

Whitepaper and Final Performance Report
NEH Grant #HD-5120910

Egyptian Ceremony in the Virtual Temple
Avatars for Virtual Heritage
(Short title: Egyptian Oracle)

Jeffrey Jacobson, Director
PublicVR

Submitted: 30 Nov 2011

Abstract

The Egyptian Oracle is a live reenactment of a public ceremony from ancient Egypt's Late Period. A life-sized projection of the Virtual Egyptian Temple extends the physical theater into virtual space. The central actor is a virtual priest, controlled by a professional puppeteer, offstage. The main supporting actors are a real person in costume and a (virtual) sacred boat bearing the spirit of the God, Horus. Audience members participate in the role of the ancient populace, an immersive learning experience. We want to introduce this essential aspect of ancient Egypt, develop the medium, and inspire empathy for other cultures. Data gathering is exploratory, in preparation for formal research. The National Endowment for the Humanities funded this work during the 2010/2011 academic year (Digital Humanities Startup Grant: HD-5120910). The resulting production will tour at a number of venues in New England, the code and script are open-sourced, and the data gathered will form the basis for a more in-depth evaluation. The performance is an early prototype and the lessons learned around it form the basis for a full implementation project, which we will propose shortly.

Table of Contents

Abstract	1
1 Introduction	4
2 Project Activities	6
2.1 Planning.....	6
2.2 Midpoint Goal.....	6
2.3 Communications Software	7
2.4 Change in Software Platform.....	7
2.5 Addition of a Surround Sound System	7
2.6 Larger Role for the Puppeteer	8
2.7 Larger Role for the Animator	8
2.8 Change to Fully Live Performance at York University	8
2.9 Additional Performances and Variations.....	9
2.10 Addition of Professor Burgess.....	9
3 Accomplishments & Products.....	9
3.1 The Performance Itself.....	9
3.2 The Open Source Software	9
3.3 The Traveling Kit	10
3.4 Publications.....	10
3.5 Institutional Review Board Approval.....	10
3.6 The All-Live Performance	11
3.7 Acknowledgements	14
4 Evaluation	16
4.1 Results From Page One of the Questionnaire.....	16
4.2 Audience Comments.....	18
4.3 Results From the Videos.....	19
4.4 Other Lessons Learned	20
4.5 Protocol and IRB.....	20
5 Continuation and Impact.....	21
6 Gillam's General Report	23
7 Literature Review	28
7.1 The Virtual Egyptian Temple.....	28
7.2 Drama and Performance in the Temples	28
7.3 The Original Egyptian Oracle	29
7.4 Digital Puppetry	29
7.5 Educational Theater and Cultural Heritage	30

7.6	Digital Puppets for Educational Theater	31
7.7	People in Virtual Heritage.....	32
7.8	Works Cited (In this Section)	32
8	APPENDIX: The Alternate Script.....	36
9	Public Implementation Materials.....	44
9.1	Story Board for the Performance	44
9.2	The Role Cards	58
9.3	Snapshots of the Project Web Site.....	59
9.4	Snapshots of the Project Wiki	60
9.5	Code Documentation.....	64
9.6	The End User License Agreement for the Open Source	71
10	Institutional Review Board.....	74
10.1	Approval Letters.....	74
10.2	Protocol.....	76
10.3	K-12 Cover Letter	79
10.4	K-12 Permission Form.....	80
10.5	Expedited Review Application	83
11	Evaluation Materials.....	89
11.1	After-Show Questionnaire	89
11.2	Summary Form for Questionnaire Data.....	91
11.3	Raw Data from Questionnaires.....	92
11.4	Instructions for the Video Scoring Rubric.....	96
11.5	Video Scoring Rubric.....	97
11.6	Raw Data From Video Rubric	102
12	Project Management Documents	106
12.1	Senior Staff.....	106
12.2	Senior Advisors.....	106
12.3	Other Valued Contributors	107
12.4	Institutional Partners.....	107
12.5	Deliverables and Teams.....	108
12.6	Snapshots of the Discussion Forum.....	117
12.7	Schedule.....	120
13	Publicity and Publications.....	122
13.1	The Puppet Showplace Theater Flier.....	122
13.2	The General Flier.....	123
13.3	Ajayan Nambiar’s Master’s Thesis.....	124

1 Introduction

The Egyptian Oracle performance is a live reenactment of an authentic public ceremony from Ancient Egypt's Late Period. We project our Virtual Egyptian Temple on the wall at life scale extending the physical theater into virtual space, as shown in Figure 1. The temple is not a film and not a static image, but a true three-dimensional space, which the audience navigates during scene changes. The central actor is a high priest, an avatar controlled by a live human puppeteer, hidden offstage. The supporting actress, in costume, stands to one side with a clear view of the screen, mediating the experience. Audience members represent the Egyptian populace acting out brief roles in the drama. Finally, the sacred boat (left) is another puppet also controlled by the puppeteer. In the drama, the will of the temple god moves the boat.



Figure 1: The priest interrogates two audience members playing the part of neighbors in a dispute. Next, the priest will appeal to the spirit of Horus in the sacred boat for judgment.

The show conforms to a high level of historical accuracy, suitable for any museum setting. Members of the audience come before the god with questions to be answered and problems to be solved (. The priest poses questions to the god, and interprets the movements of the boat as divine revelation, with the force of law; the processional Oracle was an essential feature of Egyptian public life during this period. The National Endowment for the Humanities (USA) funded the development of the performance, evaluation, and open-source software (HD-5120910). This 90-second video of sample scenes illustrates the interactive nature of the show better than any written explanation:

<http://publicvr.org/egypt/oracle/shortvid.html>

Educational theater has a long history in museums and as special events at K-12 schools. It is an important and useful way to excite students about the subject matter and convey certain ideas that are not easily represented in any other way. These events are best employed as part of a larger curriculum; they can illustrate ideas in unique, interactive ways that help students

synthesize information they recently learned in the classroom. Egyptian Oracle is designed for children 8-12 years of age, although older children and adults enjoy it too.



Figure 2: The spirit of Horus moves the sacred boat to choose the woman (center) for a great honor. This is the moment when many realize the priest is a puppet and not a program.

Our immediate goal is to show audiences how ceremony and drama were essential to ancient Egyptian culture, something not well represented in most museum exhibitions or textbooks. More broadly, we want to sharpen their empathy for other cultures and connect ancient civic life with that of today. We also want to investigate the educational power of this low-cost technology, which we will open-source at the end of the project. The same approach could represent other times, places, scales and topics. The puppet could be a Roman emperor, a dinosaur, or Mr. Protein, guiding the audience through a human cell. By mixing physical and virtual reality, we gain many of the advantages of both, producing an immersive experience.

PublicVR is a 501c3 non-profit corporation dedicated to free software and research in Virtual Reality for Education and Human Factors. Two of our most active areas of research and development are cultural heritage and educational theater. We provide an infrastructure for researchers and their project teams to bid on grants, sign and enforce agreements, process donations, and distribute their works. Support includes web hosting, accounting services, strategic planning, communications infrastructure, version control and archiving, and equipment purchasing and loan. We also support the dissemination of knowledge on Virtual and Augmented Reality for Education and Human Factors by funding demonstrations, public events, museum installations, and publications. PublicVR is a “virtual” corporation, with no official membership or staff. All projects and all staffing are on a contract basis, although long-term affiliates provide continuity. All intellectual property donated or produced under PublicVR’s legal is free to the public for noncommercial use. PublicVR holds a non-exclusive copyright to all such works. See <http://publicvr.org>.

For more information on the scholarly foundations of this project, please see 7 Literature Review. You can see samples of our web presence in section 9.3 Snapshots of the Project Web Site and 9.4 Snapshots of the Project Wiki.

2 Project Activities

The following discussion presumes that the reader has seen the original grant application (HD-5120910).

We completed our project goals within the year originally promised, September 2010 – August 2011, and we chose to do additional work in the September 2011.

2.1 Planning

Mixed reality projects require a high degree of organization because they require close cooperation between professionals from disparate fields: history, computer science, human-computer interaction, art and animation, educational psychology, music, and theater. Even their deliverables tend to vary greatly in form and nature but must fit together into a coherent working whole. An additional challenge for any mixed reality project comes from the team being geographically separated and everyone working on it part-time. This arrangement has significant advantages of low fixed cost and ability to “cherry pick” the best talent from almost anywhere. However, it requires discipline, planning, and good communication tools.

We began planning work in August, 2011, immediately upon notification that we had been awarded funding for the project. We constructed a preliminary design and initial schedule, and we constituted project task teams. Each task team was assigned deliverables and a percentage of each member’s project time. For scheduling we used a basic Gantt chart to lay out the major stages of the project and their temporal relationships. For details on all of the project management, see section 12 Project Management Documents.

Despite all of these controls, this was still a creative project, and the planning had to allow flexibility as the work took shape. To get the base work done, we revised the schedule five times, backed off some of the formalism in the task team assignments and deliverables, gave the puppeteer and the animator larger roles, and worked hard to get a performance before an audience of children. We also chose to improve the project by having two extra performances, adding a surround sound system, and making the performance at York University completely live. For details, see section 3.6 The All-Live Performance.

2.2 Midpoint Goal

On February 12th we had our first rehearsal at the University of Buffalo, NY, generously hosted by Drs. Josephine Anstey and David Pape. We used an early working version of the software, which had most of the priest movements implemented and a few basic boat actions. Planning this mid-term workshop gave us a deadline to work toward, forcing us to build a comprehensive rough draft of the project at an early stage. We then give ourselves permission to change anything we wanted, from that point forward. We ended up reusing most of the elements, but from a fresh perspective. The biggest change was giving the puppeteer and the live actress complete control over the script. The narrative team had written it by committee, which got the job done and taught us a lot, but it needed to be finished by experts.

2.3 Communications Software

We used a standard “phpBB3” electronic bulletin board for most of our internal communications. It is located at <http://forum.publicvr.info/> but the area for the Oracle project is only visible by logging in with a forum account. The forum supports permanent threaded conversations with file attachments, easily accessible via a web browser. This is essential for long-running conversations, because email is ephemeral and chronologically organized. See 12.6 Snapshots of the Discussion Forum for some examples.

Similarly, we shared computer code and artwork using Subversion (SVN), a popular source code repository system, which gives users access to all versions of the software/artwork anywhere on the Internet. Setting it up was rather difficult because of the way Unity is structured, but it was worthwhile. Unity, Inc. sells a much more convenient “asset server” which works similarly, but it only manages versions of things in Unity. SVN can track any kind of file, such as the Autodesk 3ds Max animations, source images, and music, all of which are essential. Historically, SVN was not often used for non-text files, because it treats them in a space-inefficient manner. However modern network speeds and nearly unlimited disk drive capacity has made this much less of a problem. We continue to monitor the development of other version control systems; we have seen ones that are somewhat better, but not enough to justify the cost of changing over at this time.

After some bad experiences attempting to teleconference with Skype and TokBox, we settled on using traditional conference calls for our virtual meetings for this project. Only the narrative team had in-person meetings, and then only in the first half of the project.

2.4 Change in Software Platform

We chose Unity (www.unity3d.com) as our software platform, instead of the old Unreal Tournament 2004, which we had originally proposed. UT 2004 had always been difficult to use, and by the time the project began, it was antiquated. We could have chosen UT 2004’s successor, the Unreal Development Kit (UDK), which is far superior and free. That would have been a good decision, because of its excellent graphics capabilities. However, we decided that Unity was the best choice.

We were able to do everything we needed in Unity Free, the free version of their software. Unity is well-documented, well-structured, and easy to learn, and it runs on Macintosh, the PC, most web browsers, and several mobile devices. It also has a lot of capability for future expansion. Most notably it can be used to implement networked online virtual worlds (e.g., Second Life). The only downside is that it has only a “middle weight” graphics engine, requiring more work by the artists than a highly capable development environment such as UDK. Nevertheless, we decided that the superior flexibility of the Unity platform mattered more.

2.5 Addition of a Surround Sound System

In the Summer of 2011, Ajayan Nambiar was a master’s degree student in the Department of Digital Media at Northeastern University. For his thesis project, he completed an internship at PublicVR constructing a sound system for the Egyptian Oracle performance. PublicVR purchased the equipment, and he did the work under the supervision of Dr. Jacobson and his program advisor at Northeastern. The result was a portable installation, based on a home sound system, a professional sound mixing board, and mobile microphones. His thesis is available at <http://publicvr.org/IndexDownloads/NambiarA2011.pdf>

Mr. Nambiar came back to PublicVR for an internship in the fall of 2011 during which he improved the sound specialization effects for the software. He used the FMOD Sound Library, free software already integrated with Unity. The effect is a greater sense of space and sound quality. Nambiar also made the travelling installation more rugged, using luggage donated by Dr. Jacobson. He is writing a conference paper about his work.

2.6 Larger Role for the Puppeteer

Our puppeteer (Brad Shur) quickly became indispensable to all major phases of the project, especially in designing the overall experience. The original \$2000 allocated for his compensation was obviously insufficient. We renegotiated our contract with his employer, Puppet Showplace Theater, giving them a total of \$5000 of project funds for his time and for staging one rehearsal and one performance there. This was taken from the original budget's \$2000 for Brad Shur, the \$1500 payment to Puppet Showplace Theater, their \$200 equipment allocation, and \$1300 from expected travel costs.

2.7 Larger Role for the Animator

In the original grant, we greatly underestimated the effort required to produce the animations and integrate them with the code. Significant input from the project technical director (Jacobson) was required to help the animator (Hopkins) deliver animations in a form the software could use. We are fortunate that our programmer (Kirschner) had experience with digital puppeteering, a specialized skill. The original animation budget had been \$1200 for two student interns, paid by PublicVR internal funds. In the end, we had to pay Hopkins \$4615, and he worked hard for it. We also gave Kirschner a \$1000 bonus for all his extra effort, in addition to his \$5000 base fee. PublicVR paid for the cost overrun.

2.8 Change to Fully Live Performance at York University

Christopher Innes and his group at York University had been given \$3000 for their advice and insight in the design process and to stage an Egyptian Oracle performance. With permission from the Office of Digital Heritage, York staged an alternative performance with all live actors, all physical props, and an alternative script. See section 3.6 The All-Live Performance and 8 APPENDIX: The Alternate Script

The actors were Robyn Gillam's students, who wrote their own alternative script for the Oracle, and performed it in front of a green screen. We digitally placed them in an appropriate location in the Temple during each scene. The result was very informative, and gives us a valuable perspective on future productions. The recording for the performance is available at this temporary location,

Part One: <http://vimeo.com/29782690>

Part Two: <http://vimeo.com/29782786>

The video will soon be posted at their permanent home:

<http://moderndrama.ca>

2.9 Additional Performances and Variations

The May 1, 2011, performance at the Boston Cyberfest drew only 6 attendees, due to weather and scheduling problems. They have promised another performance at their Axiom Center for new and experimental media, which we are currently working to schedule.

We chose to have an additional performance on May 13, 2011 at the Immersive Education Conference at Boston College. It went well, and we gathered good data from it.

We felt it was very important to see how children responded to the performance, considering it is ultimately intended for museums and other all-ages venues. We scheduled with three separate community-based youth groups, and all of them canceled a week or a few days before the scheduled shows. Finally, we scheduled a visiting show at the William Diamond Middle School, which went very well.

We are aware that the NEH does not fund K-12 education, although they are friendly to K-12 use of things produced by their projects. We undertook a performance at a middle school, and the necessary approvals, at our own expense.

2.10 Addition of Professor Burgess

Professor Lowry Burgess is an eminent artist who has done a lot with communications technology, and has become an essential adviser to Egyptian Oracle. We have formalized his role, and budgeted \$1500 in PublicVR funds for his effort. Adding him also gave us access to the Institutional Review Board at Carnegie Mellon University. They reviewed all our testing protocols research to make sure the protocols adhere to federal ethical guidelines.

3 Accomplishments & Products

We accomplished everything we originally proposed – and more.

3.1 The Performance Itself

First and foremost, we produced the performance itself. A film of the complete May 20 performance at Puppet Showplace Theater is available here:

<http://publicvr.org/egypt/oracle/longvid.html>

For documentation on the narrative, please see section 9.1 Story Board for the Performance and section 9 Public Implementation Materials generally for everything needed to stage the Egyptian Oracle performance.

Furthermore, performers can rewrite the narrative in a number of interesting ways. See section 8 APPENDIX: The Alternate Script. With a programmer and an animator one can also change the available backdrops and movements. With enough effort, one could change the entire theme.

3.2 The Open Source Software

We have open-sourced and documented the software, which is accessible here:

<http://egyptianoracle.wikispaces.com/>

Users will be able to download an executable file to stage the show, or they can download the source code. The source code and artwork will also be stored on our SVN server (section 2.3 Communications Software), and we will give a user account to anyone who wants to make a serious effort to improve it. Similarly, the documentation will be stored in a public Wiki, for which we will grant user accounts upon request. For more information on all these materials, see section 9 Public Implementation Materials.

3.3 The Traveling Kit

All of the electronics needed for the show can be packed into the luggage shown in this image. Generally, this includes a laptop computer, the controller, a headset for the puppeteer, a stereo amplifier, a mixer, 2 mobile microphones and their base station, 5 speakers with tripod stands, a short throw projector, a lot of cabling, the role instruction cards, costume for the live actress, and test-taking materials. All of this is detailed in Ajayan Nambiar's Thesis, which is available at <http://publicvr.org/IndexDownloads/NambiarA2011.pdf>



3.4 Publications

Drs. Robyn Gillam and Jeffrey Jacobson now have a contract with Duckworth Books to write a book about the Egyptian Oracle generally and this project specifically. A complete draft is due in August, 2012, with publication later that fall.

Ajayan Nambiar's Master's Thesis at <http://publicvr.org/IndexDownloads/NambiarA2011.pdf> is already self-published on the PublicVR website. He is recasting it and adding more discussion of his current work to a paper intended for the International Conference of Auditory Displays in Atlanta, 2012.

Dr. Jacobson has written an unfinished draft paper about the project, intended for the Journal on Computing and Cultural Heritage. He will submit an abbreviated version of the paper to the Conference of High Tech Heritage in Amherst, 2012.

3.5 Institutional Review Board Approval

One of the most important products of this effort is a protocol for gathering data on learning and attitudes at the performances. Our methods conform to federal guidelines for ethics in research and were formally approved by the accredited Institutional Review Board at Carnegie Mellon University. Now, it will be a relatively simple matter to gain approval for similar performances in the future. For more information see section 4 Evaluation.

3.6 *The All-Live Performance*

By Robyn Gillam, Egyptological Consultant

As part of our research into the performance of ancient Egyptian oracles for the development of our live-virtual event, I have prepared, in collaboration with Christopher Innes, a student performance of an oracular event that was filmed in blue screen format by the staff of the Canada Research Chair in Performance and Culture (CCR) at York University, Toronto, on April 4, 2011.

A full recording is available at this temporary location,

Part One: <http://vimeo.com/29782690>

Part Two: <http://vimeo.com/29782786>

They will soon be posted at their permanent home,

<http://modern drama.ca>

The full script is available in section 8 APPENDIX: The Alternate Script.

This performance was one of a series customarily performed in Egypt in the Greek and Roman Mediterranean, a course taught by me for the Programmes in Classical and Religious Studies in the Department of Humanities in the Faculty of Liberal Arts and Professional Studies at York University, Toronto. These performances, which are scripted, directed and performed by the students in this course as part of their major assignment, while originally staged as live events, are all based on actual Egyptian liturgical or performance texts of the later period (4th century BCE to 2nd century CE) (Gillam, 2005, 138-44). Since 2005, in collaboration with Christopher Innes and the CCR, these events have been filmed in blue screen format for insertion into the appropriate spot in Public VR's virtual temple, using screen shots. The video clips are hosted on the CCR website under historical materials, but they have also proven extremely useful for the understanding of the uses and limitations of available spaces for the performance of rituals in Egyptian temples.

Since there is no complete script of an oracular event dating from the time period studied in the course, the students had to prepare their own script without reference to a single original text, using the same collection of sources utilized by the team working on the virtual oracle. These sources span a time period from the 12th century BCE to the 3rd century CE and reflect various aspects of the oracular ceremony, as well as its evolution over time. The oracular performance was part of a larger event, performed by two tutorial groups, which represented the Festival of the Raising of the Sky at Esna in southern Egypt, an event that celebrated springtime and fertility (Sauneron, 1962, 71-194). Texts describing this festival in detail in the temple at Esna date from the late 1st to late 2nd centuries CE, with much of the documentation dating from the reign of the emperor Domitian (81-96 CE). Although no oracular event was scripted as part of the festival, such events often occurred when the god's statue was carried in procession during such public events, within the temple grounds or outside (Kruchten, 1986, 92ff.). The insertion of the oracle into this festival was suggested by the observation of Kruchten (1986, 211-14) that in one instance, a consultation took place after the image of the god had been "charged up" by the rays of the sun. As the same ritual of touching the image by the sun's rays is recorded at the Esna festival (Sauneron 1962, 127-181), it was decided to place the oracular consultation directly after this rite had taken place. The Union with the [Sun] Disk rite was performed by one tutorial group, and the oracular consultation by the other.

Since the Rite of “Union with the [Sun] Disk” took place in front of the main door of the festival hall of the temple (Sauneron, 1962, 284), the action represented in the oracular performance is located in the courtyard, as part of the procession of the god to the Birth House, to witness the birth of his royal and divine son, an important part of the festival (Sauneron, 1962,185-242), alluded to at the end of the students’ oracular performance.

In order to create a script for their performance, the students used materials from different periods and contexts to help them create a script appropriate to the time period of the festival (the reign of Domitian) and the themes of the course. Foremost among these are multiculturalism, along with the negotiation and construction of identity in a colonized society. Their script succeeded well in realizing all these objectives. The opening speech of the priest presents the ruling ideology, which equates the emperor with Pharaoh, conferring legitimacy both on him and the temple under his patronage. It also emphasizes the creative and fructifying power of the Nile flood, controlled by the local god, Khnum, who created the world as a potter throwing vessels on a wheel (Morenz, 1960, 183-5; Hornung, 1982, 69-70). The annual Nile flood was vital not only for the well-being of Egypt, but the food supply of the whole Roman empire, recognized in the great Isis temple that Domitian built in Rome itself (Lembke, 1994).

After the speech of the priest, the image of the god is placed in the model boat for the procession and placed on the shoulders of two priests. (The small size of the filming area meant that there was no room for any more boat bearers). It is then that the first petitioners approach the oracle. The first two are Egyptian. One question is legal, about a theft and the other about the fertility of petitioner’s wife. The other two petitioners are Greek. One asks about his marriage prospects, the other about the fertility of his land in the coming year. Like the virtual oracle, the script allows the oracle to display its full repertoire (indicating a negative or affirmative response, choosing a person from a “lineup,” indicating a preferred document, and giving different answers when a question is repeated). This version of the routine is distinguished by the presence of a Greek scribe, recording all oracular decisions, a measure deemed necessary for the political security of the province of Egypt and the empire as a whole (Ripat, 2006).

Because of Roman policy aimed at curbing the influence of the temples and their economic supports, this oracular ceremony is not as grand or formal as the earlier ceremonies documented in the temple of Amun in Thebes in the earlier first millennium, and of course, there are no questions of a political nature, as these would be regarded as treason (Ripat, 2006). However, a full range of social and legal issues are addressed, showing the continuing importance of the temple and its oracular gods in Egyptian life (Frankfurter, 1998, 145-197).

The enactment of this oracular session by the students was also valuable for the light it shed on the physical aspects of the ceremony. The students were responsible for making all props and costumes, as well as writing, directing, and acting the script. The processional model boat and the image of the god were each made by one student and were great assets to the performance. The boat was made of strong cardboard, with wooden carrying poles. The statue, measuring exactly one cubit in height (52.5 cm) was modeled in clay on a wire armature. Since the two props were created independently, securely anchoring the statue in the boat proved a challenge, and it proved impossible to raise the front of the boat as part of the affirmative movement suggested by scholars (Kruchten, 1986, 105). Although our statue and boat had structural problems of their own, this suggests that the very large, elaborate and, undoubtedly, very heavy processional boats could not have been manipulated in such an emphatic way. Another issue we noted with the boat was the necessity for the bearers to be of similar height, although this might not have been a problem if the boat was being carried by a large number of men.

As is the case with the virtual oracle, we noted the importance of the position of the god's boat in relation to the audience (both onlookers and those participating in the rite), in order that the movements in which the god's decisions are embodied are legible. The enactment of the rite in a public place with clear sight lines would be of paramount importance for the comprehension and validity of the processional oracle, which gave decisions openly, not in secret. While it may not have been possible for all the spectators to see which document the god chose, the decision was always repeated for their benefit by the officiating priest and, was in any case, fully visible to the petitioners, as shown in our re-enactment.

Lastly, the live reenactment demonstrates the importance of musical/percussive accompaniment to this event, which is suggested by earlier depictions of oracular sessions, shown accompanied by female musician priestesses equipped with hand drums and sistrams (sacred rattles) (Černý 1962, 42). I feel that the students' decision to punctuate every decision of the god with a shake of the sistrum rattle to be an inspired one that can be closely related to actual cultic practice (Robins, 1993, 145-9). Such musical accompaniment would be a welcome addition to the virtual oracle performance.

In all, the enactment of a live oracular performance by my students has proven extremely informative for understanding how the event unfolded in actual space, as well as alerting us to some potential problems with the actual manipulation of the processional boat. I would like to thank Christopher Innes and the CCER for making this performance possible and my students for their hard work, dedication and good humor.

Works Cited

- Černý, J. (1962). "Egyptian Oracles," in Parker, A Saite Oracle Papyrus from Thebes in the Brooklyn Museum (Papyrus Brooklyn 47.218.3). (Providence: Brown University): 35-48.
- Frankfurter, D. (1998). Religion in Roman Egypt. Princeton University Press, Princeton, NJ.
- Gillam, R. (2005). Performance and Drama in Ancient Egypt. London: Duckworth.
- Hornung, E. (1982). Conceptions of God in Ancient Egypt (tr. J. Baines). Ithaca: Cornell.
- Kruchten, J-M. (1986). Le grande text oraculaire de Djéhoutmose intendant du domaine d'Amon sous le pontificat de Pinedjem II. Bruxelles: Fondation reine Elisabeth.
- Lembke, K. (1994). Das Iseum Campense in Rom. Heidelberg: Verlag Archäologie und Geschichte.
- Morenz, S. (1973). Egyptian Religion (tr. A. E. Keep). Ithaca, Cornell, University Press.
- Ripat, P. (2006). "The Language of Oracular Inquiry in Roman Egypt." Phoenix 60. 3/4: 304-328.
- Robins, G. (1993). Women in Ancient Egypt. Cambridge, MA: Harvard.
- Sauneron, S. (1962). Les fêtes religieuses d'Esna aux derniers siècles du Paganisme. Cairo: Institut Française d'Archéologie Orientale.

3.7 Acknowledgements

Senior Staff

Jeffrey Jacobson, Ph.D. (jeff at publicvr.org, <http://planetjeff.net>) Project and technical management. Evaluation design and analysis. Configuration management. Interim and final reports. Distribution websites.

Robyn Gillam, D.Phil. (gillam at yorku.ca) - Egyptology research. Provided source materials, constraints and an educated viewpoint during our creative process.

Friedrich Kirschner (friedrich at zeitbrand.net, <http://zeitbrand.de/>) Our programmer. His extensive background in film and previous experience with digital puppetry was crucial and very welcome.

Brad Shur (sunrisepuppets at gmail.com) Our puppeteer for all performances. Gave invaluable advice and insight on the dramaturgical needs of the performance.

Kerry Handron (khandron at gmail.com) Leader of the narrative team. Developed and managed all of the performances of the Carnegie Museum of natural history. Gathered the data, there. Was the life actress all of their shows.

David Hopkins (davidhopkins3000 at gmail.com) Artwork and animation. The remarkably beautiful Temple was also his work from a different project.

Essential Contributors

Brenda Huggins (brenda.l.huggins at gmail.com) Was the live actress in all of our shows and assisted Brad with Making final adjustments to the script.

Asa Gray (asa.gray at gmail.com, <http://asa-gray.com/>) Created the original music for performance as well as ambient sounds for the Temple.

Ajayan Nambiar (ajayandn at gmail.com) Engineered the traveling kit for performances, which features a surround sound system. Created sound effects in the music and ambient sound of the Temple to give a greater sense of depth and realism.

Natthaphol Likhithaworn (aries15041985 at hotmail.com) Improved the animations and software performance. His dual ability to do artwork and programming is quite valuable.

Michael List - Was the puppeteer for the Carnegie Museum shows.

Advisory Board

Lowry Burgess, Prof (lb30 at andrew.cmu.edu, <http://artscool.cfa.cmu.edu/~burgess/>) Gave valuable advice on the psychological and aesthetic impact of the show. Assisted with securing Institutional Review Board Support for our evaluation efforts.

Christopher Innes, D. Phil. (prof.innes at gmail.com) Assisted in efforts to gain additional funding. Facilitated the live performance at York University.

John Baek, Ph.D. (johnybaek at gmail.com) Gave valuable advice on the evaluation protocols.

Michael Nitsche, Ph.D. (michael.nitsche at lcc.gatech.edu, <http://www.lcc.gatech.edu/~nitsche/>) Gave valuable advice on the software and the production in general.

Semi Ryu, Ph.D. (sryu2 at vcu.edu, <http://www.semiryu.net/>) Gave valuable advice on the dramatic structure of the production and possibilities for further improvement.

Other Friends and Contributors

Josephine Anstey (josephine.anstey at gmail.com, <http://www.josephineanstey.com/>) and David Pape (depape at buffalo.edu) were generous to host our mid-project dress rehearsal at the University of Buffalo, and their suggestions were most welcome.

Jon Hawkins (jhawkinsmusic at gmail.com) Rebalanced the sounds for the performance to better work with Nambiar's sound system.

Ken Hargrove, Heather Bloss, Ted Grindrod - Independent evaluators of the performances.

Brianna Plaud (briannaplaud at gmail.com) Made the costume worn by the actress in the Boston area performances.

Institutional Partners and Contributors

PublicVR (Boston, <http://publicvr.org>) Lead institution for the project. Provided administrative support, additional funding, and significant in-kind support.

Puppet Showplace Theater (Brookline, MA, <http://www.puppetshowplace.org/>) Provided performance venue for the April 19th dress rehearsal and May 20 performance. Provided crucial staffing (Brad Shur.

Carnegie Museum of Natural History (Pittsburgh, <http://www.carnegiemnh.org/>) Provided an excellent venue, educational context, audiences, and evaluation.

William Diamond Middle School (Lexington, MA, <http://lps.lexingtonma.org/diamondms>) - Provided both venue and data gathering for the September 19 performance. Assisted with development of testing protocol.

Boston Cyberarts (AXIOM) (Boston, <http://bostoncyberarts.org/>) Provided a venue for the May 1st performance.

Boston Children's Museum (<http://www.bostonkids.org/>) Simulcast the May 1st performance into their exhibit space.

Grid Institute (<http://mediagrid.org/>) Provided a performance time, and an excellent audience for the May 13th performance at the immersive education conference.

Boston College (<http://www.bc.edu/>) Provided the performance-space for the May 13th performance. University of Buffalo (<http://www.buffalo.edu/>) Provided space for our mid-project dress rehearsal on February 12th>

4 Evaluation

Obviously, we wanted to other data on what people learned and how they felt about the show, so we could know how to make it better and gain insight on its impact. We implemented rigorous data collection procedures and ethical review procedures to set the stage for proper research 4.5 Protocol and IRB..

As part of this preparatory step, we devised a simple questionnaire, which we administered at the end of each performance (11.1 After-Show Questionnaire). The first half of the questionnaire asks two demographic questions (age and gender), two questions about the Participants role in the performance, two general assessment questions (Did you like it? Did you learn something?), and two knowledge questions. The back of the questionnaire asked for short answers, one testing knowledge, and the rest asking for suggestions and opinions. We administered no pretest and we had no control groups. We also filmed each performance, and had an independent evaluator to catalog and rate moments during the performance, such as when an audience member asks a good question (See 11.4 Instructions for the Video Scoring Rubric and 11.5 Video Scoring Rubric).

The purpose was to gather some preliminary data, which would help us to posit a more formal study, later on. We have performances scheduled for spring of 2012, where we will attempt more formal knowledge testing. A true research study will have to wait for the full implementation. Nevertheless, some interesting trends emerge from the data.

4.1 Results From Page One of the Questionnaire

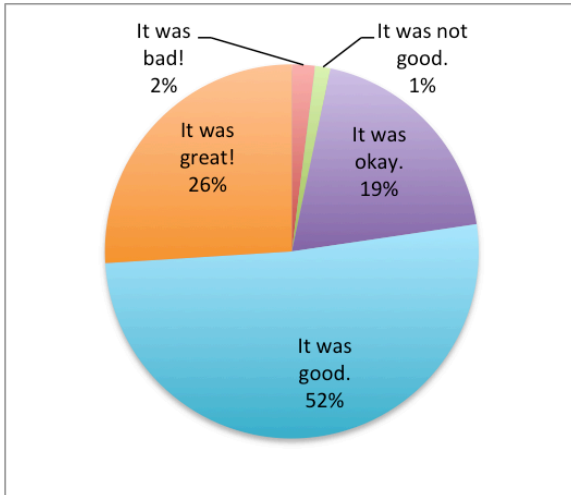
For each performance we had an independent evaluator tally up the responses on the first page of the post-performance questionnaire (11.1 After-Show Questionnaire) and enter the data in the summary form (11.2 Summary Form for Questionnaire Data). Some answers were ambiguous, and required judgment. The following descriptive statistics characterize the results, and the full, raw, data is available in section 11.3 Raw Data from Questionnaires. Our evaluators treated the short essay answers on the second page of the questionnaire as anecdotal feedback. Informally, we combined that with comments we observed in the after-show discussion in section 4.2 Audience Comments.

Generally, our results are based on a total of 150 audience members responding, on the following breakdown by show:

- Puppet Showplace Theater (May 20th): General public audience of all ages, including three children.
- Immersive Education Conference (May 13th): There was an audience of at least 150 K-12 educators and educational researchers and some graduate students, and one child. Ages ranging from mid twenties to eighties. Thirty-six of them completed the questionnaire.
- Carnegie Museum of Natural History (July 21st): Twelve teen volunteers at the museum. This is not from the same CMNH show depicted in the video.
- William Diamond Middle School (September 19th): Nearly 100 students, all of them at or near eleven years old. The show was part of their required studies on ancient civilizations, but presented as a special treat. Seventy-seven students have the necessary parental permission to fill out the questionnaire.
- In the first three shows, there was a very even distribution of ages from teens to septuagenarians.

- Across all shows, gender balance was good, with 80 males, 63 females, and 7 not reporting.

Across all groups, responses to the question, “**Did you enjoy the show?**” showed that most did, according to the percentages of their responses graphed below. We surmise that people who did not like the show tended to avoid the questionnaire, so they are probably underrepresented. Nevertheless, audience reaction was generally positive, and we have received requests for future performances based on what people saw.

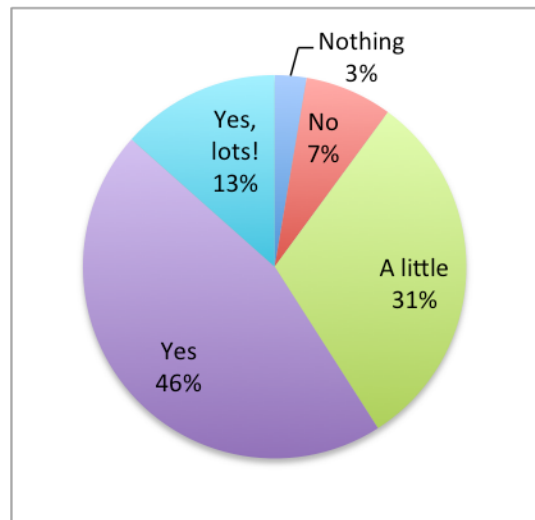


Responses to the question, “**Did you learn anything interesting?**” were similar, with the average of all responses being a solid “Yes”. See the graph, below. Just as importantly, enjoyment and perceived learning were strongly correlated (Pearson’s $R = 0.435$, $P < 0.001$). Looking at the same thing in data from the first three shows, without the data from the middle school, the correlation is still quite strong (Pearson’s $R = 0.370$, $P = 0.001$). Isolating data from the school showed the correlation exceptionally strong between reported enjoyment and reported learning (Pearson’ $R = 0.527$, $P < 0.001$). This parallels one of the more frequent suggestions in the free response section of the questionnaire that we add

more content and information to show. Audiences want more depth and detail, which we can certainly provide in a full implementation.

We also saw a small but statistically significant difference in the self-reported learning for students at the middle school versus everyone else at the show ($P < 0.05$, two-tailed, uneven samples T-Test). The school children reported a slightly higher level of learning, but showed no significant advantage in the 2 actual knowledge questions, “What was MAAT?” and “Who Was the High Priest?” The difference may have more to do with their own expectations in the school setting.

Another result is that females reported somewhat higher enjoyment ($P = 0.093$, 2-tailed, uneven samples T-Test). The evidence is still quite uncertain, because the T-Test reports that there is a 9% chance that the difference is just a random fluctuation. If the difference is real, it could be because the live actress is a woman or because one of the last events in the show (selecting the next Isis for the community play) involved the females.



About three quarters of respondents got the “Who is the High Priest” question right (The man talking to us and the actress). About half of the audience members chose the correct answer for “What is MAAT” (harmony, peace, and justice). We found no significant relationship between performance on these questions versus age, gender, or venue. It takes more than two questions to really probe learning effectiveness, but the responses we did get showed that the audience was listening and was absorbing information.

Finally, we must caution the reader not to take any of these results too seriously. They are quick and simple measures, intended to give us a little more insight with which we can posit a more serious study. In that, we definitely succeeded.

4.2 Audience Comments

The following is an informal combination of comments made by audiences on the second page of the questionnaire and during the videotaped after-performance discussions. The audiences were:

- A general audience at Puppet Showplace Theater on May 20th. Mostly adults, with a few children. This was the performance depicted in <http://publicvr.org/egypt/oracle/longvid.html>
- Educational researchers during a lunchtime performance at the annual immersive education conference at Boston College, on May 13th.
- Teen volunteer docents at the Carnegie Museum of Natural History (questionnaires only).
- An audience of students at William Diamond Middle School in Lexington, Massachusetts, near Boston, on September 19th.

Despite how different these test audiences were, there was a remarkable degree of consistency in their feedback. Here are the dominant suggestions:

- Make the show longer.
- Provide more information about what we are seeing and doing. Most people simply made the statement, but a few made suggestions. Those included printed materials, longer explanations, or a supporting class or workshop that the show could be part of.
- Give the audience more to do. They like the interaction and want more of it. In the September 19 performance, the actress asked the “young maidens” in the audience to put their hands up. All the girls, and some of the boys did enthusiastically.
- Provide more visual detail, especially the virtual Egyptians.
- Improve the animations. Have the priest do more and do it better.
- In all of the after show discussions, we asked the audience (to paraphrase) “When did you realize that the priest was not just a recording or a program following some particular script? When did that happen for you?” Each audience member who answered the question identified a point in the narrative, where the priest interacted with a volunteer audience member on stage. For some it was almost the first interaction, but for others it was not until later in the performance.
- Make the screen larger, so the experience would be more immersive.
- The most popular scene was the one in which the god took questions from the audience. We will definitely do more of that in the full implementation.

And here some suggestions we thought were particularly insightful.

- Make the narrative more interesting and therefore engaging. Give the entire production more of a plot.

- Add more physical props for the audience to play with, such as (fake) food to bring to the god as offerings.
- Show the audience some of the evidence for the existence and nature of the Oracle ceremony, at the beginning of the show, such as an image Saite Papyrus, which depicts an oracle ceremony in artwork.

4.3 Results From the Videos

For each performance, we had two independent evaluators watch the film and fill out the questionnaire in section 11.5 Video Scoring Rubric according to the instructions in See 11.4 Instructions for the Video Scoring Rubric. The following descriptive statistics characterize the results and the full, raw, data is available in section 11.6 Raw Data From Video Rubric. We had four performances, which are listed in section 4.1, above. Note that the video for the CMNH performance was for an overnight camp of Girl Scouts in grades 4 through 7 who came with family members and younger siblings, about 40 people. This was a different CMNH performance from the one that produced the questionnaires.

At this point, the main value of the videos is anecdotal, looking at the individual questions asked, audience responses at key moments, etc. The scores we got from applying the video rubric help us think about the performances, but we are not ready to report statistical results, here. We do not have enough data, yet, and there are still too many confounding factors. Reporting the results of statistical tests may give certain comparisons an unjustified appearance of authority. We encourage the reader to look at the raw data. Nevertheless there are some interesting trends worth talking about, which were visible in the recordings.

- Audiences definitely had no trouble following the action and behaving appropriately.
- Our strategy of selecting people for specific parts (e.g. the Water Thief) ahead of time appears to have worked well. Most volunteer actors got high marks from the evaluators.
- The show works better if there are at least some children in the audience. Even a few children engaging with the show seemed to have a strong positive effect on the adults.
- Children aged 6 and 7 do seem to get something out of the show, but they do not engage fully. Those aged 8 to 12 do very well.
- The adults tended to do well acting out their parts, but they were less enthusiastic in the general interactions, such as the Egyptian style applause.
- The show really depends on audience feedback, and does not usually work well with an adult crowd of less than 20 people.
- When the priest is addressing someone or pointing to something, the live actress often has to interpret for the audience. With a monoscopic projection the direction of the priests pointing looks different depending on the location of the observer. This is true regardless of whether the image is on a flat screen or in a dome. We would like to experiment with the new 3D projectors too see if a stereoscopic image is more readable.
- The puppeteer was able to have the priest directly address someone that the puppeteer can only see through the WebCam link. This is a good sign for future projects where the puppeteer may be in a remote location somewhere else on the Internet.

4.4 Other Lessons Learned

Making an early prototype of the Egyptian Oracle performance was a good experience for us, forcing out a number of issues that we might not have anticipated had we attempted a full implementation. In no particular order, these are some of the lessons learned:

- It appears to be nearly impossible to describe the performance to anyone who has not seen something similar. For example, we spent a half hour each on the phone with a reporter from the Boston Herald and another from the Boston Globe in the run-up to the May 1 performance. They simply failed to understand what we were doing, so no article resulted from our calls. Fortunately, the 90-second introductory video works well and needs very little additional explanation.
- We are quite pleased with Unity as a software platform for this work.
- In the future, we will demand a returnable deposit for any large audience group.
- We definitely needed an art director for the project, someone to look after the artistic nature of the whole production.
- We must spend more effort on music and sound effects. Our intern, Asa Gray, did a fine job on the ambient music, but we did not give him enough time to produce the sounds for the transitions and actions. More importantly, a music and sound person should be involved from the very beginning of the design.
- Our very best ideas came from the original historical sources. That should not be a surprise, because the Egyptian processional Oracle was a very mature genre of religious performance. The Egyptians had centuries to perfect it.

4.5 Protocol and IRB.

We first developed this process on advice from the accredited Institutional Review Board at Carnegie Mellon University. Later we expanded it to handle groups of children and classes at K-12 schools, which required a considerable investment of time and effort. We are aware that the NEH does not fund K-12 education, although they are friendly to K-12 use of things produced by their projects. We undertook a performance at a middle school, and the necessary approvals, at our own expense. Importantly, that means we now are covered for data gathering in ambiguous situations such as public shows where a school group or a youth group is in attendance. The key difference is that the children's' parents are not present, so prior written approval is necessary.

We filmed our performances and the discussion afterward, all for later analysis. We alerted the audience to the camera in the back of the room and let them know that their faces would not be captured on camera as long as they looked forward at the screen. We also told them they could avoid having their voices recorded by simply remaining silent. In all our performances, no one objected, and we received a great deal of cooperation. Audiences were also eager to offer their suggestions for improvements to the show. We distributed a short questionnaire at the end, to probe their attitudes and ask a few factual questions. For the show to William Diamond Middle School on September 19, we gained prior approval from most of students' parents. Children who did not have approval were seated off to one side of the performance space. They still had a good view, and were able to interact, but were not in view of the camera.

For the details on our protocols and approvals, see section 10 Institutional Review Board. This is one of the important products of this project. By establishing our ability to gather data, we are well-positioned to do full research in a follow-on project.

5 Continuation and Impact

We will continue to publicize the work through our website, the open source, and our publications. We hope to build a community around the software and encourage people to share their improvements through our SVN server and the Wiki.

We will seek funds to do a full implementation of the Egyptian Oracle performance from a variety of sources. One of those will be the NEH's office of Public Programs under their "America's Cultural and Historic Organizations" grant program, for which applications are due January 11, 2012. We are also a partner on Dr. Christopher Innes's re-application for funds to Canada's Social Sciences and Humanities Research Council. Innes's proposal describes three educational public shows, one of which employs the technology and techniques developed at Egyptian Oracle, and another, which also uses the Temple and the priest.

For the full implementation project we will need these basics:

- A stage director/writer to help us develop the show as an artistically coherent whole.
- A larger panel of content experts.
- An extensive and detailed evaluation of the educational effects/capabilities.
- A senior animator with a significant budget.
- A musician/musicologist involved with the project from the beginning.
- Good videoconferencing software with the ability to share the desktop.
- A broad distribution plan.
- Remote interface capability for the puppeteer.
- A better sound spatialization system for public shows and museum-based venues.
- A way to put more informational context around the show through a website, printed materials, possible involvement with the museum exhibit, etc.

We will also experiment with extensions such as:

- Adding a remote audience by simply creating a two-way Skype session between the performance space and a remote audience area. By projecting both scenes large-scale, on the wall, it is theoretically possible for the live actors and the puppet to interact with the remote audience. This is certainly worth investigating because it would require no programming but simply careful design of the projection setup and sightlines.
- Staging the show in virtual space, through a shared online virtual world, similar to Second Life, but with better technology. This would enable people to "attend" the show via the Internet.
- Mix the online show with the physical show. One possibility is to project the virtual attendees (actually their avatars) life-size onto a side-wall.
- Film the virtual show using machinima techniques along with the educational techniques.

A wide range of mixed reality presentations, performance, games, and interaction designs are now emerging. At the same time, digital avatars are also becoming more prevalent and important in both games and education. The Egyptian Oracle dramatically merges these trends, at the same time

being grounded in educational theater, which has a long and productive history. Egyptian Oracle will be an instructive example for artists, educators, and entertainers.

Part of the distribution plan for a full implementation of the Egyptian Oracle project will be to create a self-sustaining enterprise. It would be a nonprofit theater group that travels to different locations during the performance. The same group would also show institutions (usually museums) how to stage the show themselves.

Appendices

6 Gillam's General Report

The following is my own review of what we accomplished in the Egyptian Oracle project (NEH HD-5120910). I would like to commend the programmers and puppeteers for a job well done. The goal of the project was to produce a working prototype of the ceremony and performance, which we certainly have done. As expected, a number of issues remain around the movements and appearance of the priest and shrine bearers.

I shall begin this review with a discussion of the shrine and its bearers. Although no actual boat shrine of the type used in processional festivals has survived, many depictions can be found in Egyptian visual art of the second and first millenniums BCE. Although these objects represented the character of an actual boat, they lacked the technical details found on real waterborne craft. However, they made up for this with very elaborate decorations that centered on a closed shrine or openly displayed image of the god of the festival. This image was, in turn, surrounded by statuettes of other divinities or kings and with decorative features, often including gold and semiprecious stones. The whole ensemble was decorated with flowers, precious cloths, and small ostrich feather fans (Kruchten, 1986, 7-8; Brand, 1999). These latter features indicated the presence of the spirit of divine royalty. Larger examples of these fans were carried by priests walking alongside the shrine, but not engaged in carrying it (Kruchten, 1986, 8).

The number of priests actually carrying the shrine varied according to the importance of the god and the level of royal patronage (Černý, 1962, 36). References to the number of carrying poles for the shrines found in Egyptian texts are subject to interpretation but indicate that as many as perhaps 50 persons could be engaged in this activity, which was regarded as a great honor (Černý 1962, 36). Obviously such a large numbers of shrine bearers would make the work of the programmers and puppeteers impossibly complex, and the number used at present is an acceptable compromise. However, in order to make the Oracle performance more realistic, it is essential to make the movements of the bearers both more convincing and with more individual variation.

For the sake of simplicity and also to lower expenses, the boat shrine, priest and bearers have been constructed as a single unit. While this allows both the programmers and operators to create and animate a seamless and coherent whole, it has also created a scenario where the movements and character of the components making up the puppet are not sufficiently differentiated from each other or sufficiently legible or complex in themselves. Also, although a great deal of progress has been made with the walking movement of the bearers, the programming of their walking movements across the ground surface needs to look more realistic. An important desideratum for the further development of this project would be the greater differentiation of these individuals, as regards physical appearance, facial features, or even gestural mannerisms. As the bearers are conceived to be acting together under the influence of the god, they would appear much more convincing if they exhibited more fluid movements and individual character.

Of far greater importance is the appearance and movement of the high priest himself. As the master of ceremonies, he is main dramatic focus of the performance, and the figure to which the audience devotes most of its attention. He also provides the main interface between the real and virtual worlds. While I regard the general appearance and costume of the priest as satisfactory, both his stance and gestures require some improvement. While it is an important part of both

the philosophy and practice of this project that the priest is not too lifelike, but displays some of the exaggeration of physiognomy that we find in puppetry (Engler, et. al., 1973), this can sometimes be inappropriate. I refer in particular to the stance commonly assumed by the priest, with legs apart and hips thrust forward. This stance is found nowhere in formal Egyptian art and is at variance with ideas of decorum expressed in this culture (Baines 2007, 1-30). It is particularly inappropriate for the exalted and dignified figure who comes face to face with the god every day in the temple sanctuary and communicates directly with that god on public occasions (Fairman 1954, 179-81).

A more serious issue that could be addressed with further funding is the refinement of the technical or specialized actions of the officiating priest. In practice, he would proceed before the boat shrine, walking backwards so as not to turn his back on the god, at the same time as he would be waving the incense burner in front of the boat (Černý 1962, 42, fig. 9). Due to lack of sufficient funding, it has not been possible to program both of these movements. This is unfortunate, for without having the incense burner to manipulate, the priest appears to be moving his hands in an ineffectual or meaningless fashion. His backward movements also need to be improved, because, at the moment, he appears to be hopping up and down or dancing, actions inappropriate to the dignity of his office and the decorum of the event.

The manipulation of the incense burner is also quite complex in and of itself. The whole unit, which represented a human hand holding an offering on its palm at its outer end, terminated where it was grasped in the head of the falcon Horus (Beinlich, 1978). The hand held the metal or clay receptacle where glowing charcoal dissolved grains of incense. In the middle of the arm part of the burner was another receptacle filled with fresh grains of incense. Numerous representations confirm that while the priest was moving the burner to and fro, he was also throwing fresh pellets from the middle receptacle into the burner at the end, one grain at a time (Schäfer, 1986, 228). Such a movement would have required excellent hand and eye coordination and was no doubt learned from years of practice. Still, it would have been central to his role in the processional festival. The coordination of the censer movements during the oracular consultation raises questions about the continuity of the censuring activity and raises the possibility that the high priest could have handed the censer to another priest while interacting with petitioners. A possible solution to this problem would be to follow the procedure used in large temples, where the high priest confronts the god somewhere outside the temple in the course of the procession (Kruchten, 1986, 39), rather than the routine followed at the village temple at Deir el Medina, where the priest walks backwards in front of the boat (Černý, 1962, 42, fig. 9).

Further funding would allow these aspects of the ceremony to be researched in more detail and would permit the construction of other puppets or the elaboration of the existing one, to add more actors attendant on the god, including the above-mentioned fan bearers, assistants to the high priest, or even musicians and singers found in some representations. The grandest of oracular ceremonies, held in the great temple of Amun at Karnak in the early 1st millennium BCE even featured more than one divine boat, although only one was active in oracular sessions (Kruchten, 1986, 3). Further funding would also make possible the re-creation of such elaborate events.

In the second part of this paper, I would like to report on work done with Jeffery Jacobson and David Hopkins in updating and improving the virtual temple. This had been an important aspect of this project, as the temple is now freely available online through Unity 3D. Last summer, we went back over the original sources for the wall decoration of the temple, chiefly the reports of the Oriental Institute Epigraphic Survey (1939-40) on the temple of Ramesses III at Medinet Habu (12th century BCE), now also freely available online. In addition, we reviewed the other

main source, for the temple architecture, the temple at Edfu (3rd-2nd century BCE) (Rochemonteix and Chassinat et al.,1892-1985). These were the sources for the original VR temple, and remain so as they are, of all Egyptian formal temples, the best preserved in their entirety. However, we did supplement these sources with comparable materials from Oriental Institute Epigraphic Survey publications (1936) of other temples of Ramesses III, chiefly for architectural elements. For the decorative programs of the wall decorations, especially interiors, we further explored Ptolemaic and Roman temples at Dendera and Esna (1st centuries BCE-CE) using the Napoleonic Description de l'Égypte (Jomard, 1809-28) and the Institut Française d'Archéologie Orientale publication of the Dendera temple (Chassinat and Daumas, 1939-52). Among many other sources consulted, numerous works of Dieter Arnold (1992, 1994, 1999) have proved indispensable.

This Summer, with the help of a small grant from my university, I was able to visit Egypt, where I took the opportunity to take over a thousand high resolution digital photographs in the temples at Edfu, Esna, Medinet Habu, Dendera, Abydos, Medinet Habu, Karnak and Luxor which will be an invaluable aid to our ongoing work on the digital temple. This photography project was particularly fruitful because ongoing conservation work by the Supreme Council of Antiquities (SCA), funded by USAID, has revealed the beautiful color schemes of these sacred spaces (Anon. 2011).

Although our virtual temple as an exemplar is not intended to represent an actual building, we have made every effort to address the diachronic and synchronic aspects of how these structures were used and how they developed. The formal Egyptian temple is attested between the mid 2nd millennium BCE and the early 1st millennium CE. Although its basic layout remained constant over this period, there were many developments and regional variations. In our later editions of this temple, we have tended to focus on the later period (post 5th century BCE) for several reasons. Firstly, the performances that I have coordinated with my undergraduate students are all based on texts from this later period, during which they are most plentiful. Secondly, with the exception of the Medinet Habu temple, the Graeco-Roman temples are the best preserved. Their walls are also covered with a wealth of inscriptional and pictorial evidence that gives valuable details about what activities were done where, when, and for what reasons in the temple (Fairman, 1954, 165-6). The later period is also a time of great cultural interaction brought about by foreign domination, raising issues around multiculturalism and postcolonial discourse that are still highly relevant to our current audiences (Lloyd, 2000; Bingen, 2007).

As it stands, our temple is part New Kingdom (12th century BCE) and part late period or Graeco-Roman. The gates and courtyard are earlier while the festival hall and sanctuary are later, a situation that can be paralleled in the actual temple at Mendes in Lower Egypt (Redford, 2010, 151-7). Although our temple does not represent an actual building, it should be historically plausible. To be architecturally and environmentally plausible, its sacred enclosure should be filled with subsidiary buildings such as granaries, priestly housing, storerooms, and food preparation areas – components that made it a functioning social and economic unit. Its sacred character would also be enhanced by a birth house (Daumas, 1977) where the god renews himself yearly, as well as a precinct for the worship of the god Osiris (Coulon, L., Leclère, F., and Marchand, S., 1995), who represents the death of the temple god. The only addition we have been able to make recently is the sacred lake, representing the water of creation and the site of many water-borne ceremonies.

However, the temple precinct needs more sacred trees to flank the processional way to the front of the pylon, which should also be lined with sphinxes (Cabrol, 2001). Outside the gate, in the world beyond, we would like to construct a quay for the sacred boat that took the god on

journeys on the Nile, as well as the bustling town, with its mud-brick houses, of which the temple was the focus (Grajetski W. and Quirke, S., 2002-3). Although we are very pleased with what we have been able to accomplish with the NEH Digital Startup grant, much remains to be done. Additional funding could create a more attractive and legible temple, as well as provide it with an environment that could greatly enhance the learning experience of future audiences.

Works Cited

- Anon. "Training and Conservation in Luxor," ARCE Conservation 2011 [Report]: 1-6.
- Arnold, D. (1992). *Die Tempel Ägyptens*.
- , (1994). *Lexikon der ägyptischen Baukunst* (Zürich: Artemis).
- , (1999). *Temples of the Last Pharaohs*. New York: OUP.
- Baines, J. (2007). *Visual, Written Decorum. Visual and Written Culture in Egypt*, Oxford University Press.
- Beinlich, H. (1978). "Ein ägyptischer Räucherarm in Heidelberg." *Mitteilungen des Deutschen Archäologischen Instituts Kairo* 34: 15-31.
- Bingen, J. (2007). *Hellenistic Egypt: Monarchy, Society, Economy, Culture* (ed. R. Bagnall). Berkeley: University of California.
- Brand, P. (2001) "Sacred Barks," *The Oxford Encyclopedia of Ancient Egypt* (ed. Donald B. Redford). New York: Oxford University Press, 9 August 2011. <http://www.oxfordreference.com.ezproxy.library.yorku.ca/views/ENTRY.html?subview=Main&entry=t176.e0627>
- Cabrol, A. (2001). *Les voies processionnelles de Thèbes*. Leuven: Peeters.
- Černý, J. (1962). "Egyptian Oracles," in Parker, A Saite Oracle Papyrus from Thebes in the Brooklyn Museum (Papyrus Brooklyn 47.218.3). (Providence: Brown University): 35-48.
- Chassinat, É and Daumas, F. (1934-1952). *Le temple de Dendara*. Cairo: Cairo. Institut français d'archéologie orientale.
- Coulon, L, Leclère, F., and Marchand, S. (1995). 'Catacombs osiriennes de Ptolémée IV à Karnak.' *Cahiers de Karnak* 10: 205-37.
- Daumas, M. (1977). 'Geburtshaus.' *Lexikon der Ägyptologie II* (ed. W. Helck and E. Otto). Wiesbaden: Harrosswitz: 462-76.
- Engler, Larry and Fijan, Carol, *Making puppets come alive : a method of learning and teaching hand puppetry*. New York: Taplinger,1973
- Epigraphic Survey. (1930-40). *Medinet Habu* Chicago: Oriental Institute.
- Epigraphic Survey. (1936). *Ramses III's Temple within the Great Enclosure of Amon*. Chicago: Oriental Institute.
- Fairman, H. W. (1954). "Worship and Festivals in an Egyptian Temple," *Bulletin of the John Rylands Library* 37: 165-203.

Grajetski W. and Quirke, S. (2002-3). "The temple of Nubt, Naqada, the remains of the New Kingdom (about 1500 BC)" <http://www.digitalegypt.ucl.ac.uk/naqada/temple/plannk.html>. August 12, 2011

Jomard, E. (ed.). (1809-1828). Description de l'Égypte: publiée par les ordres de sa majesté l'empereur Napoléon le Grand. Paris: Édition impériale.

Kruchten, J-M. (1986). Le grande text oraculaire de Djéhoutmose intendant du domaine d'Amon sous le pontificat de Pinedjem II. Bruxelles: Fondation reine Elisabeth.

Lloyd, A. B. (2000) "The Ptolemaic Period," in The Oxford History of Ancient Egypt (ed. I. Shaw). Oxford: OUP: 369-94.

Redford, D. B. (2010). City of the Ram-Man: The Story of Ancient Mendes. Princeton: Princeton University Press.

Rochemonteix, M., Chassinat, É., et al. Le Temple d'Edfou Paris : Ernest Leroux, 1892-1985.

Schäfer, H. (1986). Principles of Egyptian Art. (tr. and ed. J. Baines). Oxford: Griffith Institute.

7 Literature Review

The following is a survey of similar work and literature relevant to the project. Eventually, all this will become part of a journal article.

7.1 *The Virtual Egyptian Temple*

The formal Egyptian temple represented a royal palace (Bell, 1997, p. 133) and was a focus for community gatherings (McDowell, 1999, pp. 91-104) as well as being an important cultural and economic multiplier (Kemp, 1989, pp. 193-97). The temple kept the vast majority of the population at a distance from the vital daily cult rituals at its heart (Spalinger, 1998), but it also *invited the participation of the general population in large open-air festivals* and provided a place for public prayer at the back wall of the sanctuary, which represented the bedroom or throne (“great seat”) of the god (Cabrol, 2001, pp. 580-1).

Our virtual temple is the setting for our mixed reality performance of the Oracle. The temple embodies the typical forms and constructions of the later period of Egyptian history (650 BCE to 200 CE), but with reference to earlier architecture (Troche, 2010). It does not represent any actual house of worship, but is instead an idealized example, an *exemplar* (Barsalou, 1992, p. 28), of its type. Its intentional simplicity supports focused educational narratives, free from the idiosyncrasies of any specific temple. We chose to build a late period temple because most of our performance scripts date from that time. Also the greater complexity of the wall decoration of that period better documents the various activities that went on inside the temple and around it.

The Virtual Egyptian Temple project began in 1993 using some of the earliest computer graphics hardware and software available for common use. In 1994 it showed in the Guggenheim Soho as an example of how to exploit the new artistic medium, *Virtual Reality*. Over the years, the temple has evolved through several versions, using several technologies, always with the same goal in mind: to educate the public about Egypt and explore the capabilities of new media. Like the ones before it, the current virtual Temple is available to the public for noncommercial and educational use. It is currently the subject of guided tours at the Carnegie Museum of Natural History in Pittsburgh.

7.2 *Drama and Performance in the Temples*

Religious experience was based on “seeing” the god (Assmann, 1996, pp. 222-4, and Spalinger, 1998, pp. 251-2) and knowing that the temple and its staff kept a “balance” (*Maat* in Egyptian) (Gablin, 2007, p. 337) between the human and divine. This reciprocal arrangement was personified by the King, who was the transmission point between these two spheres (Hornung, 1982, pp. 138-142, 201-4). Successful balance maintained the necessities of life, including the flooding of the Nile and the social stability of the population. The social stability meant that all the people kept to their social stations and were gainfully employed in their appropriate occupations in a harmonious and non-threatening natural environment (Assmann, 1979).

7.3 *The Original Egyptian Oracle*

The Egyptian oracle cannot be directly documented before the New Kingdom (1539 to 1075 BCE), when temples in large urban centers became the focus of religious and political display. Thutmose III (1479 to 1425 BCE) describes how he was chosen to be king by the god Amun during a festival, and other rulers of this period describe private conversations with the god. However, it is not until the reign of Ramesses II (1279 to 1213 BCE) that the processional oracle is fully documented. This event, in which the spirit of the god caused its image to move in response to spoken or written questions on legal and personal matters, is attested at great state festivals as well as at village gatherings.

During the Third Intermediate Period (1075 to 712 BCE), when the priests of Amun ruled southern Egypt on behalf of the god, the oracle intervened directly in state affairs. It is from this time that the most detailed descriptions of oracular procedure survive. Although the oracular decisions appear, for the most part, to be foregone conclusions, occasionally the god acted unexpectedly.

Applications of the oracular functions proliferated at this period. The Brooklyn Oracle Papyrus (651 BCE), with its striking vignette, shows that this form of the oracle survived into the late Period, and classical writers such as Herodotus attest to the importance of oracles in Egyptian culture, as well as the respect they garnered in the Greek-speaking world. During the period of Greek-Macedonian and Roman rule (332 BCE to 638 CE), new forms of oracular consultation were imported from Greek culture, but the processional oracle survived into the Christian period.

Although the Egyptian temples lost their political influence and much of their wealth under the Romans, all oracular decisions were carefully monitored and recorded in Greek, testifying to their continuing importance. Certain events occurring in modern Egyptian culture, such as funerals and religious festivals, provide ethnographic parallels that may shed light on the practices used in ancient oracular performance.

7.4 *Digital Puppetry*

Most digital puppets are *avatars*, representations of their users in online virtual worlds such as Second Life, World of Warcraft, and many games and virtual reality-based educational applications. (The fact that everyone is a puppeteer in these emerging mass-communication media is provocative.) The term *digital puppet* is broadened to include representations of anthropomorphic animals, caricatured humans, or more abstract beings – in much the same way as real puppets are. The one thing that all puppets have in common is control by one or more human beings at performance time.

Jim Henson created the first modern digital puppet, Waldo, in 1988. It interacted directly with physical puppets. Today, most of the advanced digital puppets are used for film production, as in the series “Sid the Science Kid” (Henson, 2009). The Henson Company and other practitioners have developed a range of innovative control devices, most of them involving the manipulation of physical models. The marionette in Figure 3 by Mazalek (2007) is an example of this approach.

Most of the highly realistic or lifelike digital puppets, such as Gollum from the Lord of the Rings (Allison, 2011), are driven by live motion capture of an entire human figure. For Gollum, the actor’s movements were directly translated to the virtual body, which was digitally captured and merged with the live footage. The effect is expressive and human, perfect for detailed humanoid figures. However, it is not the ultimate control interface. The reason why the Henson Company

and others use more abstract control mechanisms is the power of caricature. They want to deliberately exaggerate or abstract puppet motions to achieve dramatic effect in a way that would not be efficient or possible with full-body motion capture. Unfortunately, the great majority of digital puppets, the avatars in games and online virtual environments, are controlled by keyboard and mouse, which is limiting. One of our long-term goals is to make better low-cost control schemes accessible to the public.

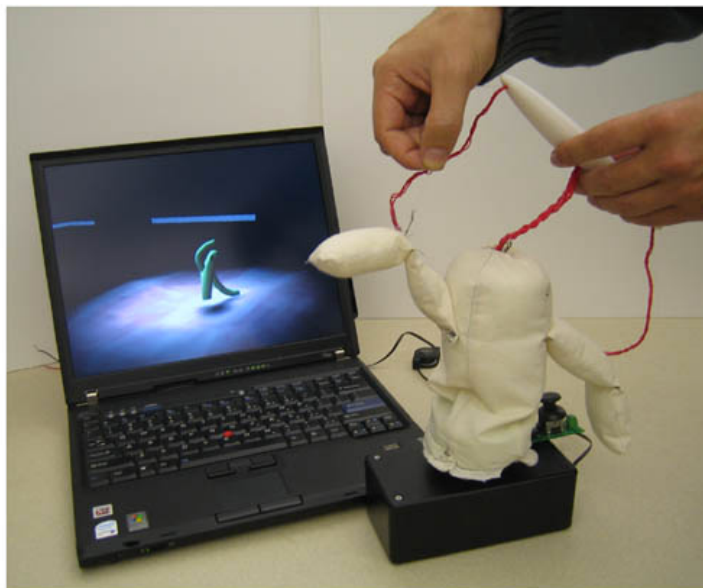


Figure 3: This physical marionette is the control device for its virtual doppelgänger (Mazalek, 2007).

Puppetry has a close connection with shamanic ritual. A ritual object such as a mask or puppet is used by the shaman, who enters a trance state of consciousness. This results in a performance of great excitement, public engagement, and reflection of community (Ryu, 2008). Our goal is to capture some of the excitement and meaning of the original ritual. Beginning with the Egyptian Oracle, we are attempting to enact and further "extend" the meaning of ritual for the digital age, exploring the psychical and technical dimensions of the virtual. The puppet is a transformative vehicle for both the performer and the community, in this case bridging ascending layers of abstraction and sacredness in the Oracle performance.

7.5 Educational Theater and Cultural Heritage

Dramatic productions for educational purposes have a long and productive history. Today, many large science museums have small theaters and workstations where educators give demonstrations and talks, often with audience participation. Children's museums stage puppet shows, introducing children to science topics and social issues. Theater is also educational for student actors in K through 12 schools and higher education. Since the 1920s, students have learned a wide range of subjects and developed their personalities by learning stagecraft (Ward, 1957). In theater, the games, improvisation, and role-play foster communication skills, problem solving, social awareness, and positive self-image.

One of the most widely used forms of Theater in Education is reenactment of scenes from an historical time period: "An enactment may be cast in the past, the present, or the future, but happens in the 'now of time.'" (Wilheim, 2002, p. 8) This strategy encourages students to interact with the material, challenging them to take on the viewpoint of a character. For example, undergraduate students perform rituals documented in Egyptian religious texts from the Late or Graeco-Roman periods (Derchain, 1981), the Mysteries of Osiris in the Month of Khoiak (Gillam, 2005, pp. 100-8), and Confirmation of Power in the Egyptian New Year ceremonies (Gillam, 2010). These enactments provide a powerful learning experience for the students and reveal aspects of the ceremonies not easily evident in the text.

A much less structured approach is the Living Museum (Gillam, 2005). Actors and the reconstructed or restored historical architecture together simulate a community from the past, which visitors can explore and with which they can interact. The actors play an interesting balancing act between staying in character and recognizing the reality of the modern person talking with them. Examples include Historic Williamsburg (www.history.org) and Fort Snelling in Minnesota (www.mnhs.org). The live actress in the Oracle performance also does this. The public wants to see history acted out (Gillam, 2005).

7.6 Digital Puppets for Educational Theater

A small number of dramatic productions use a sophisticated avatar/puppet for direct viewing by an audience. Ryu (2005) and her digital puppet performed a shamanistic drama for a live audience. Andreadis and his colleagues (2010) created a live performance by avatar/puppets in a virtual Pompeii, which was projected onto a large screen for a live audience. Anstey et al (2009) staged a number of dramas with a mixture of virtual and live actors. As with a traditional play, the audience is "along for the ride."

Egyptian Oracle is an interactive performance, where audience members may communicate directly with the puppet. There are other notable examples. In "Turtle Talk with Crush," at Disney theme parks, children see and converse with a virtual digital puppet projected onto the glass of an aquarium (Trowbridge, 2009). In a cultural sensitivity training scenario employing the *Gepetto* system (Mapes, 2011), a trainer-puppeteer controls virtual Arabs with a single user/audience member. In the *TeachMe*[™] system, used to help middle school children resist peer pressure, a single puppeteer controls five virtual characters, who interact directly with the user/audience (Wirth, 2011).

Much similar work is being done with artificially intelligence (AI) of human figures that interact with the audience/user. These are neither puppets nor avatars, but *agents* or *bots*. Sophisticated agents require a great deal of skill and expense to program, but have the obvious advantage of being portable, tireless, and potentially connected to databases not directly accessible to human readers. Kenny (2007) and Swartout et al (2006) describe their own cultural sensitivity trainer, an AI-driven direct competitor to the puppeteered system *Gepetto* described in Mapes (2011). The Intelligent Virtual Environments group at Teesside University developed another sophisticated AI system. In their "Madam Bovary" simulation, the user takes the role of a major character, the foil for the protagonist (Cavazza et al, 2007). Each of these systems is intended for a single user in a CAVE-like (Cruz-Neira, 1993) display.

Good AI-driven interactive storytelling can be developed without extreme cost. For example, Anstey (2009) and Pape also staged interactive psychodramas that respond to the emotional state of the user. Ryu (2008) developed a shadow puppet that responds directly to the user. In both systems, the programming for the artificial intelligence is relatively simple, but the artistic and narrative design makes it a powerful experience.

Actually, the *TeachME™* system is a hybrid (Wirth, 2011). When the puppeteer is not directly controlling an avatar, it acts according to a set of pre-programmed rules and behaviors. In this way, all five avatars are active in a way throughout the scenario. Many adventure games allow a single user to control a group of characters, using a similar strategy (e.g., *Everquest*).

7.7 People in Virtual Heritage

"Virtual Heritage" is the use of electronic media to recreate culture and cultural artifacts as they might have been or interpret them as they are today (Moltenbrey, 2001; Roehl, 1997). The central element is usually a three-dimensional computer model of a person, place, or thing, especially an ancient monument, temple, home, or other social space (CAA 2009; VAST 2009; VSMM 2009). Today, most virtual heritage applications are intended for a desktop computer and are often web-delivered, and very few include virtual people. At a recent conference only the presentations by Fortel and Pietroni and the one by Jacobson and Handron described the use of one or more virtual people (CAA 2009).

Applications that **do** include people fall into four categories. **(1)** Virtual people are simply there in the environment, going about their business. They could be simple crowds (Ulicny, 2002) or a complex drama (Andreadis, 2010). **(2)** The virtual people interact with the user in some meaningful way (Champion, 2008a, 2008b). **(3)** In online worlds such as *Second Life* (2009), users represent themselves as ancient peoples and interact with each other and artificial people (Bogdanovych, 2009). **(4)** The experience is personal, as the user interacts with a single complex virtual person (Jacobson, 2008; Economou, 2001). These same categories of virtual people can be implemented in *augmented reality*, which is some mixture of the physical world and VR. For example, the LIFEPLUS EU 1st system (Papagiannakis et al, 2004b) describes a proposed and later built hybrid where virtual humans, as ancient Romans, are visible to observers in the physical ruins of Pompeii. The augmented reality also included reconstructions of some of the architecture but was primarily focused on the people. *Egyptian Oracle* is an augmented reality with interactive people, both physical and virtual.

7.8 Works Cited (In this Section)

- Andreadis, A.; Hemery, A.; Antonakakis, A.; Gourdoglou, G.; Mauridis, P.; Christopolis, C.; and Karigiannis, J. N. (2010) *Real-Time Motion Capture Technology on a Live Theatrical Performance with Computer Generated Scenery*, 14th Panhellenic Conference on Informatics. IEEE Computer Society, ISBN: 978-0-7695-4172-3 <http://doi.ieeecomputersociety.org/10.1109/PCI.2010.14>
- Anstey, J.; Patrice Seyed, A.; Bay-Cheng, S.; Pape, D.; Shapiro, S. C.; Bona, J.; and Hibit, J. (2009) *The Agent Takes the Stage*, International Journal of Arts and Technology 2009 - Vol. 2, No.4, 277-296.
- Assmann, J. (1979). "Königsdogma und Heilserwartung. Politische und kultische Chaosbeschreibung in ägyptischen Texten," *Apocalypticism in the Mediterranean World and the Near East*. Uppsala. ed. David Hellholm. Tübingen (Mohr, 1983): 345-77.
- Assmann, J. (1996). *The Mind of Egypt: History and Meaning in the Time of the Pharaohs*. tr. A. Jenkins (New York: Henry Holt).
- Allison, T. (2011). *More than a Man in a Monkey Suit: Andy Serkis, Motion Capture, and Digital Realism*, Quarterly Review of Film and Video, v28, n4.

- Barsalou, L. W. (1992). *Cognitive Psychology*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc. 0-8058-0691-1 (hardback) 0-8058-0691-0 (paperback).
- Bell, L. (1997). "The New Kingdom Divine Temple: The Example of Luxor" in *Temples of Ancient Egypt*. ed. B. Schafer. Ithaca and London: Cornell University Press and Tauris: 127-83.
- Bloom, B. S. (1956). *Taxonomy of Educational Objectives; Book 1 Cognitive Domain*. New York: Longman, Inc. 0-582-28010-9
- Bogdanovych, A.; Rodriguez, J. A.; Simoff, S.; Cohen, A.; and Sierra, C. (2009). "Developing Virtual Heritage Applications as Normative Multi-agent Systems" in proceedings of the Tenth International Workshop on Agent Oriented Software Engineering (AOSE 2009) at the Eighth International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS 2009), Budapest, Hungary, May 10-15, 2009. Accepted for publication.
- Cavazza, M.; Lugin, J.L.; Pizzi, D.; and Charles, F. (2007). "Madame Bovary on the Holodeck: Immersive Interactive Storytelling" in proceedings of the ACM Multimedia 2007, ACM Press, Augsburg, Germany, 2007.
- Champion, Erik. (2008a). "Game-based historical learning" in Rick Ferdig, (ed.). Handbook of Research on Effective Electronic Gaming in Education, Information Science Reference, Florida, USA, 219-234. ISBN 978-1-59904-808-6 (hardcover), ISBN 978-1-59904-811-6 (e-book).
- Champion, Erik. (2008b). "Otherness of Place: Game-based Interaction and Learning in Virtual Heritage Projects," *International Journal of Heritage Studies*, 14(3), 210-228. <http://www.tandfonline.com/doi/abs/10.1080/13527250801953686#preview>
- CAA (2009). Computer Applications in Archaeology, Williamsburg, VA, USA, March or http://www.caa2009.org/CAA2009_CompletePrelimProgram030409.pdf.
- Cabrol, A. (2001). *Les voies processionnelles de Thèbes*. (Leuven: Peeters).
- Cruz-Neira, C., Sandin, D., and DeFanti, T. A. (1993). Surround-Screen Projection-Based Virtual Reality: The Design and Implementation of the CAVE. SIGGRAPH '93.
- Derchain, P. (1965). Le papyrus Salt 825 (BM 10051): Rituel pour la conservation de la vie en Égypte. Brussels: Académie Royale de Belgique.
- E&S (2010) <http://www.es.com/>
- Economou, D.; Mitchell, W.; Pettifer, S.; Cook, J.; and Marsh, J. (2001). "User Centered Virtual Actor Technology" Conference of Virtual Reality, Archeology, and Cultural Heritage (VAST). 1-58113-447-92001.
- Gablin, L. (2007). "Private Religion," in *The Egyptian World*. ed. T. Wilkinson (New York/London: Routledge).
- Gillam, R. (2005). Performance and Drama in Ancient Egypt. (London: Duckworth).
- Gillam, R.; Innes, C.; and Jacobson, J. (2010). Performance and Ritual in the Virtual Egyptian Temple. Computer Applications in Archaeology (CAA), Granada, Spain, April, 2010.
- Hornung, E. (1982). *Conceptions of God in Ancient Egypt: The One and the Many*.tr. J. Baines. (Ithaca, NY: Cornell University).
- Hunt, D.; Moore, J.; West, A.; and Nitsche, M. "Puppet Show: Intuitive Puppet Interfaces for Expressive Character Control" in *Medi at terra. Gaming Realities. A Challenge for Digital Culture*. ed. M. Santorineos (Fournos Centre for the Digital Culture, 2006), Athens, October 4-8, 2006, 159-167.

- Jacobson, J. (2011) *The Effect of Visual Immersion in an Educational Game; Gates of Horus*, International Journal of Gaming and Computer-Mediated Simulations (IJGCMS), special issue on educational applications, Spring, 2011, IGI Global.
- Kemp, B.J. (1989). *Ancient Egypt: Anatomy of a Civilization* (London: Routledge)
- Kenny, P.; Hartholt, A.; Gratch, J.; Swartout, W.; Traum, D.; Marsella, S.; and Piepol, D. (2007). "Building interactive virtual humans for training environment," in Interservice/Industry Training, Simulation and Education Conference (I/ITSEC) 2007.
- McDowell, K. G. (1999). *Village Life in Ancient Egypt* (London/New York: Oxford University Press).
- Mapes, D. P., Tonner, P., Hughes, C. E. (2011) *Geppetto: An Environment for the Efficient Control and Transmission of Digital Puppetry*. HCI (14), v6774, 270-278, Springer.
- Mazalek, A. and Nitsche, M. "Tangible Interfaces for Real-Time 3D Virtual Environments" in Proceedings of the International Conference on Advances in Computer Entertainment Technology, ACE 2007 (Salzburg, AU, June 13-15, 2007) (New York: ACM Press, 2007), 155-162.
- Moltenbrey, K. (2001). "Preserving the Past," *Computer Graphics World*, September, 2001.
- Papagiannakis, G.; Schertenleib, S.; O'Kennedy, B.; and Poizat, M. (2004b). Mixing Virtual and Real scenes in the site of ancient Pompeii. *Journal of Computer Animation and Virtual Worlds*, 16(1), 11-24.
- Roehl, D. B. (1997). "Virtual archeology. Bring new life to ancient worlds," *Innovation*, 28-35.
- Ryu, S. (2005) *Virtual Puppetry and The Process of Ritual* Computers and Composition(C&C.): Elsevier, 2005.
- Ryu, S.; Faralli, S.; Bottoni, P.; and Labella, A. (2008) *From Traditional to Virtual Interactive Puppetry: A Comprehensive Approach*, Proc. of ISEA 2008, 14th International Symposium on Electronic Arts, Singapore: July 25-August 3, 2008.
- Spalinger, A.J. (1998). "The limitations of formal ancient Egyptian religion," *Journal of Near Eastern Studies* 57: 241-260.
- Swartout, W.; Gratch, J.; Hill, R.; Hovy, E.; Marsella, S.; Rickel, J.; and Traum, D. "Toward Virtual Humans," in *AI Magazine*, v.27(1), 2006.
- Troche, J. and Jacobson, J. (2010). An Exemplar of Ptolemaic Egyptian Temples. *Computer Applications in Archaeology (CAA)*, Granada, Spain, April, 2010.
- Trowbridge, S., Stapleton, C. (2009) *Melting the Boundaries Between Fantasy and Reality*, *Computer*, v 42, n7, 57-62, July 2009, doi:10.1109/MC.2009.228.
- Ulicny, B. and Thalmann, D. (2002). Crowd Simulation for Virtual Heritage. First International Workshop on 3D Virtual Heritage, Geneva
- VAST (2009) VAST International Symposium on Virtual Reality, Archaeology and Cultural Heritage. www.vast2009.org
- VSMM (2009) Conference on Virtual Systems and MultiMedia (Dedicated to Digital Heritage). <http://www.vsmm2009.org/>
- Ward, Winifred Louise. *Playmaking with Children from Kindergarten through Junior High School*. New York, NY: Appleton-Century-Crofts, 1957.

Wilheim, Jeffrey D. *Action Strategies for Deepening Comprehension*. New York, NY: Scholastic Professional Books, 2002.

Wirth, J.; Norris, A. E.; Mapes, D. P.; Ingraham, K. E.; and Moshell, J. M.: *Interactive Performance: Dramatic Improvisation in a Mixed Reality Environment for Learning*. HCI (14) 2011: 110-118

8 APPENDIX: The Alternate Script

This script was developed by the students in <Say course name> under the direction of Dr. Robin Gillam. They then acted it out live in front of a green screen, so backdrops from the Virtual Egyptian Temple could be added later. See section 3.6 The All-Live Performance.

Scene One

Chief-Lector Priest (Egyptian - one)
Priests/boat carriers (Egyptian - two)
Musician (one)
Fan Bearers (two)

The Chief-Lector Priest, musician, and fan bearers stand behind the altar.

The musician is playing the sistrum rattle. While the Chief-Lector Priest speaks, the Priests hold the boat. The fan bearers lift up the god, they pick up the image of the god that is sitting on the altar, and place it on the boat.

CUT

NOTE: Fan bearers NEED fans.

The fan bearers stand on either side of the god waving their fans in unison.

Chief-Lector Priest:

When the Chief-Lector Priest speaks, the fan bearers stop waving their fans and the musician stops playing the sistrum rattle.

While the Chief-Lector Priest speaks, the Priests carrying the boat walk two small steps forward. The Chief-Lector Priest walks backwards in front of them waving his incense.

Year 7, fourth month of winter, day one,

On The Festival of The Lifting of The Sky.

We welcome the grace of the creator god, Khnum-Re,

Here in the courtyard of Esna in the great city of Latopolis

The blessed primeval god Khnum-Re

Has come forth in processional appearance.

Praise he who provides the land with the seeds of life

Prepare these offerings of bread and beer, choice cuts and everything good.

We give offerings to his beauty Khnum-Re

And thank him for the promise of harvest and for the coming season of flood

Khnum-Re, the beautiful creator of all things

We offer incense to you as daily food. (Chief Lector Priest waves his incense towards the god)

For you are the one who on his potter's wheel,

Creates all beings and things, and is now before us.

Khnum-Re, may your beautiful face be gracious to the master of the two lands, Son of Re Domitian, and may he be healthy and prosperous

Today and for eternity.

CUT.

(Take podium away)

Scene Two

Chief-Lector Priest (Egyptian - one): Ava/Nathan

Priests/boat carriers (Egyptian - two): Matt and Sam

Amen-kha (Egyptian - one): Sara A.

Scribe (Greek): Rados

Fan Bearers (Egyptian - two): Kat and Donnette

Bes-Ra (Guilty of stealing Amen-kha's donkey - one): Iryna

Ser-Amen (Accused of stealing Amen-kha's donkey - one): Petra

Witness (one): Christina

Musician (one): Aya

Note: Director needs five new actors for this scene to be in position before it starts. The Chief-Lector Priest, boat carriers, fan bearers, and the musician remain on stage from the previous scene. For this scene, the musician is situated at stage left behind the questioner.

Amen-kha stands at the front of the stage in a quarter-turn position. He is separated from Bes-Ra and Ser-Amen who are kneeling to his right in a diagonal line facing the Chief-Lector Priest. The witness and scribe stand at stage right. The scribe writes down (from left to right) the responses to the questions in Greek and continues to do so throughout the procession. The musician plays the sistrum rattle and only stops when someone speaks.

Chief-Lector Priest:

The Chief Lector Priest faces Amen-kha.

Who are you and why have you entered the house of the god?

Amen-kha:

Amen-kha steps forward, moving closer to the Chief-Lector Priest. As he speaks, he bows his head in gratitude.

It is I, Amen-kha. I have come to beseech of the great god Khnum-Re, Lord of Iuniya ("yoo-knee-ya").

Chief-Lector Priest:

The Chief-Lector Priest turns toward the god. The Priests pick up the boat and rest it on their shoulders.

My good Lord, is there a matter that one should report in the divine presence?

The Priests carrying the boat move one step forward and thrust the boat upwards in unison, indicating an affirmative answer. The Priests return to their original position, standing with the boat on their shoulders.

Chief-Lector Priest:

The Chief-Lector Priest turns to Amen-kha, making sure to never turn his back on the god.

Amen-kha, let your question be known, for the great god Khnum-Re, Lord of Iuniya (“yoo-knee-ya”), will hear you.

Amen-kha:

O gracious Lord, thank you for hearing my question! I inquire of the great and powerful god Khnum-Re: Which of these men (Amen-kha points to Bes-Ra and Ser-Amen) has stolen my donkey? Grant me this.

Chief-Lector Priest:

The Chief-Lector Priest turns to Khnum-Re.

Lord Khnum-Re, the creator of all beings, on behalf of Amen-kha I ask of you: Which of these men that stand before you (The Chief-Lector Priest points to Bes-Ra and Ser-Amen) has stolen the donkey of Amen-kha?

The Priests carrying the boat turn to their left and take one step toward Bes-Ra. The boat is pushed upwards. The Priests return to their original position.

Bes-Ra:

Bes-Ra stands up and remains standing for the rest of the scene.

I dispute! My lord, I would never do such a thing!

Amen-kha:

Then I must ask once more of my Lord Khnum-Re, which of these men has stolen my donkey?

Chief-Lector Priest:

The Chief-Lector Priest faces the god.

To my Lord Khnum-Re, great, great god, Amen-kha asks you: Which of these men has stolen his donkey?

The Priests turn to their left and take one step toward Bes-Ra. The boat is pushed upwards, confirming that it was Bes-Ra who had stolen the donkey. They return to their original position.

Chief-Lector Priest:

The Chief-Lector Priest addresses Bes-Ra.

Before the priests of the god, the scribe, and the people of the town, let it be known that it has been granted by Khnum-Re, Lord of Iuniya (“yoo-knee-ya”), that you (Emphasis on this word, points to Bes-Ra), Bes-Ra, have stolen this man’s donkey. You will return the donkey to Amen-kha in the presence of the doorkeeper Pen-ta-Weret and pay a fine of nine drachmas.

CUT.

Amen-kha and the two extras exit the stage.

Scene Three

Chief-Lector Priest (Egyptian - one): Ava/Nathan

Priests/boat carriers (Egyptian - two): Matt and Sam

Petosiris (Egyptian - one): Danielle

Scribe (Greek - one): Rados

Fan Bearers (Egyptian - two): Kat and Donnette

Witness (one): Christina

Musician (one): Aya

Note: Director needs one new actor for this scene. The Chief-Lector priest, boat carriers, fan bearers, scribe, witness, and the musician remain on stage from the previous scene. The musician returns to stage right.

Chief-Lector Priest:

The Chief-Lector Priest turns to face Petosiris.

Why have you entered the god's house in this great city of Latopolis?

Petosiris:

I am here to ask of the great and beautiful Khnum-Re, Lord of Iuniya, a question concerning the fertility of my wife, Bese ("Be-say").

Chief-Lector Priest:

The Chief-Lector Priest turns to Khnum-Re.

O Khnum-Re, master of the universe, will you graciously deliver the truth to this man?

The Priests carrying the boat move forward and up, indicating an affirmative answer. They return to their original position.

Chief-Lector Priest:

The Chief-Lector Priest turns to Petosiris.

Petosiris, rejoice, for Lord Khnum-Re will hear you! (The Chief-Lector Priest turns to the god) I come to you, Khnum-Re, as you are powerful. Please hear my words. Petosiris and his wife, Bese ("Be-say"), desperately wish to have a child born to them. Will you grant them this gift, great god?

The Priests carrying the boat move forward and up, indicating an affirmative answer. They return to their original position.

Chief-Lector Priest:

The Chief-Lector Priest turns to Petosiris.

Scene Four

Chief-Lector Priest (Egyptian - one) Nathan and Ava

Priests/boat carriers (Egyptian - two) Matt and Sam

Aphrodisios (Greek - one) Sarah

Scribe (Greek - one) Rados

Fan Bearers (Egyptian - two) Kat and Donnette

Witness (one) Christina

Musician (one) Aya

Note: Director needs one new actor for this scene. The Chief-Lector Priest, boat carriers, scribe, fan bearers, witness and the musician remain on stage from the previous scene.

Aphrodisios is at stage left with two pieces of papyrus in his hands.

Chief-Lector Priest:

The Chief-Lector Priest faces him as he enters.

Have you come to this house of god to inquire of the most honourable god, Khnum-Re, Lord of Iuniya (you-nee-a)?

Aphrodisios:

Yes. I must ask of Khnum-Re, the greatest of gods, a most important question.

Chief-Lector Priest:

The Chief-Lector Priest turns toward the image of the god.

Khnum-Re, the powerful creator of all beings and things before us, will you hear this man's inquiry?

The Priests carrying the boat move forward and thrust the boat upwards, indicating an affirmative answer. They return to their original position.

Chief-Lector Priest:

The Chief-Lector Priest turns to Aphrodisios.

Aphrodisios, the great god Khnum-Re will hear your question, so let it be known.

Aphrodisios:

Aphrodisios gives the Chief-Lector Priest his two pieces of papyrus as he speaks.

I ask of the blessed Khnum-Re, here in this courtyard of Esna: Shall I marry Tapatheus out of love or Ammonous for status and money?

Chief-Lector Priest:

The Chief-Lector Priest turns toward Khnum-Re and as he speaks, he lays the pieces of papyrus on the ground before the image of the god.

To the beautiful Khnum-Re, creator of all things, the most honourable god. On behalf of Aphrodisios, son of Areios, I ask: Whom shall this man marry: Tepetheus, his love, or Ammonous, daughter of Marreies for her dowry?

The Priests carrying the boat move toward the papyrus with Ammonous' name on it.

Chief-Lector Priest:

Aphrodisios, Lord Khnum-Re has bestowed upon you the knowledge which you seek. It is Ammonous, daughter of Marreies, who you are destined to marry.

Aphrodisios:

O greatest of gods! I am grateful for your answer; however, I must admit I am disappointed to know it! I thank you for your wisdom; you know better than I do.

CUT.

Aphrodisios exits stage left.

Scene Five

Chief-Lector Priest (Egyptian - one) Nathan and Ava

Priests/boat carriers (Egyptian - two) Matt and Sam

Patrios (Greek - one) Sara A.

Scribe (Greek - one) Rados

Fan Bearers (Egyptian - two) Kat and Donnette

Witness (one) Christina

Musician (one) Aya

Note: Director needs one new actor for this scene. The Chief-Lector Priest, boat carriers, scribe, fan bearers, witness and the musician remain on stage from the previous scene.

Patrios the Greek is standing at the back of stage left and walks towards the Chief-Lector Priest carrying a special offering of the most expensive incense in a small but elegant vial handing it to the Chief-Lector Priest who faces him.

Chief-Lector Priest:

The Chief Lector Priest turns to Patrios asking:

Have you come to this courtyard to inquire of the greatest of the gods, the most honourable of gods, Khnum-Re, Lord of Iuniya?

Patrios:

Patrios Answers:

Yes, I must ask the Lord of all Lands and the most high, a question regarding the Inundation and the likelihood of the prosperity of my crops.

Chief-Lector Priest:

The Chief-Lector Priest turns toward the image of the god asking:

Khnum-Re, the powerful creator of all beings and things before us, will you hear this man's inquiry?

The Priests carrying the boat move forward and thrust the boat upwards, indicating an affirmative answer. They return to their original position.

Chief-Lector Priest:

The Chief-Lector Priest turns to Patrios saying:

Patrios, son of Athanasos, the greatest god Khnum-Re will hear your question, so let it be known.

Patrios:

Patrios still facing the Priest asks:

Oh divine God, blessed of all the world, highest of all the Gods, I ask you: Will my crops be touched by the waters of the Nile during the season of the inundation and therefore prosper?

Chief-Lector Priest:

The Chief-Lector Priest turns to the God asking:

Dearest Lord, will you grace this man with prosperous crops during the season of Inundation?

The Priests carrying the boat move forward and thrust the boat upwards, indicating an affirmative answer. They return to their original position.

Chief-Lector Priest:

The Chief-Lector Priest still facing the God asks::

O great Lord, you have declared that the crops of Patrios, son of Athanasos, will be prosperous. Is this truthful?

The Priests carrying the boat move backward and thrust the boat downwards, indicating a negative answer. They return to their original position.

Chief-Lector Priest:

The Chief-Lector Priest still faces the God saying:

O Great God, you have given us two different answers so I must ask again: Will you give this man prosperous crops during the season of the Inundation?

The Priests carrying the boat move backward and thrust the boat downwards, indicating a negative answer. They return to their original position.

Chief-Lector Priest:

The Chief-Lector Priest addresses Patrios:

Son of Athanasos, the Lord of all lands declares that your crops will not be prosperous in the coming season of Inundation.

Patrios:

Patrios Speaks:

O greatest of the Gods, I thank you for your truthfulness in forewarning me!

Patrios bows down to the God and stays frozen in this pose along with his witness.

CUT.

Note: Patrios and his witness are now off stage. The Chief Lector- Priest is now alone with the fan bearers, musician, scribe, and boat carriers.

Chief-Lector Priest:

The Chief-Lector Priest looks around the courtyard he then looks to the audience or camera stating:

As I see before me no more petitioners, let us continue to the Birth House!

The Chief-Lector Priest, boat carriers, scribe, fan bearers, and the musician each strike a pose and freeze in this final pose indicating the conclusion of the scene.

CUT.

Egyptian Oracle Story Board

Updated 01/31/11 -- JJ

Definitions:

Storyboard – this document.

Priest – High priest of the temple, the star of the show. He is distinguished from the other priests by wearing a leopard skin over one shoulder.

Otherwise, he wears the same long pleated kilt and sandals as the others.

Live Actor – a human in the role of lower-ranking priest. We have a female actor, so she will be the lead musician in the temple. A bit of a back story in case of a question.

Boat – A ceremonial boat, carried by eight priests. The boat bears a shrine containing the divine image of the God. The whole thing (shrine, quote, and priests) functions as a single puppet, also under the puppeteer's control.

Temple – the Virtual Egyptian temple, which exists in a virtual space.

Screen – the main projection screen or surface. We project the temple onto it with the digital projector driven by PC.

Virtual Camera – the point in virtual space which serves as the “eye” of the audience. It determines what view of the temple is shown on screen.

Mixed Reality Space – The virtual space of the temple and the priest added to the physical space of the live actor and the audience. The screen is the interface between them.

Scene – much the same as in a standard play: A particular arrangement of the priests, boat, audience, and live actor in the mixed reality space.

Event – a major action, which must be pre-scripted. For example, focusing the Virtual Camera on the offering table in the Festival Hall. Part of Scene 3.

Scene Transition – an entirely pre-scripted movement of everything, bringing everyone into position for the next scene.

This storyboard describes:

- (1) the role (required) dialogues for the Egyptian Oracle performance
- (2) frames the improvisational elements
- (3) names informational resources needed for the improvisation
- (4) names of needed resources such as animations and props in each scene
- (5) locations of the actors, puppets, audience members, and the *virtual camera* in the space.
- (6) the track or course of the priest, boat, and virtual camera during each scene change.

Priest dialogue is in **green**. Live Actor dialogue is in **blue**. Directives to ourselves and editorial comments are **red**. Things they are supposed to paraphrase, rather than say verbatim, are *in italics*.

Other Files

Props.doc – All physical props and materials, including the role cards.

Controls.doc - The control scheme employed by the Puppeteer to control the Priest and the Boat.

Source.doc – The same source materials used by docents at the museum when they are giving tours of the temple. Will probably have to be more than on file.

Screenshots.doc – Pics of the temple, boat, and priest. Kept separate from the story board, because of its size.

Sounds.doc – Catalogues the music, sound FX, and ambient sounds for the temple and the whole ceremony.

9 Public Implementation Materials

9.1 Story Board for the Performance

Big Facts

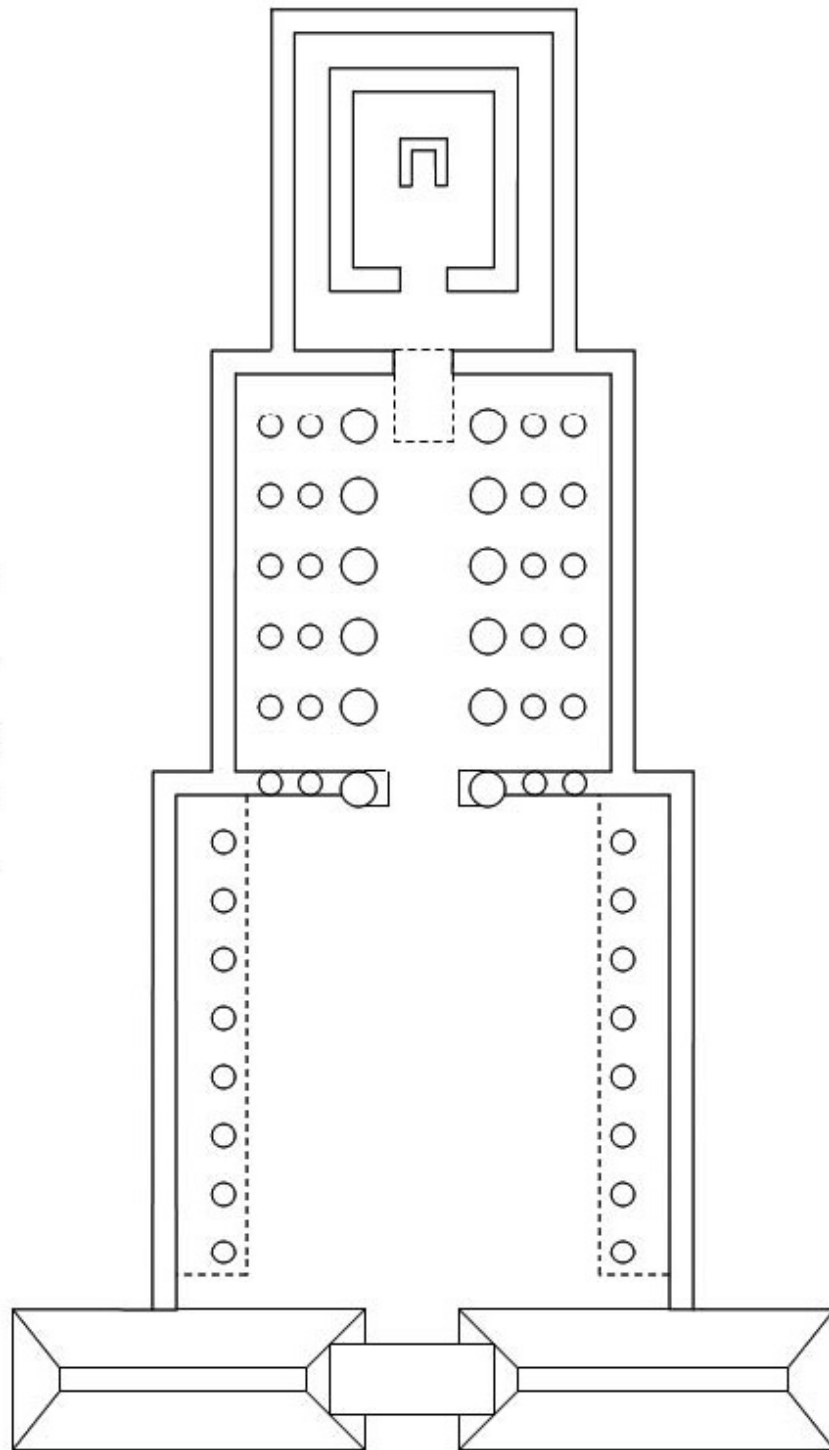
The software keeps all scene transitions and events in an ordered list. The narrative (below) describes their sequence. When the puppeteer presses the "forward" button on his controller or computer keyboard, the next event or transition happens. When he presses the "backward" button, the previous one occurs. We expect to go backward during rehearsals, but not performances.

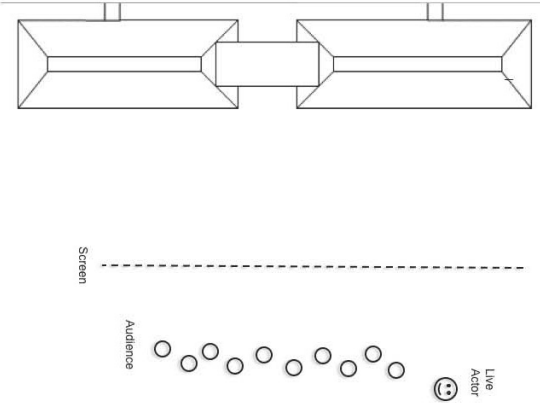
We will have one performance each at Puppet Showplace theater, AXIOM

Gallery, Boston College, the Carnegie Museum of Natural History (CMNH), and York University. CMNH and York have their own actors and puppeteers.

We have an alternative "mode" in mind for the live actor. He or she can be a modern-day person, like a tour guide or an educator. This would change the dialogue and interaction High Priest, somewhat. Probably the CMNH performances would be the best venue.

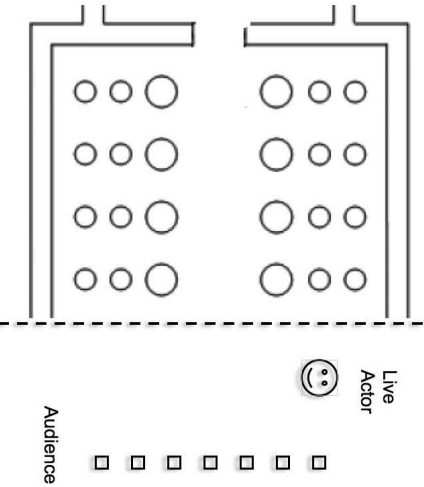
Floorplan of the Temple



Narrative Bits	Maps and Other Spatial Information	Resources
<p>Scene 0 : Outside the Theater Proper (e.g. lobby)</p> <p>Depict audience members as Egyptian townfolk. Give them something to hold and/or do to reinforce the idea.</p> <ul style="list-style-type: none"> • Hand out role cards and explain how they work (separate sheet) • Give the "current mayor" his/her mark of office. • Give the priest cards to three males, musician cards to three females. • Hand out other gifts or props. Nothing fake for Children 4th-6th grade. <p>Have a big poster out front, in the lobby area, which gives context. Possibly have a live person facilitating, answering questions.</p> <ul style="list-style-type: none"> • 399 BC, festival of the New Year. • The temple is the cultural and economic heart of the town. <p>Scene 1 : Pylon</p> <p>Live Actor: Hello everyone, and welcome to the Temple of Horus! My name is Artemeis, and I am the chief musician of the temple. It is our custom as Egyptians to greet each other by raising both hands in the air, like this. Let's all give it a try! Both hands in the air, like this. It is just like a hand shake or a bow. Today, I will be your guide through the temple, because it is a very special day! Does anyone know what special day it is today? Well! I am very excited, because today we are celebrating the New Year, my absolute most favorite holiday of all time! Who else thinks that it is fun to celebrate the New Year? Awesome! What are some other holidays that people like to celebrate? These are all wonderful celebrations! But remember, we are here today to celebrate the New Year. This is also a time when we celebrate the generosity of the gods, and the rising of the Nile to water our crops.</p> <p>Ad-lib with audience to get them talking about holidays, focus on community/family gathering - make community/family stronger.</p> <p>Live Actor: <i>I think it is a little awkward to start with this</i> (At the temple of Horus, as part of the New Year festivities, the priests will bring the god out on his boat from the sanctuary. They ask that the spirit of the god live in the boat.) We all know that Horus is the god kingship, who gives our king, Parah, the power to rule. Horus is also the god of the sky, and his form is the Hawk. Let's take a look at the very large front of the temple, called the pylon. Everyone say, "Pylon". It is gigantic and colorfully decorated with perfect images and embellishments. Over there is Horus, you can tell that it's him because his head is in the shape of a hawk. And who do you think this is? (gesture to Pharaoh) Yes, that's right! It's Pharaoh! These images on the temple tell a story, what do you think is</p>	 <p>After setup is complete, the temple is left in this view during scenes 0 and 1:</p>	<p>Role Cards (see RoleCards.doc)</p> <p>Mark of office for new mayor, a garland of flowers.</p> <p>Big Poster Use image from the Digital Egypt for Universities site of the temple of Set physically dominating its town.</p> <p>Ambient sounds for the temple exterior.</p>

<p>happening in this story? Here, Horus grants Pharaoh the power and authority to defeat the enemies of Egypt. This power is represented by a sword. What are some other things that look interesting?</p> <p>Live Actor Improv With Audience: (Use some of the presenter/audience interaction from existing tours at the museum to set up expectation for participation by audience. The most likely points of interest are flag poles, pharaoh smiting scene, and hawk statues.)</p> <p><i>For example: Pharaoh smites the enemies of Egypt, overcoming the forces of Chaos. The celebration of the new year is about the same thing, restarting time itself.</i></p>		
<p>Transition from Scene 1 to Scene 2: Live Actor: Alright! Now, who is ready to go into the courtyard of the temple? Here we go! The puppeteer presses the key which advances the scene/event.</p>	<p>A simple transition. The Virtual Camera moves forward, through the main gate, stopping just past it, revealing the courtyard.</p>	<p>Sound transitions from temple exterior to courtyard.</p>

<p>Scene 2: Courtyard</p> <p>Live Actor: Here is the courtyard of the temple of Horus. It is a wide open space. And look, there is no roof over head! The open sky over the courtyard reminds us of the connection between heaven and earth. People come here in large crowds for religious celebrations and rituals. Everyone comes to these events dressed in the same, simple clothes to show that they are humble before the gods. What do you like to do/have when you celebrate something fun but important? Where do people gather together to celebrate? What kind of activities do you do together to celebrate? (Food, drink, music, etc.)</p> <p>Live Actor Improv With Audience: Converse with the audience on food, drink, games, music, entertainment, etc.</p> <p>Live Actor Improv: Since we are all here today to celebrate together, let's give a round of applause like Egyptians do! First, raise one fist in the air like this, now raise the other, and then pound on your chest like this! Let's try that one more time, all together. Right arm up! Left arm up! Now let's celebrate! (pounds chest) Now every time we see something or someone important, we celebrate together in this way.</p>		<p>? Should we pass around candy or something? For child audiences, there could be liability issues. Inclined not to.</p> <p>Ambient sounds and music for the Courtyard.</p>
<p>Transition from Scene 2 to Scene 3:</p> <p>Live Actor: (quietly - sharing a secret) O.K. So now let us leave the bright sunny and hot courtyard to enter the cool and quiet Festival Hall. It is a hall full of columns. puppeteer presses the key which advances the scene/event.</p>	<p>A simple transition. The Virtual Camera moves forward, through the main gate, stopping just past it, revealing the courtyard.</p>	<p>Traveling sound/music. Area to area blending</p>

<p>Scene 3: Festival Hall:</p> <p>Live Actor: The Festival Hall is the most sacred space that Egyptian citizens who are other than priests or Pharaoh would see, and important things are done here. Let's take a look.</p> <p>Puppeteer presses a button which causes the view to focus on the offering table with the Hyun's kneeling statue behind it.</p> <p>Each one of these offering tables is a shrine to a family's ancestors. People bring food and gifts to the shrine.</p> <p>Live Actor: "What food and gifts do you see at this shrine here" (draw out answers of eggs, fish, wine etc and comment on what a great meal for ancestor in afterlife)</p> <p>Live Actor Improv: Refer to the benefits of sharing offerings with the gods instead of relying on your descendants. See background information below.</p>		<p>We arranged a set of offerings that should be easy to "read." This needs review. See screenshots.</p> <p>Note that scenes 3 and 4 both take place in the Festival Hall. Ambient sound and music for the Festival Hall.</p>
<p>Background info on the Family Shrine (Stelae) Offerings: The son or the eldest child of a wealthy family would officiate at the parent's funeral, and set up a foundation to supply the offerings to the family shrine in perpetuity. The offerings were redistributed to the people after being placed in/at the shrine. Unfortunately, private tombs were often despoiled.</p> <p>Having a statue or Stela in a temple was much safer, guaranteeing offerings would keep coming so long as the temple and the family's foundation lasted. In this case, the spirit becomes a client of the god, and the family offerings were distributed to everyone working in/on the god's estate. People would remember the person's name and repeat it. There would be extra special offerings to the family shrines and to the god of the temple on a festival day. (This may be cut.)</p> <p>Optional (Use only if you need to stall for time.) The story written here on this wall is about a great engineer who lived generations ago. The canals he planned even worked in years the Nile was very low and kept the fields watered and the people fed. His descendants bring offerings here on festival days.</p>		

Transition, Scene 3 to Scene 4: Festival Hall

Live Actor: Oh, there is a very interesting story that I wanted to tell you! One day,

Actor is interrupted by processional music from the sanctuary.

The audience view point swings to one side, until it is perpendicular to the axis of the temple. At the same time the procession (the boat and the priest) move into the position shown. The priest is careful never to turn his back on the divine image of the god in the ceremonial boat.

Live Actor: Here is our leader, the chief priest Petiese. He takes care of the temple and is in charge of the other priests. Pharaoh himself appointed Petiese to the regional council, so he is a very important guy (pause) The spirit of the great god, Horus, is on that boat, right there. I can hardly believe it! Let's greet the Chief Priest, Petiese, and the spirit of Horus with a round of Egyptian applause. Do you remember how to do that? Right fist up in the air, left fist in the air! Now applause! (pounds chest) **Should there be a better description about what is about the happen here?** Horus will now address the needs of the town.

As the procession enters, chief priest recites part of "the Wisdom of Ani"
<http://forum.publiocr.info/viewtopic.php?p=927#p927>

Chief Priest:

Do not raise your voice in the house of god, He abhors shouting;
 Pray by yourself with a loving heart, Whose every word is hidden.

He will grant your needs,
 He will hear your words,

He will accept your offerings.
 Offer to your god, (CUT)

Beware of offending him, (CUT)

Do not question his images, (CUT)

Do not accost him when he appears.

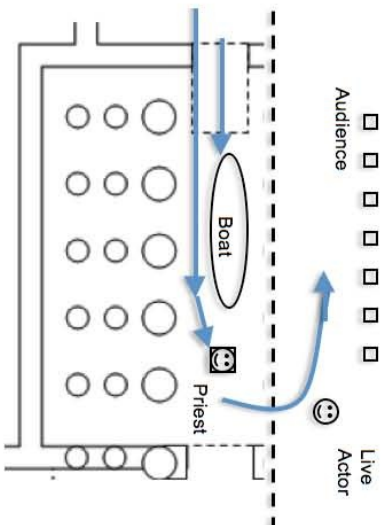
Do not jostle him in order to carry him, Do not disturb the oracles

Be careful, help to protect him,

Let your eye watch out for his wrath. And kiss the ground in his name.

He gives power in a million forms, (CUT)

He who magnifies him is magnified. (CUT)



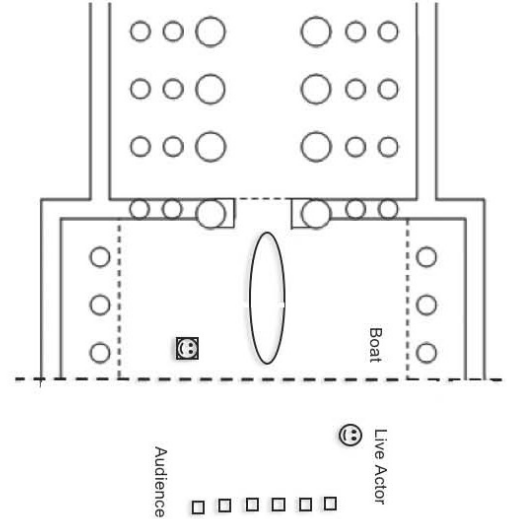
Audience viewpoint move
 Boat moves forward
 Priest moves forward
 Priest turns to face audience

Ambient sound and music for the Festival Hall.

Music for the procession and transition.

<p>Scene 4:</p> <p>Live Actor to the High Priest: O Honored Servant of the God, what great matters will be brought before Horus, on this great festival day?</p> <p>High Priest: "The town mayor served honorably for a long time, and has now has decided to step down. Let him come forward to receive your thanks."</p> <p>Live Actor: The mayor is here today! Will he please stand and receive thanks from the community! Everyone, right fist up, now left! And applause! helps the audience member with Mayor's Mark of Office (garland of flowers) and the "Retiring Mayor" come forth, and leads the audience in Egyptian style applause.</p> <p>High Priest: "Now the time has come for a new mayor to be chosen. Will the candidates place their resumes before Horus!"</p> <p>Live Actor Facilitates: Who here wishes to be the new Mayor? If you have brought your resume, a card that looks like... please come forward. Place your resumes before Horus, and stand over here to await his decision. Choose three audience members to put their role cards at three specific locations at the front of the stage ("Strike Points").</p> <p>High Priest: (explains how it is the god's decision who the next mayor will be, and how we know who Horus has chosen)</p> <p>Live Actor: We will know when Horus has made his decision, because the boat will dip and point to the new mayor of the town.</p> <p>The Boat: Picks a resume by moving to it and pointing down at it.</p> <p>Chief Priest: Horus has chosen you for a great honor! You are now responsible for the welfare of the people. Let us all celebrate.</p> <p>Live Actor Facilitates: Congratulations to the new Mayor of the town, what is your name? Let us celebrate our new mayor, Joe Smith! Egyptian style audience applause. The outgoing Mayor hands the garland of flowers to the incoming one. Everyone puts one hand in the air and beats their chest with the other.</p> <p>High Priest: "In addition to the change in the town's leadership, members of our community will now receive a great honor. Will all of the young acolytes and musicians please stand."</p> <p>Live Actor: Now, where are the priests and musicians who have important business before the great Horus? Please stand! Horus will now determine if you are ready and worthy of a promotion. Live actor chooses one of the standing audience members to come forward</p>		<p>Role cards for: oncoming mayor outgoing mayor musician promoted priest</p> <p>Three strike points on the stage.</p> <p>Animation for boat choosing one strike point.</p> <p>The mark of mayoral office, a garland of flowers.</p> <p>Special music for the god approving of something.</p>
---	--	---

<p>High Priest (priest of audience member is male, musician if female) The spirit of the god is in the sacred boat. O mighty Horus, do you approve this young priest/musician to rise higher in your service? The god approves very vigorously. High Priest: "Congratulations! You are now a senior priest/musician. Live Actor conducts him back to his seat. Live Actor: How exciting! Let's congratulate the priests and musicians with Egyptian applause! Right arm up! We have a similar transaction to promote a female musician. ></p>		
<p>Transition From Scene 4 to Scene 5: High Priest: Now we will move to the courtyard where another crucial public matter awaits us." The priest and boat move to the courtyard, turning leftward The audience viewpoint follows, then swings around to face the shrine. Live Actor: Alright everybody, lets follow the High Priest into the courtyard. This is so exciting. I love the festival of the New year!</p>		

<p>Scene 5:</p> <p>High Priest: "Who has an audience before Horus?"</p> <p>Live Actor: Well, I believe that there are two neighbors here today who have been righter over the same thing for a long time. Both of their houses share a common wall, and now there is a great big whole in that wall! Neither of the neighbors thinks it's their job to fix it! Today, Horus will decide who will be the one to fix the wall. Can the two neighbors who are here please come forward so we can settle this dispute. The Live Actor herds two people to the two most widely separated strike points. A single person represents each side, with their family/supporters in the crowds.</p> <p>Chief Priest (to everyone): "The common wall between two houses has collapsed. Both occupants claim the other didn't maintain it and is thus responsible for repairing it." (to one person) "What do you have to say?" (wait, if no answer) "Did you keep your side of the wall in good repair?" (to other person) <i>add something similar based on previous answer (to Horus)</i> "Great Horus, we await your decision."</p> <p>Live Actor: We will know who Horus thinks is the responsible one, because the boat will point to them.</p> <p>The boat chooses a person by moving or pointing towards him or her. The live actor emphasizes the action of the boat.</p> <p>High Priest: "The great god Horus has ruled the you will repair the wall, and pay damages. Everyone in the community will check their walls for weakness or damage. By the divine principle of MAAT, the harmony of all things, we must each and follow the law and contribute to the community."</p> <p>Live Actor: Next, we have a very serious matter to figure out. Someone here has been accused of stealing water from their neighbor to water their own crops! This is a very serious crime in a desert nation! He who steals water, steals life. Who has a card with the water symbol on it?</p> <p>High Priest: "Let the accused up! What do you have to say?"</p> <p>Live Actor: Is it true? Did you steal water from your neighbor for your own crops?</p> <p>High Priest: Does Horus agree with the statement? Did the accused steal the water?</p>	 <p>We will have the audience move first, sometimes, then the boat+priest. Or vice versa. We'll change it around.</p>	
---	--	--

Boat answers **yes**

Live Actor: Oh, **no!** Since this is such a serious matter, could we ask Horus again?

High Priest: As this is of the greatest importance, we ask for confirmation! Is the accused innocent?

Boat answers **no**

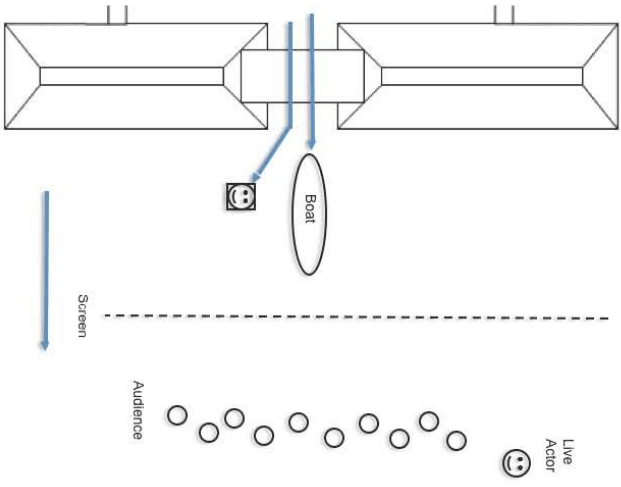
High Priest: And with a divided answer, we request a final judgment! Did the accused speak truthfully of their innocence?

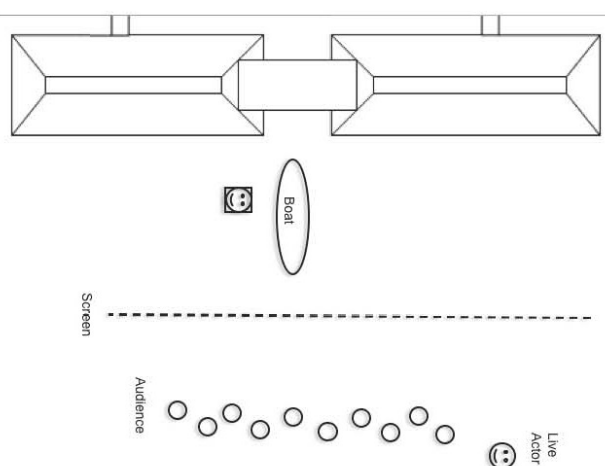
Boat answers **yes**

High Priest: Horus has vindicated you! Go in peace, knowing that the gods see you for the good citizen you are. We honor you Horus, thank you for your wisdom, we will look elsewhere for the criminal who so endangers our society.....

Transition Scene 5 to 6:

High Priest: Let us now leave these dire matters behind us and go meet the people.



<p>Scene 6:</p> <p>Live Actor: "Horus will sometimes answer personal questions, about important matters such as marriage, children, or career. You see, I would like to ask one thing first: O' Pedfase, my teacher and mentor, please ask the god if Bakennefi (Ba-ken-hefe) will ever marry me?"</p> <p>High Priest Ad-Lib: <Chuckle, maybe barfer > O' great Horus, will Bakennefi and Artemedis ever marry?"</p> <p>Horus will reply with "yes" or "no" by moving the boat.</p> <p>Live Actor Ad-Lib (to the audience): Now we can ask Horus any question that we want! Is there anyone else here who would like to ask a question? Maybe there is something that you are having a hard time making a decision about? Encourage the audience to ask questions important to them. Give some examples, like whether to take Latin or French next year. (Talk to the teacher and find out what questions the kids are likely to.) e.g. Take that job? Buy that house? Root for that sports team? High Priest Ad-Lib: Pose the questions in <i>yes/no form to Horus.</i></p> <p>High Priest: "Now is the time for blessings! Does anyone wish to approach Horus?"</p> <p>Live Actor: Who wants to be blessed by the god? Great, then stand up to receive your blessing!</p> <p>Audience member in the role of a parent (set up in advance by the Live Actor): "I would request a blessing for my child."</p> <p>-BASKET OH BLESSINGS? So everyone who wants one has it?</p> <p>High Priest (reads a blessing written on a piece of paper held by the live actor): "Make the bread sweet, the water sweet, protect this child against wrath of gods and all evil magic. Life prosperity and health through great and goodly old age."</p> <p>The live actor folds the paper, puts it into a locket, and gives it to the child. If there are no adults in the audience, a doll will do.</p> <p>Chief Priest: "Now Horus will choose a young lady to play the part of Isis in the festival of the Resurrection of Osiris, next season. <i>This is a play, you are acting the parts of gods... We need someone who is smart, etc., etc.</i>"</p> <p>Live Actor: How exciting! This is my most favorite part of the ceremony of all! Last year, I had the honor of playing the part of Isis in the festival play. Where my single ladies at? All the single ladies, put your hands up! Horus will not choose one of you to play the part of</p>		<p>Paper and locket for baby/child</p> <p>We want to have the priest hand the paper through the fourth wall to the live actor, but we may not have time to put that in.</p>
---	---	---

<p>Isis in the resurrection play!</p> <p>The boat chooses someone by moving towards them. The live actor will have to disambiguate.</p> <p>Chief Priest: "Now Horus will return to the inner sanctuary. We are a stronger community in the eyes of the god, we are in harmony, which is MAAT, balance and harmony in all things." Boat retreats to inner sanctuary.</p> <p>Live Actor: Now that this part of the ceremony is over, it is our sacred duty to show our gratitude by celebrating! So, let's Eat! Dance! Play and Sing!</p>		
--	--	--

Notes

- We should probably have fewer vignettes, (e.g. a promotion, a fortune told) so we can spend more time with the remaining ones.
- Ask for funding for an incense burner for the priest to carry.
- We probably have to elaborate the interactions a bit, and cut a few.
- We want a lot cards.
- Possibly hand out replicas of Walton Hall objects and other transitional objects.
 - Plastic fruit
 - Pita bread
 - Baskets
 - Simple mallets
 - Eggs
- We could hand out prizes for participation. For example, the museum makes scarab beetles as a prize.
- Hand them out as rewards for interactions.
- We can get cheap foamy stickers for all sorts of Egyptian stuff.
- Alternative for **Scene 6:** Have a general session for blessings for all sorts of things, like players of the local sports team.
- We will definitely film the performance for later evaluation.
- Some aspects of performance could be done on the web. We should think about proposing an online version of Egyptian Oracle, perhaps one we could do in second life or some other online virtual environment.
- We have to put together a package of information for the performance giving background on the Egyptian Oracle, Egyptian life, and the Temple. The my vector in the puppeteer will study's materials to give them some ability to answer questions from the crowd. We have a lot of experience with this already at the Carnegie Museum.
- We should give the teachers something they can take away. At the very least, we could give them a copy of the actors information packet.
- The priests didn't eat beans to keep the fattening down. Maybe mention it at the very end of the scene or the show.

9.2 The Role Cards

The following is the text for the role cards that are given to audience members, with paragraph per card. The cards are color-coded for the benefit of the live actress who has to move the volunteers into position when they are ready to play their roles.

Each card will have one or more duplicates. For example, there is only one accused water thief, but there are two disputing homeowners. There can also be three or four candidate mayors, and any number of ascending priests.

Retiring Mayor – You have served the people of the town for years and now wish to retire. Today the oracle will choose your replacement. When it is time, stand and accept the gratitude of the people and after the oracle chooses the next mayor, wish them luck. *(One card.)*

Potential new Mayors – Today the town's mayor of many years is retiring. You are one of several potential candidates to replace him. Simply being considered as a candidate is an honor. When called to do so, move to the front of the room and place this paper on the ground in front of the oracle's boat and step back. If you are chosen, stay to receive your mark of office before you sit down. *(Three cards)*

Ascending Priest - You are a junior member of the priesthood and have excelled in your studies. Your teachers feel it is time to ask Horus if you should move up a level in the temple, talking on new responsibilities. *(Many cards.)*

Homeowners with collapsed wall – You have a lovely home, which shares a wall with your neighbors. They do nothing to take care of it on their side, and it finally collapsed. You will be called to stand in the front of the sacred boat, and Horus will decide whether you or they will pay for the repairs. When the Priest asks you questions, do not accuse your neighbors, but defend your own conduct. *(Two cards)*

Accused of Water Thief - You have been accused of stealing water from the neighboring fields for your own field. This is a very serious crime but you know you are innocent. You will be called to declare your innocence. Stand your ground but be respectful. *(One Card)*

Asking for a Blessing - After the god has addressed public business, he may choose to accept personal petitions. You wish to ask for a blessing from the god for your child. To begin, make your address your request to the High Priest with great ceremony. *(Two Cards)*

9.3 Snapshots of the Project Web Site

PublicVR – Project: Oracle

http://www.publicvr.org/html/pro_oracle.html

PublicVR – Project: Oracle

Home Contact PlanetJeff

PUBLIC VR

About Us

Projects

- Egyptian Oracle
- Virt Egypt Temple
- Gates of Horus
- Pompeii
- VRGL
- CuratorVM
- CaveUT

Installations

Collaborate

Open License

Publications

LATEST NEWS:

The Egyptian Oracle

The Egyptian Oracle performance is a live reenactment of an authentic public ceremony from ancient Egypt's Late Period. We project our Virtual Egyptian Temple on the wall at life scale extending the physical theater into virtual space. The temple is not a film, not a static image, but a true three-dimensional space, which the audience navigates during scene changes. The central actor is a high priest, an avatar controlled by a live human puppeteer, hidden offstage. The supporting actress stands in front of the screen, in costume, mediating the experience. Audience members represent the Egyptian populace acting out brief roles in the drama. Finally, the sacred boat (left) is another puppet also controlled by the puppeteer. In the drama, the will of the temple god moves the boat. Either video is better than any explanation:

[Intro Video](#) (90 sec) [Full Video](#) (25 min)

The initial phase the project is now complete, giving us a working prototype and a model for future development. To read about it in great detail, download our

[Final Report](#)


If you would like to stage the performance yourself, or build something else with the software, click here to access

[Application and Source Code](#)

The show conforms to a high level of historical accuracy, suitable for any museum setting. Members of the audience come before the god with questions and problems to be solved. The priest poses questions to the god, and interprets the movements of the boat as divine revelation, with the force of law; the processional Oracle was

Credits

9.4 Snapshots of the Project Wiki

jeff-publicvr.org · My Wikis · My Account · Help · Sign Out · wikispaces

★ home PAGE ▾ DISCUSSION HISTORY NOTIFY ME EDIT


- Wiki Home
- New Page
- Recent Changes
- Manage Wiki

▼ All Pages

- home
- executable
- source

▼ Navigation Options

Show All Pages

Add Tag 

The Egyptian Oracle Documentation Pages

by Jeffrey Jacobson, Ph.D. 12/15/11
jeff@publicvr.org

This site contains documentation and discussion around the executable package and the open source software produced by the Egyptian Oracle project. The work was funded by a grant from the National Endowment for the Humanities (HD-5120910) to PublicVR (www.publicvr.org), dedicated to the use of virtual reality in research and education. The reader is expected to already know a fair bit about the project. For a general introduction, please see:

http://publicvr.org/html/pro_oracle.html

and for a very in-depth description of the project and everything produced by it, please see

<http://publicvr.org/egypt/oracle/whitepaper.pdf>

We cast this documentation in the form of a wiki, so users and the public could contribute to it just as they may contribute to the code. Every page has a discussion associated with it, and anyone may post. If you would like to improve this site, send a request to Jeff@PublicVR.org

The Executable

Click on this link to access the executable package and usage documentation.

The Source Code and Documentation

Click on this link to access the source code and all of the artwork for the priest, the boat, and just enough of the Temple to understand what they're doing. This page also includes the current documentation for the code. The code requires the free version of Unity 3.4, available at <http://www.unity3d.com>. The full code artwork are available upon request to Jeff@PublicVR.org

Please Donate Your Improvements!

The whole point of open source is so that everyone can share everyone else's improvements on a growing body of work. If you have Unity Pro, we can give you an account on our **SVN server**, so you can upload your changes directly into our code base. pending review, we will leave it in the next release. Unfortunately, Unity Free does not work with SVN, but if you send us your improvements to the code, we can add them for you.

We also welcome your improvements to this site, especially the usage and code documentation.

Credits

Senior Staff

Jeffrey Jacobson, Ph.D. (jeff at publicvr.org, <http://planetjeff.net>) Project and technical management. Evaluation design and analysis. Configuration management. Interim and final reports. Distribution websites.

Robyn Gillam, D.Phil. (gillam at yorcu.ca) - Egyptology research. Provided source materials, constraints and an educated viewpoint during our creative process.

EgyptianOracle – executable


http://egyptianoracle.wikispaces.com/executable

Reader Google

Plesk Wikispaces Simple Advanced Facebook ScholarOne Manuscripts PLS Erf Thesaurus QBO Pompeii_FM PublicVR_FM

EgyptianOracle – executable


jeff-publicivr.org My Wikis My Account Help Sign Out wikispaces



★ executable PAGE DISCUSSION HISTORY NOTIFY ME EDIT

Wiki Home
New Page
Recent Changes
Manage Wiki
Search Wiki

All Pages
home
executable
source

Navigation Options
 Show All Pages
Add Tag 

http://publicivr.org/html/pro_oracle.html

The Egyptian Oracle Executable

You can download the executable for the Egyptian Oracle, here

<http://publicivr.org/egypt/oracle/OraclePublic-v1.4> 500 meg

Instructions are in the README.TXT file, but those are likely to be out of date. The latest are always here:

Changes From the Original Version Zero (which is available upon request)

- Eliminated the lip movements based on voice input.
- Forced a consistent frame rate, regardless of machine speed.
- Fixed a number of problems with the animations
- Rebalanced the of music and ambient sounds

Known Problems

- After the priest 1st comes out of the inner sanctuary, using the control to move his head causes it to spin crazily. The problem goes away the first time you move his arms.
- We need a way to exit the software gracefully, instead of killing the window. That may be why killing the software repeatedly causes something bad to build up in the operating system, eventually requiring a reboot.

System Requirements

- PC running Windows 7
- Processor equivalent to at least two cores at 2.0 GHZ Intel Xeon
- Video card at least equal to a GeForce 9800 gt with 512K RAM
- xbox 360 controller

Installation

- Unzip OraclePublic-vX.zip
- Move the folder OraclePublic wherever you want it to go.
- Attach a digital projector to your computer and aim it at the wall.
- Make sure that your Xbox 360 controller is plugged into a USB port.

Launch

- Open the folder OraclePublic
- Double-click EgyptianOracle.exe
- A dialogue box will appear.
- Select the resolution you want for your projector.
- Be sure to un-check the box that would make the software run in windowed mode.
- Click the "Play!" button to launch the application
- Wait a couple of minutes, it has a lot to load.
- When the software starts, you should see the front of the Temple.

OPERATION

Transitions

1. As described in the script, there are several scene transitions. Pressing F0 or F10 will set everything back to the beginning, in front of the Temple. Pressing any of the other function keys will trigger the transition from one scene to another. Ordinarily these are done in order:
 - F1 - from the front into the courtyard.
 - F2 - from the courtyard into the Festival Hall.
 - F3 - focus on the offering table
 - F4 - move into position to interact with the priest pressing this button also brings the procession out of the sanctuary and into the Festival Hall
 - F5 - move everything from the Festival Hall to the courtyard
 - F6 - move everything from the courtyard out to the front
 - F7 - fade to black

Boat Controls

1. Use the four-way rocker switch.
 - left - to select a person or thing on the LEFT side of the screen
 - right - to select the person or thing on the RIGHT side of the screen
 - up - to signal approval
 - down - to signal disapproval

Priest Controls

1. Use the left trigger to slow down all other movements. The further it is depressed, the slower movements get.
2. The POV on the left controls his head.
3. The POV on the right controls his arms.
 - left - gesture with both hands to his right
 - right - gesture with both hands to his left
 - up - gesture with both hands forward
 - down - gesture with both hands toward himself
1. Button Y - raises his hand and arm up, pointing forward. All of the other arm motions work and are blended with this position.
2. Button B - puts his hand down by his side

EgyptianOracle - source


http://egyptianoracle.wikispaces.com/source

Reader Google

Plesk Wikispaces Simple Advanced Facebook ScholarOne Manuscripts PLS Erf Thesaurus QBO Pompeii_FM PublicVR_FM

EgyptianOracle - source

jeff-publicvr.org My Wikis My Account Help Sign Out wikispaces




★ SOURCE PAGE DISCUSSION HISTORY NOTIFY ME EDIT

Wiki Home
New Page
Recent Changes
Manage Wiki

Search Wiki

All Pages
home
executable
source

Navigation Options
 Show All Pages
Add Tag 
edit navigation

http://publicvr.org/html/pro_oracle.html

Egyptian Oracle Source Code

This package contains the source code for the Egyptian Oracle software, but without the virtual Egyptian Temple. It only has the doors and the floor plan of the temple, but it does have the priest, the boat, and all the controls working.

<http://publicvr.org/egypt/oracle/OraclePublicSource-v1.4.zip> 766 meg!

The complete source, WITH the temple, is available upon request.

The documentation for the code follows:

To see the source code, open this file in Unity Free or Unity Pro 3.4
OraclePublicSource-v1.4/Unity/Assets/animated_non-toon.unity

System Requirements

- Unity Free or Unity Pro 3.4
- PC running Windows 7
- Processor equivalent to at least two cores at 2.0 GHZ Intel Xeon
- Video card at least equal to a GeForce 9800 gt with 512K RAM
- xbox 360 controller

NOTICE: (12/14/11) The following documentation applies to the original version zero of the code, written entirely by Friedrich Kirschner friedrich@zeitbrand.net, who also wrote the documentation. Since then, Natthaphol Likhithaworn aries15041985@hotmail.com has made some changes to the code, requested by Jeffrey Jacobson jeff@publicvr.org:

- Eliminated the lip movements based on voice input.
- Eliminated the *.bat script formerly needed to launch the application.
- Forced a consistent frame rate, regardless of machine speed.
- Fixed a number of problems with the animations
- Rebalanced the of music and ambient sounds

The code is now at version 1.4, and the documentation below does NOT account for the changes listed above. (Version zero of the code is available upon request.) We plan to fix it soon.

Oracle Priest Puppeteering Documentation

Unity Setup:

Important Folder structure:

BoatAnimations – has all animations for the Boat
PriestAnimations – has all Animations for the Priest
Transitions – has all unity-created interpolation animations for Boat, Priest and Camera. These are all assigned to their respective GameObjects manually, in addition to the 3DStudio animations
Code – all code classes.

9.5 Code Documentation

All of the scripting code used in the Egyptian Oracle software was either written by Friedrich Kirchner, or selected by him from freely available software. He produced the following documentation, which applies to the version of the software we use for all of the performances. The original executable and the code itself are available upon request to Jeff at PublicVR.org. To access the most recent versions of the executable, the documentation, and the source code, go to

<http://egyptianoracle.wikispaces.com/>

The code in the artwork may be used for noncommercial purposes as described in the legal notice in the next section.

Oracle Priest Puppeteering Documentation

Unity Setup:

Important Folder structure:

BoatAnimations – has all animations for the Boat

PriestAnimations – has all Animations for the Priest

Transitions – has all unity-created interpolation animations for Boat, Priest and Camera. These are all assigned to their respective GameObjects manually, in addition to the 3DStudio animations

Code – all code classes.

Important GameObjects:

Priest

The main Priest Puppet, has AnimControl, MoveAroundScript and micInputScript attached and uses a total of 23 animations, 3 of them transition animations (name is lowercase). For more details on what the scripts do see below.

All Animations named *_copy_copy or *_copy are copies of the originally in 3DStudio Max created animations with AnimEvent triggers attached for footsteps.

Should animations change, a new copy has to be made (as originally imported animations are read-only) with a script. For more info on that script, see:

<http://answers.unity3d.com/questions/8172/how-to-add-new-curves-or-animation-events-to-an-im.html>

The Priest also has an Audio-Source Attachment which allow audio to be played from the Priest's position.

Lower case named animations indicate transition animations created within unity from the curve editor. These need to be changed in conjunction with the PriesWalkTo objects (see below) in order to change transitions!

PriestWalkToOne to PriestWalkToThree

Serves as interpolation points for scene transitions and are assigned to MoveAroundScript as PriestPosOne to PriestPosThree. Note that the MeshRenderer Component is disabled, which means that they do not show up as cubes in the finished scene.

The position of these are in line with the final position after the interpolation animation of the priest is finished and the rotation gives the script the necessary information to rotate the priest to the camera.

If you want to tweak transitions, you need to change both the transition animations in the curve editor and these objects – the end-point of the animation curve and the translation of these objects have to align!

Boat

The main Boat Object, includes 16 animations, (again 3 lowe-case named transition animations). Also has BoatControl and MoveAroundScript_Boat attached (again, more info in the code section below). Also has an Audio Source for footstep and sound emitting from the boat.

BoatWalkToOne to BoatWalkToThree

Similar to PriestWalkToOne, used for interpolating the boat in scene transitions. These Objects have AudioSource Components and are used to play all ambient music in the project. They are assigned as BoatPosOne to BoatPosThree in the MoveAroundScript_Boat.

Same thing applies to tweaking transitions as above!

Controller and Camera

Controller was an Object already present in a previous iteration of the project (before my time) and I have left it untouched, with the exception of disabling the SoundBrain script as we were using a different method of triggering sounds in the Oracle performance. Camera is an object that shows up after collapsing the Controller object and is the more important one.

Camera has a CameraControllerAnimated Script and a CameraFade Script attached, in addition to an Animation component with 6 transition animation (created using the unity curve editor) and an audio source for music. There's also a cameraFade script used for fading the screen to black at the end of the performance (more detail, as always, below).

Left Door and Right Door

Have their own animations for opening and are handled through the camera object.

Important Settings:

All Button and Axis names are assigned in the Unity Input Manager (go to Edit->ProjectSettings->Input in the menu bar)!

Code Overview:

All Code is written in C# unless otherwise noted. All Code Scripts are located within the Assets/Code folder in the Unity2 directory. Most Classes are attached to GameObjects in Unity (will be noted otherwise) and configured as such in the Unity editor.

The Code assumes an Xbox360 Game Controller for Windows.

The following Classes are used for animation blending and movement within the scene:

AnimControl

Used for the priest stationary animation blending – talking motions, head movement, special animations. This is attached to the Priest Object within Unity.

Reads various joystick input and blends between pre-defined animations (discussed in more detail later).

BoatControl

Used to trigger the special Boat animations. This is attached to the Boat Object in Unity. Also controls footstep sound (through anim event callback)!

Reads digital joystick pad input (D-Pad, the left hand 4 way switch on the Xbox360 Game Controller) and triggers blended animations.

cameraControllerAnimated

This is used to trigger camera movement (usually referred to as scene transitions) within the environment. Also triggers sound! Is attached to the Camera Object within Unity.

Reads Keyboard input (F1-F7 or 1-7 and F10 or 0) to start a specified camera animation and sound.

Creates a CameraFade Object to fade the screen to black on F7. Also handles the opening of the doors of the inner sanctuary.

MoveAroundScript

Also used for the scene transitions, but this script moves the priest around. Is also attached to the Priest Object. Also uses anim events as sound triggers for footsteps.

MoveAroundScript_Boat

Also used for scene transitions, this time moving the boat around. Again, using anim events as sound triggers for footsteps.

The following Classes handle the lipsyncing:

micInputScript

Attached to Priest Object within Unity, creates Osc and Packet to read OSC messages (microphone amplitude) from external software. Moves upper and lower lips of Priest Object.

Osc

Not placed/attached in Unity! Helper Class for parsing OSC messages and handling network sockets. Written by the lovely people from MAKE.

Packet

Not placed/attached in Unity! Helper Class for parsing OSC messages. Written by the lovely people from MAKE.

And there are some miscellaneous classes for effects:

CameraFade

Not placed/attached in Unity! A class that fades a screen overlay to a specific color. Found on the Unity Wiki, originally written by Kentyman.

Fade (JavaScript)

I disabled this one. Has been used for ambient sound before Priest project.

Library (JavaScript)

I disabled this one. Has been used for ambient sound before Priest project.

SoundBrain (JavaScript)

I disabled this one. Has been used for ambient sound before Priest project.

Animation Code Concepts:

The goal for the puppeteering system was two-fold.

First, a semi-procedural approach in which a small number of base animations can be blended to create enough in-between animation for the movement to not get repetitive.

Second, have the blending not be linear, but user-controllable in speed and weight, for the puppeteering to be more dynamic and fitting to the live dialogue.

Unity has a rich set of functions for blending and controlling animations, giving you the option to control both timing and weight for individual animations.

This was implemented as a 3-layered system.

First, by using regular digital buttons to “queue” specific animations, but also using the left trigger on the Xbox360 Controller to then decide on time-position the queued animations should be blended to.

Second, much the same way, the right analog stick then controls the blending between four distinct talking animations, depending on the position of the analog stick. Stick position determines the time-position and weight of the presented talking animation.

And third, a small amount of idle animation is kept throughout the blending process to avoid complete lifelessness in case an animation is held in place.

In addition to the three-layered approach, the left analog stick has direct control over the pitch and yaw of the Priest's head.

All Joystick input was buffered according to the puppeteer's preference and computer specifications.

Unfortunately, the documentation on how the Unity blending-functions behave when executed from within different classes is a bit lacking, which led to some trial-and-error as to determine what code gets executed when and which animations overwrite which others.

In order to keep track of some of the stuff that's happening (as Unity has no Debugger), I introduced some debug variables into the code. I hope they help in understanding how stuff works.

The AnimControl Class:

The core of the animation system is in the AnimControl class, which serves as the Priest-Characters' main animation class. It is attached to the Priest-Object in Unity and in turn uses that objects' animation list.

Some important things to know:

- All animation blending for special animations (raise hands, hands on hips, etc.) are blended using time-position according to the left trigger value. Their weight blends in and out automatically!
- Talk animations blend both time and weight according to the right analog stick values.
- The references to specific animations (as in, the animation names) are "hard-coded" and need to be changed if the animation names change (see switchAnim function). This was due to lots of tweaking during development and better overview over animation specific modifiers.
- Angle for the procedural movement of the head is hardcoded (+/-60.0 and +/-45.0 for yaw and pitch).
- The pointing animation proved difficult to tweak and is now semi-procedural, rotation the spine together with advancing the time-position. This is done in the doHeadMove function.
- Sampling animation is a bit of a weird one in unity, as you need to enable all animations, then sample, then disable all animations. I have researched this for a while and it's hard to believe that this is the only way, but haven't found any other solution.
- Footsteps are played randomly from an array

The BoatControl Class:

This class reads input of the D-Pad of the Controller and triggers Boat animations such as Approve, Disapprove, etc. It also has audio callback functions for footstep sounds triggered by AnimEvents in the Boat Animations, thus, all Boat animations had to be copied to make them

editable. In case you want to change Boat animations, you have to copy them again and put in the AnimEvents again. All Boat Animation names are hard-coded into the class due to the development process.

Things to be aware of:

- Due to the fact that it seems impossible to “blend out” animations, there's some hardcoded timing happening in the LateUpdate function.
- It seemed like Unity was unhappy with two scripts doing animations in the Update function (MoveAroundScript_Boat and this one) and thus I moved animation commands into the LateUpdate function. Setting things up into different animation layers was tried but didn't work.
- Footsteps are played randomly from a selection of 7

The MoveAroundScript Class:

This class (and very similarly, the MoveAroundScriptBoat class) is used for transitioning from one location in the temple to another. It is attached to the Priest Object. Transitions are triggered using the F1-F7 keys (or 1 through 7 alternatively) and usually start a transition animation that interpolates the Priest Model. This animation was created in the unity animation editor and can be tweaked.

This class needs to know the exact translation and rotation of the end points of the transition animations and thus needs the PriestWalkTo... points mentioned above as reference.

Some important things to know:

- Blending in and out of the idle and walking animations was a bit of a trial and error thing, and is now done with the “Blend” function.
- stepCallback is a callback function for footsteps and you can tweak the firing of that function in the copied walking animation (WalkBackward_copy_copy) using the animation editor

The MoveAroundScript_Boat Class:

Very similar to the above. Attached to the Boat Object. Note that the Boat does not turn towards the camera procedurally and thus the transition animations have to start/end at the same transformations! (start of new transition has to be the same as end of old transition).

The CameraController_Animated Class:

Keyboard input triggers camera transitions – animations that are created in the unity animation editor. Also hides the mouse-cursor on start and plays transition music on Keyboard input.

AnimEvents in each camera transition animation call the playMusic function with a reference to a music clip in the transitionMusic Array.

Holds a pointer to the CameraFade object assigned to the Camera GameObject and triggers cameraFade on F7/7.

Also triggers door animations.

The MicInputScript Class:

We listen for UDP packages on the hardcoded port 31841 from localhost (127.0.0.1). This class uses the MAKE OSC C# library from the MAKE Controller Kit:

<http://makezine.com/controller/>

The OSC script needed some hoops to run stable within unity. For more information, please refer to:

<http://forum.unity3d.com/threads/16882-MIDI-or-OSC-for-Unity-Indie-users>

MicInput uses call backs to set the mouth movement and moves the lips of the Priest character. Lower lip is moved in full, left/right lower lip is moved 1/4th and upper lip is moved half of lower lip.

The received OSC message is assumed to carry a float as its first value, which will then be read out and used as amplitude information!

External Software:

For microphone input, I use some software based on OpenFrameworks V0.62, called audioInput, that I developed before this project. SourceCode is available as part of the MSBTools project here:

<https://github.com/fiezi/msbTools>

The software uses the preferred Windows device for audio input and reads amplitude information. It then creates an OSC-message and sends the amplitude information as a float.

The options of the software are to be set up as follows (and are also set up like this by default):

Channel

This is a modifier to the base UDP port on which the software operates – 31840.

So a Channel value of 1 sends data to 31841 (the port our MicInputScript is listening on!), a value of two sends to 31842 etc...

OSCpath

Is the path part of the OSC message. Since we assume the first value of the OSC package to be a float value, this is not parsed by MicInputScript.

Start Sending

The program sends data when this button is RED and stops sending when it is WHITE. Click to toggle.

9.6 The End User License Agreement for the Open Source

End User License Agreement

30 November 2011

Egyptian Oracle Source Code and Artwork

PublicVR jeff at publicvr.org

A. *Non-Commercial Uses.* Redistribution and use of this Original Software in source and binary forms, with or without modification, are permitted **without charge or fee** provided that the following Conditions are met (each a “Condition” and, collectively, “Conditions”):

1. *Non-Commercial Reuse.* Subject to certain exceptions below, the redistribution or reuse (such works being referred to as “**Covered Software**”) is for non-commercial purposes and use only. “Non-commercial,” as used in this Agreement, shall mean that *no party* (including an entity) collects any money, either directly or indirectly, from the Covered Software. If you are uncertain if a particular use would qualify as either “non-commercial” or “commercial” in nature as defined in this Agreement, please contact PublicVR directly. If, in Public VR’s sole discretion, your Covered Software qualifies as non-commercial in nature you are hereby granted a non-exclusive, royalty-free, worldwide license for the Original Software, which permits you to reproduce, distribute, publicly display, publicly perform (including via digital transmission) or create derivative works from the Original Software.
2. *Reuse of Source and/or Binary Code.* Redistributions or reuses of both source and binary code must contain (1) the statement “Copyright (c) 2011 PublicVR. All rights reserved”. (the “Copyright Notice”), (2) a visible list of Conditions 1-7 of this Agreement, and (3) the following acknowledgement and disclaimer (the “Disclaimer”): **"This product employs the following software: Virtual Egyptian Temple™© PublicVR and Egyptian Oracle™©, which is free to the public at "www.publicvr.org".**
3. *Use of Artwork and Credit for Use.*
 - a. *Generally.* In addition to use of source or binary code, imagery generated using Virtual Egyptian Temple may be incorporated into Covered Software, including but not limited to still imagery, video, multimedia presentations or performance art (collectively, “Artwork”).
 - b. *Preservation of Historical Accuracy.* Artwork, as defined above, may contain historical elements or attributes, including but not limited to clothing, hieroglyphics or language, architecture, art and other items such as pottery or painting, etc. As PublicVR’s Original Software is primarily meant to serve as an educational tool, great measures have been taken to ensure the historical accuracy of such elements and attributes. **If any such historical elements are contained in Artwork that is incorporated into Covered Software, the author may not alter any of these elements or attributes in any way without prior written consent of PublicVR.**
 - c. *Credit.* If Artwork is incorporated into any Covered Software, the work and any

derivative thereof must contain the following notice: **"This artwork includes imagery generated using the Virtual Egyptian Temple and Egyptian Oracle, which are products of PublicVR (<http://publicvr.org>)."**

4. *Location of Required Notices and/or Disclaimers.* The Copyright Notice, Conditions Disclaimers and Credits must appear in one of the following places:
 - a. in the end-user documentation of any and all redistributions or reuses;
 - b. in the software itself, in a place where such notices normally appear in accordance with industry standards.
5. *Trademarks.* PublicVR owns various trademarks, including "Virtual Egyptian Temple" and "The Egyptian Oracle." Accordingly, products derived or created using the Original Software may not be called "Virtual Egyptian Temple" or "The Egyptian Oracle," nor may "Virtual Egyptian Temple" or "The Egyptian Oracle" appear in the product/service name, nor may you imply any kind of endorsement, sponsorship or association with PublicVR without prior written permission from PublicVR.
6. *Reciprocal License.* In exchange for allowing use of its Original Software, you grant the non-exclusive, royalty-free, worldwide license to PublicVR, to reproduce, distribute, publicly display, publicly perform (including via digital transmission), create derivative works or sub-license any of your Modifications to the Original Software. As used in this Agreement, "Modifications" shall mean: 1) any code or file that results from an addition to, deletion from or modification of the contents of a file or code containing Original Software or previous Modifications; 2) any new code or file that contains any part of the Original Software or previous Modifications; 3) Any new code or file that is contributed or otherwise made available under the terms of this Agreement.
7. *Distribution of Modifications.* Any modifications you create to contribute to the Original Software are governed by the terms of this Agreement. You represent and warrant your modifications are your original creations and/or that you have sufficient rights to grant the rights conveyed from this Agreement.
8. *Availability of Source Code.* Covered Software that you distribute or otherwise make available must also be made available in Source Code form and that form must be distributed only under the Terms of this Agreement. In addition to including all the required information stated above, you must inform recipients of the Covered Software how they could obtain the Source Code for the Covered Software in a reasonable manner. (See section "B. Commercial Uses" for an exception to this.
9. *Versions of this Agreement.* PublicVR reserves the right to modify the terms of this Agreement at any time. Any new versions will be given a new version number. Covered Software created under a previous Agreement will be governed by the Agreement as it existed at the time it was issued for the Covered Software. If you wish to sublicense the Covered Software, you may choose to sublicense it under such previous terms, or under the terms of any subsequent version of this

Agreement.

B. *Commercial Uses* Commercial or profit-making reuse and/or redistribution of this software is permitted provided that:

1. Conditions 2-7 above are met.
2. The person or organization wishing to conduct the redistribution and/or reuse has come to a mutually agreeable arrangement with PublicVR, and such arrangement has been approved by the parties in writing. **In addition, such agreement shall be subject to the approval of PublicVR's Board of Directors, and shall not be effective until approved.**

C. *Additional Provisions (Applicable to both Commercial and Non-Commercial Uses)*

1. *Disclaimer of Warranty.* THIS SOFTWARE IS PROVIDED "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL PublicVR OR THEIR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
2. *Miscellaneous.* This Agreement represents the complete agreement concerning the subject matter hereof. If any provision of this Agreement is held to be unenforceable, this Agreement shall be modified only to the extent necessary to make it enforceable. The law of the Commonwealth of Massachusetts shall govern this Agreement. As between PublicVR and other contributors, each party is responsible for claims and damages arising, directly or indirectly, out of its utilization of rights under this Agreement and you agree to work with PublicVR and other contributors to distribute such responsibility on an equitable basis.

10 Institutional Review Board

This section contains key documentation from our successful application to the Institutional Review Board at Carnegie Mellon University to conduct our study. Approval was necessary before we could conduct any data gathering.

10.1 Approval Letters

Carnegie Mellon University

Institutional Review Board

Federalwide Assurance No: FWA00004206

IRB Registration No: IRB00000603

Office of Research Integrity and Compliance

Warner Hall, Fourth Floor

Pittsburgh PA 15213

412-268-1901

irb-review@andrew.cmu.edu

Certification of IRB Approval

To: David Lowry Burgess, Jeffrey Jacobson, Kerry Handron
From: Sharon Carver
Department: Art
Date: October 11, 2011
Re: HS11-249: The Egyptian Oracle

This is to notify you that your modification request submitted on September 5, 2011 to include changes in location and consent form was approved on **October 11, 2011** by expedited review.

Approval for this study expires on **April 24, 2012**.

Please be reminded that if additional changes are to be made, those changes will need to be reviewed prior to implementation. Please refer to the above referenced protocol number in all correspondence regarding this protocol.

Please call the Office of Research Integrity and Compliance at 412-268-7166 if you have any questions regarding this memo. Thank you.



Sharon Carver, Ph.D., IRB Interim Chair

Carnegie Mellon University

Institutional Review Board

Federalwide Assurance No: FWA00004206

IRB Registration No: IRB00000603

Research Regulatory Compliance

Warner Hall, Fourth Floor

Pittsburgh PA 15213

412-268-1901

lrp-review@andrew.cmu.edu

Certification of IRB Approval

IRB Protocol Number: HS11-249
Title: The Egyptian Oracle
Investigator(s): David Lowry Burgess, Jeffrey Jacobson, Kerry Handron
Department(s): Fine Arts
Date: **April 25, 2011**

Carnegie Mellon University Institutional Review Board (IRB) reviewed the above referenced research protocol in accordance with the requirements of Public Law 99-158 as implemented by 45 CFR 46 and CMU's Federalwide Assurance. The research protocol has been given **APPROVAL by Expedited Review on April 25, 2011 as authorized by 45 CFR 46.110 7() and 21 CFR 56.110. This APPROVAL expires on April 24, 2012** unless suspended or terminated earlier by action of the IRB.

All untoward or adverse events occurring in the course of the protocol must be reported to the IRB within three (3) working days. Any additional modifications to this research protocol or advertising materials pertaining to the study must be submitted for review and granted IRB approval prior to implementation. Please refer to the above-referenced protocol number in all correspondence.

Federal regulations require that all records relating to this research protocol be maintained for **at least three (3) years after completion** of the research, and be accessible for inspection and copying by authorized representatives at reasonable times and in a reasonable manner.

The Investigator(s) listed above in conducting this protocol agree(s) to follow the recommendations of the IRB and the Office of the Provost of any conditions to or changes in procedure subsequent to this review. In undertaking the execution of the protocol, the investigator(s) further agree(s) to abide by all CMU research policies including, but not limited to the policies on responsible conduct research and conflict of interest.

The IRB maintains ongoing review of all projects involving humans or human materials, and at continuing intervals, projects will require update until completion. At the end of the current approval, a progress report and current consent form must be submitted to the IRB summarizing progress on the protocol during that period. Please be advised that the progress report requests information pertaining to women and minorities; therefore, this information should be tracked with your participants' data.

Please call the Research Regulatory Compliance Office at 412-268-1901 if you have any questions regarding this certification. Thank you.



David Danks, Ph.D., Chair, IRB

10.2 Protocol

Attachments
for PublicVR's Application for Expedited Review
For the Egyptian Oracle Project
Please direct all questions to
Jeffrey Jacobson, jeff at publicvr.org, 617-435-0517

Introduction

Purpose: The National Endowment for the Humanities funded the creation of the Egyptian Oracle performance (GRANT-HD5120910), an exercise in educational theater. The performances are the primary mission of the grant and will continue regardless. In this application we request permission to conduct the evaluation protocols.

Components: The facilitators are the puppeteer, the live actress, the introducer, the videographer and the test proctors. The audience will be drawn from the general population. We have ten minor roles defined for audience members, and one role card for each of them. Their full text is attached.

Each performance space is a large room with a screen and video projector. There will be an open area in front of the screen for the live actress and participating members of the audience. Let us call participating audience members the volunteers.

In K-12 settings, the test proctors will collaborate with the teachers. One or more teachers must be present at all times during the performance and subsequent testing.

Data Gathering: The test proctors will distribute the post-performance questionnaires. We will also videotape the performance for later analysis. Some video tapes will also be edited and processed for use in promotional materials.

Composition: As shown in the image, below, the virtual Egyptian Temple is projected on a wall or large screen. A professional puppeteer, offstage, controls the virtual priest on the right. The puppeteer also controls the sacred boat carried by eight priests on the left. The actress (left) interacts with the priest and the audience—a volunteer is shown on the right. The priest interacts with the boat, the actress, and the audience generally. See the attached script for a full detail of the storyline and interactions. Be aware that not all of the dialogue can be determined in advance, because the show is interactive.

Protocol for Public Audiences

Gathering Permissions

As visitors arrive, the facilitators distribute the role cards to members of the audience they think appropriate to each minor role. If the visitor is adult:

“Would you like to be part of the show by playing a very small role as an ancient Egyptian? This card describes a role you might like.

Please be aware that we are videotaping the performance for research and promotional purposes. We will not mention your true name or give your identity in any way, but if you volunteer for the part, your likeness will be captured on film.”

If the visitor is a child over eight years of age, accompanied by his or her parents:

To parents: "May I ask your child if s/he would like part of the show by playing a very small role as an ancient Egyptian? This card describes the role. Please be aware that we are videotaping the performance for research and promotional purposes. We will not mention anyone's true name or give their identity in any way. But if your child volunteers for the part, his/her likeness will be captured on film."

If permission is granted: "We are going to pretend to be in ancient Egypt, in this show. For just a couple of minutes, would you like to play the part of an ancient Egyptian? The part is described on this role card."

Audience members seat themselves.

Before the Show: The Introducer will call the audience to order and make the following announcement:

Hello and welcome! We are working on a new project and would like you to help us know which parts are working and which are not. If something seems silly, please play along, but be sure to tell us afterwards. We will be having a discussion after the show, because we want to know what is exciting, what is boring, what you already know, and if there are parts that don't make sense.

Our camera operator, <point him/her out> will film the show from the back of the room. If you don't want your face in the recording, simply look forward towards the screen, or just sit in back, out of the camera's range. We will also record the sound and discussion; so if you don't want to be in that, simply remain silent. We will make the film available to anyone who didn't get a chance to see the show. <Allow time for people to change seats if they want to.>

In just a few minutes are going to pretend that we are ancient Egyptians. Just a quick review..... which continent is Egypt on? Right. Now think of a timeline. Now it is 2011 AD. Was ancient Egypt in AD or BC? Right (or I think it was older than that) BC. We are going to set our show in ancient Egypt's Late Period, that's hundreds of years BC.

Some of you have been given a role card. When your part is called, you will be asked to stand in the front of the room. Pretend you are the person described on the card and feel free to be creative. you are to approach the god, you should do it with reverence. Show respect in any way you choose.

Your guide for the show will be Artemerdis, the chief musician of the temple.

The actress steps out and takes over, beginning the show. We will videotape the performance for later analysis. Some of the video footage will also be edited and processed for use in promotional materials, but only the.

After the show: The introducer will lead a general discussion with the audience and cast about the show. They will also distribute the questionnaires and collect them. For some shows we will do this before the discussion and for some we will do it after the discussion.

Protocol for K-12 Audiences

We will we will negotiate with the school administration to designate which classes will see the Egyptian Oracle performances at their school. To each student in each class, the teacher will give a

permission form and a cover letter. (Both are attached.) The teacher will instruct the student to take the permission form home to their parents for consideration. If the parents approve, they sign the permission form, and send it back to the school with the student. The teacher will collect the permission forms.

Before the Show: For each participating class, the teacher will prepare his/her students for the show. S/he will:

- (1) Remind them of what the permission form and cover letter said about the show.
- (2) Assign role cards to some or all of the students who brought back signed permission forms.
- (3) The teacher gives each role card to a permissioned student who s/he thinks can handle it. We will provide enough role cards for all students to play a part, however minor, but the teacher will have discretion on which cards and how many are assigned.
- (4) When it is time for the performance, the teacher conducts her students to the performance space. She seats all of the students who have permission forms in view of the camera, and seats the other students elsewhere. If more than one class is seeing the performance of same time, their teachers will coordinate seating.

When the students are all seated in the performance-based, the teachers will call them to order and introduce the live actress.

The actress steps out, beginning the show. We will videotape the performance for later analysis. Some of the video footage will also be edited and processed for use in promotional materials. We will only use footage with children whose parents specifically gave permission for the use of their children's' images. Specifically, they will have had to check the "yes" box on Page 2 of the permission form. We will depend on the teachers to tell us who those children are.

After the show: The introducer and/or a teacher will lead a general discussion with the audience and cast about the show. The facilitators and/or the teachers will distribute the questionnaires and collect them. For some shows we will do this before the discussion and for some we will do it after the discussion.

The teachers will insure that only students who brought permission forms will receive the questionnaire. The teachers are free to give the non-permitted students some other task to perform at that time or take them away.

School auditoriums are often very busy. If there is not time to conduct the data gathering in the performance venue, we will collaborate with the teachers to bring the students back to the classroom and do the data gathering there.

The teachers will collect the permission forms and the completed quizzes. We receive both from the teachers, and keep the permission forms in a safe location (e.g., a lock box). The quizzes will contain no identifying information, and can be filed with regular papers.

10.3 K-12 Cover Letter

This is only for use in K-12, according to the protocol. Not necessary for adults or families.

19 October 2011

Dear Parents and Guardians of Sixth Graders,

We are very excited to announce that on Friday the 16th of September, PublicVR will bring an experimental production, the ***Egyptian Oracle***, to our school. PublicVR is a Boston-area nonprofit dedicated to research in virtual reality for education, especially in educational theater. The production is a live re-enactment of an authentic Ancient Egyptian public ceremony in which the town's high priest adjudicates civic matters and tells fortunes by posing questions to the god, Horus. A virtual Egyptian Temple will be projected on the wall. The priest is an avatar (like in a videogame), controlled by a professional puppeteer. The priest collaborates with the temple musician (played by a member of the PublicVR team), and with the Egyptian populace, played by the audience of sixth graders. If you would like more information about PublicVR and the ***Egyptian Oracle***, please enter this on your web browser:

<http://publicvr.org/egypt/oracle/summary.pdf>

The National Endowment for the Humanities is funding the Egyptian Oracle. PublicVR is conducting research on the effectiveness of the show for learning and whether it helps children develop empathy for other cultures. The production will be videotaped and PublicVR will gather data. **Please see the attached permission form, which must be returned to your child's Ancient Civ. teacher no later than Tuesday, September 13th in order for your child to participate.** If you choose NOT to grant permission, if we do not receive the permission form from you, or if some part of the permission is incomplete or unclear; your child will still see the performance as scheduled by the teachers on Friday September 16. S/he will be seated out of view of the camera, and will not be selected to have a role in the performance. If you have any questions, please contact Dr. Jeffrey Jacobson, 617-435-0517, Ms J. Burgin (jburgin@sch.ci.lexington.ma.us or 781-861-2460 x2320), or your child's Ancient Civ. teacher.

Thank you,

<Names of school administrators and teachers follow...>

10.4 K-12 Permission Form

This is only for use in K-12, according to the protocol. Not necessary for adults or families.

Carnegie Mellon University

Consent Form for Participation in Research

Right to Ask Questions & Contact Information

If you have any questions about this study, you should feel free to ask them now. If you have questions later, desire additional information, or wish to withdraw your participation please contact (1) your child's teacher or (2) Dr. Jeffrey Jacobson at 617-435-0517 or jeff@publicvr.org

If you have questions pertaining to your rights as a research participant; or to report objections to this study, you should contact the Research Regulatory Compliance Office at Carnegie Mellon University. Email: irb-review@andrew.cmu.edu . Phone: 412-268-1901 or 412-268-5460.

Consent

By signing below, you agree that the above information has been explained to you and all your current questions have been answered. You understand that you may ask questions about any aspect of this research study during the course of the study and in the future. By signing this form, you agree that your child may participate in this research study.

PARENT SIGNATURE

DATE

PRINT THE CHILD'S NAME

Minor's Assent

This research has been explained to me and I agree to participate.

MINOR'S SIGNATURE

DATE

Notice

If you do NOT grant permission or we do not receive a permission form, no data involving your child will be collected, or used in the study. However, he or she will still get to see the performance as scheduled by the teachers during the regular school day. The teacher will seat your child out of view of the camera, your child will not participate in the performance, and s/he will not fill out the questionnaire.

IRB No: [\[this section will be completed by the IRB office\]](#)

page 3

Approved:

Expires:

Modified:

Version 4/2010

Consent Form for Participation in Research

Risks

The risks and discomfort associated with participation in this study are no greater than those ordinarily encountered in daily life or during or during regular classroom activities.

Benefits

Your child will learn something important and fun about Ancient Egypt they are unlikely to see anywhere else. He or she will also get to see some of the latest techniques in virtual reality for live theater.

Confidentiality

During the show, we will videotape the audience from the back of the room. For most of the audience, we will only see the backs of their heads, which is all we need. We will also record their voices, but not their names. There will be no way for anyone who does not know your child, already, to guess their identity.

By participating in the study, you understand and agree that the researchers (Carnegie Mellon University) may be required to disclose your consent form, data and other personally identifiable information as required by law, regulation, subpoena or court order. Otherwise, your confidentiality will be maintained in the following manner:

Your data and consent form will be kept separate. Your consent form will be stored in a locked location on Carnegie Mellon property and will not be disclosed to third parties. By participating, you understand and agree that the data and information gathered during this study may be used by Carnegie Mellon and published and/or disclosed by Carnegie Mellon to others outside of Carnegie Mellon. However, your name, address, contact information and other direct personal identifiers in your consent form will not be mentioned in any such publication or dissemination of the research data and/or results by Carnegie Mellon

Optional Permission

I understand that the researchers may want to use a short portion of any video or audio recording for illustrative reasons in presentations of this work for scientific or educational purposes. I give my permission to do so, provided that my child's name does not appear.

YES NO (Please initial here _____)

Rights

Your child's participation is voluntary. He or she is free to stop participation at any point. Refusal to participate or withdrawal of your consent or discontinued participation in the study will not result in any penalty or loss of benefits or rights to which you might otherwise be entitled.

IRB No: [\[this section will be completed by the IRB office\]](#)

page 2

Approved:

Expires:

Modified:

Version 4/2010

Consent Form for Participation in Research

Right to Ask Questions & Contact Information

If you have any questions about this study, you should feel free to ask them now. If you have questions later, desire additional information, or wish to withdraw your participation please contact (1) your child’s teacher or (2) Dr. Jeffrey Jacobson at 617-435-0517 or jeff@publicivr.org

If you have questions pertaining to your rights as a research participant; or to report objections to this study, you should contact the Research Regulatory Compliance Office at Carnegie Mellon University. Email: irb-review@andrew.cmu.edu . Phone: 412-268-1901 or 412-268-5460.

Consent

By signing below, you agree that the above information has been explained to you and all your current questions have been answered. You understand that you may ask questions about any aspect of this research study during the course of the study and in the future. By signing this form, you agree that your child may participate in this research study.

PARENT SIGNATURE

DATE

PRINT THE CHILD’S NAME

Minor’s Assent

This research has been explained to me and I agree to participate.

MINOR’S SIGNATURE

DATE

Notice

If you do NOT grant permission or we do not receive a permission form, no data involving your child will be collected, or used in the study. However, he or she will still get to see the performance as scheduled by the teachers during the regular school day. The teacher will seat your child out of view of the camera, your child will not participate in the performance, and s/he will not fill out the questionnaire.

IRB No: [\[this section will be completed by the IRB office\]](#)

page 3

Approved:

Expires:

Modified:

Version 4/2010

10.5 Expedited Review Application

Carnegie Mellon University

For IRB Office Use
IRB No: _____
Rec'd: _____

APPLICATION FOR IRB REVIEW OF RESEARCH INVOLVING HUMAN SUBJECTS

(Not for exempt research)

Please complete this application as thoroughly as possible. Your application should include the following:

1. A consent form using the current CMU template that the participants and/or parent/guardian will be required to sign.
2. A copy of any questionnaires, surveys, images, de-briefings that will be used.
3. A copy of any recruitment documents (including advertisements, flyers, letters, invitations, email) to be used;
4. A copy of the training certificates for all individuals working on the research unless they are on file with the CMU IRB. Training is available at: <http://www.citiprogram.org>. See the [IRB website](#) for details.
5. If the PI is a student, the faculty advisor must submit a Faculty Advisor Assurance Form.

Please email all documents to irb-review@andrew.cmu.edu. For assistance call CMU Research Compliance @ 412-268-5460 or email irb-review@andrew.cmu.edu. Additional information and templates are available at <http://www.cmu.edu/osp/regulatory-compliance/human-subjects.html>

1. Protocol		
Title: The Egyptian Oracle		
<input type="checkbox"/> This is a previously approved study that has lapsed.	Previous IRB No: HS	
2. Principal Investigator (PI)		
Name: David Lowry Burgess		Department: Fine Arts
Telephone: 412-441-7199	E-mail: lb30@andrew.cmu.edu	Training Cert. <input type="checkbox"/> Attached <input checked="" type="checkbox"/> On File
<input type="checkbox"/> I am a student. If so, please provide information about your faculty advisor below.		
Faculty Advisor Name:	E-mail:	Training Cert. <input type="checkbox"/> Attached <input type="checkbox"/> On File
<i>If a student is the PI, the faculty advisor must complete and submit a Faculty Advisor Assurance Form.</i>		
If there is someone other than PI to correspond with regarding this protocol, please list below.		
Contact Person Name: Jeffrey Jacobson	Telephone: 617-435-0517	E-mail: jeff@publicvr.org
Business Manager for your department:		E-mail:
3. Co-investigators		
Name: Jeffrey Jacobson	E-mail: jeff@publicvr.org	Training Cert. <input checked="" type="checkbox"/> Attached <input type="checkbox"/> On File
Name: Kerry Handron	E-mail: handronk@carnegiemnh.org	Training Cert. <input type="checkbox"/> Attached <input checked="" type="checkbox"/> On File
Name:	E-mail:	Training Cert. <input type="checkbox"/> Attached <input type="checkbox"/> On File
Name:	E-mail:	Training Cert. <input type="checkbox"/> Attached <input type="checkbox"/> On File
Name:	E-mail:	Training Cert. <input type="checkbox"/> Attached <input type="checkbox"/> On File
Name:	E-mail:	Training Cert. <input type="checkbox"/> Attached <input type="checkbox"/> On File
Name:	E-mail:	Training Cert. <input type="checkbox"/> Attached <input type="checkbox"/> On File
4. Funding		
<input checked="" type="checkbox"/> Unfunded research	Sponsor/Source:	
<input type="checkbox"/> External Funding	SPEX Proposal #:	
<input type="checkbox"/> Internal Funding	Oracle String:	
Grant Title:		

For IRB Office Use
IRB No: _____
Rec'd: _____

<i>If you don't know the funding/grant information, please get it from your department's business manager.</i>	
5. Protocol Description	
Provide, in lay terms, a summary of your proposed study as outlined below. You may attach the protocol to this form if you like.	
Purpose of the study. The National Endowment for the Humanities funded the creation of the Egyptian Oracle performance (HD5120910). They did NOT fund an evaluation or exploratory research, which is what we propose here at our own expense .	
Describe the research procedures (include the activity, location and time required of the participant). See attached.	
Who will be asked to participate? Members of the general public, AND STUDENTS IN K-12 SCHOOLS.	
Will questionnaires or surveys be used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Will tasks be done on a computer? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, how will the tasks be accessed? <input type="checkbox"/> Remotely via the internet? <input type="checkbox"/> In the research lab? <input type="checkbox"/> Other, please explain:	
Will deception be used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe how participants will be debriefed. Please include the debriefing material and/or script.	
Will the research be conducted on the CMU campus? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If no, please indicate the location(s). Venues are: Carnegie Museum of Natural History (Pittsburgh, PA); Puppet Showplace Theater (Brookline, MA), Boston College (Immersive Education Conference, Boston, MA), Atlantic Warf Building (Boson CyberFest, Boston, MA), DIAMOND MIDDLE SCHOOL, LEXINGTON, MA. See attached permissions. <i>If applicable, please attach documentation of permission to conduct research in private, non-CMU space.</i>	
6. Participants	
Will any of the following classes of vulnerable subjects be involved in the proposed study? (check all that apply)	
<i>Class</i>	<i>Comments</i>
Pregnant women, human fetuses <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Pregnant women will not be specifically included or excluded. (See http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.htm , research that is incidental to pregnancy and has no risk to the fetus can only include pregnant women if ALL aspects of Subpart B are met.)	
Neonates <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Prisoners <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Children <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Audiences of all ages, AND K-12 CLASSES
Individuals with compromised mental status <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, indicate how this will be determined.	
Will the participants be capable of understanding the nature of the study and the consent process? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, explain.	
What is the age range of participants in the proposed study? All ages, but we will NOT attempt to gather data from audience members younger than 8 years old.	
How many participants are needed for the study? 500	How was that number determined? Educated guess, based on knowledge of similar exploratory studies.
What do you estimate the ratio of males to females be? 1/1 Will this be reflective of the local population? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Will you target a certain population? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Please explain	
What do you estimate the percentage of minorities will be? Equivalent to the general population in the areas where performances are held.	
Please list inclusion and exclusion criteria. None.	
7. Participant Recruitment	

For IRB Office Use
IRB No: _____
Rec'd: _____

Describe how participant recruitment will be performed. Include how and by whom potential participants are introduced to the study. Advertisements inside the museum, on the web, through e-mail lists. FOR K-12 AUDIENCES, THROUGH DIRECT NEGOTIATION WITH THE HOST SCHOOLS. See attached.
<i>Check all boxes below that apply.</i>
<input type="checkbox"/> CMU directory <input checked="" type="checkbox"/> Postings, Flyers <input type="checkbox"/> Radio, TV
<input checked="" type="checkbox"/> E-mail solicitation. Indicate how the email addresses are obtained: Membership mailing lists for participating organizations: The Carnegie Museum of Natural Sciences, Boston Cyberarts, PublicVR, Puppet Showplace Theater.
<input checked="" type="checkbox"/> Web-based solicitation. Specify sites: bostonlyberarts.org publicvr.org puppetshowplace.org carnegiemnh.org
<input type="checkbox"/> Participant Pool. Specify what pool:
<input type="checkbox"/> Other, please specify:
<i>Please attach any recruiting materials you plan to use and the text of e-mail or web-based solicitations you will use.</i>
8. Consent
Do you plan to use consent forms? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, you must complete the section below on waiver of informed consent. If yes, describe how consent will be obtained and by whom. FOR GENERAL AUDIENCES, WE WILL NOT COLLECT CONSENT FORMS. WE WILL COLLECT CONSENT FORMS FOR K-12 AUDIENCES.
If participants are minors will assent forms be used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If No, please explain.
Will the consent form be presented on paper or online? <input checked="" type="checkbox"/> Paper <input type="checkbox"/> Online
Are you requesting to use a consent format that is different from the CMU model consent? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, please explain.
Are you requesting a waiver of informed consent? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, please explain how each of the elements listed apply to your study: 1. The research involves no more than minimal risk to the subjects; 2. The waiver will not adversely affect the rights and welfare of the subjects; 3. The research could not practicably be carried out without the waiver and ; 4. Whenever appropriate, the subjects will be provided with additional pertinent information after participation. FOR GENERAL AUDIENCES WE WILL USE VERBAL CONSENT. FOR K-12 AUDIENCES, WRITTEN PARENTAL CONSENT AND STUDENT ASSENT.
Are you requesting a waiver of written documentation (signed) of informed consent? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, please answer the following questions. 1. Will the only record linking the participant and the research be the consent document and the principal risk to the participant harm would be from breach of confidentiality? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2. Do you consider this a minimal risk study that involves no procedures for which written consent is normally required outside of research? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
9. Risks and Benefits
Will participants receive intangible benefit from the study? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Discuss the direct and indirect benefits to participants. They may be entertained and educated.
Discuss the risks to participants. They may be bored.
Discuss how any risks will be managed and/or minimized. We will adhere to all fire safety and non-crowding regulations for public events. We will do our best to inform and entertain the audience.
If deception is involved, please explain.

For IRB Office Use
IRB No: _____
Rec'd: _____

Indicate the degree of physical or psychological risk you believe the research poses to human subjects (*check which one applies*).

Minimal Risk: A risk is minimal where the probability and magnitude of harm or discomfort anticipated in the proposed research are not greater, in and of themselves, than those ordinarily encountered in daily life of during the performance o routine physical or psychological examinations or tests.

Greater than Minimal Risk: A risk is greater than minimal where the probability and magnitude of harm or discomfort anticipated in the proposed research are greater than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.

Describe how the study fits in this risk level. Equal or less than the risk of going to any participatory public event OR SCHOOL ACTIVITY, with minimal physical requirements.

10. Participant Compensation and Costs

Are participants to be compensated for the study? Yes No If yes, what is the amount, type and source of funds?

Amount:	Source:	Type (gift card, cash):
---------	---------	-------------------------

Will participants who are students be offered class credit? Yes No

Are other inducements planned to recruit participants? Yes No If yes, please describe.

Are there any costs to participants? Yes No If yes, please explain. Puppet Showplace Theater will charge admission. Carnegie Museum of Pittsburgh will offer the show free with general admission. The Immersive Education Conference (at Boston College) will offer the show free to conference goers. Boston Cyberfest (Atlantic Warf Building) will offer free admission to the public. THERE WILL BE NO COST TO STUDENTS FOR THE K-12 PERFORMANCES.

Will you compensate participants for injury resulting from participation? Yes No NA If yes, please describe. There is no significant likelihood of injury. See Attached description.

11. Confidentiality and Data Security

Will personal identifiers be collected? Yes No Will identifiers be translated to a code? Yes No

Will recordings be made (audio, video)? Yes No If yes, please describe. The show includes audience participation and discussion before and afterward. We will film the entire event,

Is the information so sensitive that you will obtain a certificate of confidentiality from NIH? Yes No

Who will have access to data (surveys, questionnaires, recordings, interview records, etc.)? The PI and co-PIs.

Describe how you will protect participant confidentiality and secure research records (Will they be stored on a secure computer, locked cabinet, etc?). No identifying information will be collected or stored. Personal anonmyty will be maintained.

Describe your process for monitoring data to ensure that study goals are met. (Review of lab notebooks, meetings to review data, etc.) We will review the data itself and the data gathering methods after each performance to insure efficiency and adherence to human subject protocols and the methods we describe here.

12. Conflict of Interest

Do you or any individual who is associated with or responsible for the design, the conduct of or the reporting of this research have an economic or financial interest in, or act as an officer or director for any outside entity whose interests could reasonably appear to be affected by this research project: Yes No

If yes, please provide detailed information to permit the IRB to determine if such involvement should be disclosed to potential research subjects.

13. Cooperating Institutions

Is this research being done in cooperation with any institutions, individuals or organizations not affiliated with CMU? Yes No If yes, please list and describe their role. PublicVR produced the performance itself and will process the data. CMNH, Boston Cyberarts, Puppet Showplace Theater, AND DIAMOND MIDDLE SCHOOL, will each provide

For IRB Office Use
IRB No: _____
Rec'd: _____

venues for the performances and material assistance with staging the show and gathering the data. CMU provides artistic, intellectual, and practical direction as well as final review.
Have you received IRB approval from another IRB for this study? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Pending If yes, please attach a copy of the IRB approval.
If applicable, please provide the name(s) and address(es) of all officials authorizing to access human subjects in cooperating institutions not affiliated with CMU. Jeffrey Jacobson, Director, PublicVR, 333 Lamartine St., Jamaica Plain, MA, 02130 Kerry Handron, Director, Earth Theater, Carnegie Museum of Natural History, Aaron Walsh, General Coordinator, Immersive Education Summit, <i>Please attach documentation of approval.</i>

Principal Investigator's Assurance Statement for Using Human Subjects in Research

I certify that the information provided in this IRB application is complete and accurate.

I understand that as Principal Investigator, I have ultimate responsibility for the conduct of IRB approved studies, the ethical performance of protocols, the protection of the rights and welfare of human participants, and strict adherence to the studies protocol and any stipulations imposed by Carnegie Mellon University Institutional Review Board.

I understand that it is my responsibility to ensure that the human participants' involvement as described in the funding proposal(s) is consistent in principle, to that contained in the IRB application. I will submit modifications and/or changes to the IRB as necessary.

I agree to comply with all Carnegie Mellon University policies and procedures, as well as with all applicable federal, state, and local laws, regarding the protection of human participants in research, including, but not limited to:

- Ensuring all investigators and key study personnel have completed human subjects training program;
- Ensuring protocols are conducted by qualified personnel following the approved IRB application;
- Implementing no changes in approved IRB applications or informed consent documents without prior IRB approval in accordance with CMU IRB policy (except in an emergency, if necessary to safeguard the well-being of a human participant, and will report to the IRB within 1 day of such change);
- Obtaining the legally effective informed consent from human participants or their representative, using only the currently approved date-stamped informed consent documents, and providing a copy to the participant.
- Ensuring that only IRB-approved investigators for this study obtain informed consent from potential subjects.
- Informing participants of any relevant new information regarding their participation in the research that becomes available.
- Promptly reporting to the IRB any new information involving risks to research participants, including reporting to the IRB, Data Safety and Monitoring Boards, sponsors and appropriate federal agencies any adverse experiences and all unanticipated problems involving risks to human subjects or others that occur in the course of the research.
- If unavailable to conduct research personally, as when on sabbatical leave or vacation, arrangements for another investigator to assume direct responsibility for studies will be made through modification requests to the IRB;
- Promptly providing the IRB with any information requested relative to protocols;
- Promptly and completely complying with IRB decisions to suspend or withdraw approval for projects;
- Obtaining Continuing Review approval prior to the date the approval for a study expires (approval for the study will automatically expire);
- Maintaining accurate and complete research records, including, but not limited to, all informed consent documents for 3 years from the date of study completion;

Carnegie Mellon University

For IRB Office Use

IRB No: _____

Rec'd: _____

- Informing the CMU IRB of all locations in which human participants will be recruited for protocols and being responsible for obtaining and maintaining current IRB approvals/letters of cooperation when applicable;
- Complying with federal, state and local laws and regulations and sponsor terms and conditions; and
- Complying with CMU policies on the responsible conduct of research.

Principal Investigator Name and Signature

Date

Note: If e-mailed from the PI's CMU e-mail account a hand written signature is not needed. Please type in name and date. If the PI is a student, the faculty advisor must submit a Faculty Advisor Assurance Form.

Please email all documents to irb-review@andrew.cmu.edu.

Note: Links to the policies and Federal regulations for the protection of human research subjects (including the Code of Federal Regulations [C.F.R.] Title 45 CFR Part 46 and Title 21 C.F.R. parts 50 and 56) are available on the IRB web page (<http://www.cmu.edu/provost/spon-res/compliance/hs.htm>).

Comments: The National Endowment for the Humanities funded the creation of the interactive performance and the scholarship, programming, and artwork to

11 Evaluation Materials

11.1 After-Show Questionnaire

Egyptian Oracle Exit Interview

How old are you? _____

Are you a boy or a girl?

Boy

Girl

Prefer not to say

Did you get a role card? (circle one)

Yes

No

I don't know.

Did you act out any of the parts? (circle one)

Yes

No

I don't know.

Did you enjoy the show? (circle one)

It was bad!

It was not good.

It was okay.

It was good.

It was great!

Did you learn anything interesting? (circle one)

Yes, lots!

Yes

A little

No

Nothing

What was MAAT to the Egyptians? (circle one)

A floor mat

The power of god

Harmony, peace, and
justice

Horus

Who was the high priest? (circle one)

The live,
human actress

Horus

The lead priest
carrying the boat

The man talking to
us and the actress

What makes the boat move when it answers a question?

(Please write)

We want to make our show better. What parts did you like and we should keep? (Please write)

Give us some advice on how to make the show better (Please write)

Is there anything else you would like to tell us?

Thank you for your help!

11.2 Summary Form for Questionnaire Data

#	How old are you?	Gender b=boy g=girl	Acted a Part? y/n	Enjoyed The Show? 1-5	Did U Learn Anything? 1-5	What was MAAT? 1-4	Who was the Hight Priest? 1-4
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

11.3 Raw Data from Questionnaires

Immersive Education Conference							
Show	How old are you?	Gender b=boy g=girl	Acted a Part? y/n	Enjoyed The Show? 1-5	Did you Learn Anything? 1-5	What was MAAT? 1-4	Who was the High Priest? 1-4
iED	18	M	0	5	4	3	4
iED	71	M	0	5	2	3	4
iED		F	0	4	3	3	4
iED		M	1	4	3	3	4
iED	40	F	0	5	2	3	4
iED	20	M	0	4	1	3	4
iED	39	F	0	1	3		4
iED	26	M	0	3	4		4
iED		M	0	2	3		4
iED	27	F	0	4	4		3
iED	57	F	1	3	2	3	4
iED	33	M	0	4	3	3	4
iED	34	F	1	2	4	3	4
iED	42	M	1	3	2	2	3
iED		M	1	3	2		4
iED	53	M	0	4	3	3	4
iED	21	F	0	4	2	3	4
iED	27	M	0	3	4		3
iED		M	1	4	1		3
iED	42	M	0	4	2	3	2
iED	24	M	0	4	2	3	4
iED	65	F	0	4	1	3	2
iED	33	M	0	3	2	3	4
iED		F	0	4	3		4
iED	51	F	0	4	3		4
iED	62	M	1	3	3	2	4
iED	57	F	1	4	2	3	4
iED	38	M	0	4	2	3	4
iED		M	0	4	3		4
iED		M	0	4	2	3	4
iED	60			4	3	2	4
iED	57	M	0	4	3		4
iED	77	M	0	4	2	2	1
iED	54	M	0	4	2	3	4
iED	36	F	0	4	2	3	4
iED	21	F	0	4	2	3	4

Puppet Showplace							
Show	How old are you?	Gender b=boy g=girl	Acted a Part? y/n	Enjoyed The Show? 1-5	Did you Learn Anything? 1-5	What was MAAT? 1-4	Who was the High Priest? 1-4
PST	51	M	1	4	1	3	3
PST	7	F	1	5	2	2	4
PST	57	F	1	4	2	3	1
PST	36	M	0	4	2	2	4
PST	39	F	0	5	2	2	4
PST	30	F	0	4	2	2	4
PST	36	M	0	4	2	3	4
PST	37	M	1	4	1	2	4
PST	33	F	0	4	1	3	4
PST	29	M	0	4	3	3	4
PST	65		0	5	1	2	4
PST	69	M	1	5	1	2	4
PST	43	M	0	4	2	3	4
PST	10	M	0	4	2	3	4
PST	52	M	1	4	2	3	4
PST	60	M	1	4	2	3	3
PST	32	F	0	4	1	2	4
PST	n/a	F	0	4	2	3	4
PST	10	M	0	4	y	3	3.5
PST	45	F	1	5	1	4	4
PST	43	M	1	5	2	2	4
PST	62	F	0	5	1	2	4
PST	n/a	M	0	4	1	2	4
PST	47	M	1	4	1		4
PST	52	M	1	4	1	3	4
PST	8	F	1	4	2	2.5	

Earth Theater							
Show	How old are you?	Gender b=boy g=girl	Acted a Part? y/n	Enjoyed The Show? 1-5	Did you Learn Anything? 1-5	What was MAAT? 1-4	Who was the High Priest? 1-4
	13	M	1	4	3	1	4
ET	13	M	1	3	3	3	4
ET	19	M	1	4	2	3	3
ET	17	F	1	5	2	3	
ET	16	M	1	4	2	3	4
ET	15	M	1	4	2	3	4
ET	14	F	1	5	3	3	4
ET	13	F	1	4	2	3	4
ET	16	M	1	3	5	3	4
ET	24	F	1	4	4	3	3
ET	17	F	1	4	3	2.5	3.5
ET	15	M	1	4	2	3	4

William Diamond Middle School

Show	How old are you?	Gender b=boy g=girl	Acted a Part? y/n	Enjoyed The Show? 1-5	Did you Learn Anything? 1-5	What was MAAT? 1-4	Who was the High Priest? 1-4
WD	11	M	0	5	1	3	4
WD	11	M	0	5	2	3	4
WD	11		0	3	4	4	4
WD	12		0	4	2	3	4
WD	12	F	1	4	2		4
WD	11	F	0	5	1	3	4
WD	10	M	0	3	3	4	3
WD	11	M	0	4	1	3	3
WD	11	F	0	5	3		3
WD	11	M	1	4	3	3	
WD	11	M	0	5	2		4
WD	11	F	1	5	2		4
WD	11	F	0	4	2		4
WD	11	F	1	4	3	3	4
WD	11	M	0	3	3	3	4
WD	11	F	0	4	2	3	4
WD	11	M	1	5	3		4
WD	11	M	0	5	1		4
WD	12	M	0	5	2	3	4
WD	11	M	0	4	3		4
WD	12	F	0	5	2		
WD	11	M	1	4	2	4	1
WD	11	F	0	4	2	3	4
WD	10	M	0	5	2	3	4
WD	11	F	0	4	2	4	3
WD	11	F	0	5	2		4
WD	11	F	1	5	2	3	4
WD	11	F	0	5	3		4
WD	11	M	0	5	2		4
WD	11	M	0	3	3		4
WD	12	M	1	3	3		4
WD	11	F	0	4	2		
WD	11	F	1	5	2	2	2
WD	11	M	0	4.5	1	3	
WD	12	F	0	3.5	2.5		
WD	11	F	0	5	3	3	4
WD	11	F	0	3	3		2
WD	12	F	1	4	3	4	4
WD	11	M	0	3	3	3	4
WD	11	M	0	4	3	3	4

Show	How old are you?	Gender b=boy g=girl	Acted a Part? y/n	Enjoyed The Show? 1-5	Did you Learn Anything? 1-5	What was MAAT? 1-4	Who was the High Priest? 1-4
WD	11	M	0	3	3	2	2
WD	11	M	1	5	2		4
WD	12	F	0	5	3	4	4
WD	11			1	5	1	3
WD	12	F	0	3	3	3	4
WD	11	F	0	3	3	3	4
WD	11	F	1	4	3		4
WD	11	F	0	4	4		
WD	11	F	0	3	4		4
WD	11	F	0	3	2		4
WD	12		1	3	4		2
WD	11	M	0	3	3		
WD	11	F	0	5	5		
WD	11	M	0	1	3	1	4
WD	12	M	0	4	2		
WD	11	M	0	4	2	3	4
WD	12	M	0	4	3		
WD	11	F	1	4	2	3	4
WD	10	F	0	5	2	3	4
WD	11		0	5	2	3	4
WD	11	M	0	3	5	3	4
WD	11	F	0	3	4		4
WD	11	F	0	4	2	2	2
WD	11	M	0	4	2	3	4
WD	12	M	0	5	2	3	4
WD	11	F	0	5	2	4	3
WD	11	M	0	3	3	3	4
WD	11	M	0	4	3		4
WD	12	M	0	4	3	2	4
WD	11	M	0	5	2	3	3
WD	11	M	0	4	3	4	4
WD	12	M	1	3	3	4	2
WD	11	F	0	4	2	2	4
WD	11	F	0	5	1	3	4
WD	12	M	0	3	3	4	4
WD	11	F	0	4	1	3	4
WD	11	M	1	5	2	4	4

11.4 Instructions for the Video Scoring Rubric

Rubric for Scoring Oracle Performances

Often, the actress will pose questions to members of the audience. Some are *general*, such as, “What is your favorite holiday?” or “What part of the Temple do you like best?” Other questions focus on a specific event or object, such as “What offerings do you see placed on this small family shrine?” At other times, the actress will prompt members of the audience to ask their own questions for her or the priest to answer. (There is one question, about the family shrine, which is required by the script, and appears preprinted in the scoring sheet. Separate scores are given to each of the two disputing neighbors. There is one point in the script where the actress poses the question to the priest; in that case we rate only audience participation.)

For each question or statement, the evaluator will:

Write it down.

Rate it from 1 (useless) to 5 (excellent). Evaluate the quality of the question/statement. Is it asking/saying something useful? Is it consistent with the rest of the performance? Does it add to overall enjoyment?

Indicate the questioner’s apparent age.

Indicate the questioner’s apparent gender.

We gather demographic information to see what parts of our audience we are reaching, and whether we have diversity in our test population.

Some members of the audience received role cards, which help them play a very small part in the show. The evaluator rates the quality of each performance for their chosen roles, using the same scoring described for questions or statements, above. When more than one person plays a role (e.g., young priests and musicians receiving a mass promotion) they are rated all together as a group, and demographic data is not collected. Later, we may rate them individually, but those parts are so simple there is very little to do. Finally, the evaluator also separately rates the degree/intensity/quality of audience participation during the time someone is playing the part.

11.5 Video Scoring Rubric

Show:			
Evaluator:			
Date Evaluated:			
Questions Posed by Audience (Rate Questions)	Grade 1-5	Age	Gen der
<insert question here>		0-8 9-12 13-18 19-30 30+	M F
<insert question here>		0-8 9-12 13-18 19-30 30+	M F
<insert question here>		0-8 9-12 13-18 19-30 30+	M F
<insert question here>		0-8 9-12 13-18 19-30 30+	M F
First Question Posed by Actress (Rate Answers)			
<insert question here>	Grade 1-5	Age	Gen der
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F

Second Question Posed by Actress (Rate Answers)			
	Grade 1-5	Age	Gen der
<insert question here>			
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
Third Question Posed by Actress (Rate Answers)			
	Grade 1-5	Age	Gen der
<insert question here>			
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F

Fourth Question Posed by Actress (Rate Answers)			
	Grade 1-5	Age	Gen der
<insert question here>			
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
What offerings do you see at the family shrine?	Grade 1-5	Age	Gen der
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F
<insert audience answer here>		0-8 9-12 13-18 19-30 30+	M F

How well did people play their parts?			
	Grade 1-5	Age	Gen der
Retiring Mayor		0-8 9-12 13-18 19-30 30+	M F
.....Rate Audience Participation			
Candidate Mayors			
.....Rate Audience Participation			
Priests & Musicians Promoted			
.....Rate Audience Participation			
Disputing Neighbor (On the LEFT)		0-8 9-12 13-18 19-30 30+	M F
Disputing Neighbor (On the RIGHT)		0-8 9-12 13-18 19-30 30+	M F
.....Rate Audience Participation			
The Alleged Water Thief		0-8 9-12 13-18 19-30 30+	M F
.....Rate Audience Participation			
Artimedris' Question			
.....Rate Audience Participation			

	Grade 1-5		
Blessing for a Child (1)		0-8 9-12 13-18 19-30 30+	M F
..... <i>Rate Audience Participation</i>			
Blessing for a Child (2)		0-8 9-12 13-18 19-30 30+	M F
..... <i>Rate Audience Participation</i>			
Which Flowers to Plant		0-8 9-12 13-18 19-30 30+	M F
..... <i>Rate Audience Participation</i>			
Choosing Isis for the next play.			
..... <i>Rate Audience Participation</i>			

11.6 Raw Data From Video Rubric

Immersive Education Conference			
	Grade	Age	Gen
Questions Posed by Audience (Rate Questions)			
None			M
First Question Posed by Actress (Rate Answers)			
What holiday are we celebrating			
Friday the 13 th	2	19-30	F
Second Question Posed by Actress (Rate Answers)			
Whats interesting about the pylons?			
Flag poles	5	30+	M
What offerings do you see at the family shrine?			
Food	3	30+	F
Flowers	3	30+	F
Retiring Mayor	5	30+	M
<i>.....Rate Audience Participation... Asian male</i>	4		
Candidate Mayors	3		
<i>.....Rate Audience Participation</i>	3		
Priests & Musicians Promoted	3		
<i>.....Rate Audience Participation</i>	3		
Disputing Neighbor (On the LEFT) White male	5	30+	M
Disputing Neighbor (On the RIGHT)	4	30+	M
<i>.....Rate Audience Participation</i>	3		
The Alleged Water Thief	5	30+	M
<i>.....Rate Audience Participation....white male</i>	4		
Artimedris' Question			
<i>.....Rate Audience Participation</i>	2		
Blessing for a Child (1)	5	30+	M
<i>.....Rate Audience Participation</i>	2		

Puppet Showplace Theater			
	Grade	Age	Gen
Questions Posed by Audience (Rate Questions)			
Why are the pictures so big?	3	30+	F
First Question Posed by Actress (Rate Answers)			
What holiday are we celebrating today?			
The New Year	3	19-	F
Second Question Posed by Actress (Rate			
What is interesting about the pylons?			
Im s	3	19-	F
Third Question Posed by Actress (Rate Answers)			
Whats happening in these pictures? Who are these			
Horus giving Pharaoh the right to rule	3	19-	F
Fourth Question Posed by Actress (Rate Answers)			
Does anyone remember what the outer structure is			
pylon	4	0-8	F
What offerings do you see at the family shrine?			
flower	5	0-8	F
drink	4		F
Retiring Mayor: White	3		F
.....Rate Audience Participation	3		
Candidate Mayors	5		
.....Rate Audience Participation	3		
Disputing Neighbor (On the LEFT)	5		M
Disputing Neighbor (On the RIGHT)	5		F
.....Rate Audience Participation	2		
The Alleged Water Thief	5		M
.....Rate Audience Participation	1		
Artimedris' Question			
.....Rate Audience Participation	3		
Blessing for a Child (1)	5		M
.....Rate Audience Participation	3		
Blessing for a Child (2)	5		F
.....Rate Audience Participation	3		
Which Flowers to Plant	5		M
.....Rate Audience Participation	3		
Choosing Isis for the next play.			
.....Rate Audience Participation	4		

Earth Theater (Ken)			
	Grade	Age	Gen
Questions Posed by Audience (Rate Questions)			
Will I be popular at school	4	0-8	F
Will it rain this year	4	0-8	F
Will I have friends in Portland	4	0-8	F
Will I have a daughter	5	0-8	F
First Question Posed by Actress (Rate Answers)			
What continent is Egypt on			
Africa	5		
Second Question Posed by Actress (Rate Answers)			
What era is the setting for ancient Egypt? AD or BC?			
BC	5		
Third Question Posed by Actress (Rate Answers)			
How do you approach a god			
Bow	5		
Sing	5		
Fourth Question Posed by Actress (Rate Answers)			
What is your favorite food			
Spaghetti	4		
Rice	4		
Pizza	4		
What offerings do you see at the family shrine?			
Berries	5		
Bread	5		
fish	5		
flowers	5		
Retiring Mayor	3	13-18	F
.....Rate Audience Participation	2		
Candidate Mayors	3		
.....Rate Audience Participation	3		
Priests & Musicians Promoted	4		
.....Rate Audience Participation	4		
Disputing Neighbor (On the LEFT)	5		F
Disputing Neighbor (On the RIGHT)	5		F
.....Rate Audience Participation	3		
The Alleged Water Thief	5		F
.....Rate Audience Participation	4		
Artimedris' Question			
.....Rate Audience Participation	2		
Blessing for a Child (1)	4		F
.....Rate Audience Participation			
Choosing Isis for the next play.			
.....Rate Audience Participation	2		

William Diamond Middle School (Ken)			
	Grade	Age	Gen
Questions Posed by Audience (Rate Questions)			
Will I have a good job when I grow up?	5	9-12	M
Am I awesome?	2	9-12	F
Do the teachers like me?	3	9-12	F
First Question Posed by Actress (Rate Answers)			
Who is the statue?			
Horus, because he has a hawk's head	5	9-12	M
Second Question Posed by Actress (Rate Answers)			
Who is the figure next to the statue?			
The High Priest?	4	9-12	F
A musician?	4	9-12	F
The Pharaoh	5	9-12	F
Third Question Posed by Actress (Rate Answers)			
what is the of the statue over the shrine?			
Female	4	9-12	F
Fourth Question Posed by Actress (Rate Answers)			
What is the name of the structure outside the temple?			
The Pylons	5	9-12	all
What offerings do you see at the family shrine?			
Flowers	3	9-12	F
Retiring Mayor	4	9-12	M
.....Rate Audience Participation	5		
Candidate Mayors	3	9-12	
.....Rate Audience Participation	4		
Priests & Musicians Promoted	3	9-12	F
.....Rate Audience Participation	4		
Disputing Neighbor (On the LEFT)	4	9-12	M
Disputing Neighbor (On the RIGHT)	5	9-12	F
.....Rate Audience Participation		2	
The Alleged Water Thief	5	9-12	F
.....Rate Audience Participation		1	
Artimedris' Question	5		
.....Rate Audience Participation	4		
Blessing for a Child (1)	5	9-12	F
.....Rate Audience Participation	5		
Blessing for a Child (2)	5	9-12	F
.....Rate Audience Participation		5	
Choosing Isis for the next play.			
.....Rate Audience Participation	5		

12 Project Management Documents

12.1 Senior Staff

Jeffrey Jacobson, Ph.D. designed managed and directed the project and the production. He managed the schedules, financials, the data gathering, the data analysis, and the final write-up. He designed the data gathering methods.

jeff at publicvr.org <http://publicvr.org>

Robyn Gillam, Ph.D., at York University, York, Ontario, was our Egyptologist. She did all of the initial research, and devised at all stages of the project.

gillam at yorku.ca

Friedrich Kirschner designed and wrote all of the software and had a significant input on the design of the show, and the puppeteer's control interface was his design. We were lucky that he has prior experience in digital puppetry (Kirschner, 2008). [friedrich at zeitbrand.net](mailto:friedrich@zeitbrand.net)

Brad Shur, Artist in Residence at Puppet Showplace Theater in Brookline, MA, was our puppeteer. His input was essential in all aspects of project, especially in construction of the narrative and design of the control interface.

sunrisepuppets at gmail.com <http://www.puppetshowplace.org/>

Kerry Handron led the first stage effort to develop the narrative and managed all aspects of staging the show at the Carnegie Museum of Natural History in Pittsburgh. There, she also plays the role of the live actress.

HandronK at CarnegieMNH.org <http://www.carnegiemnh.org/>

David Hopkins did all of the artwork for the virtual Temple (actually a separate project), the sacred boat, and the costume for the priest. He also produced all of the animations. Ralph Sutter created the actual priest.

davidhopkins3000 at gmail.com

12.2 Senior Advisors

Josephine Anstey and David Pape at the University of Buffalo graciously provided performance space for our February mid-project performance. Their feedback has also been interesting and useful.

<http://josephineanstey.com> <http://mediastudy.buffalo.edu/people/dave-pape/>

John Baek (Oregon State University) advised Jeffrey Jacobson on the data-gathering methods and analysis. Our efforts are much better because of his input.

Dean Lowry Burgess (Carnegie Mellon University) provided expert insight and guidance throughout the project and all the perceptual, artistic, and educational aspects.

lb30 at andrew.cmu.edu <http://artscool.cfa.cmu.edu/~burgess/>

Christopher Innes, Ph.D., the Canada chair of Research in Drama, York University, provided great assistance in developing a proposal for follow-on projects. He also worked with Gillam to make the live Oracle performances at York possible. <http://www.moderndrama.ca/about>

cdinnes at hotmail.com

Professor Michael Nitsche (Georgia Tech) is Friedrich Kirschner's previous and current advisor, and has considerable experience in digital puppetry himself. His advice in this area has been quite helpful. michael.nitsche at lcc.gatech.edu

Semi Ryu is at Virginia Commonwealth University, School of the Arts, Department of Kinetic Imaging. She has worked on virtual puppetry and rituals in interactive media since 2002. Her advice was quite valuable.

sryu2 at vcu.edu. <http://www.semiryu.net/>

12.3 Other Valued Contributors

Richard Graefe (Wordsmith of Rhode Island) has been a great help editing our public documents.

Natthaphol Likhithaworn came to PublicVR for a six-month internship at PublicVR under Northeastern's occupational training program. As part of his duties, he re-implemented the animations for Egyptian Oracle, making them smoother and more accurate. It was a large task, requiring considerable time and effort. However, his ability to handle both the programming and the artwork was very valuable.

Michael List is the puppeteer for the Carnegie Museum of Natural History's version of the Oracle performance.

Ajayan Nambiar provided a first-level solution to sonically unify the physical and virtual spaces. This was his Master's Thesis project from Northeastern University's Media Design program. He also designed the travelling kit, the hardware needed to put on the show. ajayandn at gmail.com

Ralph Sutter provided the body model for the priest.

Ralph Sutter <rsutter at ralphsutter3d.com>

12.4 Institutional Partners

PublicVR provided the largest of the in-kind support for this project, primarily in the form of additional paid contractor time. PublicVR also provided use of its pre-existing virtual Egyptian Temple and equipment and workspace for the animation production and earlier rehearsals.

<http://publicvr.org>

Carnegie Museum of Natural History provided a great deal of in-kind support for the project, gathering audiences of children for the performances there, providing use of their Earth Theater, and matching support in the form of staff time and use of equipment.

<http://www.carnegiemnh.org/>

Carnegie Mellon University provided advice and approval for our data gathering through their Institutional Review Board. The Egyptian Oracle project is part of a much larger process of inquiry in new media led by Dean Lowry Burgess in the College of Fine Arts there.

<http://www.cmu.edu>

The Grid Institute and Boston College provided performance space and scheduled audience time during their immersive education summit on May 13th. <http://mediagrid.org/>

Boston CyberArts provided performance space for our May 1st showing. <http://bostoncyberarts.org/>

The Boston Children's Museum provided space, staff time, and equipment for a simulcast view

of the May 1st Oracle performance.
<http://www.bostonkids.org/>

12.5 Deliverables and Teams

This document was out of date by the end of the project, but it was essential for the team's early integration. We changed the section labeling from numbers to letters to avoid confusion with this document's section numbering scheme.

Egyptian Oracle Project
Deliverables & Team Assignments
01/12/11 Jacobson jeff at publicvr.org

These are the major deliverables for the Egyptian Oracle Project.

Each deliverable is described on its own page, with its major components, where each component is also a deliverable. The last two pages, Documentation and Follow-on Grants, are really categories of deliverables, but it is convenient to list them this way.

Each major deliverable has a core team, whose members have to sign off on any final product, and supporting team members, who generally help out. Anyone is always welcome to comment. The percentages listed approximate how each person should split his or her time in producing the different deliverables. Everyone works on this project part-time, and we all have very different levels of commitment. So 80% from a person who is hired for only ten hours on the project is quite different from 20% from someone spending two months.

Because we are not tracking or defining hours of effort, we cannot list the number of hours each person is putting into each deliverable. For now, just consider (when you look at the percentages) that Jeffrey Jacobson is expected to put in the equivalent of four months full-time, Kerry Handron, Brad Shur, Robyn Gillam, and Friedrich Kirschner, will all put in approximately two months full time, Hopkins about a month, Sutter about two weeks, and everyone else is at two days or less.

This document is meant to go with the Gantt chart, which defines the project schedule.

Team members' assignments and e-mails are listed here:

Name	E-mail	Expertise	Primary Team
Jeffrey Jacobson	jeff at planetjeff.net	Director	All
John Baek	john.baek at science.oregonstate.edu	Advisor	Evaluation
Asa Gray	Asa.Gray at gmail.com	Sound	Animation
Robyn Gillam	gillam at yorku.ca	Egyptologist	Narrative, Docs
Kerry Handron	HandronK at CarnegieMNH.Org	Manager & Narrator	Narrative, Evaluation
Stephen Hughes	Stephen.Hughes at uni.edu	Researcher	Follow-On Grants
David Hopkins	davidhopkins3000 at gmail.com	Animator	Animation
Christopher Innes	prof.innes at gmail.com	Advisor	Follow-On Grants
Heidi Kayser	hkayser at axiomart.org	Manager	Performances
Friedrich Kirschner	friedrich at zeitbrand.net	Advisor	Animation, Narrative
Michael List	Listm at CarnegieMNH.org	Puppeteer	Performances, Narrative
Ellen McCallie	MccallieE at CarnegieMNH.Org	Advisor	Advisor
Roxy Myrum	artistic at puppetshowplace.org	Design	Performances
Michael Nitsche	michael.nitsche at lcc.gatech.edu	Advisor	Animation
Semi Ryu	sryu2 at vcu.edu	Advisor	Narrative
Brad Shur	sunrisepuppets at gmail.com	Puppeteer	PolyNarrative, Animation, Performances
Ralph Sutter	rsutter at ralphsutter3d.com	Animator	Animation

Deliverables

A.A Narrative

The Narrative is the central axis of the project, driving all other deliverables. It contains all required information for the puppeteer, live actor, and the software, together, to conduct the performance with the audience. Parts of it are pre-scripted sequences, which the puppeteer can simply trigger. Much of it is background knowledge regarding the ceremony, the Temple, and Egyptian life, which the puppeteer and live actor use to structure interaction. Some of it is short narrative threads, such as jokes, which anticipate likely interactions with audience members.

The Narrative is verbal, visual, and spatial, encompassing a four-way dialogue among the audience, the puppeteer, a live actor, and the temple god on his ceremonial barque. It will be: (1) a pre-scripted sequence where a Priest and the barque emerge from the inner sanctuary to the Hypostyle Hall (2) interactive ceremony in the Hypostyle Hall (3) a scripted transition to the courtyard (4) interactive ceremony in the courtyard (5) scripted transition outside in front of the temple (6) interactive ceremony in front of the temple pylon (7) scripted transition back into the temple.

The core team for this effort consists of: Robyn Gillam (Egyptologist) at 80%, Kerry Handron (Museum Expert) as the team leader and primary editor at 70%, Brad Shur (Puppeteer) at 40%, and Friedrich Kirschner (Programmer) at 30%. All aspects of the Narrative require unanimous agreement of the core members. Other contributors are Jeffrey Jacobson at 10%, Semi Ryu (Senior Advisor) at 80%, and Michael List at 40%. Major sub-deliverables are described in the subsections that follow.

a.a.a Historical Background

Historical facts and ethnographic information, which (1) serve as raw material for the Narrative, and (2) support the historical authenticity of our approach.

a.a.b Draft Narrative

A functional draft encompassing all seven phases of the performance, each with just enough detail to bring out the major issues. After it is done, we will take it apart and start over.

a.a.c Draft Story Board

The storyboard will have three columns, with the draft narrative on the left, the spatial interactions mapped out in the center, and needed resources (e.g., props, software) on the right.

a.a.d Final Story Board

A functional final draft encompassing all seven phases of the performance. It should contain all of the detail required for the final performance, put together in some coherent and testable way.

a.a.e Documentation

A written description of what was done, why, and how someone else can build upon this work. It also includes cards for members of the audience, each card containing information on a role an audience member might play.

A.B Artwork

This deliverable consists of all the digital artifacts, which the puppeteer, live actor, and audience used to mediate the interactive show. This includes the three dimensional artwork and ambient sound.

Core team members are Ralph Sutter (3D artists) at 50%, Michael Lowe (3D Artist) at 60%, Asa Gray (Music) at 100%, David Hopkins (animation) at 80%, and Jeffrey Jacobson (Supervision) at 10%. All members of the team will be required to comment; everyone else is invited to comment.

Following are the major sub-deliverables.

a.b.a Priest

Complete model of the priest with clothing and props, in both Autodesk® 3ds Max® and Unity format. The model will also have to be "rigged," meaning that it has theoretical bones and joints which govern its behavior.

a.b.b Barque

The ceremonial barque, or boat, carried by eight priests. It bears the shrine, which is supposed to have the divine image of the god Horus within it. However, the doors to the shrine are shut, and the lower portion of the shrine is wrapped in linen. May include a ninth priest burning incense.

a.b.c Temple

A rebuild of the virtual temple to meet a new, more highly accurate set of specifications. This is technically a separate project, not part of the Egyptian Oracle grant or budget. However, it interacts with Egyptian Oracle closely enough to warrant integrated planning. David Hopkins is doing the artwork, Asa Grey did the ambient sounds and music, Robyn Gillam has provided all of the needed information, and Jeffrey Jacobson is supervising. It will need final review.

a.b.d Documentation

A written description of what was done, why, and how someone else can build upon this work. This includes a website for the temple and a companion website for the Egyptian Oracle.

A.C Animation

This deliverable consists of all of the software, animations, dynamic sound, and *physical* control devices. Especially, the software, to continuously control parts of the puppet.

Core team members are Friedrich Kirschner (Programmer) at 70%, Brad Shur (Puppeteer) at 30%, Ralph Sutter (animator) at 100%, and David Hopkins (animator) at 20%. Supporting members: Semi Ryu (10%), Michael List (10%), Michael Nitsche (Senior Advisor), Jeffrey Jacobson (10%).

Major sub-deliverables are described in the following subsections. Each one will have two phases, Draft and Final, except for Documentation.

a.c.a Puppeteer's Rig

The physical devices the puppeteer uses to control the priest and the barque. Initially, this will be simple game pad(s) or joystick(s) or some other common game interface devices. Continuous controls and lots of buttons will be needed. Foot pedals are an option. The same team, which handles the software and artwork (above) handle this.

a.c.b Triggered Priest Movements

Animations for the priests, which the puppeteer can trigger, such as walking or raising hands in greeting. This sub-deliverable will also have to include movement blending software that will allow multiple motions (scripted or intentional) to coexist simultaneously.

a.c.c Continuous Priest Controls

Intentional, continuous controls, such as small joystick or POV to control the priests head.

a.c.d Barque Controls

The barque and its bearers will be treated as one, single puppet. The barque will move from one set point to another, along with the priest and the audience camera for every scene change.

a.c.e Barque Animations

The barque will be able to tilt up or down or move forward or backward, indicating approval or disapproval by the god. It should also be able to shake indicating rage. Finally, we will need animations for the barque moving forward, turning, or "strafing" to one side or another.

a.c.f Scene Control

The barque, the priest, and the audience camera all move at once during each scene change. Perhaps the puppeteer will need a toggle control to move everything forward from one scene to the next.

a.c.g Transition Sequences

Described above, in the section on Narrative.

a.c.h Documentation

A written description of what was done, why, and how someone else can build upon this work.

A.D Evaluation

We want to measure how engaging and enjoyable the audience found the performance to be and measure its educational effectiveness. Team: Jeffrey Jacobson (30%), John Baek (100%), Kerry Handron (10%).

a.d.a IRB

Absolutely any protocol involving human test subjects requires Institutional Review Board approval through an accredited organization. We will use Carnegie Mellon University's IRB process with help from Professor Lowry Burgess, there.

a.d.b Analysis of Videos

Our best testing tool will be analyzing the video recordings of the performance and the audience. We will see how they respond to the performance, measuring things such as how many questions or comments they make, and how many appear to be sleeping or texting, or otherwise not paying attention. We can also infer what they're learning from the questions they ask and the comments they make

a.d.c Questionnaire

To be distributed to some or all of the audience members after the show. It will ask a small number of knowledge questions and general questions on enjoyment.

a.d.d Analysis of Questionnaire.

Analysis of responses to the questionnaire.

a.d.e Documentation

A written description of the results and a discussion of the implications.

A.E Performances

a.e.a Technical Rehearsal

On Feb 12th in Buffalo, we will convene to stage a rough version of the show for ourselves. We expect to learn much and Jacobson will write a summary of attendee comments and decisions made, there. Those who cannot attend can watch the video and submit separate statements, either verbal or written.

a.e.b Earth Theater Stage Design

The projection screen, projectors, information displays for the puppeteer, the puppeteer's location, sound systems, seating, lighting, and everything necessary to house the performance. It is particularly important that the puppeteer be able to see and hear enough, either directly or through some video feed. This deliverable includes integrating the puppeteer's rig and also preparing to videotape in both the performance and the audience. Lowry Burgess (70%) will advise on the integration of the show into the immersive space. Kerry Handron (10%), Michael List (20%), and CMNH staff (50%) will engineer everything.

a.e.c Earth Theater Performance(s)

At least one rehearsal, and one videotaped performance. The CMNH has committed to staging the show at least several times more. Team member allocations are Michael List (40%), Kerry Handron (10%), and CMNH Staff (50%). The team handles all publicity, distributes and collects questionnaires, prepares videotapes, and distributes and collects waivers, if necessary.

a.e.d Puppet Showplace Theater Design & Performance

Same task description as for Earth Theater, above. PST staff (100%) and Brad Shur (10%) will handle this.

a.e.e AXIOM stage Design & Performance

AXIOM staff (100%) and Brad Shur (10%) will handle this.

a.e.f York University Stage Design and Performance

Christopher Innes (100%), Robyn Gillam (10%), and students at York (100%) will handle this.

a.e.g Documentation

Description of the shows, saved videos and photographs, and written observations.

A.F Publications

Eventually, everyone will be involved in this, but especially Jeffrey Jacobson.

a.f.a Whitepaper

The final report required by for the NEH. We can make this as long or short as we like, but it is important, because it will become a permanent and very public record. It includes all documentation written for all the other deliverables, as well as general description, synthesis, and references to similar works elsewhere.

a.f.b User Manual

This is an instruction book for anyone who wants to stage the Egyptian Oracle himself or herself, or modify it for their own use. For our own use, we will write the first draft of this, largely from documentation from the individual deliverables. We will seek additional funding to develop the user manual and package elements of the Egyptian Oracle performance for public distribution.

a.f.c Website

We will reformat the contents of the whitepaper into a website about the project, It will include videos of the performance (not the audience), the updated temple model, and a very long list of credits.

a.f.d Articles

We expect to produce quite a few spinoff publications from this project. Some will be scholarly papers in educational or museum-related journals and magazines. Others will be an arts magazines or journals. Still others can be in the popular press and at various conferences. It is important that we publicize, as much as possible.

A.G Follow-On Grants

While we do apply some project funds toward developing these grants, as we promised, their scope is greater than the Egyptian Oracle itself.

a.g.a SSHRC Partnership Grant

We are proposing a follow-on grant to a Canadian government-funded organization, which is due Nov 10th. It is a three-way partnership between PublicVR, York University (Toronto), and King's College (London). We propose a three-part performance, where the first act is the Egyptian Oracle in Egypt, the second act is a ceremony in the virtual temple of Isis and Pompeii, and the third act is in the virtual Odeon, small theater at Pompeii. Christopher Innes is spending 100% of his time developing this, with major input from Jeffrey Jacobson and historical background developed by Robyn Gillam and Richard Beacham.

a.g.b IMLS Grant


This will be a grant proposal to the Institute of Museum and Library Services, under their national leadership challenge grants program. Essentially, we will ask for enough money to do the Egyptian Oracle Project over again, with sufficient funding to do it bigger and better. We don't have to start writing it until the end of November, and by then we will have come across many things for which we will need funding. Grant application is due February 1.

a.g.c Technology Development Grant

We will continue our speculations and regular Skype meetings to discuss how we want to develop our puppeteering technology. We will insert our ideas into the various grants we write. Stephen Hughes is working on a highly focused stand-alone technology development grant for the NSF for the December 15th deadline. Next year, we may write a more general technology development grant.

12.6 Snapshots of the Discussion Forum

We used a standard “phpBB3” electronic bulletin board for most of our internal communications. It is located at <http://forum.publicvr.info/> but the area for the Oracle project is only visible by logging in with a forum account. The forum supports permanent threaded conversations with file attachments, easily accessible via a web browser. This is essential for long-running conversations, because email is ephemeral and chronologically organized.



PublicVR Forum

Online discussions of everything having to do with PublicVR, especially current projects, tech support, educational practice and theory. See <http://publicvr.org> for basic information and send questions to jeff@publicvr.org

[Logout \[goshen \]](#) [0 new messages](#)

[FAQ](#) [Search](#) [Members](#) [User Control Panel](#)

Last visit was: Sun Nov 27, 2011 4:35 pm It is currently Wed Nov 30, 2011 7:50 pm

[View unanswered posts](#) | [View active topics](#)
[View unread posts](#) | [View new posts](#) | [View your posts](#)

Board index » PUPPTEERING » Egyptian Oracle Implementation
All times are UTC - 5 hours

Egyptian Oracle Implementation

[\[Moderator Control Panel \]](#)

[new topic](#) Page 1 of 1 [12 topics]

Topics	Author	Replies	Views	Last post
Project Status: Updated 06/19/2011	goshen	0	198	Mon Aug 30, 2010 7:19 pm goshen →
drafts of narrative [Go to page: 1, 2, 3, 4, 5]	kerry	45	874	Wed Jun 15, 2011 9:24 am berenike →
dress rehearsal 18/4	berenike	0	86	Wed Apr 27, 2011 3:44 pm berenike →
Music and Sound FX [Go to page: 1, 2]	goshen	14	304	Sun Apr 03, 2011 8:06 pm Asa →
Boat Animation	dhopkins	0	86	Fri Mar 25, 2011 10:01 am dhopkins →
Unity implementation updates [Go to page: 1, 2, 3, 4, 5]	Kirschner	49	835	Tue Mar 22, 2011 3:03 pm goshen →
Evaluation	goshen	0	93	Wed Feb 23, 2011 4:41 pm goshen →
Notes for the Narrative.	goshen	6	223	Mon Dec 13, 2010 4:37 pm goshen →
Hardware setup and Specs	Kirschner	0	113	Tue Nov 16, 2010 5:03 pm Kirschner →
The New High Priest Model	CaseyShenery14	2	155	Fri Oct 08, 2010 9:03 pm goshen →
Unity3D vs. UDK CAVE feasibility	Kirschner	0	352	Tue Sep 21, 2010 7:45 pm Kirschner →
Important Technical Facts and Unresolved Issues	goshen	0	149	Mon Aug 30, 2010 7:37 pm goshen →

Display topics from previous: All Topics Sort by Post time Descending [Go](#)

[new topic](#) Page 1 of 1 [12 topics]

Board index » PUPPTEERING » Egyptian Oracle Implementation
All times are UTC - 5 hours

Who is online

Project Status: Updated 06/19/2011

[Moderator Control Panel]



 Page 1 of 1 [1 post]

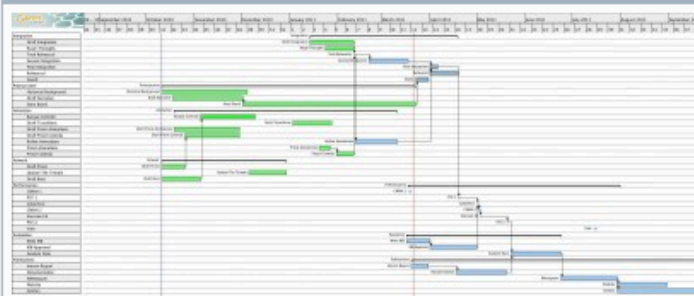
Unsubscribe topic Bookmark topic Print view E-mail friend Bump topic		Previous topic Next topic
Author	Message	
goshen	Post subject: Project Status: Updated 06/19/2011 Posted: Mon Aug 30, 2010 7:19 pm	
<div style="border: 1px solid #ccc; padding: 5px;"> online Joined: Tue May 27, 2008 11:29 pm Posts: 489 </div>	<p>The Egyptian Oracle project is about 3/4 done! Now that we are in the home stretch, we do not need and elaborate planning. Here is the news and the to-dos:</p> <p style="text-align: center;">http://vimeo.com/24297667</p> <p>People have a really hard time imagining what the Oracle performance is, even with full explanation and pictures. Nothing has worked better for me than showing them this clip and telling them that the priest and the boat are live-controlled puppets.</p> <p>All of our required performances are done. (We are doing a couple extra.)</p> <p>All our data is gathered.</p> <p>The software is complete.</p> <p>The immersive sound system is complete. This is AJ's thesis work, some software tweaks and a bunch of sound equipment that really makes the performance space sound much more convincing.</p> <p>The Remaining Tasks:</p> <p>JEFF:</p> <ul style="list-style-type: none"> Develop a rubric evaluating the videotaped performances and discussions. Have John Baek review my rubric. Score the data & analyze. Analyze the questionnaire data. Post everything for comment. Collect comments from everyone. Collect writings from Friedrich, Kerry, Robyn. Compile the final report. <p>ROBYN:</p> <ul style="list-style-type: none"> References and rationale for why we built the Oracle performance the way we did. Your take on our historical accuracy and success/failure to capture the spirit of the original performances. Key improvements you would like to see in a follow-up performance. Background on the virtual temple, references and rationale for why built it the way we did. <p>FRIEDRICH:</p>	

The Buffalo rehearsal went well. We learned a lot, and gave an early copy of the software to Kerry and Josephine. This link will take you to a video of it.

<http://vimeo.com/20295021>

Since we are doing images, here is the project's current Gantt chart showing the past and future schedule. As you can see from the way the tasks cluster, we are about to complete a distinct first phase of constructing the software/artwork application, and entering the performance & evaluation phase.

Attachment:



GrandSchedule.jpg [320.73 KiB | Viewed 113 times]

Current Activities:

Right now, Friedrich is doing the heavy lifting, completing the software. This includes a lot of artistic judgments on how the transitions work, and how the controls of the priests work. Dave is providing bits of animations to Friedrich.

Dave is also fixing bits of the temple, especially the lighting. It is way too dark and blue-green as you can see in the Buffalo video.

After the 20th, Robyn will provide advice on the priest and the boat, so Dave can fix those.

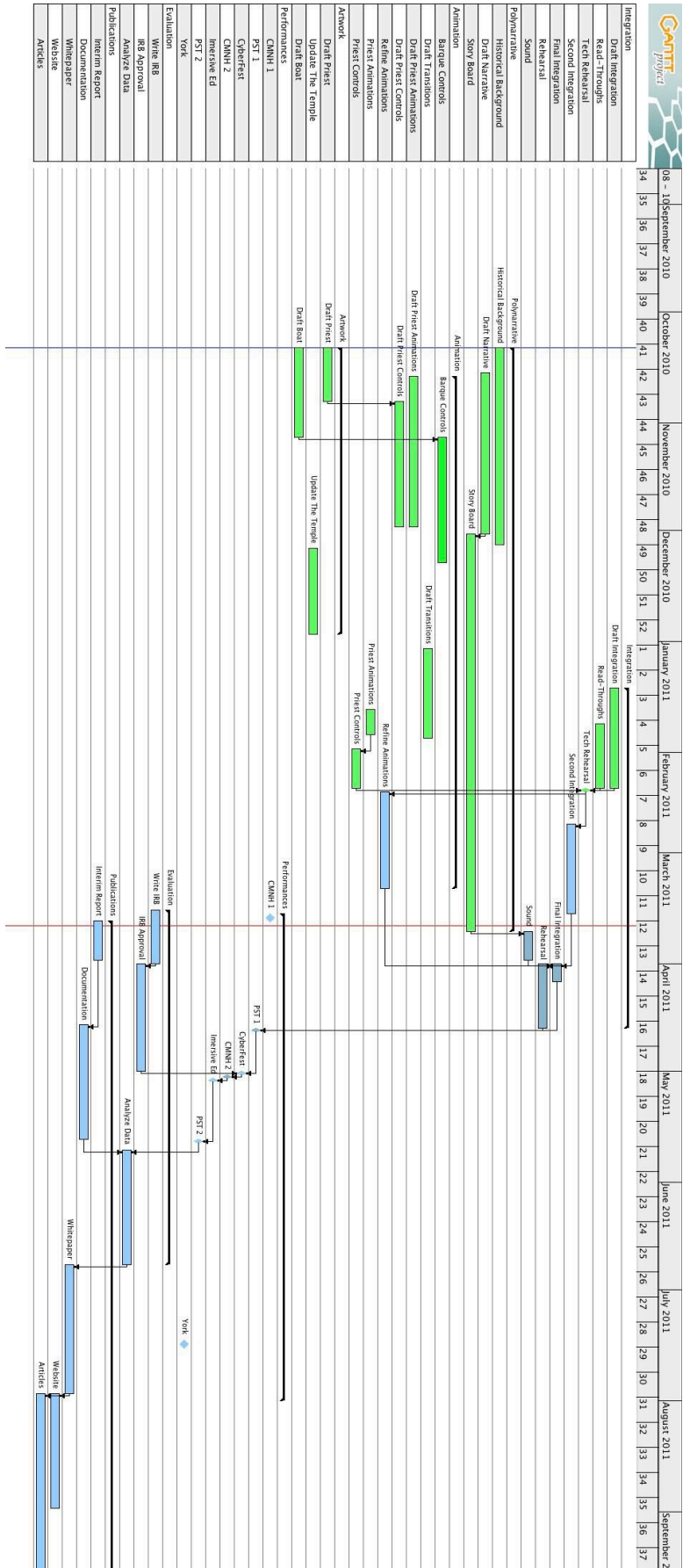
Asa Gray is now composing sound effects and "dramatic moments" music.

I got some good advice from John Baek on evaluation, I'll write the IRB application this week.

Semi Ryu and Michael Nitsche watched the video and sent in written comments. I posted those to the forum. See the Drafts of Narrative thread ([viewtopic.php?f=20&t=337&start=0](#)) for all such notes.

The Future

The Boston Children's Museum is very interested in Oracle, so we will see what comes of that.

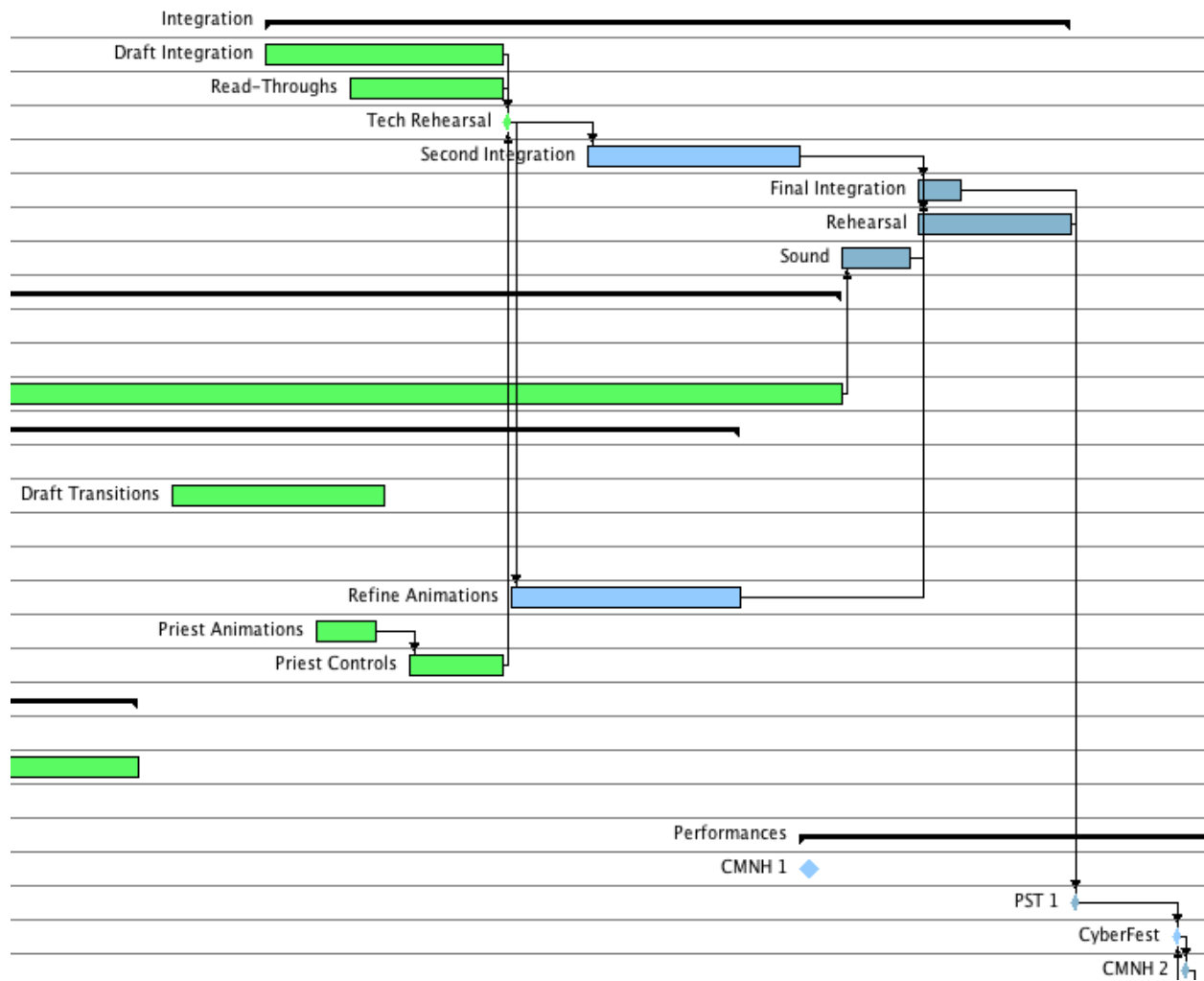


12.7 Schedule

To track our schedule, we used a basic Gantt chart tool. It provides a simple but highly effective way to see all tasks laid out on the calendar with their dependencies drawn. The tasks in green have been completed, blue are in progress or not yet started. The red line is the “today” when this chart was generated. Two tasks completely behind the red line, at the time, were late, so we had not yet colored them green.

Note how the project had two distinct phases, shown by the two clusters of tasks. First, came the engineering and artwork followed by the performances, evaluation, debugging, and publications. A fair bit of development of the on-stage dialogue and interactions took place at this stage, once the actors had all the pieces in place and audiences to work with.

It was fascinating to see patterns like this evolve. In the first half of the project, we redrew this chart five times as we came to understand the work better. As a team we had never worked together before, and only a few of us (Anstey, Kirschner, Nitsche, Pape, Ryu) had done a remotely similar project in the past.



Close-up view from part of the Gantt chart.

13 Publicity and Publications

13.1 The Puppet Showplace Theater Flier



SUNDAY, APRIL 17, 2011

INCUBATOR TUES: "The Egyptian Oracle" by Public VR

THIS WEEK AT PST

Incubator!

TUES | April 19 | 7pm to 9pm

About Incubator: Every other Tuesday, PST hosts a "drop-in" session where emerging artists, veteran puppeteers, teachers, and puppet enthusiasts gather to discuss and develop creative ideas in a casual, informal environment.



Here artists of all media and genres, experienced or not, can experiment with new puppetry ideas, materials and styles. It's a place where knowledge is shared, constructive critique is the norm, and collaborations are born. This event is free and open to the public, with a suggested donation of \$5.

What's happening this week:

Preview of "The Egyptian Oracle", by Public VR- an immersive educational experience that recreates an important religious event from the Ptolemaic Period. By projecting a Virtual Egyptian Temple onto a wall real space merges with virtual space, creating a shared continuum for audience and actors. The star is a virtual High Priest, controlled by a human puppeteer (PST Artist in Residence Brad Shur) interacting with a live actor (PST staff member Brenda Huggins) and the audience, who role-play as the Egyptian populace. The high priest queries the spirit of the temple god which is embodied in a ceremonial boat carried by eight assistants. Fortunes will be told, judgments made, and blessings given.

We will film the event, ask audience members what they learned, and have a general discussion afterward. This experimental work was made possible by the National Endowment for the Humanities and the performance venues in Boston and Pittsburgh.



About PublicVR: PublicVR is a Non-Profit (501c3) organization dedicated to free software and methods for using Virtual Reality in education and research. They are particularly interested in interactive learning games based on virtual worlds, and on projection-based displays which visually immerse the student in the learning space. The use of Virtual Reality is no longer the stuff of science fiction. PublicVR projects are in use for education, skills training, and even for the medical therapeutic treatment of balance disorders.

More information at
<http://publicvr.org>

EGYPTIAN ORACLE | PERFORMANCE AT PST
Friday | May 20 | 7:00pm
BUY TICKETS!

13.2 The General Flier

The Egyptian Oracle

PublicVR will recreate an important religious event from the Ptolemaic Period, the Egyptian Oracle. Projecting our Virtual Egyptian Temple onto a wall opens the real space into the virtual, creating a shared continuum for audience and actors. The star is a virtual High Priest, controlled by a human puppeteer interacting with a live actor and the audience, who role-play the Egyptian populace. The high priest queries the spirit of the temple god, which is embodied in a ceremonial boat carried by eight assistants. Fortunes will be told, judgments made, and blessings given. We will film the event, ask audience members what they learned, and have a general discussion afterward, all totaling 90 minutes. The information we gather will help us improve the show and inform our educational research. This was made possible by the National Endowment for the Humanities (grant HD5120910) and the performance venues in Boston and Pittsburgh. See <http://publicvr.org>.



April 19th, 7:00pm-9:00pm, Public Rehearsal and Workshop, \$5 donation, Puppet Showplace Theater (<http://www.puppetshowplace.org/>) **Boston**

May 1st, 2:00-4:00pm, Boston CyberFest Performance, Free, Atlantic Warf Building, 290 Congress Ave. (<http://bostoncyberarts.org/festival/events/>). Live video streaming to Boston Children's Museum. **Boston**

May 7th, 2:00pm-3:00pm, Carnegie Museum of Natural History (Earth Theater), Free with museum admission. (<http://www.carnegiemnh.org/>). More **performances monthly**, to be scheduled. **Pittsburgh**

May 13th, 12:30-2:30pm, Boston College. Part of the Immersive Education Summit. See conference programme for details at (<http://mediagrid.org/summit/>). **Boston**

May 20th, 7:00pm-9:00pm, General Performance, \$8 admission, Puppet Showplace Theater. **Boston**



13.3 Ajayan Nambiar's Master's Thesis

It is too large to include here. See:

<http://publicvr.org/IndexDownloads/NambiarA2011.pdf>