URCAS presentation paper

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---Katie's part--

As part of a Memphis Center Fellowship in the Arts, Bao Bao and I along with Dr. Clinton and Professor Floyd worked as a team to develop an online game using 3D modeling of ancient architecture from the Minoan period in Greece (slide-modeled object.) In this game, 3D modeled objects, inspired by actual artifacts from the site, will populate a digital reconstruction of an ancient house, called The House of the Rhyta. (slide-maps) The House of the Rhyta is found on Pseira, a small Greek island a few miles off the coast of the island of Crete. The settlement there was an important seaport occupied from the Neolithic period until the Byzantine era. Through the hundreds of years' worth of natural disasters and different renovations, this structure has been through many changes and therefore this project is designed to create a 3D atmosphere of the house during the Minoan period specifically from 1450-1400 B.C.E. (slide-detailed map) The Minoan town of Pseira sat on the southeastern coast of the island, facing Crete. (slide-large plan) The House of the Rhyta, the setting for our game, is especially intriguing because there is evidence of it being both a living space and a religious space for Minoan ritual practices.(slide- detailed plan) A structure with six rooms, it was found with artefacts once used for cooking along with ritual items, some even used for sacrifices. (slide-3D comparison) The larger more open lay out of the upper rooms, which have been concluded as ritual spaces, contrasts with the tighter flow of the rooms on the lower floor most likely used for storage and food preparation. Although previous research has revealed some information about what activities occurred in certain rooms, it is never possible to be certain how people really interacted with ancient spaces, because those spaces do not exist anymore. Through the 3D model, we are

creating a method for contemporary people to interact with destroyed ancient space. Creating a videogame with The house of the Rhyta as the setting allows us the opportunity to track the game users' movement in the house to trace access and circulation patterns.

This will tell us what spaces were public and private, and perhaps what types of people were entering different areas. (slide-room 8) For example, in what we call room 8, there is a small door way that leads to room 9, but directly to the left as one enters the room, there is also a staircase.

The number of people who choose to go through the doorway compared to those who chose to go up the staircase will tell us which was the primary way people would reach the main shrine. This will help us to separate the domestic work rooms from religious spaces.

This semester, our main focus has been on building a model of The House of the Rhyta for our game. We had to develop an understanding of this ancient Greek space in order to set realistic goals for the creation process. This in the humanities portion of "the digital humanities" which is how we would describe our work. We have worked together to accomplish the shared goal of developing an educational and accurate game. As Bao Bao does the digital animation and modeling portion, I conduct research on the context and history of the space. I think some of the most interesting challenges in this developing field called "digital humanities" come from using previously conducted research and collected information for new or different purposes, also known as legacy data. "Legacy data" refers to anything from excavation records to previously constructed models that we did not create and were not formatted for our purposes within the digital humanities. Often times when we use repurposed data, there are formatting differences that we must reconsider and rework in our project. We look at this project and celebrate our successes in upcycling, especially work of Rhodes' community members. I will hand it off to

Bao Bao as she explains her process and dives into some of those exciting challenges. The process of creating this digital atmosphere, which Bao Bao will explain, is important to recognize because this game is an artwork, and like making any work, there are always setbacks and triumphs to consider and embrace.

---Bao Bao's part---

I am very glad to be a part of this project, especially because of its relevancy to my art and math double major. The opportunity to combine artistic creativity and scientific accuracy in this game perfectly suits my interest and allows me to explore 3D modeling from a scientific perspective with rich archeological context of Minoan world. The power of 3D modeling has not been fully realized in both archaeological application and educational purposes. Our goal at the beginning of the semester was to use 3D modeling software, Autodesk Maya, to accurately reconstruct the House of the Rhyta and then take a step further to create an educational game based on the 3D model. In the technological process, as Katie mentioned, there were, of course, lots of exciting as well as frustrating moments.

Since I had very limited experience with 3D modeling software before getting into the project, I started off by watching tutorials and learning how to use Autodesk Maya. The process of getting used to the software in the first two weeks turned out to be a painful process. But fortunately, it has been very helpful to also be in Professor Floyd's 3D animation class while simultaneously working as a Memphis Center Fellow in the Arts. In Prof. Floyd's class, I ended up learning how to build structures in a process which I call "box modeling" [box model slide] The basic idea of box modeling is that I start with a box and by changing the shape, I could make any structure I want and this is what this process looks like.

[Working with Legacy data slide] Our project uses the previous work of two other Rhodes student fellows who were working on this last year. There are some models they built which we first thought we could employ in our game developing process. However, their models were not as helpful as we had hoped. This is a prime example of the "legacy data" encounter which Katie spoke of before. The software they used is called Google SketchUp. They used this software to create the 3D models for both the house **as well as the** objects. Transition slide 1 Because there is a transition from Google SketchUp to Autodesk Maya, we had to first import their models into Autodesk Maya, Transition Slide 2 as we can see in the picture from those green lines, there are a lot of unnecessary shapes being created in the process. And what we need to know is that these shapes greatly increase the size of the data. Since we are using the models to eventually develop a game, it is very important to keep the House and objects in a reasonable small size, so that the game can run smoothly without requiring the large capacity of the computer, so we were trying to figure out if there was any way to get rid of these unnecessary shapes. [Transition Slide 3] This is what the process looks like. To clean up each face of the wall, we had to delete these red triangular shapes and recreate a new piece to cover the area. The process was so complicated and time-consuming that I ended up deciding to abandon the old model and make a new one.

[New version Model Slide 1] I finished our new model with textures. {point out}This is the view from the top without the roof. [New Model Slide 2,3,4] These are the view of the house from different perspective. [New Model Slide 5,6] These are the interior parts of the House. The result is satisfying because better than the previous one, I added layers for the model, so despite see the house in whole, we could also choose which part we want to see. For instance, [Layers 1] we start with the top view of the house with the roof and by turning off the layer with the roof,

[Layers 2] now we can see the wooden beams under it, and by turning off the layer with the wooden beams, [Layers 3] now we can see the interior from the top. Similarly, if we start with the side view of the house [Layers 4], by turning the layer with the sidewall, Layers 5 now we can see the interior part from the side, and we can even turn off the middle wall Layers 6 to see the far wall with the side perspective. Also [Surfaces Slide] comparing with the old model, we have fixed the problems with the extra shapes on the house and the data size is much smaller which is good for our next step—developing our video game.

[Textures and Material Slide] The issue we are facing recently is how to accurately texture the model based on the historical information and the images from the site. {point out} What we are using for the texture of the walls is the image from the site, but this image only gives us few feet of walls to work with. [Texture Repetition Slide]This cause a problem of repetitive patterns in the process of texturing in Maya. So our next goal is to find a way to make the wall more realistic and less patterned and eventually develop the game with this model we have built.

---Back to Katie---

Now that the textures have been added, we have a model that accurately recreates the ancient house we have been studying. Now we are ready to go forth and take the next step in our research and build the videogame. Which we can do through the renewed support of the Memphis Center Fellowship in the Arts for next semester.

In the last few weeks, Bao Bao taught me how to play videogames as I identify more with art history than videogaming. As we explored other historically based video games, we were able to critique them and conclude what would be beneficial to our project, and what creates a user-friendly experience. (slide- samothrace game)

When playing a game called Samothrace Mariner, we discovered there needs to be a balance between the aesthetic accuracy and the productivity of the game. The function and the forms need to work together in a way that is both visually interesting and also mentally enticing. In Samothrace Mariner, no map was supplied to the user, this might be accurate for the ancient traveler but it led to frustration as a gamer with little direction. We then wanted a map for our game, but that would compromise the research goal of simulating the ancient experience. Then we came up with a compromise idea, for example an available map that can be be accessed after completing tasks, or it is only available for a limited time. (slide- saxon game)

While playing a game called Saxon, we encountered problematic tasks that we should avoid in our game because they might change the way users move around the house. We want them to move freely in the model for us to collect tracking data about their movement decisions. In Saxon, we had to find animals to slaughter for food, and this changed our interaction with the environment. We would not want our users to have to "find" something, but rather our tasks should be accurate to the activities in the house, like a domestic chore or performing a ritual.

(slide-thank you)

While the creation of the model and the research have been beneficial for Bao Bao and I as undergraduate students, witnessing our team's development within the field of "digital humanities" has been eye-opening and encouraging for all of us. Many games are designed with teams of researchers and programmers. For example, Samothrace Mariner had a team of professional full time game designers and still look three years to roll out to the public for playing.

It is a privilege but also a challenge to reach for the goal of a completed working game in only two semesters as undergraduate students, even with the help of Dr. Clinton and Prof Floyd,

this is still a challenge. These two departments of art history and digital animation have come together to create something that in the end will give us more information about the House of The Rhyta, while also entertaining and educating users. Through art historical and archaeological research and an understanding of Maya and the creation of the model to be used in the game construction software, Unity, we are ready to move into the fall semester and take even more strides towards the goal of creating an interactive online game.