Lee Sonko Portfolio Submission In fulfillment of 3D Skills Prerequisite Entry-Level Master's Prerequisites Department of Occupational Therapy San Jose State University

Lee Sonko



OrbSWARM is a technology-art project begun in 2006. It is a fleet of 6 semiautonomous spherical robots that roll, dance, sing, and illuminate. I am one of 3 leaders on the project of 25 volunteer artists. A friend had the initial vision for the project and I jumped on board with gusto, wanting resolutely to be a part of a project that would marry art and multiple high technologies.

I wear many hats on this project: organizer, grant and financial officer, property owner, performance manager for several events, designer and fabricator of several components, musician, and promoter.

I designed and built the power sub-system. Though I had never built anything like it, trusting my intuition, electronics fundamentals, and determination made the power subsystem a great success. I was pleased that my design impressed even the Electrical Engineer PhDs in the group. The design was not without its problems, but realizing when a solution is "good enough" is an excellent life-lesson!

I taught myself how to weld aluminum and steel on the project. I've since taught others.

The audio system was designed by other members but I took the lead on creating compositions for this 6 piece "orchestra". As artists, we had to ask ourselves what a sentient OrbSWARM would sound like. We created several soundscapes, musical

compositions, and sound effects that have delighted spectators. It is remarkable how the sounds emanating from the piece create a strong emotional connection between audience and art.



While we built OrbSWARM as a grown-up meditation on artificial life, children flock to it. There is something curious about the shape and motion that challenges our notion of



anthropomorphism. The vehicles have precious little expressiveness, no face, no limbs, no top or bottom, no head or tail. And frankly, it is 100 pounds of sharp metal trying to take a chunk out of your leg. But people are still inexplicably drawn to them as cute characters. Understanding working with this anthropomorphisism is an exciting challenge. There is therapeutic value in having kinetic machines relate to occupational therapy clients. Body language cues are universal among mammals and being able to identify when a rolling ball is "happy" or "sad" can give a client another dimension to think about body language.

This is the most difficult project I ever did for fun and I would do it again in a heartbeat. **Colossus** is the first large scale art project I worked on. I ground and fitted every part on the sculpture. It is a massive merry-go-round-like creation where participants grab a rope



and pull the stones around in a circle. You can see the participant's view of the piece while interacting with it below. An essential part is the excitement and perception of danger involved in piece. It is hard to capture the feeling in a photograph but there is a very real sense that the boulder might fall on you. The cognitive dissonance present when one sees a 5 ton boulder gently gliding above one's head is certainly something to consider.

The theme of joyful and comfortable interaction with the physical world is a core concept in occupational therapy. This piece is a meditation on that theme.





Steel Heart is a collaborative artwork built by a friend and me. We designed it together,



he did the steel forming and I did the electronics and kinetics.

The meticulously shaped steel heart is cold and solid but it has a secret inside. When the participant picks it up and holds it tightly, body heat causes the heart to actually beat from within. Electronics inside the piece detect the change in temperature when being held and actuate motors to create this effect.

I greatly enjoyed building this piece and find it significant as an artist because of the casual juxtaposition of so many elements: The cold,

solid, unforgiving metal is suddenly made live by a simple rhythmic vibration. The fabrication techniques of pounding sheet-steel into such an intricate shape are brutal and require considerable muscle, but the electronic brain inside is extremely delicate using the most subtle logic to emulate a living creature. The resulting art work appears as one unified vision but it took two designers collaborating together to make it work.



The Serpent Mother is a 168 foot long skeletal serpent made of steel and fire, coiled around and fiercely protecting her egg.

I spent six months helping to design, fabricate, and show this piece at the 2006 Burning Man festival with an art group called the Flaming Lotus Girls. The piece has since toured the world. Some of things I did on the piece include: helping to design and fabricate the LED lighting system, designing moving lighting patterns, working on the flame effects system, cutting, welding, bending, and grinding metal components.

The project management style of this massively collaborative project had a large influence on how I think about productive groups. Their process relies heavily on asking the group how to proceed and specifically doesn't name an organizational hierarchy. It relies on participants stepping forward and managing or participating as they see fit. This style has worked extremely well for the Flaming Lotus Girls and I have used it on other projects where appropriate to great effect.



An essential element of the sculpture is that it can be controlled by participants. The flame effects shoot and the head moves when buttons on the sculpture are pushed. This relates directly to occupational therapy; learning how to control the world around us, be it a mechanical serpent head or a prosthetic limb, can be frustrating or joyful depending how the problem is framed. We specifically designed the controls with an appropriate learning curve and interface for our audience, to be enjoyable and rewarding for the participant and spectators. It has been a great success.