COSC127 SP24

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May 31, 2024

Word Count: 861

CS127: Fried Chicken Wing Art Installation Final Report

Part 0: Link to Demo Video:

https://drive.google.com/file/d/1ESwmjJ5bVr218gM133JFEHO_XrrqLXWa/view?usp=sharing

Part 1: Concept:

An art installation that combines robot arm and VR space. With the movements of Robot arm, different angles of the VR space could be seen. Robot arm is extended from a wire frame sculpture to represent the wing. The “chicken” in the title means people are afraid to present their inner world to others, this concept is represented by a small monitor only revealing fraction of VR space at each time. Thus, the monitor works as a small window to communicate with the audience. “Fried” in the title stands for the robot arm is programmed to do fixed movements like a human living 9 to 5 life every day without change being “fried” and exhausted.

Part 2: Work I have done:

1. Wireframe sculpture: hand built from 3mm metal wire, fixed with zip tie. With head shape similar to my own head and body shape considering the movements of robot arm

2. Robot arm base table assembling: bought Uline packing table kit, need self-drilled holes for assimilation.

3. Robot arm Installing: Installing the robot arm onto the base table, connecting wires and setting up control box properly. (This step received help from Professor Alberto)

4. Robot arm Calibration: manually calibrating the robot arm, setting up virtual environment for script control, initializing control script start position. (This step received help from Julian.)

5. Robot arm movement programing: firstly, creating a series of movements and ordering them from small movements to larger movements. Secondly, test each movement and combinations of them to ensure they will not exceed axis restrictions. Finally, add a float limit to each movement, and use a random between 0 and 1 to trigger each movement randomly and thus form a random combination each run.

6. VR part: Reused a model I made in CS22 and a technique I used before of creating sea surface, along with several other simple animations and models I made to form a dark VR scene setting. (This part's light setting received help from Coco and Professor Mahoney).

7. Miscs: 1) Spear model made from wood sticks and duct tape, painted in red

   2) Core model made from a ping pong ball in the middle to provide shape support, stuffed with ropes, layered with duct tape and painted in red

3) Mask (3 attempts failed): First attempt was a self face casting, It is really difficult to complete by single person since eyes will be covered by casting material. Second attempt is harden a cloth using the same material, the weight will crush the wire sculpture. Third attempt was using a gas mask, the weight of the mask although do not crush the wire frame sculpture, it will significantly tilt it and will get in the way of robot arm's 2nd axie movement.

4) cables for aesthetic purpose: aimed to create the sense of ghost in the shell anime, connect human with cables. The cables were made from pop tubes painted in black.

5) Oculus Harness to fix the oculus onto robot arm, hand made using the same wire as the sculpture

6) Box for covering the Oculus device (two failed attempts): First attempt was using plastic boards, but the boards were difficult to cut, does not bend and stick together as I want. The second attempt used card boards, but looks cheaply made so I removed them.

7) Setting up monitor: the monitor was attached to connecting piece using heat adhesive tapes. The 6th axis will rotate 180 degrees after each calibration of the robot arm, so the monitor was not properly oriented until the start of final presentation at technigala. There are two builds of the VR scene, one apk form for casting and the other for play mode to remove the edges in casting.

Part 3: Outsourced Assets:

1. Robot arm borrowed from Professor Alberto, the identification is IRB120 by ABB.

2. Drill kits for assembling base of robot arm is borrowed from Professor Mahoney.

3. Skybox image of VR setting: https://www.artstation.com/artwork/zOnVbm

4. Spear model in VR setting: https://sketchfab.com/3d-models/lance-of-longinus-c99cc77024a141beb6555778fd577d0a

5. Oculus 3 device used to track VR space was borrowed from CS23 course.

6. Aluminum Connector was manufactured by Race Metal Smith

7. Monitor Specification: VILVA 15.6 inch 1080P

Part 4: Reflections and Improvements:

1. The Metal wire material for the sculpture is too soft and too thin, it does not hold shape well and does not take as much visual focus as I want, so choosing other material such as CNC aluminum panel and stack them together might be a good alternative. (But will add cost.)

2. The VR scene is not creating a strong connection with the sculpture.

3. There are many unexpected problems encountered along the way of making this, so the workflow was not very smooth. (Special thanks to Professor Mahoney for

providing decisive advice, resources, and connections for solving various problems along the way).

4. The industrial purposed robot arm is not ideal for the use of holding monitor, it is more difficult to program and have relatively limited movements when comparing to performance oriented ones such as https://www.kassowrobots.com/products/7-axis-collaborative-robot-arm-kr-series