

Haley Orshonsky

Intro to New Media Arts

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### **ART 150 Final Project**

For my final project, I decided to create a game utilizing both Processing and the Arduino. I decided on this because I believe my greater skills lie in software rather than hardware, and I wanted to challenge myself to code something I haven't attempted before and try my hand at communication between the Arduino and Processing. Trying to think of a concept for the game took some time, but I knew I wanted interactivity to be at the center of it. I ultimately decided on the basis on my game being different actions with sensors causing different manipulations to happen to the items in Processing, and the player has to figure out which actions will help them complete the game. To do this, I utilized the Ultrasonic Sensor and the Touch Sensor (MPR121). Different distances detected by the Ultrasonic Sensor would cause different things to happen to the shapes in the level, and different ranges of outputs touched on the MPR121 would cause different things to happen to the shapes in the level. For example, in one of my levels, different distances detected by the Ultrasonic Sensor would cause the opacity of the shapes in the level to change, and the different ranges touched on the MPR121 would cause the shapes to move.

Now that I had the interactivity down, I had to give these actions a purpose. Manipulating shapes using sensors is fun, but isn't really a game. I decided on hiding four different numbers underneath of the shapes and having the player have to figure out which actions would reveal

these numbers to them. The user would then enter these numbers into a 4X4 keypad, then they would win the game. I felt this was still too easy though, so I decided to give the numbers an order, and the player has to not only figure out how to reveal the numbers, but figure out what order they need to be in as well. This not only adds a layer of complexity, but also opens a possible competitive element to the game as well. Two players could each have their own set up, and see who could both reveal their numbers and enter the code in the correct order first. I felt I now had a complete game idea and could move on to different designs for the levels.

Ultimately, I was only able to implement one extra level, but ideally the game would have many different levels, utilizing a number of different sensors. I believe with the framework I have set up, creating more levels with different sensors would be relatively simple. The hardest part was getting the first level to work, after that implementing the second level took significantly less time. For my second level, I utilized a different shape with different colors, and instead of having the two sensors do two different things, I instead had them both manipulate the size of the shapes, so it was more confusing as to which action needed to be done to be able to reveal the numbers. From here I believe there are endless level possibilities and it would definitely be fun to go back in and try to create more.

Overall, this project was both very fun and very challenging to do. The most challenging part was figuring out how the Arduino and Processing communicated. Once I got that figured out and objects were being manipulated, creating the levels was really fun to experiment with. I've never built a non-command line game before and being able to utilize the skills I have learned in this class to build my first one was a really nice way to wrap up the semester. I'm excited to

continue to experiment with Arduino communication outside of this class and continue to learn more!