Synchro Data Mini-Report

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ECE 180, Winter Quarter

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Database Schema

We have been using a MySQL database to store our project's game data. We break our data up into two tables, Players Table and Games Table. We use our Players Table mainly to keep track of each player's currently suggested difficulty and to load their data when a player profile is chosen. The Games Table contains data for each game played by any player. We use it to keep track of performance, which enables our iterative learning model. The data collected is as follows:

Players Table:

- ID
- Name
- Games Played
- Suggested Difficulty
- Training Completed

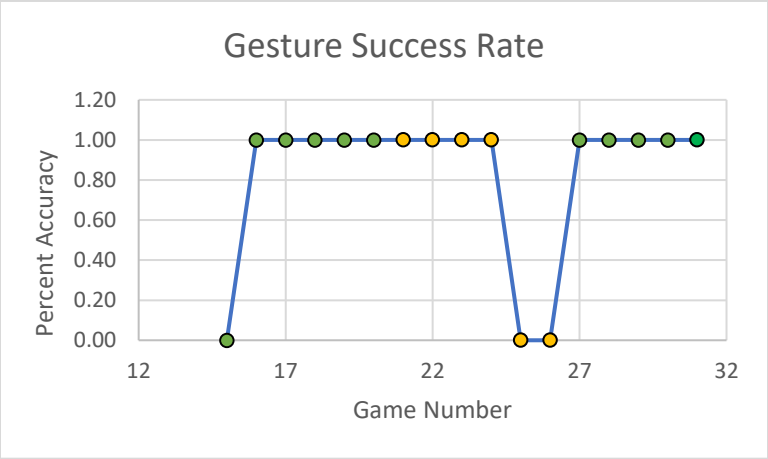
Games Table:

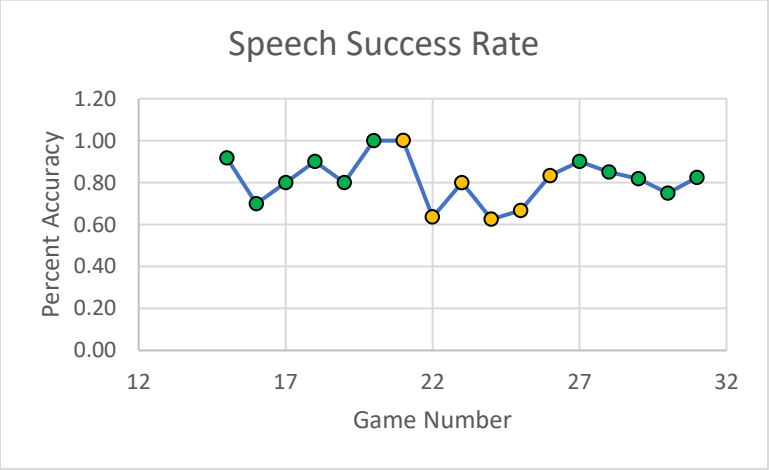
- Game ID
- Player
- Player Game Index
- Difficulty
- Gestures Accuracy
- Speech Accuracy
- Died
- Lives Left*
- Gesture Time Avg*
- Speech Time Avg*
- Total Score*

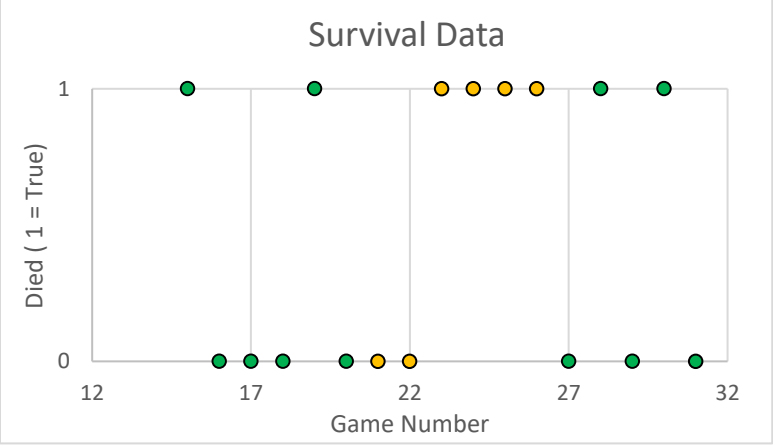
* Added after data analysis

Data Collected

The below plots have been generated from a segment of our stored game data. They consist of one player playing through Easy mode, getting promoted to Medium, and then lastly being demoted back to Easy. The green data points represent games played with Easy difficulty, and the orange represent Medium difficulty games.







Data Analysis

The purpose of collecting data is not only to provide input to our iterative learning model, but also to fine-tune our game parameter such that the game is working as intended. We want to confirm that players are actually learning through our iterative learning scheme and that the difficulties are appropriately set up. By analyzing our data, we can determine what needs to be changed. The main game parameters that we are adjusting are:

- Small Laser travel speed
- Number of lasers shot per round
- Big laser warm-up time
- Gesture list
- Gesture time allowed
- Speech time allowed

The most significant issue that we noticed from the data is that our static gesture commands at this point are rather easy. Once players learned what the gesture should look like through the tutorial, they typically achieved 100% success rate. We can see that there were a few 0% accuracy points in our data. These occurred when the player died quickly and missed the only gesture command given, usually due to prioritizing dodging the lasers, since they were close to dying. We will address this by adding several more gesture, including more complex motion gestures. Additionally, we may decrease the time allotted to complete these gestures.

The speech data trends seem more successful in achieving our goals. From the plot above, we can see that the player's performance improved over his first 5 games in Easy, allowing him to unlock Medium difficulty. His performance in this higher difficulty dropped by about 10%, which is significant, but not too drastic. When he got demoted back to Medium, his performance rose again. We noticed that people struggled the most with speech unscrambler commands, so we will try to stick to words with five letters or less, and possibly weigh these commands to be worth more points.

The survival data collected shows pretty decent trends. People definitely died more often on higher difficulties. We noticed that people started developing technique after playing multiple games. Some people tried to move only when and as much as necessary, while others liked to move continuously from one end of the screen to the other. While we didn't actually get to Hard difficulty when collecting data from people outside of our group, testing data shows that it is very difficult to survive under this difficulty. While we want to maintain a challenge, we may slightly lower the laser parameters to make it more manageable.