ENGR3420 Analog and Digital Communications Project Proposal:

Educational Signals Puzzle Game

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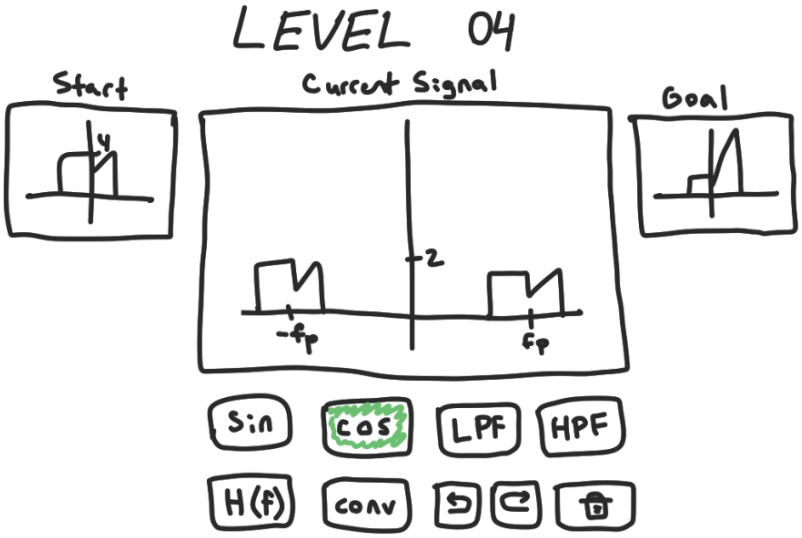
Introduction:

One of the best ways to show understanding of a concept is to be able to teach it back, because in order to bestow information upon another individual, one's own grasp on the topic at hand must be strong in and of itself. Following along with this path of reasoning I believe that it would be an interesting showcase of my own understanding of Analog and Digital Communications by teaching middle and high school aged students about Signals & Systems, Amplitude Modulation, and (time permitting) Probability & Random Variables. I intend to accomplish this through developing an educational game.

Game Summary:

The game would start with a tutorial that would introduce younger individuals to the world of signal communications and would then switch to a low stakes test-like game where the player would perform a different series of operations on a source signal to reach a desired output.

Game Mockup:



Preliminary layout for the game UI (the user just applied the cosine signal to the original signal).

Objective:

As mentioned in the introduction the primary goal for this project is to create an educational game that is able to dispense these concepts in a fun and engaging manner.

Personal Goals:

Underneath the primary objective of creating a working game is my own personal goals of being able to effectively explain some of the fundamentals of signal math such as FFT's, the concept of time vs. frequency domains, LTI and non-LTI operations, and the logic behind signal modulations. Essentially touching upon the first four or so chapters of the AD Comms textbook through different puzzles.

Budget Request:
Considering that this project is solely software (of which is all free), and all other in-game assets will be made in-house there should not need to be a budget for this project.

Related Figure:
The inspiration for this project actually came from a game that I used to play several years ago, but was reminded of while working on one of the past problem sets. The game is called Factory Balls and is a puzzle game with mechanics that I hope to emulate.

The original game can be found here : https://www.coolmathgames.com/0-factory-balls

Timeline:

- 10/29: Finish drafting proposal.
- 10/31: Have a basic concept list down (topics that will be taught).
- 11/01: Start working on development (Javascript; make GitHub repo).
- 11/02: Touch base with teaching team regarding progress.
- 11/05: Have in-game mechanics figured out.
- 11/08: Have the alpha version of the game completed (with graphics).
- 11/12: Have the beta version of the game completed (with music).
- 11/15: Have the full version of the game completed.
- REST OF NOVEMBER: Making edits, extra wiggle room.
- 12/06: Prepare for presentation.