COMP 580 Project Proposal

Anthony Kan, Austen Kelly, Kent Torell

Key Idea

Our project will be a cooperative maze game for visually impaired or blindfolded players. One player will have access to a 3D-printed map, while the other will hear only sound clues. By communicating their pieces of information, they will help each other to lead the person in the maze to the correct destination.

Target Users

The target users of this game are people at Maze Day. This game is primarily designed for blind people. However, with use of blindfolds it can be extended to anyone who can hear.

Architecture Diagram

This game will be played by two players: the runner and the director. The director will have access to a 3D-printed map of the maze. The runner will be stationary and have headphones which will provide sound-based clues as to where in the maze they are. The runner will describe the sounds they hear to the director, who will use the map to infer the location of the runner and guide them to the end destination.

Movement pad: The runner will not be actually moving through the game-world, but instead virtually moving using a four-directional movement pad. The runner will have four choices for movement: one square forwards, turn left in place, turn right in place, and turn 180-degrees around in place. After the runner chooses their move, the audio portion will adapt accordingly, as the input gets sent to the virtual map.

Game Board: The game board is a standalone portion of our project. It is a physical, non-reactive board which is a visualization of the world of our game. The four sides of the board will be an ocean, train tracks, a breezy meadow (?), and a road. The center will be a tree with birds. There will be a fixed 5x5 maze on the board with a randomized start and end location indicated by a goal tile. Each square on the maze is 2x2

[insert relevant map image here]

Audio: The audio played to the runner will be a function of the runner's location in the maze. The sound will be directed in the left/right headphone for orientation. If the runner walks towards something, that sound will increase and steps sounds will play to indicate that they have successfully moved. If the runner accidentally walks into a wall, a thud sound will play.

Headset communication: The runner and director will communicate using a walkie-talkie system, so that they must alternate speaking.

Virtual maze: The player's location and sound volume information will be stored in a graph, with sound being controlled by a pygame sound program. The start and end locations for a given game will be randomly chosen from a set of reasonable pairs, and we will manually set the goal location up on the game board accordingly at game time. The player's input to the movement pad will update the virtual player's location accordingly and generate the resulting sounds.

Technologies and Hardware

We plan to create the audio for our game using pygame, a native tool in Python. This audio will be played to the runner using noise-cancelling headphones, which will also be used for communication. For this communication, we will use a technology with walkie-talkie style alternating channels. We are using this system in order to promote balanced communication. The map for the game will be a 3D-printed model. This part of the game requires in-person use, but we have chosen this method so that it may be easily accessible to blind people, for the 3D map allows the director to feel out the board instead of relying on sight as in most maze games. (In order to extend this game to be entirely online, we could also implement a game board on a website, where two remote players could team up, one still hearing sounds, but the other with a visual version of the map.)

Team Logistics

Team members: Kent Torell (torell), Austen Kelly (akellyca), Anthony Kan (akan)

Point person: Kent Torell

We will maintain our code on Github. The coding responsibility will be roughly divided as

follows:

(We haven't really decided this, but maybe)

Kent: 3D printing. Controller/communication input functionality.

Austen: Maze design. Volume control/playback output.

Anthony: Sound clip generation.