

6.111 Final Project Abstract  
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### Human Tracking System

For our final project, we will design, test and implement a system which will track a person's movements in real time. This will be accomplished by placing two ultrasound sensors in a large, open, rectangular space. They will be placed perpendicular to each other. The sensors will send periodic pulses, calculate where the person is and then route coordinate data to the VGA display. This data will then be used to map the movements of the person into the movements of Pac Man in a simple version of the Pac Man game.

This project will consist of two main blocks. The motion sensing block will be used to obtain the user's location and the other will be the VGA block, which will take the location of the person, and map that onto the screen. The sprite for the user will be Pac Man, and the user must avoid monsters and eat fruit to gain points.

Michael will work on the motion sensing block. This will consist of a synchronizing block, a signal generating block and a processing block. The synchronizing block will ensure that the two sensors generate pulses at the same time. The signal generating block will emit an ultrasound pulse and record the echo signal from bouncing off of the person standing between the sensors. The processing block will take the original and the echo system, approximate the difference in phase between these two signals and then convert it to digital xy coordinate data and send it off to the VGA.

Cassie will work on the VGA block. Once the VGA receives the coordinates of the user, it will generate a sprite on the screen in the appropriate place, and create a simplified version of Pac Man. The VGA block will consist of the 3 sprite generators, and a game controller. The three types of sprites to be generated are monster sprite, the user sprite, and fruit sprites. The game controller will move the monster around to chase the user sprite, and create fruit sprites for the user to pick up.

We will first build the simplest interface possible between these two blocks to hopefully see any potential problems that could arise during interfacing the two main blocks. Then, each block will be built and tested. Finally, the two blocks will be interfaced and we will collectively tie up loose ends to ensure a successful project.