

EE 267 proposal: VR Pac-Man

Jingtao Xu (jingtaox@stanford.edu)

Yingran Xu (yingran@stanford.edu)

Motivation

Pac-Man is a old arcade game first released in 1980. Although decades have passed since it was first released, Pac-Man is still very popular nowadays and is among the most famous arcade games of all time. As game lovers, we are going to rebuild this classic game using the power of VR.

Objectives

1. Implement a first person 3D Pac-Man game using three.js and WebGL.

The general game mechanism follows that of the traditional Pac-Man game as described in wikipedia (<https://en.wikipedia.org/wiki/Pac-Man>). In the classic game, the player can see the entire map. However, in our first person 3D Pac-Man game, the player can only see what the Pac-Man sees. The walls, Pac-Man, and pac-dots will be created and rendered on screen using three.js.

2. Extend it to a VR game.

We will render two different views, one for each eye, onto the screen.

3. Incorporate IMU.

Use IMU to do orientation tracking and use those data to let user control the game. (i.e. Let user move in the direction that he/she is facing). As what we did in the previous homework, we are going to implement the 6 DOF orientation tracking using the quaternion model and stream the data from Arduino to our browser.

4. Add ghosts.

If time permitted, we will add adversarial ghosts as in the original game.

Previous work

The first Pac-Man VR game in 1996:

It was a 3D, first-person game, played with a Visette virtual reality visor and a gyroscopic joystick. It was made in 1996 by Virtuality Entertainment. The cabinet was a

2000 SU series model, where the player stood in a ring set at the waist line. The player could turn his head and a tracking system built into the glasses would detect it and turn Pac-Man's head in the game. Crouching and standing tall were also allowed and movement was done with a joystick. The game cabinet itself was expensive, as was play which cost five dollars for five minutes of play.

VR Pac-Man at EGX 2016:

It was running on Android Gear headsets and ROVR treadmills. The treadmill itself costs 500 dollars and requires oversized Crocs.

Our approach

It seems that it costs a lot to play Pac-Man in virtual reality. We are going to make it affordable to the public using IMU and WebGL. The IMU will keep streaming user orientation data to the browser and the game will update player's position accordingly. No need to buy a treadmill unless you want to work out while playing the game.

Timeline

	Description of Work	Start and End Dates
Week One	Implement a first person Pac-Man game in three.js	May 25 ~ June 2
Week Two	Extend it to a VR game. Use IMU outputs to control the game.	June 2 ~ June 9
Optional	Add ghosts	Optional