ENGR 202

Section61

Group 5

**How to install**

This game uses matlab spriteKit framework. To play this game there are few system requirements. This framework only works in matlab 2014b or higher version only. The spriteKit toolbox is included in the zip folder. To install the toolbox 1st click on the toolbox and it should automatically install. Matlab should start after installation and there should be a popup box confirming the installation.

**How to play**

To play the game 1st calibrate the accelerometer using the serial setup button on the gui. After that, press the new game button to start the game.

To stop the game, click stop button on the screen.

To exit the game, click exit button on the screen.

**Rules of the Game**

The objective of the game is to avoid meteorites that come flying. Is the spaceship was allowed to avoid a meteorite player will gain 10 point and if the spaceship collide with a meteorite -10 points will be gain.

**Controllers of the Game**

Hold the accelerometer parallel to the ground to start. To move up tilt the accelerometer up in around y axis in positive x direction and to move down tilt down in the opposite direction.

To move forward tilt the accelerometer around x axis in positive y direction and to move back tilt the opposite direction.

Game use an alpha filter to control the spaceship based on accelerometer readings.

Advance Functionalities

1. Advance user interface:

Use spriteKit framework to draw sprite on the canvas. There are two sprites in the game. Those two sprites are the spaceship and the meteorites. Each sprite has two states and those two states are roaming state and explosion state. At roaming state sprites will move across the canvas and at collide state meteorite will be replaced with an explosion

1. Advance algorithms:

A collision detection algorithm is used to detect collisions. Canvas is 400 by 800 pixel frames. The edge detections are detected using the spaceship center coordinates if the spaceship center exceeds 400 in y direction or 800 in x direction the velocity is reversed and moved back into the canvas. Same applies if the center of the spaceship decrease zero. Collision with meteorites is detected in a same manner based on the x and y coordinate intercept. If the coordinates intercept with 10 pixel threshold value then there is a collision. If there is a Collison the state of the meteorite is changed

1. Advance visualization:

A .png image of space is used in the background and it’s continuously rotation to give the effect of space chip is moving in the space. Meteorites have velocities in negative x direction to give the effect that meteorites are approaching towards the spaceship.

1. Dealing with uncertainty:

Alpha filter is used to filter the accelerometer data with an alpha value of 0.5. This allows a smooth control of the space ship. A tilt angle thresh hold is used to move the spaceship if only certain angle is exceeded. This gives more stability of the spacecraft to the player.