Adithya Raghuraman

15-112 Term Project

Proposal + Competitive Analysis

**Project Proposal**

For my term project, I plan to make a “Bike Race” game that would involve the user trying to keep a bike on a given track and overcome numerous obstacles on the course of its path. The aim of the user is to complete the course in the shortest time possible. There will be varying levels of difficulty of the tracks. For example, a rather trivial track would be one that consists of a straight-line path from start to finish. On the other hand, a convoluted path would involve several twists in the path that the user has to carefully maneuver through in order to complete the course. The most challenging aspect of this project is going to be implementing the physics. There can be several ramps in a given path and the motion of the bike has to be that of a accurate projectile once the bike leaves the projectile. In order to do this, I need to carefully reflect upon the knowledge of physics that I already have and implement it in the game. Additionally, the user would have the option to wheelie the bike by using the up and down arrows.

For this project, I’m going to be using pygame as my platform for developing the game. I attended Lukas Peraza’s optional lecture on pygame and I have used some of the code from his blog for my game too.

Let’s get into the main details of how I intend to make the game. First of all, there is going to be an outer run function that actually implements the game. I will then need a GameObject class that sets the framework for the individual objects in the game. This class would extend the pygame.sprite.Sprite class. The two different objects that I have are the Bike and the Track and hence I will have two subclasses that extend the GameObject class. At this point, the bike class is responsible for moving the bike and each instance of the track class have an (x,y) and a length *l* and an angle *a*, which mean that I would be drawing a track from (x,y) of length *l* and angle to the horizontal *a*.

In order, to get the “wheelie” feature, I simply add to the angle of the bike object and rotate the image of the bike appropriately. I alse need to align the bike on the track so the base angle of the bike would be the angle of the track itself. Now, I need to make sure that my bike is on the track at all times. For this, I need to use the pygame collision detection method and make sure that if the vertical component of the velocity of the bike is 0 then it has to be at the level of the track. In order to make this even more sophisticated, I plan to make loops in my track and if my bike is not travelling fast enough at the top of the loop, then I need to drop the bike to the bottom. Another complicating factor here is that if the bike is airborne, then when it lands, I need to make a smooth transition from the landing position to the rest of the bike.

**Competitive Analysis**

This game is heavily inspired by the android/iOS game called “Bike Race The Free Game”. This game has been of great fascination to me for the last few years and I really felt that for this term project, I could chose to make this game. While I knew that implementing the game can be incredibly challenging, and it has clearly been evident that it has definitely been challenging so far, I believe that this would be a great learning opportunity.

There is one existing term project that has implemented a close adaptation of this game. This was done by David Lu in the Fall 2011 semester in a project called “Line Rider Python”. There are several similarities between my proposed project and his in that both these projects require in depth in game physics to be effective. However, the biggest difference between the two projects is that in that particular project, the user does not have the ability to move the bike and once the user initiates the ride, the bike automatically finishes the track. However, in my game, it is the user that moves the bike and the aim of the game is to reach the destination in the quickest time possible.

Other than this, there were no other similar projects that I could find.