Game Design Document of

Super Sonic

as a part of Computer Games(IT-426), DA-IICT

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Contents

Abstract

This document describes the working of the game 'Super-Sonic'. Super-Sonic is a racing video game on a mountainous terrain with dangerous curves and a collision sensitive track. The central character, Sonic runs through a winding road and he has three competitors along with him. The player is supposed to complete the race of three laps ahead of his opponents. The Artificial Intelligence module control the rest of the three players to give a tough competition to the player. Also the game has sound effects associated with each components to give a more enriching game experience.
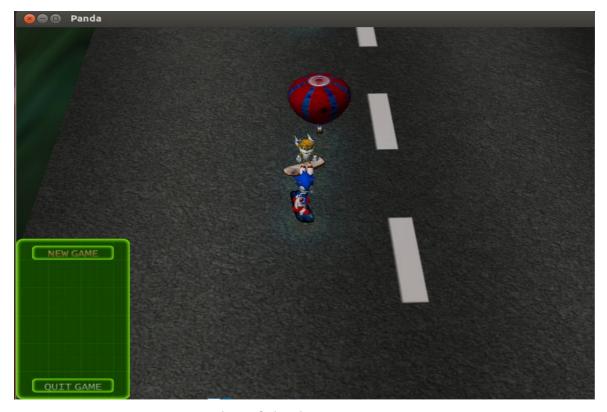
A brief description

Super-Sonic is a single player racing game. The central character of the game is Sonic, who runs along a mountainous country side along with his competitors. Sonic need to complete the race by running three laps of the track and based on his speed he gets his score. He also needs to come ahead of his competitors in order to win. Sonic can be controlled by the user using keyboard or a joystick. The user can control the throttle of the run which decides the maximum acceleration of Sonic. The race track consists of dangerous curves and the player needs to turn swiftly in order to stay on the track. If the player runs off the track he will be brought back to the track with his acceleration decreased.

A screenshot of Super Sonic

The opponents have an Artificial Intelligence module embedded in them. Based on the artificial intelligence, the opponents swerve to the left or right of the track, by going either to the left or right lane. The opponents also intelligently overtake the first player and also avoid collisions with the track boundaries. Various parameters of the opponents like the throttle, acceleration, speed are controlled by the artificial intelligence component.

The game also has sound components associated with each player, so that we get a 3D experience. To make the gaming experience more enriching, there are game background music complementing the graphics.

2

A screenshot of the demo race using Game AI

Environment

The environment consists of a hilly countryside and a road snaking past through the landscape. The road has very dangerous curves, which the player needs to cross carefully by tilting and accelerating at the required amount. The road also has a collision detector which detects when the player moves out of the road. In case a player strays away from the path, he is brought back to the center.

Game Characters

The game characters include Sonic and three bots. The bots are named 'Tails', 'Rocket Snail' and 'Balloon'. Sonic is the central character and the first player. The player needs to control him. The other three characters are controlled by the computer and the computer decides their lanes, throttle and acceleration.

Character behaviour

All the players try to defeat the other players. The bots use artificial intelligence to defeat Sonic who is controlled by the player. Every bot is associated with sounds so that Sonic can know when the other bots are trying to overtake it. When Sonic gets off the track the collision tracker checks and brings Sonic back on the track.

Gameplay

During the race, the player need to throttle and accelerate to run ahead. The player needs to turn left or right to stay on the path and avoid the dangerous curves. The score of the player depends on the distace he has covered. The player needs to complete three laps in order to complete the race, and also needs to stay ahead of the other three players. All the other opponent players try to race ahead of the players and the user needs to prevent that.

Control of the game are as follows:
Keyboard

W key – Used for the forward motion of the character.

A key –Used to moving Sonic in left direction.

D key – Used for moving Sonic in right direction.

S key – Used for moving Sonic backward.

Controller

Y key – Accelerate Sonic

B key – Stop Sonic

Right key – To move Sonic right side

Left key – To move Sonic left side.

Game termination and win

The game finishes after the player has completed all the three laps. If the player completes all the three laps before the other three players, then he wins, else he loses.

Screenshot of the winning screen

System requirements

Super Sonic is based on Panda3D. So it is cross platform(can run on any platform). To run the game, there has to be an installation of Panda3D runtime on the platform.

Source code

The cource code of the Super Sonic is available [here](#).