Documentation

SUPINFO International University

INSTITUTE OF INFORMATION TECHNOLOGY

Asc1 Group Project
Development

Delivery

Umar Callachand, Priyeshan Sreeneebus, Deepti Puresh, Souheila Mungroo,Yash Jogoo, Neelesh Bahadoor

Documentation

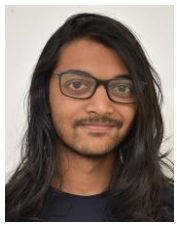
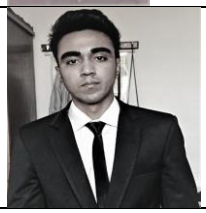
Version 1.0
Last update: 06/06/2013
Use: Students
Author: Samuel CUELLA

Table of contents

1 GROUP SUMMARY

1.1 GROUP MEMBERS

Campus: Mauritius
Class: B1

ID Open Campus	Last Name	First Name	Photo
223174	CALLACHAND	MUHAMMAD UMAR	
264144	SREENEEBUS	PRIYESHAN	
223138	MUNGROO	SOUHEILA	
223376	PURESH	DEEPTI DEVI	
223369	JOGOO	YASHVANT VYAS	
223011	BAHADOOR	JIVESHSING	

2 PROJECT REPORT

Last Name	Part Done
CALLACHAND	ALGORITHMS AND PHYSICS
SREENEEBUS	ALGORITHMS AND PHYSICS
MUNGROO	INDEX.HTML PAGE DESIGN AND USER MANUAL
PURESH	START SCREEN AND DOCUMENTATION
JOGOO	DESIGNING AND STYLING
BAHADOOR	DESIGN

3 SOLUTION MANUAL

NIGHT MISSION PINBALL

USER MANUAL

Fig 1.0 Main Page of Night Mission

Introduction

The Night Mission Pinball simulates a modern arcade type pinball game. Many hours were spent on evaluating and measuring a large variety of pinball games to finally come out with this one which is adapted to today's world. We also measured dynamic characteristics such as gravity, tilt sensitivity to make sure that the ball's action corresponds to the physics of a real pinball game.

Pinball games vary widely in their features and ball action. From a features standpoint, the launching of the ball, the flippers buttons are the same on all machines. Glowing pink digits are used for score, credits, ball counts on Night Mission Pinball. It may seem strange to have credit counts, free game, free score on a computer game but the start-up processes are so close that the simulation demanded it.

The multi-player selection method is also available where 1 to 4 players can play. The coin slot allows us to setup the game correctly to choose how many players are able to play. Flippers sweep angles between 10 to 65 degrees.

Note:

You need a local server to launch the game! I appreciate that it's a bit confusing, even contradictory at times, but it all boils down to browser security. It is because if JavaScript had free reign while operating under file:// there would be nothing stopping it loading pretty much *any* file, and sending it off who knows where.

Windows

On Windows, there are lots of "bundle installers" available which package together and set-up popular web technologies like Apache, PHP and MySQL from a single exe.

We would recommend either WAMP Server or XAMPP and both have easy set-up guides available. WAMP specifically installs an icon into your system-tray from which you can stop and restart the services, as well as modify Apache settings such as creating a new folder alias for a project.

Instead of an 'all in one' bundle you could also download just a web server on its own. Both Microsoft IIS and Apache can be downloaded for free.

Note: Skype likes to steal port 80 by default. This is the traditional port for a web server to run over and it might stop WAMP or similar being able to start. To disable this within Skype go to "Tools - Options - Connection" and uncheck the "Use port 80 and 443 as alternatives for incoming connections".

Note: If you use WAMP Server you may find that IE11 causes it to freeze. Here is the fix for that.

OS X

Being a Unix environment at heart there are more options available on OS X than Windows. But if you'd like an "all in one" approach like WAMP, with a nice clean and easy to use interface, then we'd strongly recommend MAMP. This comes in two versions: one free and one paid for.

Naturally there are also guides for setting up a local web server manually, such as this guide written for Mountain Lion. Pick whichever approach you feel most comfortable with.

Grunt connects

Grunt is an extremely powerful tool to have installed, regardless if you use it as a web server or not. At its essence, it's a JavaScript based task runner and allows you to automate tedious time-consuming tasks. We use it in Phaser to build our distribution scripts for example. But it can also be configured with the plugin Connect to serve local files, acting as a web server.

Simple HTTP Server with chrome or Python

If you need a quick web server running and you don't want to mess around with setting up Apache or downloading an app, then Chrome or Python can help. Coogle Chrome has an app called "Web Server for Chrome" which can be set up very easily.

Python comes with a simple built-in HTTP server, which can serve files from any local folder. Naturally the only thing you need to have installed is Python. Read the full guide here

Features

Night Mission Theme & Layout

Our pinball theme is Night Mission mostly because of the bright colours on the black background of the pinball game. Also, the galaxy background offers the player a dreamy like version of Pinball.

Instructions

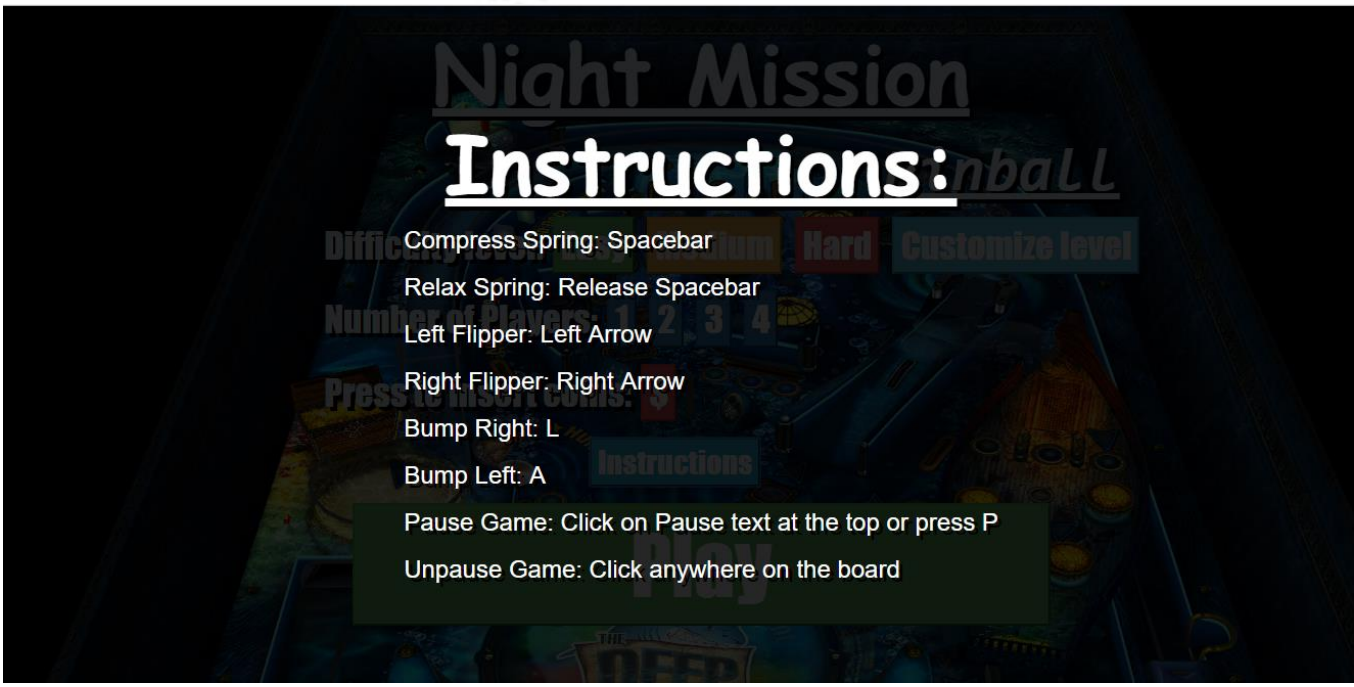


Fig 2.0 Instructions of Night Mission

Ball Dispensing

Gravity effects are considered in ball travel and ball to surface collisions consider bounciness and friction effects. These effects are user adjustable at the beginning of the game on the main page. Ball is launched by compressing the spring and is done by pressing the "SPACEBAR" button. The speed by which ball is launched depends on how long you compressed the spring. The longer time you press, the higher speed it gains to launch.

Ancillary Features

The playfield has 7 stand-up targets (A, B, C, D, F, L, Y), 2 bumpers, 9 rollovers (N, I, G, H, T, D, R, O, P) and a bump table which when clicked between left and right too much, the table tilt and the current ball is lost.

Competition Features

Real pinball games are often used for competition. Hence, we implemented our pinball game for players to be able to beat the free-game score, high score and other players. A game can get boring if it is easy to tamper with and adjustable in a way that makes it too easy to beat scores. Night Mission Pinball is fully adjustable and a player can make it easy to play but the harder version is also available for the competition-souled.

Modes

Night Mission has several modes such as the multi-player mode and the difficulty mode.

Multi-player Modes

Competition is important in any game. So, in Night Mission, the multi-player mode is available so that players can beat each other high scores. This render the game more interesting and it is like a challenge for players. At the start of the game, number of players can be selected from 1 to 4.

Difficulty Modes

A game is more of a challenge if it comprises difficulty levels for the player to choose. From easy to medium to hard, any player can find their way. Therefore, anybody can play depending on their capabilities.

Pause Mode

To pause game, press "P" or click on "Pause" on top left corner of table. To un-pause, click anywhere on the table.

Fig 3.0 Pause Mode

Game Over Mode

The game is over when all players have played and balls are over. The high score then appears followed by the player with the highest score.

Fig 3.1 Game Over Mode

Adjustable Parameters

Adjustable parameters will now be covered. It is advisable to stay within the ranges specified for the parameters. Click on "Customize Level".

Fig 4.0 Adjustable Parameters

Gravity

Gravity is the force which pulls the ball downwards. A higher value of gravity will pull the ball more towards the bottom. It can also be set to zero which will cause the ball to roam freely on the table.

Tilt Sensitivity

It determines how sensitive the bump table is to be tilted. The easier the level, the more the table can bump. Now in customizing, you can specify the level of sensitivity. The value of tilt sensitivity is proportional to the sensitivity of bump table. If player bumps table too much, the table tilts and the current ball is lost.

Fig 4.1 Warning for tilt

Number of Balls Per Player

This also can be chosen at the beginning of the game. The players are each assigned balls and each player play with the same number of balls.

Free-Score

Free-score depends on the difficulty level. It varies from 20,000 to 75,000. For the easy level, a player is assigned 20,000, for medium level 50,000 is assigned and finally, for the hard level a free score of 75,000 is assigned.

A free ball is given when free-score is reached. Go and find out by playing!

Function Summary

PLAY MODE

Spacebar = Launch ball
Left Arrow = Left Flipper
Right Arrow = Right Flipper
A = Bump Table to Left
L = Bump Table to Right

Pinball Jargon

Bonus: Bonus points are counted one by one as a player hits a target or make sequences on the playfield. This is in addition to any points that may be received for a hit.

Free Score: Free Score is accumulated depending on targets hit or sequences on the playfield. It is gained in addition to the points received if a target is hit.

Credits: Credits depends on how many coins have been inserted. It is on a one-to-one function, that is one credit per coin.

Drain: Losing the ball between the flippers or down the out lanes.

Out Lanes: These are the ball-guides on the sides of the machines that cause the ball to drain (the D in DROP for example).

Rollover: A place usually between lanes where a player gets points if ball rolls over that point.

Stand-up Target: A target that protrudes out of the playfield when hit.

4 TECHNICAL DOCUMENTATION

Game Engine

Phaser

Phaser is a Desktop and Mobile HTML5 game framework.

We chose this engine as it is fast, free and fun open source framework for Canvas and WebGL powered browser games.

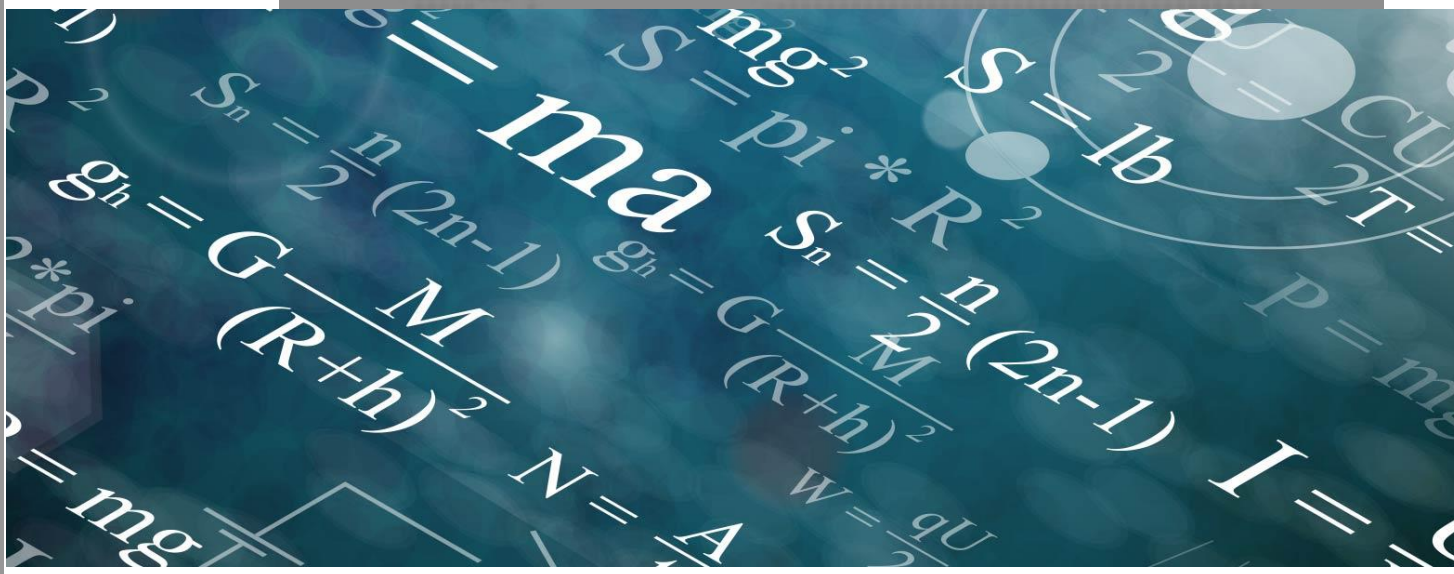
Phaser Features

- Preloader
- Physics
- Sprites
- Groups
- Animation
- Particles
- Camera
- WebGL and canvas
- Input
- Mobile Browser

Graphic Engine

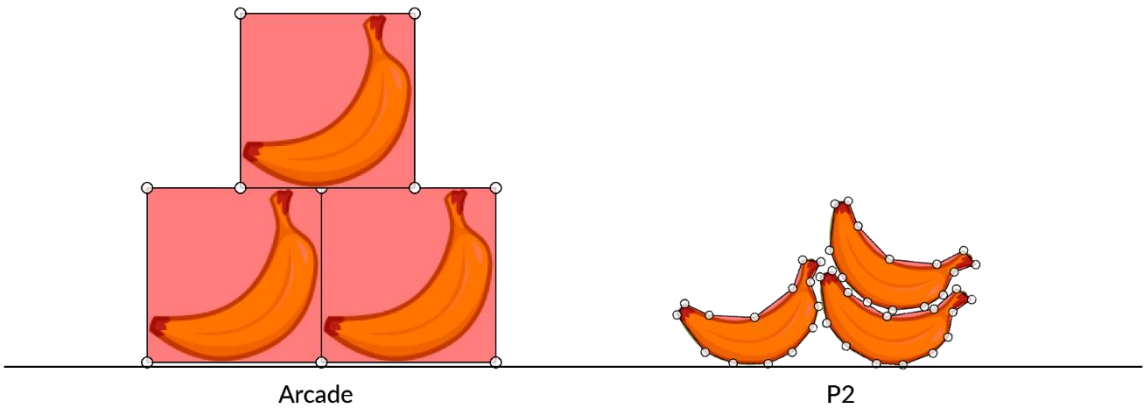
It is very easy to implement good graphics and animation using Phaser. We just need to load images and declare them as different sprites each with its own specifications. We can also draw objects in Phaser.

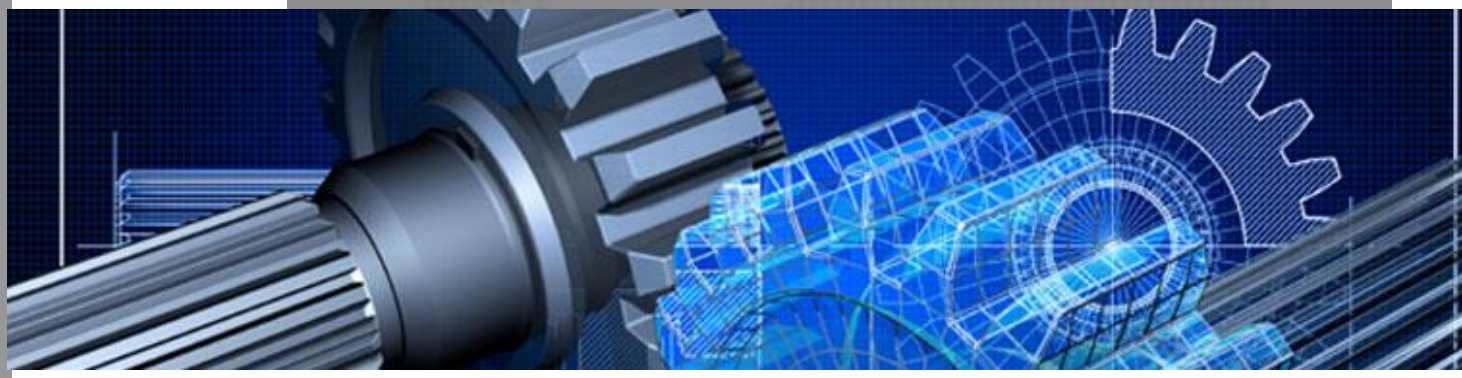
Furthermore, as its on HTML5, we are free to use CSS to design our page together with lots of libraries such as Bootstrap.



Physics Engine

First of all, Phaser has a lot of built-in physics type, (for example: Arcade physics, Box2d physics, P2 physics and Ninja physics). We chose P2 Physics as it is best suited for a pinball game. Arcade physics is easier to use but in P2 we can set an object with custom polygons for impact events as shown below:





Physics of the ball

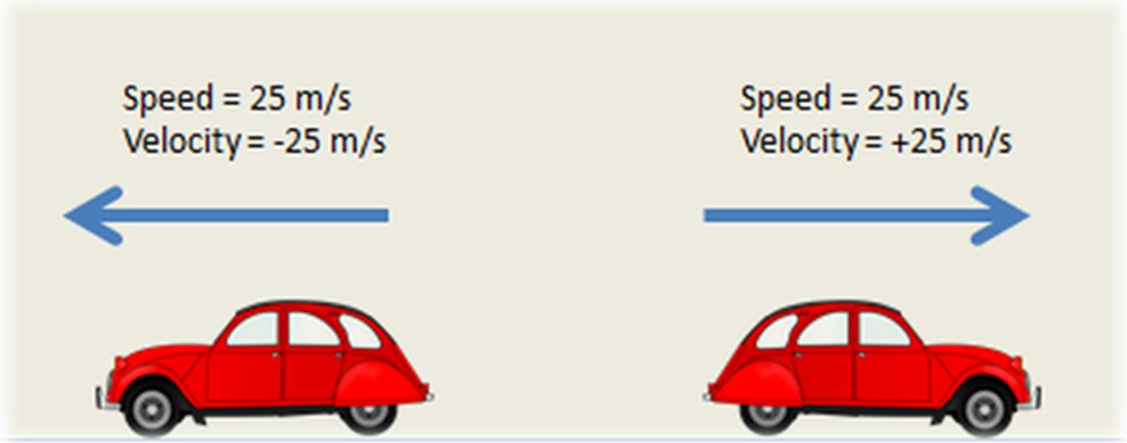
GRAVITY

In Phaser it is easy to declare the gravity of the ball. We did the game in such a way that the gravity affects the level of the game. That is, if the gravity is high, most of the time the ball will be near the flippers and its hard as the player won't have time to rest. On the other hand, if gravity is low, the ball will roam a bit freely and therefore the player will get a lot of bonuses.

Furthermore, with high gravity, the ball will perform more parabolic paths.

ELASTICITY/RESTITUTION

When the ball collides with obstacles, a fraction of its energy is lost to the other bodies. We implemented the restitution to 0.9 which means that 10% of the ball energy is lost whenever it has collided with an obstacle.



BUMPERS

There are 2 big bumpers and 5 small ones. The velocity of the ball is increased when collided with them. As velocity is not linear, we need to know in which direction the ball is heading and increases the velocity to this direction.

A negative velocity y means the ball is heading to the top, a positive y means the latter is heading down.

A negative x velocity means the direction is to the left and positive means to the right.

FLIPPERS

The left flipper's anchor is set to 0,0 means that the pivot is top-left corner when rotating and the right flipper's anchor is set to 1,0, that is, the pivot is top-right corner when rotating. They are rotated to a maximum of 65 degrees.

A function is called when the ball collides with the flippers to help make the ball directed upwards with a high velocity.

BUMPING TABLE

The game is simulated so well that we can bump the table same as the real pinball.

The physics we used to implement this feature is that if we bump the table to the right, the ball gains positive x velocity (speed to the right). On the other hand, if we bump the table to the left, the ball gains negative x velocity (speed to the left).

SPRING

When the player holds spacebar, a variable named "speed" is increased continuously to a maximum value. When spacebar is released, the ball is launched with an initially negative velocity y of same value as "speed".