Nacho Run

Architecture/Design Document

Table of Contents

COMP 565 Graphic Systems
Professor Karamian

May 2019

Change History

Version: 0.5

Modifier: Arnold Escobedo

Date: 5/30/2019

Description of Change: Settings/ Options Menu working, c# script updated

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Version: 0.7

Modifier: Team member 2

Date: 4/29/2019

Description of Change: How to play panel added, level number changed for other levels

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Version: 0.6

Modifier: Team Member 3

Date: 4/24/2019

Description of Change: Hurt Animation, Player Health Bar done.

Version: 0.5

Modifier: Arnold Escobedo

Date: 4/15/2019

Description of Change: Working on new animations for nacho, Dead Animation and Scripting done, Main menu working properly. Added menu music / Fixed Bugs.

Version: 0.4

Modifier: Team Member 4

Date: 4/10/2019

Description of Change: Added Portal, updated floors, Re-Organized files, added coins ect.

Version: 0.3

Modifier: Arnold Escobedo

Date: 4/15/2019

Description of Change: Main menu working properly. Fixed Bugs.

Version: 0.2

Modifier: Team Member 3

Date: 4/11/2019

Description of Change: Shooting bullets with delay. Enemy dies on collision with bullet. Level 1 done Level 2 done with parallax background

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Version: 0.1

Modifier: Team Member 2

Date: 3/30/2019

Description of Change: GUI and animations done.

1 Introduction

This document describes the architecture and design for the game “Nacho" that is being developed at California State University, Northridge (CSUN).Nacho is a 2-dimensional mobile game developed on unity. The player will be able to control the main character “Nacho” with the buttons/UI displayed on their mobile device/Desktop. Primarily, everything the user interacts with will be housed and controlled with the user interface. The purpose of this document is to describe the current architecture and design of the game “Nacho”. The project is complex, and we need to break down the project’s entirety into different sections for the full project to be understood. We will be breaking down this phase into:

- **Design Goals and Objectives:** Define what the purpose of this game and how users will interact with the game on mobile device or desktop computer
- **System Behavior:** define how the game is behaving and what is talking with one another for each key command
- **Logical Design:** explain each step of the game and what is happening to the entirety of the application
- **High-Level Design (Architecture):** showing the actual representation of the application without showing any code
- **Mid-Level Design** Diagram that outlines the major components of the game
- **Detailed- Class Design** A diagram that displays all of the classes (and their methods) in the game and how they are connected.
- **Process View** A representation/description of the hardware that the game will run on and the input/output for the game (e.g touchscreen input, audio output, keyboard input, database).
- **Physical View** considers non-functional requirements regarding to underlying hardware, may be tightly connected to process view
- **Use-Case View**

2 Design Goals

Run, Nacho Run is a mobile game for iOS and Android. Our designs were created with the smartphone screen size, and touch controls in mind.

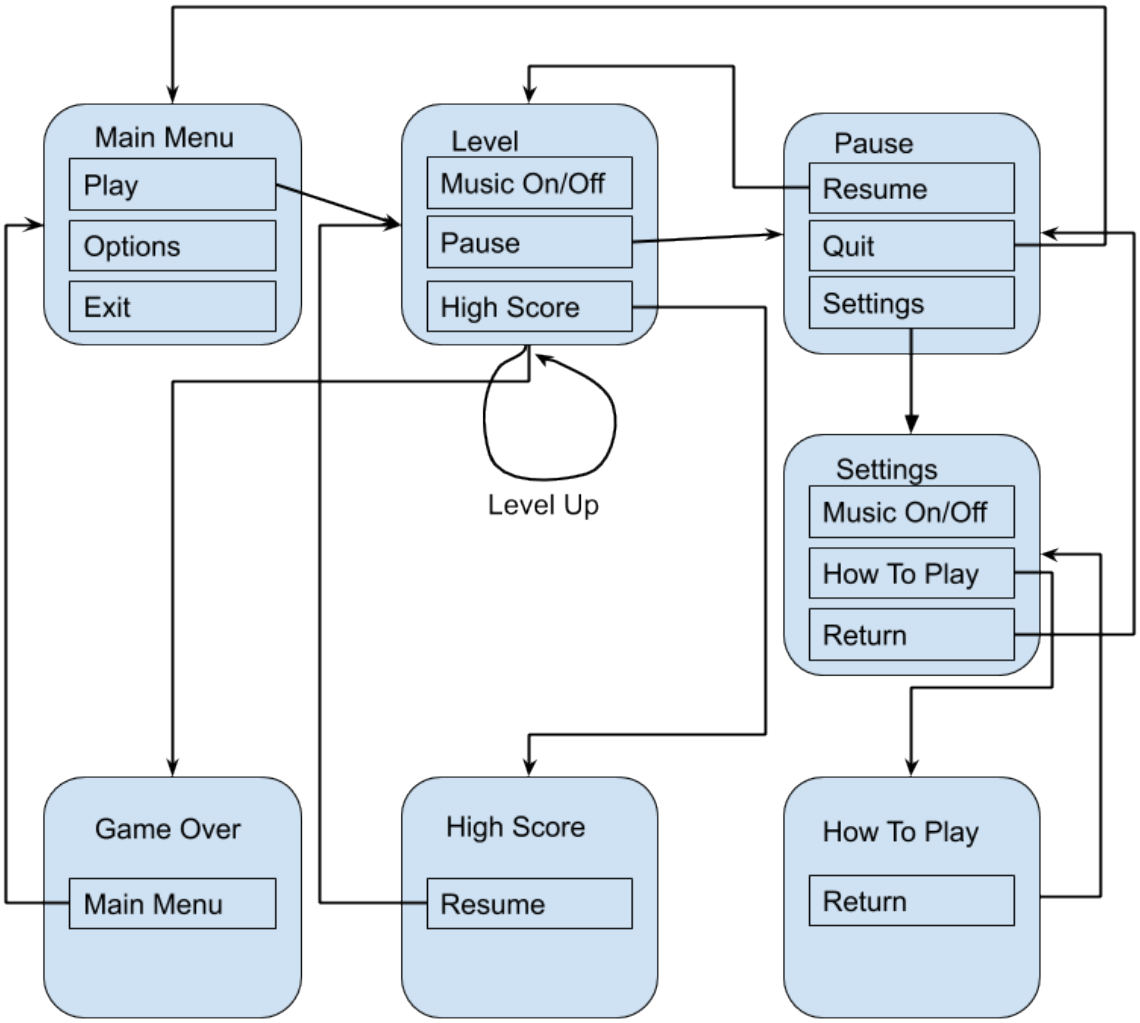
- The background of the game scrolls with Nacho’s movement to maximize smartphone screen sizes.
- Menu
- Button placement for Run, Jump and Attack were placed based on thumb placements when the phone is in landscape mode.
- Run, Jump and Attack buttons had to be the right size for thumbs.
- Run, Jump and Attack buttons are slightly translucent to allow the player to see a continuous background.

- Leaderboard, Music and Pause buttons are placed on the top of the screen for convenience.
- Leaderboard, Music and Pause buttons are smaller since they are not used as often as the Nacho controls, and to ensure the buttons fit inside the frame.

3 System Behavior

Define how the system is behaving and what is talking with one another for each key command

- The player will have to press buttons to move, jump, attack, pause game, restart game and checking options then Unity will take the inputs and execute the appropriate function(s).
- System will save the high score to Unity's built in Data Management after that player completes the game with a high score.



4 Logical View

Explain each step of the system and what is happening to the entirety of the application

- Player will start on main screen and choose to play the game, view highscore or settings.
- When player plays the game there will be 3 levels he has to complete to beat the game.
- During gameplay the player will move forward, attack, collect coins and jump over obstacles to reach the end of the level. If the player runs out of health before completing the game they will lose and have to start all over. The player loses health when collided with cactuses or enemy objects.

- Upon completing the game, the player will be shown the current high score and their score to compare, then they will have to return to the main menu.
- If player chooses to view setting they will have the option to turn off music, volume control, quality control and size control(Desktop Version).

4.1 High-Level Design (Architecture)

showing the actual representation of the application without showing any code, since we do apply a greater scope of classes in this phase of the application

User Interaction

How Nacho reacts according to the user pressing certain buttons on the user interface.

- The game is played across three different levels, each with their own specific environment and enemies.
- Buttons
    - **Play**: Will start the game by opening the Level 1 scene.
    - **Options**: Send the player to the settings page. The player can set the volume of the music and select the desired screen resolution.
    - **Exit**: Will close the game
    -  **Run**: Nacho runs to the right
    - **Attack**: Nachos attacks the enemy. Nacho slashes the enemy if he is holding the machete and he shoots the enemy if he is holding the revolver or shotgun.
    -  **Jump**: Nacho jumps to avoid falling down holes, to avoid/jump on enemies and to hop on top of platforms.
    -  **High Score**: Brings up a panel that shows the player's current score and the current high score.
    -  **Pause:** The game stops and the player has the option to Resume, Quit or go to Settings.
    - **Music**: Turns the music on and off.

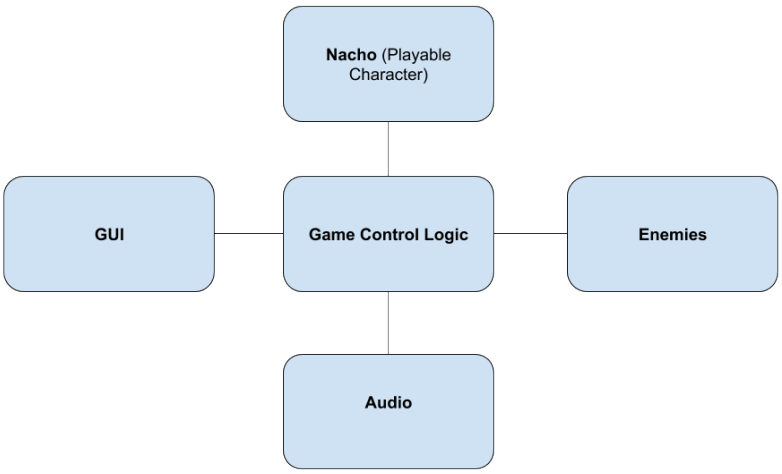


Figure: High-Level Design Components

- **Nacho** is the protagonist of the game and the only playable character that is controlled by the player. He is playable in scenes level 1, level 2 and level 3. Nacho can run right, jump and attack. The player's score is based on Nacho's finish time, the number of coins he collects and Nacho's remaining health.
- The **GUI** is all the Graphic User Interface for the game. The background scrolls based on Nacho's x-axis position. There is a new background for the main menu, and each of the three (3) levels.
- The **Enemies** include the enemies and obstacles that Nacho must avoid or destroy. The enemies can deplete Nacho's health. Enemies will have health that Nacho can deplete by attacking them within range (range depends on weapon type). Some obstacles will deplete nacho's health (cactus, holes), while others will not (crates, platforms).
- The **Audio** controls the music for the game. The main menu and each of the three (3) levels have different songs. The songs start at the beginning of each scene, are on a continuous loop and end when the scene changes. The volume of the audio can be adjusted as well as muted.

4.2 Mid-Level Design

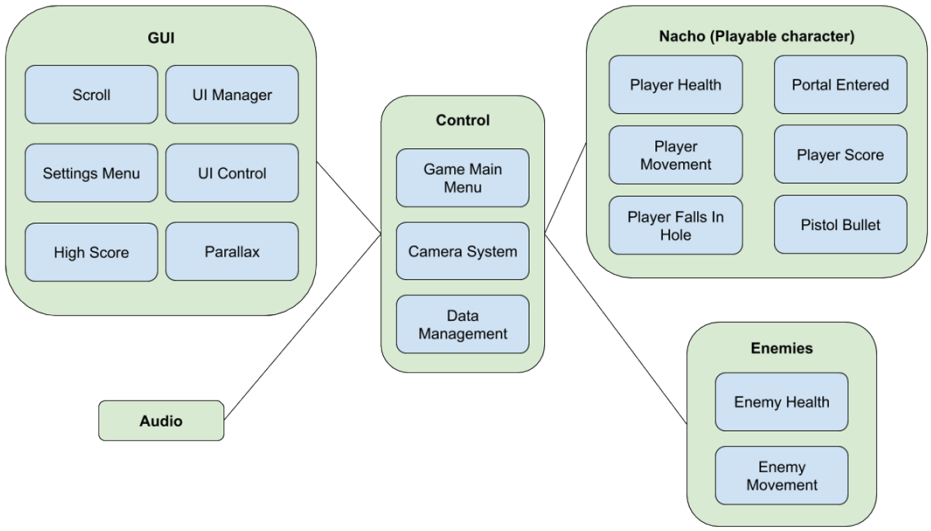


Figure: Mid-Level Design Components

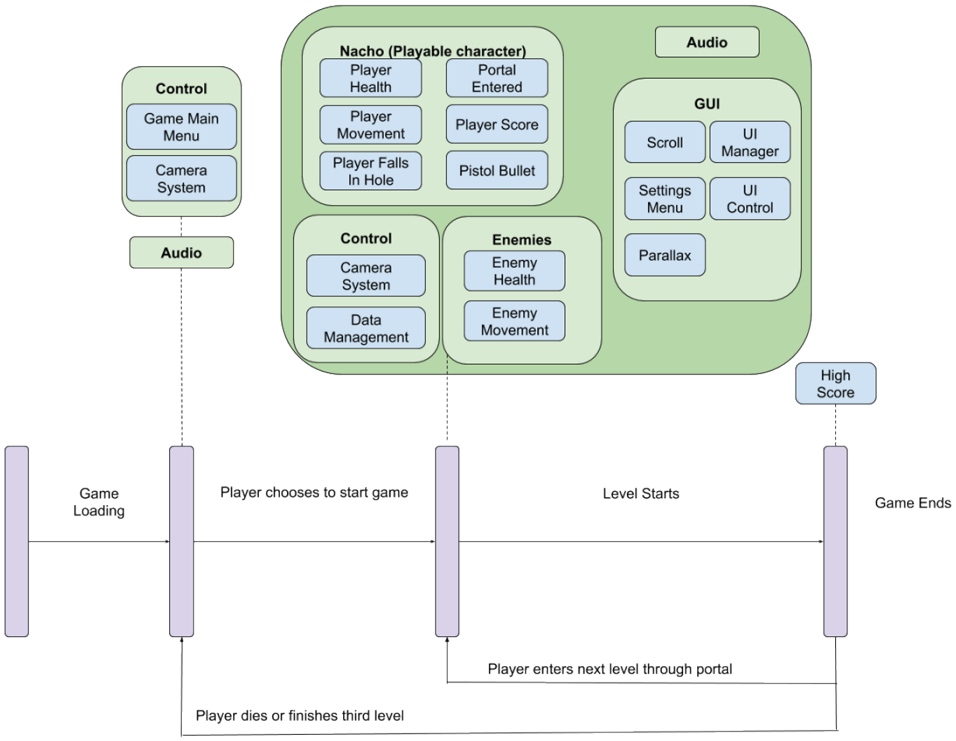
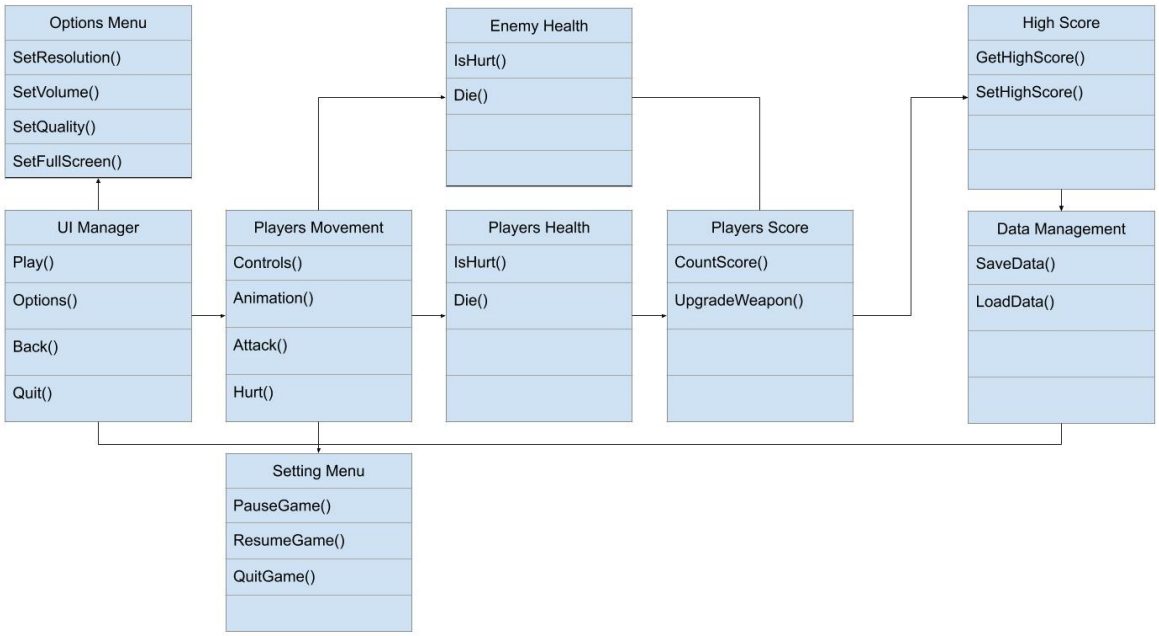
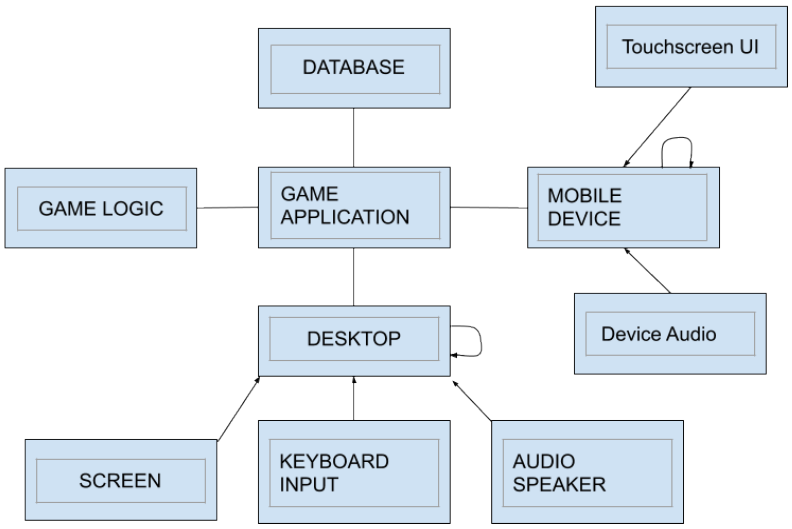


Figure: Mode Sequence Diagram

4.3 Detailed Class Design

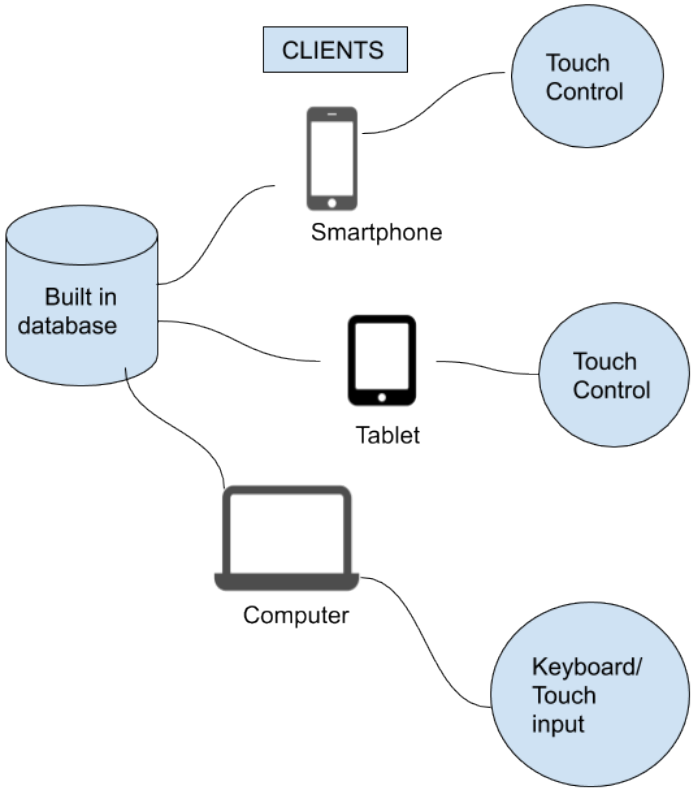


5 Process View



*The Game Application is compatible with both desktop and mobile device, Mobile users will only have the screen UI and are able to control nacho with their touchscreens while desktop or laptop users can use their keyboards for input.The game application gets the high-score information from the database provided by unity which stores a player's high-score(s).

6 Physical View



7 Use Case View


Player
Play
Options
Exit
Go to Level 2
Go to Level 3
Save Game Score
Show Game Over Panel
Nacho Dies
Save Game Score
Show Game Over Panel
Nacho Kills Enemy
Destroy Enemy Object
Gain Pesos
Enemy Hurts Nacho
Loses Taco Life
Nacho Dies if All Tacos are Lost
Nacho Passes Pesos
Gain Pesos
Jump
Run
Attack
See Leadership Board
Resume Game
Pause Game
Resume Game
Quit Game
Mute Music
Go to Settings
Go to How To Play
Return to Settings Panel
Return to Pause Panel
Mute Music
Adjust Music Volume
Adjust Resolution
Return to Main Menu