

# Homework 2

Reilly, Terrence      Justice, James      Goodall, Brad  
Maresh, Keefer      Gleason, Meagon

February 3, 2017

## System Overview

### User Interfaces

#### User Interfaces

Included within the game to help a user navigate and collect necessary data to play are various buttons and

#### Main Menu

Starts upon launching the game, and navigates to all other interfaces. Buttons present include New Game, Statistics, Controls, and Quit.

#### New Game

Starts a new game, which will take the user from the main menu into the playable game.

#### Game Interface

Where the game is played. Displays various images, such as the player and enemy avatars, as well as information relating to those characters, such as health and scores.

#### Statistics

Opens the Statistics menu, within which can be found data related to usage within the game such as high score or time played by the user.

#### Options

Opens the Options menu, which displays the current settings relating to actions within the game such as movement or firing. These settings may be customizable by the user.

#### Quit

Closes the application and ends the process of the game.

# Functional and Non-functional Descriptions

## Functional Requirements

- The user can navigate the menu to begin a new game.
- The user can navigate the menu to quit the game.
- The user can navigate the menu to see game statistics.
- The user can fire a laser at enemies.
- The user can move about their environment.
- The user can only use like-colored lasers to damage an enemy.

## Non-functional Requirements

- The menu items are legible and easy to follow.
- The color schemes for the menu complement those of the game.
- The user's weapons are fast enough to allow enjoyable gameplay.
- The user's movements are easy to control through the keyboard, with related controls not too far apart from one another.
- The colors of the different weapons are easily distinguishable.
- It is easy for the user to tell what color the enemies are.

## Performance Description

The goal of this software is simply to entertain. The game will be based off of shoot-em-ups like Galaga or other arcade platforms, but bring this functionality to PC with our own twist. It will feature a menu system that is simple to operate and functional, characters that move on the screen, including the player ship, enemies, and obstacles that may be affected by weapons in different ways. We are also implementing a slight twist by adding a mechanic of color-coded weapons to change the difficulty and player experience.

## Exception Handling

### Exception handling

There are a number of exceptions that may occur and disrupt the experience of the user.

## **Collision detection errors**

The users in-game character should be destroyed by colliding with in-game enemies and laser beams. Should the game fail to detect collisions, the in-game enemies or player may become invulnerable. Should the collision detection produce false-positives, the user may lose the game without failing to dodge enemies and laser beams.

## **Movement errors**

The user's in-game character should remain on screen at all times. If the code responsible for this task should fail, the user's session will be disrupted.

## **Audio exceptions**

If a user's audio drivers are missing or corrupted, the game's sound will not function properly. Most properly-installed operating systems should not encounter this exception.

## **Frame-Rate Exceptions**

The game should update at a constant rate of rendered frames per second. If the code responsible fails, the game may perform at an accelerated pace on faster computers, making the game far more difficult to play than on slower computers.

## **Graphics Scaling exceptions**

Depending on the resolution of the user's computer, the game will have to scale its graphics to fit the screen. If there is an error in scaling, the size and position of in-game objects may become inconsistent between resolutions. For this reason the game should be tested on a selection of common resolutions to ensure this does not occur.

## **Invalid Inputs**

Whilst the user controls their character via keyboard input it is possible they may press the wrong keys. Whilst the game itself should not behave poorly even when an invalid key is pressed, some operating systems such as Ubuntu and Windows may change focus from the game's window, disrupting the user's session.

## **Unknown Inputs**

Upon the first use of the game, a user may not know which inputs correspond to which actions in the game. If this information is not made available to the user anywhere in the game, the user may learn the correct inputs by trial and error, or become frustrated and quit. Therefore the inputs should be made available to the player before they play for the first time.

## **Acceptance Criteria**

The criteria for acceptance of the project will proceed in stages. A prototype of Lazer Blast will first be produced. For acceptance, the following criteria must be met:

- A new user can begin a new game after looking at the menu for less than 1 minute.
- A new user can quit the game after looking at the menu for less than 1 minute.
- The user can fire upon an enemy.
- The user can navigate around their environment.

Once the prototype has been accepted, the final acceptance criteria will include all the previous criteria as well as the following:

- There is a main menu with the following items:
  - New Game
  - Statistics
  - Quit
- A new user can read all items in the menu.
- The colors in the menu have the same theme as those of the game.
- Firing a dissimilar laser at an enemy does no damage.
- The weapon, when fired, reaches the enemy faster than they can move away.
- The keys for movement are all within one hand's distance, as are the keys for using weapons.
- A new user can tell the difference between the different laser colors. (That is, the contrast is high enough for the average player.)
- A new user can tell which laser color is necessary for a given enemy.

## Appendix