V. Design

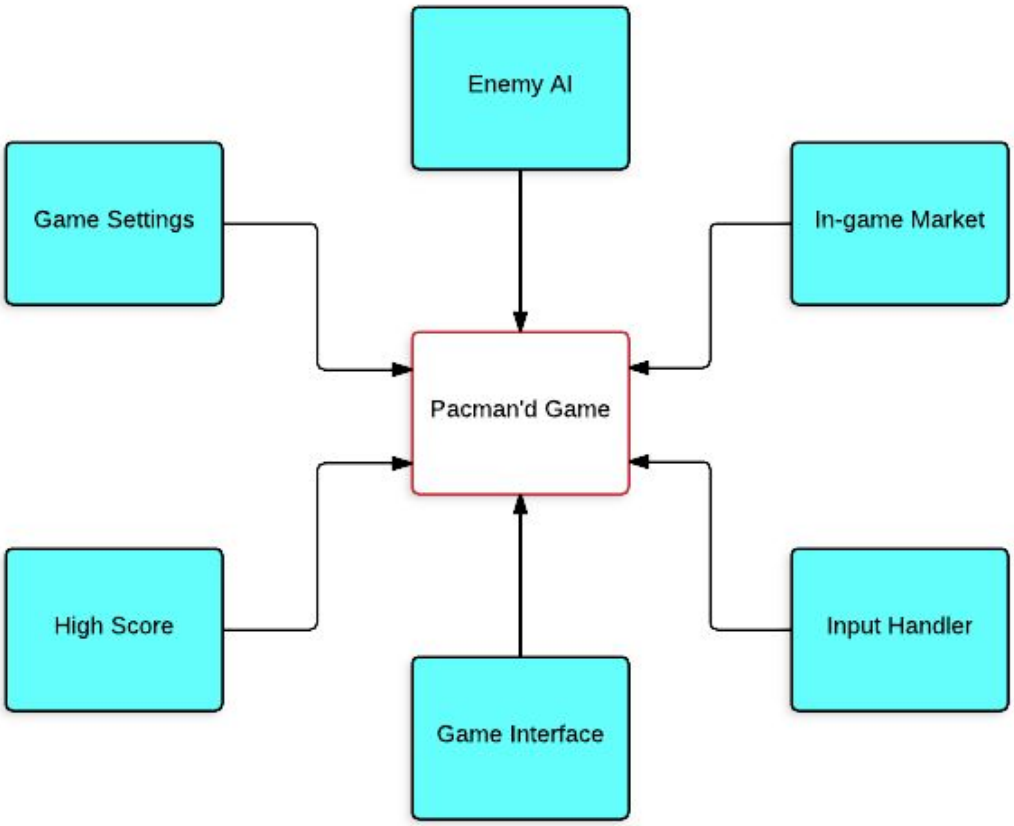

Fig. 1: Context Diagram showing subsystems of Pac'd-Man

The Pac'd-Man game relies on several subsystems as shown in Figure 1. Enemy AI is given player coordinates and controls the movement of ghosts that react to this input. The in-game market allows players to purchase and upgrade weaponry using a point currency collected during the game. The input handler passes on keyboard and mouse input to the game. Game settings allows players to change the keys used for input. The high score system keeps track of other players' progress. The game interface is what is displayed to the user while they are playing, it consists of menus and a 2-dimensional top down world.

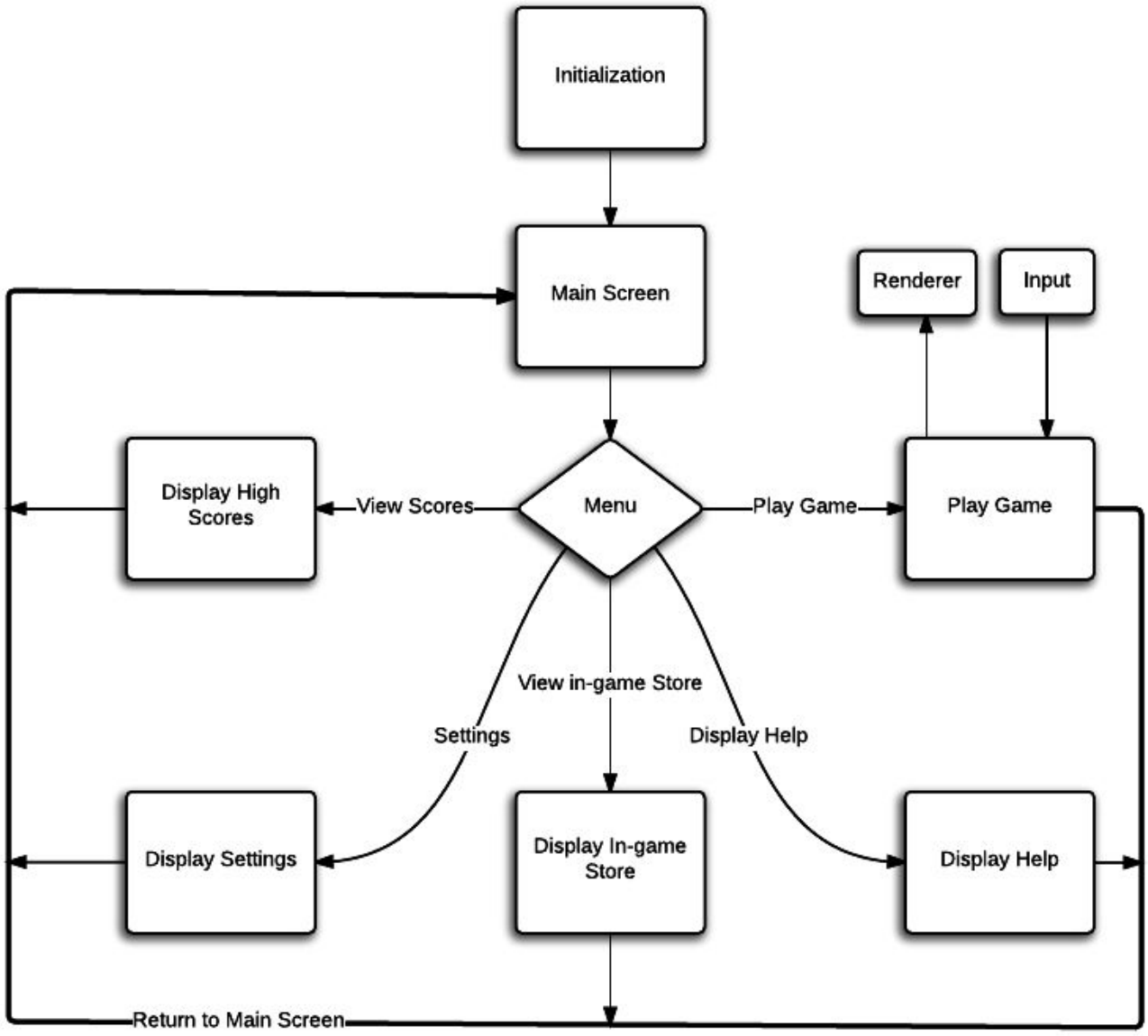

Fig. 2: Program Flow diagram, detailing program execution.

The Pac'd-Man game execution is summarized by Fig. 2. The program has a short initialization step and then presents the user with the main menu screen. From there they can choose to play the game, display help, settings, or the store. Each of these blocks relinquishes control to the main menu after execution.

Static Interface Design

Fig. 3: Weapon upgrade menu

The weapon upgrade menu, shown in Fig. 3, allows you to purchase and upgrade weapons that will allow the player-controlled character to more effectively defend himself. Each weapon has a level and an associated cost, at the top the current credits are shown. After purchasing weapons, the user can return to the game using the large button at the bottom of the screen.

Fig. 4: Built-in help system that will guide the user

To help guide novice users, the game has a built-in help section that explains the basics of gameplay. After understanding how to control the character, use weapons, and handle enemies, the user can return to the menu by using the large button at the bottom.

Fig. 5: High score system

A high score system is included in the game to encourage players to beat their own and other's prior performances. After earning a new high score users will be prompted to enter their name. If they don't earn a high score they are still presented with the high score screen and can exit using the button at the bottom of the screen.

Fig 6. Menu Screen

The menu screen is what the user is initially presented with, each entry in the list is clickable and performs that corresponding function. If the user wishes to exit the button at the bottom of the screen allows them to do so.

Fig. 7: Settings Screen

The settings screen allows customization of input bindings. Users can press the button on the right that corresponds to the functionality on the left. After pressing the button they are able to assign a new key for this action. If additional customization is needed it will be added to this screen.

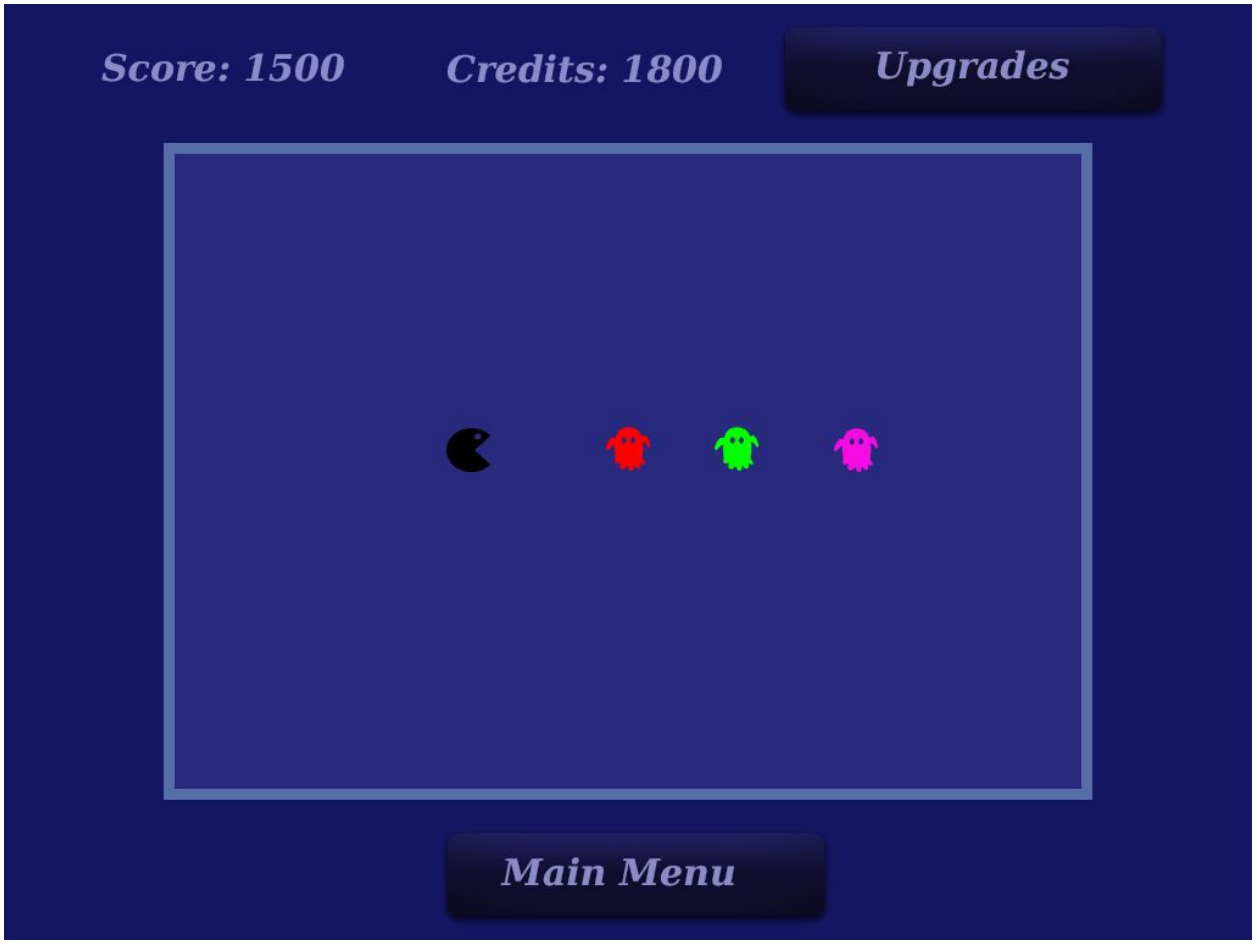

Fig. 8: Gameplay (incomplete)

The game itself is shown in Fig. 8, but it doesn't show the grid that will restrict both player and ghost movement. It also doesn't show the weapons in action, or items that will be picked up by the character. The character, when not prevented from doing so by obstacles, will be able to move up, down, left and right. The ghosts will react to the player's movement in an attempt to touch him.

All of the designs listed prior to this used a color scheme from paletton.com in hopes to provide a pleasant experience. For the game itself, we may choose the color scheme we like the most and apply it to all the screens. Additionally, all the interfaces provide buttons to show interactivity and have a menu or exit button at the bottom of the screen for consistency.

Alternative Design:

Fig. 9 Alternate help system

An alternate help system is shown in Fig. 9. Compared to the help system presented in Fig. 4, this one has an uglier color scheme, has text that isn't aligned properly, doesn't make use of space well, and doesn't use icons. In general, the colors used in the final interface have been chosen using paletton.com, a tool that was presented in class for picking colors that went well together.

Fig. 10 Alternate weapon upgrade screen

In Figure 10, a different weapon upgrade screen is shown. In this case it is hard to see what is interactive on the screen. The design presented in Fig. 3 had a more appropriate color scheme and interactivity is made more obvious by the use of buttons. Standard throughout all the designs listed in static design is the use of buttons to mark items as interactive, so users aren't wondering whether something is clickable.

Fig. 11: Alternate High Score Screen

The high score screen listed in Fig. 11 uses a different color scheme than the accepted version, but it also breaks a standard that is used throughout the accepted designs. The bottom of the screen always has a 'return to menu' or 'return to game' button. This consistency can help to guide users even in screens that they haven't seen before. It also prevents them from trying to exit and hitting something else, or accidentally exiting when trying to choose a different menu item.

VI. References

[1] Video Game Addiction. What Makes a Video Game Addictive? <http://www.video-game-addiction.org/what-makes-games-addictive.html>

Description: This article describes reasons that make video games addictive. It posits that video games are designed with addictiveness in mind, and have several "hooks" to draw a player in and keep them playing. The whole website warns against video game addiction and provides references to seeking help for those who may be addicted.

[2] Martin, Eriq. What Makes the Perfect Video Game? February 2014 <http://www.video-game-addiction.org/what-makes-games-addictive.html>

Description: This is an article by the video game review company known as IGN. It asks its readers what a video game needs to make it more perfect. It lists several factors, such as story, immersion, and cohesion. One unique answer states that the perfect game is "defined by your life circumstances."

[3] Fabricatore, Carlo. Gameplay and Game Mechanics Design: A Key to Quality In Videogames <http://www.oecd.org/edu/ceri/39414829.pdf>

Description: This paper discusses game mechanics as a crucial component to giving players the best experience possible through a video game. It provides guidelines that can help a game developer improve his or her design. Using these guidelines, one can create a game with tighter gameplay, and thus, a more enjoyable video game.

[4] Hunicke, Robin, LeBlanc, Marc, Zubek, Robert. MDA: A Formal Approach to Game Design and Game Research <http://www.cs.northwestern.edu/~hunicke/MDA.pdf>

Description: The authors of this paper describe a framework for developing video games known as MDA (Mechanics, Dynamics, and Aesthetics). They describe MDA as a way for separate levels of a team to work together in a cohesive way. MDA also formulates a game into three components: Rules, System, and "Fun." These components correspond to the Mechanics, Dynamics, and Aesthetics mentioned before.

[5] Schell, Jesse. The Art of Game Design: A book of lenses. 2008 <http://www.amazon.com/The-Art-Game-Design-lenses/dp/0123694965>

Description: This book offers a unique way to improve one's game design abilities. The author, Jesse Schell, asserts that in order to create a great game, one must compose a complete picture of its vision. To do this, she proposes that the game developer should

view games from different perspectives, such as from the perspective of a psychologist, or a sound designer, or a software engineer.

VII. Contributions

Jeff Soriano - Jeff wrote the abstract and found the majority of the references for Byron and Douglas to use. He also worked on formatting the paper and coming up the initial ideas for screenshots and functional requirements.

Byron Shure - Byron worked on creating the context and program flow diagrams. He also created the screenshots, alternative designs and wrote the descriptions to go with each figure. He also contributed to the editing of the entire document.

Douglas Yan - Douglas worked on the requirements elicitation and provided his own answers to the interview questions. He also interviewed another user. He also created the HCI persona and created the use cases and use case diagram. He also worked on the functional requirements section.