Assignment 1 Game hardware

Alexander Chow 100749034 Joseph Carrillo 100746949

I. Introduction

Our product is going to be a one handed controller for simple games with little button inputs. Our product is designed to play simple games with a comfortable controller for a casual experience. While our product is mainly targeted towards one handed players anybody would be able to use our product.

II. Project description

The problem we found with playing any game is that some one handed controllers are scary to approach since it's difficult to use a controller and all inputs meant for two hands with only one hand. There are alternatives that exist already but as mentioned before they can be overwhelming for new players since it's a lot to try and use a controller meant for two hands with one. As stated earlier this problem mainly effect players who only have one arm for playing games. We mentioned earlier that some alternatives do exist but they are uncomfortable or complicated for players. One solution that already exists is a 3D printed mechanism that can be attached to a controller that allows for accessing everything on the controller from one side of it(See Figure 1). Although this fixes the issue it is uncomfortable to support the controller with one hand, there is a stand available to make it easier on players arms but this forces players to sit in a certain position which will eventually cause players to get uncomfortable or sore from being in one position for so long. Another alternative is a one handed controller built with all of the mechanics of a basic controller in it, but this can be overwhelming to learn for new players(See Figure 2).

Fig. 1. 3D printed solution

Fig. 2. One handed controller

If the problem is not solved people who need to play with one hand may feel overwhelmed trying these existing controller or be pushed away from gaming since the controllers can be uncomfortable for long gaming sessions. This could lead to a loss of a player base because of a disability when gaming should be for anyone and everyone to enjoy.

The consequences would be felt by the one handed players. With these two issues in mind without a proper solution to introduce them into the gaming scene there is a chance that the gaming community loses a whole area of players which would be unfortunate as everyone should be able to enjoy gaming.

Our controller can be used for any game with minimal input that exist. An example of a game genre that could use our controller is party games(ex.Mario party) since most party games only need to use the standard face button of a controller (A,B,X,Y) and movement. These simple controls is what we aim to achieve for our controller so people can be introduced into the gaming scene.

We have found two papers that are related in the one handed controller area we are hoping to help with our product.

The first one is a paper talking about a one handed keyboard used for typing in VR. This product was designed for immersing the VR experience by getting a one handed keyboard for users to interact with and see the input from in game. While the reason behind this product isn't to provide a option for new players in a specific market it does have some of the same principles as our product. The design of the product was meant to be as comfortable and accessibly for the player, although their product was only for left handed people and required a table ours will have a version for both hands and will not require anything but the controller itself to be able to use.

Our second paper is a study on asymmetrical and symmetrical controllers. They wanted to see how well players could complete a race in game with the two different types on controllers(PS3 controller and an Xbox controller). They found that players performed better in the game while using the asymmetrical over the symmetrical controller. While our controller is forced to be asymmetrical since it needs all the buttons for one hand, we now have a study that shows asymmetrical controllers are better for a wide range of players. This is great information for our product since our designs were all asymmetrical, so it's good to know what the asymmetrical design will be easier for players to adapt to.

This is a picture of the patent for the Oculus controller(See Figure 3). This controller design is going to be similar to ours with the handle design but ours will not be tailored for VR and will require to be plugged into the computer rather than a wireless connection. We will be removing the circular plastic as we will have no need it and the location of buttons and joysticks.

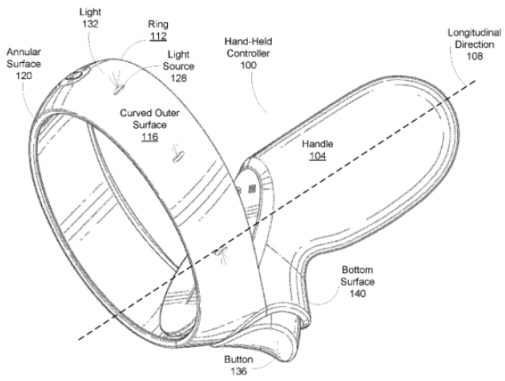

Fig. 3. oculus controller patent

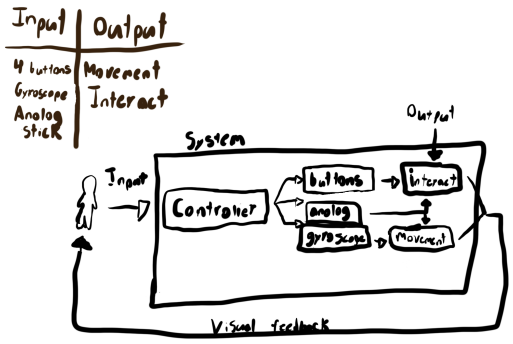

Fig. 4. System Architecture sketch

III. System Architecture

This is a simple example of our circuit. The analog has both interact and movement assigned to it as it would be used for moving around if players didn't wanna use the gyro scope for moving around, and the analog can be used for navigating any menus in the game since a gyroscope would be annoying for navigating menus. As well as using the buttons for interacting with any inputs for the game world.

3D printed modification for controller

https://www.notebookcheck.net/3D-printed-PlayStation-controller-mod-allows-one-handed-PS4-and-PS5-597669.0.html

One handed controller

https://www.benheck.com/ps4-single-handed-prototype-complete/

Patent for oculous controller

https://patent.nweon.com/11648

One handed keyboard for virtual reality

https://books.google.ca/books?hl=en&lr=&id=A203EAAAQBAJ&oi=fnd&pg=PA310&dq=one+handed+controller+games&ots=N8deYvNhST&sig=YygapopcKO2DiZg6H06BM_Nnwk4&redir_esc=y#v=onepage&q=one%20handed%20controller%20games&f=false

Asymmetrical and Symmetrical controller study

https://www.researchgate.net/profile/Ahamed-Altaboli/publication/352366975_Empirical_Comparison_of_the_Effects_of_Symmetrical_and_Asymmetrical_Video_Game_Console_Controllers_on_Players_Performance/links/60ca3c1b299bf1cd71d51955/Empirical-Comparison-of-the-Effects-of-Symmetrical-and-Asymmetrical-pdf