The Helping Hands

Eric Aivaliotis
Game Development and Entrepreneurship
Ontario Tech University
Oshawa, Canada
eric.aivaliotis@ontariotechu.net

Hao Tian Guan
Game Development and Entrepreneurship
Ontario Tech University
Oshawa, Canada
haotian.guan@ontariotechu.net

***Abstract*—Video games are a great way to experience entertainment. However, a lot of gaming platforms such as consoles are still for the most part, designed with an demographic of people who are not disabled. That is slowly changing as there is a awareness for accessibility in gaming. Microsoft has developed an accessibility control for those with motor disadvantages and third party companies have developed their own accessibility controllers for mainstream platforms. In this paper, we are going to be looking at a design for a product that will allow a person with one able hand to be able to control a regular Xbox controller with one hand while using their arm/elbow and feet to access the controls that are out of the player's reach on the regular controller.**

I. Project Description

As an entertainment form, video games provide a great deal of enjoyment to a lot of people. Part of this enjoyment is due to hardware design such as controllers for input. However, there exists people out there who have a difficult time playing games due to not being able to use the controllers properly due to a physical disability or something similar. This led to people in this disabled group to find different ways to handle controllers with different parts of their body. A lot of them even find groups online that discuss how they find a different way to use a game controller than the way those who are not disabled would use a controller [1]. Also, in recent years, there have been invented controllers that are made for those who have physical disabilities [2]. An example of this would be the adaptive controller for the Xbox that Microsoft has developed. Also, there have been third party controllers made for mainstream platforms designed for those with physical disabilities. We have came up with our own product for Microsoft's Xbox targeted for those who only have one function hand. The idea is for the player to use their able hand to control one side of an Xbox controller while we have devices that the player can use that would take the place of the buttons and thumb sticks on the other side of the controller that the player cannot use their non able hand and their able hand cannot reach the other side of the controller. Our solution consists of a special joystick that the player would rest their elbow or arm in place on the thumb sticks and foot pedals that the player would press using their feet in place of the buttons.

II. Justification

We believe that our product will have an impact. While our idea may not cater to everyone who has a physical disability but we believe we can capture a sizeable group who will benefit from this. Similar products do exist but our goal is to make ours the most easiest to set up and the most efficient design wise. If our idea did not exist, the consequences would be that people who have a disabled hand (or no hand) may not be able to find an easy and efficient way to control the games that they desire to play. Mentioned before, similar hardware does exists [3,5], however we want to make ours the most efficiently designed and in addition, make it adjustable easily to satisfy those with preferences. Another thing to add is the foot pedals/controls can easily be programmed so that the buttons can either take place of the d-pad on the left side of the controller or the XYAB buttons on the right side of the controller. This is so that we can include those who either have their left or right hand unavailable and that switching up the functionality of the controls wont be so difficult.

III. System Architecture

At the moment, our idea is broken up into two pieces of hardware. The first would be the arm/elbow joystick. For the arm/elbow joystick, their will be a box shaped body with the joystick portion sticking out. The joystick portion will have an adjustable area for the player to place their arm or elbow on. There will also be a cord sticking out of the body plugged into a box. This box will have a cord that leads to the second part of our idea, the foot pedals/controls. The foot pedals/ controls will feature buttons in the shape of arrows that will look like a d-pad. These buttons can be programmed so that instead of the d-pad, its the XYAB buttons. In addition, there will also be two buttons that will act as the trigger buttons in the back. Inspiration for the foot petals comes from the XBox One—S—X/PlayStation 4—5 game controller boxes from from RJ Cooper Associates, Inc [4]. Both the arm/elbow and foot controls will be plugged into this small box. This small box will then be plugged into the input jack at the bottom of the Xbox controller.

REFERENCES

[1] K. Ellis, K. Kao, "Who Gets to Play? Disability, Open Literacy, Gaming".

[2] B. Yuan, E. Folmer, FC. Harris Jr, "Game Accessibility: a Survey".

[3] C. Godineau, "The new Xbox adaptive controller, another step towards digital inclusion?" http://mastersofmedia.hum.uva.nl/blog/2018/09/23/the-new-xbox-adaptive-controller-another-step-towards-digital-inclusion/.

[4] R. Cooper, "XBox One—S—X/PlayStation 4—5 game controller boxes" https://store.rjcooper.com/collections/recreation-gaming/products/xbox-one-accessibility.

[5] B. Morris, T. Dove, "12 Adaptive Gaming Controllers for Disabled People" https://lifezest.co/adaptive-gaming-controllers/?utm$_source = rssutm_medium = rssutm_campaign = adaptive - gaming - controllers$.