

Motion Control Sabre

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Abstract—This document is a description and plans for a motion controller sabre

I. PRODUCT DESCRIPTION

Our project is to create a Motion detection fencing sabre, this sabre takes in which way the sword is being swung by the user and also has a button input. This is to solve some issues with motion detection devices that often have trouble with differentiating between horizontal and vertical movement with diagonal swinging.

The issue of diagonal inputs not being calculated effectively effects anyone trying to make a diagonal input, whether it be in a game or application, therefore with our device we hope to rectify this problem with our own sabre device to correctly detect diagonal input and differentiate it from vertical and or horizontal input.

II. JUSTIFICATION

A. What happens if problem is not solved

What happens if problem is not solved: If this problem or diagonal input not being calculated or inputted correctly it will lead to frustration to players and will lessen their playing experience and will lead to lower game-play reviews and or may cause the player to drop a game in its entirety. Due to this incorrect response feedback, the overall effectiveness of the products lessen and the opinion of it to the users diminish.

- Can cause frustration, lessens the enjoy ability of games
- Unresponsive control, which lessen effectiveness of product
- Motion control / immersion

B. Who feels the consequences

Any user who attempts and fails to make a diagonal movement will feel the consequence, as this issue is not a user error or user incapability but a device failure, as it cannot correctly understand the input its getting from the user and is calculating it as a different action.

Does the problem have a wider relevance: Other games that utilize motion controls while have inaccurate motion inputs

- e.g. ARMS - Doesn't feel responsive (e.g the game extends the arm further than what you intended to
- e.g Mario party (Doesn't always accurately compute motion control, such as shaking)

III. DATA

According to the study “Spatial presence and perceived reality as predictors of motion-based video game enjoyment” from the Presence: Teleoperators and Virtual Environments journal, that the interactivity of motion based games increase feelings of spatial presence, perceived reality, and enjoyment. Also, according to the study” How Responsiveness Affects Player perception in Digital Games, it is determined that through the analysis of the consequences of adding delays to the responsiveness of controls that there is an increase in the perceived difficulty in game-play and frustration in players. While this article talks specifically about delays, it still talks about it in relation as a factor of Responsiveness in controls, which is relevant to the problem that the Motion detection fencing sabre is trying to solve. These studies justify that good interactivity plays a huge role in the perceived enjoyability of games. So if the controller is not being responsive, it would illicit a negative response to any players that are playing a game with said controller.

IV. DESIGN THINKING OUTCOME

A. Empathize

We understand that motion controls can sometimes be a hassle and an annoyance as some movements cannot be correctly detected, thus making some motion controls feel incomplete.

B. Define

What we want is to make a device that better understands the users attention, specifically for sword like action. For a controller to work similarly to a sword it needs to correctly identify the users movement direction.

C. Ideation

For our product we came up with a few different methods, and came up with plenty of questions such as how many buttons we would need, how long our sword would be, how would our device physically look like, and more importantly how can we get our device to work as we intend? We eventually made our decisions based of our idea of making it compatible and easy for the users to get and use.

D. Prototype

Rough Blender of Sabre, prototype will be changed to better fit for a more comfortable experience and a have a more appealing design.

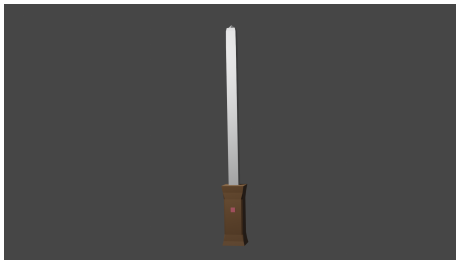


Fig. 1. Sabre Prototype.

E. Collaboration of three people

Three ideas

- Correctly determine and calculate what is diagonal movement vs what's horizontal and vertical movement
- Have functioning buttons in order to use the device outside of only its intended use, such as a parry button
- A model that is similar to a sword, but compact enough for the user to store and isn't a hindrance to its users.

F. System Architecture

Input

- A button so the user can switch to blocking
- Motion detection, so know the direction the sword is being swung

V. PRODUCT COMPARISON

A. Wii

First released motion controller in November 19, 2006 in North America. It relies on sensor bar for any movement to be detected,

B. Play Station Move

First released motion controller in September 15, 2010 in Europe.

C. Joy Con(Switch)

First released in March 3, 2017, it uses gyro motion controllers, not relying on sensor bars.

VI. PLANNING

For planning we are using multiple sites, such as a google drive, a trello (<https://trello.com/invite/fencingsabre/d543a926e0346e9970bb791d626a6f79>), and a github (<https://github.com/DashingCats/FencingSabre>).

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