Glovesy

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A functional specification document

As a requirement for CA400

Dublin City University (DCU)

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Project Title	Glovesy
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Field of Study	Computer science
Project Advisor	David Sinclair
Academic Years	2020/2021

ABSTRACT

Glovesy is a wearable computer interfacing device in the form of glove which will allow the user to interface with their computer by using custom macros, or use the device for hand-tracking in VR or AR applications.

Keywords: : Wearables, human-computer interfacing, VR, AR, Arduino

ACKNOWLEDGEMENTS

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Introduction

Glovesy is a wearable device which will allow the user to inteface with their computer, either by using user-defined macros, which will be set up using our program which will allow a number of gestures do be defined to certain actions within the pc, or by allowing the user accurate hand and finger tracking for use in Virtual and Augmented Reality.

General Description

0.1 Product / System Functions

Glovesy is a wearable human/computer interacing device, which will allow users to interact with their pc in a number of different ways, for different scopes. The primary focus of the device, will be to allow the user to set up macros, or certain movements or gestures, which the computer will recognise as a specific command, thereby allowing ease of use. Another function of the device will be to track user hand and finger movements for increased accuracy and control in VR applications, since the device is so low profile, as opposed to current VR controllers which tend to be bulky, handheld devices.

0.2 Constraints

There are a number of constraints that we foresee will have some impact on the development process of this project.

- **BlueTooth:** We can imagine that there may be some problems with connectivity over bluetooth.
- **Distinguishing Gestures:** It may be challenging to distinguish hand movements between general movement and purposeful gestures.
- **Application Support:** It could be difficult to set up programs to use the device, as, particularly in games, there may be different controls that are pre-defined.
- **Cross-platform:** a different driver will need to be made for different operating systems, which could be challenging.

Functional Requirements

- **Hand Tracking:** The device must be able to track the overall hand's orientation and position in 3D space.
  - **Criticality:** This aspect is quite important to the overall accuracy of the device, especially for tracking the hand for VR and for Gesture Recognition.
  - **Technical Issues:** A significant issue with this is that the accuracy is almost entirely dependent on the hardware, meaning if the IMU device we use is innacruate, we wont be able to do anything to improve the tracking.
- **Finger Tracking:** The device must be able to track the fingers' individual joints accurately.
  - **Criticality:** This aspect is also quite important, as it is one of the main functions of the device.
  - **Technical Issues:** One of the main issues with this is that the flex sensors that we are using are made by us, so there will need to be some calibration when first using the device.

REVIEW OF LITERATURE

0.3 Insert Section Title

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REFERENCES

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