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Information Technology, Device and Product Design

Introduction

Project was a part of Degree Programme in Information Technology at Oulu University of Applied Sciences. The topic of this project was to make a device that would work like a computer mouse.

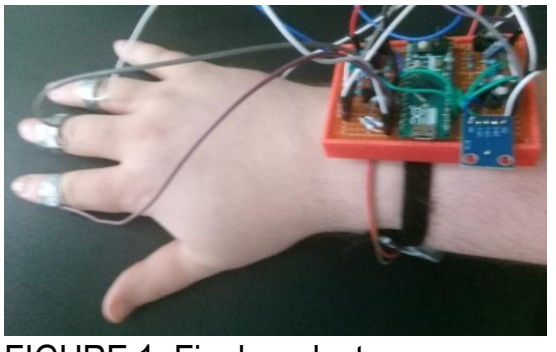

FIGURE 1. Final product

Objectives

Goal was to design a device that would work as a computer mouse by moving your hand in the air above the desk. Device needed to have all the functions that a normal computer mouse has, like moving the cursor, three buttons and scrolling.

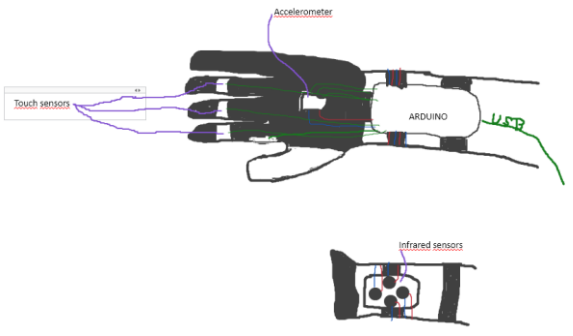

FIGURE 2. Earlier design

Methods

Infrared technology was used in detecting of the movement. Infrared LED was placed on the desk and four sensors to the hand. The voltage difference of the sensors was used to calculate the direction and the speed of the movement .

Accelerometer was used to detect the rotation of the hand and two different modes were used depending on the hand's vertical or horizontal position.

Click-functions were made with ring shaped capacitive sensors.

All the sensors were connected to Arduino Micro that controlled the cursor movement.

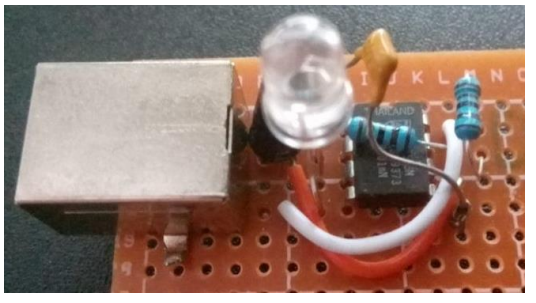

FIGURE 3. Infrared LED circuit

Results

The project was mostly succesful in producing a functioning mouse that was planned. Mouse cursor was moved like a joystick and mouse clicks and scrolls worked properly. Only problem was a bit slow and jagged movement of the cursor.

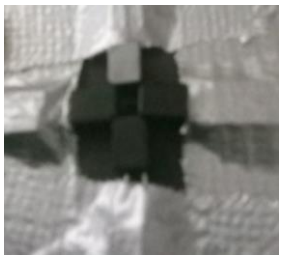

FIGURE 4. Infrared sensors

Conclusions

It is possible to make a functioning mouse with this technique, but it is not perfect. The mouse clicks and scrolls can be done well, but the cursor movement needs adjusting. Device could be done better if a wider angle infrared LED was installed or by using a more powerful processor. It is also possible to put two processors, one to control the cursor movement and one to control the clicks and scrolls.

References

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Electronic's Project

ECTS credits: 6

Date of publication: 2020, Spring

Instructors: Timo Vainio, Ensio Sieppi, Jaakko Kaski