Quad Control

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Introduction

In an age where we can monitor our cats from our smart watches and tweet automatically when we pull on our pajamas, it was a challenge to come up with a new wearable that serves a new purpose. Wearables cant be mentioned without smart watches coming into the picture. Although smart watches are quite new, we see that they are already capable of accomplishing a lot of different tasks.

Concept Design

We propose an original wearable device that has sterring capabilities to control a quadcopter. It would be very convenient to be able to direct a droid with a wristband-like device, with vertical and horizontal directing controls. This device would simplify control functionality and be a great alternative to large handheld controllers.
Our design utilizes an obtuse isosceles triangular shape that allows you to control with your thumb and index fingers, representing the X-Y, and Z planes. Where the top face represents X-Y and the bottom lower face acts as a Z (forward and backward) plane. You can essentially use two wide sides of a triangle with the obtuse angle on top to control different directions at the same time while the third face is attached to a wristband.
We plan to keep all of the essential power and microcontroller housed inside of the pyramid-like structure. The main components of our device include two batteries, a microcontroller, and a sensor.
Our idea is to send the copter commands to an app, and have the app take care of being able to send the commands to the quad copter. Some of the apps that exist today include Quadroid for Android and Astrodrone for Android/iOS.
MIT has been created a wearable device called NailO, which allows you to control other devices from your nail bed. The device works by sticking it to a nail (usually thumb) like you would a nail sticker and to use another finger on that hand to drag on that surface. We are using similar principles in our design to obtain two NailO like pads on the two faces of the triangular design.

Assumptions

- Assume the app communicating with our device has secure features such as a secure bluetooth connection that stops other apps from controlling the same quadcopter.

- The device, unlike conventional wearables, will not always be on. Its meant to only be turned on when it needs to be used.
- To be able to properly piggyback on an existing mobile application, there are definitely changes that need to be made, including being able to connect to the device through Bluetooth, and properly parsing the commands from the device, and then passing them off to the quad copter.

Use Cases

- I want to be able to integrate Quad Control with my Quadroid App.
  - Our assumptions are that you can use Quad Control as an assumption of an existing smart phone app.
  - We will have room for extra capabilities in case more wants to be added to the Quad Control.
- I want to be able to click to change settings from Quad Control.
  - You can use the touch pads as buttons with a tap.
- I want to...

Specifications

Pros and Cons

Battery consumption? Wearable has a small battery, so charge it more often.

Costs

Adafruit Gemma v2 Microcontroller - $9.95
Lithium Ion Polymer Battery - 3.7v 150 mAh for both touch pads - $5.95
Touch Sensors:

Conclusion

Quadcopter enthusiasts will have a sleek and simplistic addition to their collection of quadcopter accessories.

References

KDPS15. Hsin-Liu (Cindy) Kao, Artem Dementyev, Joseph A. Paradiso, and Chris Schmandt. Nailo: Fingernails as an input surface. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, CHI '15, pages 3015–3018, New York, NY, USA, 2015. ACM.

qua. Quadroid.