

Situated Display in Hospital Ward

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ABSTRACT

Author Keywords

Guides; instructions; author's kit; conference publications; keywords should be separated by a semi-colon. **Mandatory section to be included in your final version.**

ACM Classification Keywords

H.5.2. Information Interfaces and Presentation: Input devices and strategies; I.2.6. Artificial Intelligence: Learning

See: <http://www.acm.org/about/class/1998/> for more information and the full list of ACM classifiers and descriptors.

INTRODUCTION

Since the dawn of the computer age modalities have been an important aspect to consider when interfacing with the machines, whether it has been done using keystrokes, audio-control or gestures.

It has always been of high relevance to push the limits for how we interact with technology, mainly to empower the individual.

Technology is supposed to make common tasks even easier to achieve. Consider the case of a physically disabled person being empowered by using an alternative modality such as voice control.

In our case the focus is to improve on how people in the healthcare sector interact with technology. In the healthcare sector interaction can actually prove to have negative effects, particularly bacteria can be transferred.

One way to avoid spreading bacteria is by avoiding physical interaction with input devices.

This can result in less time spent scrubbing or rinsing as the likelihood for microbacteria being transferred via input devices is reduced.

Ultimately alternative modalities could provide employees within the sector a way to use native hand gestures to perform tasks such as interacting with x-ray images.

PREVIOUS WORK

There exist a lot of prior work within the field of HCI which is relevant to our solution. The papers which influenced this project the most will be mentioned in following section.

Alternative Modalities

Prior work in regards to pattern recognition has been of high relevance to our solution. bla bla bla bla

Smart Machines

Prior work in regards to pattern recognition has been of high relevance to our solution. bla bla bla bla

SYSTEM ARCHITECTURE

The system we have designed consists of multiple parts, one being a input device, another being a data processor, a third one being a communications service and the last one being a presenter.

The Input Device

Our motion tracking device(MTD) has been built in such a fashion that it resembles a wrist watch. This form factor makes it rather compact. Additionally a lot of people wear watches on a daily basis which makes the device of a recognizable morphology and barely noticeable for people accustomed to such devices.

The MTD contains a list of components, the most important are 6DoF Sensor, Bluetooth and the Arduino microcontroller.

The **6DoF Sensor** is the heart of the device. It is a board which contains an accelerometer and a gyroscope. This means that it is possible to measure movement and rotation of the wrist of anyone wearing the device. The input received from the 6DoF sensor is propagated to the **arduino microcontroller**. The arduino prepares the raw values into JSON data. The JSON is then sent using the bluetooth device.

Weka Gesture Recognition System

Since the input device we have built is quite lightweight, data processing needs to be done elsewhere. This provided us with the challenge of transferring data from one bluetooth capable device to another. To

Android Application

The android system is a quite limited system. It is able to display an image. It provides the user with the possibility of panning and zooming a given image. When the user zooms all the way out panning provides additional functionality. Panning

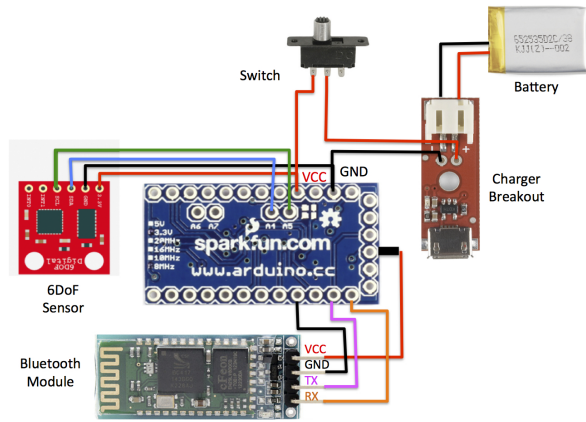


Figure 1. This schematic shows the curcuitry on the device.

left and right will then swap images from the set of loaded images.

Web service

The communication between the Weka Gesture Recognition System and the Android Application is done by a simple web-service. It provides GET, POST and DELETE requests which manipulate a queue.

GET pops all the queued gesture recognitions, POST pushes a new one to the service and DELETE clears the queue.

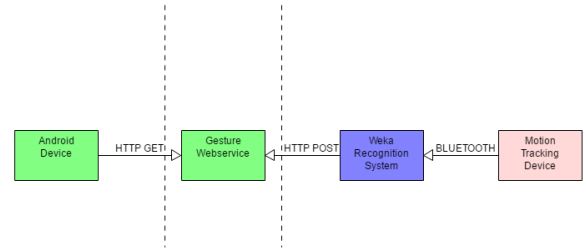


Figure 2. This schematic shows the system interactions.

RESULT

DISCUSSION

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