Russ Bielawski (jbielaws@umich.edu)
2012/09/18
PG1

Wearable Medical Glasses

Design Intent

With technological advancements in small, low-power computing, wearable medical devices are a hot research field, growing in popularity. In addition, we have seen wearable, wireless camera technology in the form of "glasses" ala projects such as Google Glass. Taking this trend, a multi-disciplinary research group comprised of professors and students from The University of Massachusetts, The University of Michigan and Yale University seek to build a research platform to investigate medical uses for such a wearable sensor device. The hypothesis is that by combining the camera sensing from the wearable glasses with other sensors, thereby creating a larger picture of the environment, non-invasive and non-medication interventions to mental illness will be possible.

Taking the hardware (and system) capabilities one step further from current systems, we'd like to build a very low power, light set of wireless glasses with an eye-facing camera to track eye movements. Our proposed platform represents a starting point for this multi-disciplinary research team.

Design Requirements

Customer Requirement # (Crxxx)	**Description**
CR001	The device shall be light enough to be worm comfortably for some time.
CR002	The device shall have, at minimum, one camera facing the user's eye, and shall be able to track these movements (off device processing is acceptable).
CR003	The device shall have a method for aquiring data. Wireless would be ideal, but if time constraints dictate, we will have a backup solution prepared.
CR004	The designed device shall operate with very low power consumption, such that it will be suitable to run on a reasonable battery in a later interation of the project.

Group Agreement

I anticipate working ~40 hours a week on this project during full swing. Currently, I am working on the project less, because the 498 work is eating up more of my time.

Including 498 obligations, I am busy, non-negotiable:

M: 3:00-4:30

T: 12:00-2:00

W: 3:00-4:30

Th: 12:30-2:00; 4:00-5:30

F: 1:00-4:00 (this is 498 lab, and it is a little negotiable)

Outside of these times, I am flexible and have plenty of time to devote to this project.

Initially, I must work in parallel on software and hardware. Initial efforts will involve prototyping camera devices, and investigating the viability of incorporating a wireless radio into the glasses. Hardware design needs to start rather soon, so prototyping must ramp up quickly.

Saturday evening – Sunday afternoon are my “day off” so to speak. I would like to avoid meeting during this time unless absolutely necessary.