

Client/Company/Organization: Virtual Reality Application Center (VRAC)

Submitter (name): Stephen Gilbert (client) Email: gilbert@iastate.edu

Project Contact: \_\_\_\_\_ Email: \_\_\_\_\_

**Project Title:**

Real-Time Mobile Eye-Tracking Glasses

**Project Abstract** (include **ALL project goal(s)**, design constraints, and technical approaches and tools):

Eyetracking glasses are available commercially from Tobii and SMI for \$40K, or you can build your own, like OpenEyes. There is a camera on one or both eyes, and a camera looking at the world. This project will develop eye tracking glasses that differ from these in that: 1) they track both eyes, not just one, and 2) they stream the data over Wi-fi in real-time, not just capture it. The software will a) tracks the eyes and b) integrate the video streams so that x,y positions of eyes can be mapped onto the image of the world. See example at <http://www.youtube.com/watch?v=DNlFrPeVjw>

- Eye-tracking hardware should be inconspicuous and does not interfere with user's view (no booms like in OpenEyes)
- System is mobile, lasting at least 3 hours on battery power
- Video data and raw x,y eye positions stream wirelessly in real time
- Eye tracking error no larger than 1.5 degrees
- Light weight (under 225 grams)
- Frame rate no less than 30 frames/second
- Hardware should be able to fit inside modified active stereo shutter glasses. (Future use in virtual reality applications)

**Expected Deliverables** (include expected schedule, cannot be open-ended, **must list at least one deliverable**):

- 1) A fully functional system that meets client's requirements!
- 2) Full documentation of software and hardware

**Specialized Resources** Provided by Client (be as specific as you can):

Access to Hom-Cam research group who has experience with streaming multiple live wireless videos, as well as several people on campus with eye tracking experience.

**Anticipated Cost:** \_\_\_\_\_ **Financial Resources Provided by Client** (if any): \$1000+

*NOTE: General Resources Provided by ISU/ECpE: MSDNAA software, and access to resources in ECpE teaching and research labs, e.g., electronics, embedded systems, etc.*

**Enter # Students Preferred/Required:**

- Electrical Engineering
- Computer Engineering
- Software Engineering
- Other (specify): \_\_\_\_\_

**Special Skills Required of Students** (be specific):

Proficiency in C++ programming  
Wireless data networking

