ECS 193AB Winter/Spring2017

Eye Tracking via Webcam for Accessibility

***Note this project has already been assigned to the following group:**

- Dominik Konecny
- Pouneh Aghababazadeh
- Dimitri Vasilev
- Alex Soong

Sponsor:

- Dr. Kwan-Liu Ma

Client:

- (Currently in talks with) Microsoft Accessibility Division

Problem Statement:

Technology is actively revolutionizing the whole world and often spurred from consumer influence. Our user interfaces are a great example with this with everything from mouse and keyboard, to touch, and even motion detection. There is, however, a group of users that cannot use the established interfaces due to certain physical and mental disabilities. There are systems that are currently available to assist users who lack fine motor skills or physical appendages, but they are either too expensive or involve using third market operating systems that essentially isolate users from a large majority of tools and content that could be available to them.

Solution:

To further extend access to Operating Systems such as Windows, we hope to develop a new user interface for these systems that involve tracking eye movement with regular integrated or store bought webcams. This solution would greatly increase the availability of these systems to disabled users of all socioeconomic classes. It would also provide alternative interfaces for normal users who may not have peripherals readily available or who have other requirements. This eye tracking could also be paired with voice recognition to provide a truly hands free experience which will be best to accommodate our target audience.

Goals:

- Use webcam to track eye movement
- Translate that movement into input for computer
- Support any generic windows webcam driver

Stretch Goals:

- Use voice control to automate input not accessible with just eye movement
- Cross platform
- System-wide integration – able to use with any program

Challenges:

- At first: learning the environment we're developing in
- Designing an intuitive experience for all users
- Getting precise, accurate mouse control on screen
- Testing the product with a comprehensive user base
  - There are many people whose interaction with computers is unlike our own, and designing for them will be significantly harder. Additionally, we will need to find such people to test our product
- Should we reach stretch goals, integrating our software with the operating system(s)

Deliverables:

- Eye tracking software executable that is easily installable/runnable