

Student Project Gaze based interaction for mobile maps



University of Zurich
Department of Informatics

Topic

There are various map based applications implemented for mobile devices where the human-computer-interaction is supported by haptic (touch) sensors. Another interaction modal for modern devices can be 'gaze-based interaction', that is, using the front camera, the eyes can be tracked. Therefore, gaze information (where people look) can be an optional input modality to control certain aspects of the display. This concept (gaze based interaction for mobile devices) is still a challenge to implement due to hardware-specific limitations and the complexity brought by environmental factors (i.e. varying lighting conditions and non-stationary device). However, some hardware options can be explored; such as coupling a near-infrared sensor with a mobile phone's front camera for tracking (while not optimized for mobile devices, open source eye tracking software solutions for low-resolution webcams do exist) and/or a constrained experimental system can be developed to simulate the gaze contingent interaction with a mobile device. Simulating the gaze-based interaction can be fairly straightforward; a freely available emulator of a mobile device can be installed on to a PC which is then connected to an eye tracking system for the gaze based interaction.

Assignment

You would offer two contributions: a) creating a prototype eye tracking "app" for mobile phone cameras which would allow further testing b) developing scenarios for interacting with maps on mobile phones (e.g., functions like zoom, pan can be optionally controlled by gaze as an input modality) and testing the performance (efficiency and effectiveness) of the proposed system for such scenarios.

Requirements

Programming skills, an interest in map based application development for mobile devices, and willingness to learn how to conduct a user study. A good command of English is essential. Thesis can be written in English or in German.

Work Load

- . 25% Theory
- . 65% Implementation
- . 10% Testing

Student Project Type

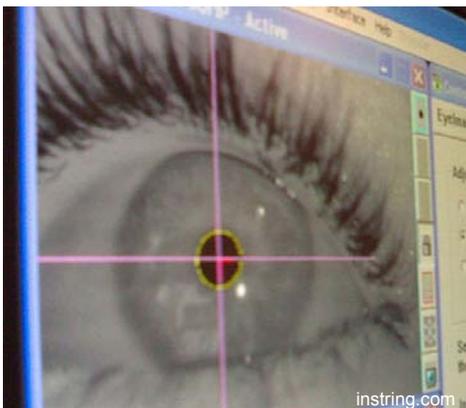
This project can be done as student project, practicum, Master/Diploma or Bachelor thesis. Goals are adjusted depending on the project type.

Supervision

Prof. Dr. Renato Pajarola
Dr. Arzu Coltekin (co-advisor, Geography)
MSc. Kenan Bektas (co-advisor, Geography)

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With gaze tracking we can determine where someone is looking



It is possible to interact with a mobile map using gaze as the input