

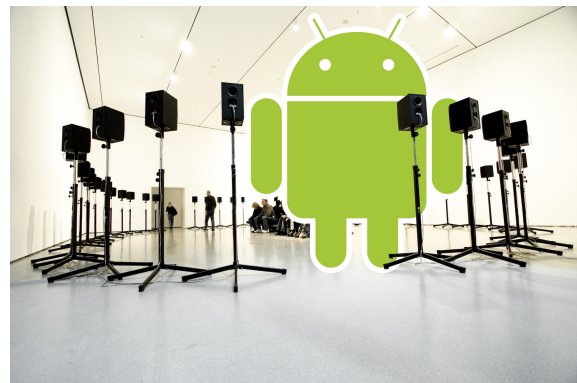


BA/MA/SA/Group/Lab:

## High Performance Location- and Attitude Estimation

Many important applications that we use in our everyday life depend on some sort of localization. Depending on the application at hand, there are different requirements on the accuracy and delay of the localization system. Virtual- or augmented reality applications require both, very high accuracy and very little delay. As such systems find their way into our living room (oculus rift, kinect), location data is either neglected or can only influence the application with rather coarse accuracy. Based on the same concept used in GPS, we developed a localization system that uses a surround sound speaker system to localize a smartphone very accurate and quick.

Although there is a proof of concept for this localization scheme, there are a few obstacles to be overcome before we can think about presenting a system that works in real time with the expected accuracy and delay. Alternatively we could further improve this localization system by using additional sensors to better estimate not only the location, but also the orientation of the phone in space. Alternatively, the delay of the system could be reduced by changing/improving the current localization algorithm or its implementation. This could go as far as implementing the computationally expensive parts on a mobile GPU. The project can be tailored to different interests (GPU implementation, algorithm design and optimization, sensor fusion, virtual reality demo application).



**Requirements:** Creativity and programming skills are advantageous. The student should be able to work independently on the topic.

**Interested? Please contact us for more details!**

### Contacts

- Pascal Bissig: [pascal.bissig@tik.ee.ethz.ch](mailto:pascal.bissig@tik.ee.ethz.ch), ETZ G61.3