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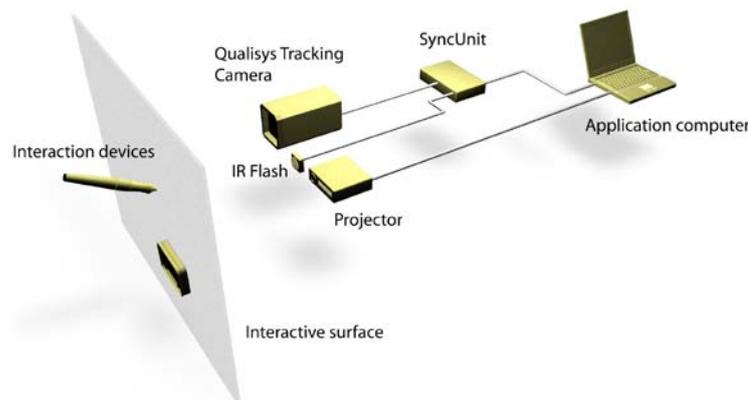
# User Study for Evaluation of a new Highspeed Tabletop Interaction System

Keywords: Human Computer Interaction, User Study, Programming

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## Background and Environment

At the ICVR, a new multi-user tabletop tracking system, called Qualitrack, has been developed. For a set of input devices positioned at or directly above the table, the system is capable of simultaneously tracking each device's position, state, and orientation. The input devices emit synchronized infrared light pulses. Each device uses a unique light pulse sequence, which allows a device identification. The system tracking rate of 250Hz provides smooth and reliable device registration. Tracked data is sent via the network to a client application. Devices are used for different interactions on vertical or horizontal displays. Pens are used for pointing, drawing, and writing. Tangible User Interfaces (TUI) are used to grab, rotate, adjust, or to position virtual models.



Qualitrack System: Multiuser Tabletop Tracking System

## Task

The Qualitrack system will now be used to analyze the influence of tracking update rate and latency on the user interaction performance. The goal is to establish a taxonomy including lower bounds for update rates (minimum refresh rate required), and upper bounds (maximum perceivable quality). For that a suitable user study application has to be designed where the effects can be observed by letting subjects interact with the designed application. This involves the design and implementation of a user study application. To develop this application, we can already provide a programming framework in C++.

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## Information & Administration

Morten Fjeld, Chalmers University Gothenburg - [fjeld@cs.chalmers.se](mailto:fjeld@cs.chalmers.se)  
Ramon Hofer, ETH Zürich, CLA F16.2 – [hofer@inspire.ethz.ch](mailto:hofer@inspire.ethz.ch)  
Andreas Kunz, ETH Zürich, CLA G 9 – [kunz@iwf.mavt.ethz.ch](mailto:kunz@iwf.mavt.ethz.ch)

### **Work packages**

- Setting up a Qualitrack system (technology, setup etc.)
- Carry out a literature research on issues such as Fitts law, DIN, and user studies.
- Analyze influencing parameters such as latency, update rate, speed, accuracy, and errors.
- Design of a study procedure to analyze the effects on interaction
- Implementation of study application
- Recruit and schedule test subject
- Carry out experiments
- Examine and interpret experimental data
- Co-author a conference publication
- Write master/bachelor thesis
- Intermediate and final presentations

### **Skills required**

- Experience in C++ programming
- Organizational talent

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Andreas Kunz, ETH Zürich, CLA G 9 – [kunz@iwf.mavt.ethz.ch](mailto:kunz@iwf.mavt.ethz.ch)