7 square meters, 8 megapixels, 10 months:
Build an interactive multi-touch floor

Goal

Interactive floors have been known since the early 90s. Their interactive capabilities, however, were limited: they either tracked users as a whole or, more recently, their feet. The goal of this bachelor project is to create an interactive floor with "toe-size" **resolution**. You will create a camera-based tracking system based on technology from the latest multi-touch systems, such as the one used in **Microsoft Surface**. The floor will form the heart of the Multi-Display-Laboratory on the second floor on the new HPI building.

The floor you build will go into this hole in the new building.

The underlying technology will be similar to Microsoft Surface

Based on the floor prototype, you will create a range of **"multi-toe" demo applications**, i.e., applications that were not possible on traditional floors, e.g., a subset of the following:
(1) a foot/toe-based GUI toolkit for people with motor disabilities in their arms,
(2) an application that involves both hands and feet, such as for playing a musical instrument,
(3) a multi-user application,
(4) a gaming application that uses the full potential of the floor, such as a live-size sports game,
(5) a demo application that will involve users sitting or lying on the table (be creative!)

Finally, you will evaluate your applications in a series of user studies as common in Human-Computer Interaction and write up your findings. Given the right results, we will support you in publishing the results.

External Partners

Smart Technologies, Calgary, Canada
(the company that makes the Smartboard).
Our contact is Gerald Morrison.

Sebastian Boring, LMU Munich will offer technical help with hardware and tracking technology.

The project will be integrated with our Human-Computer-Interaction research group, so **expect help and mentoring** from all of us, as well as your external partners Gerald and Sebastian.

A sample of the glass you will be using

Prototyping

You will develop software and hardware in parallel; until the hardware is complete, our Microsoft surface table will serve as the prototyping platform.

Skills

During the project you will **learn** the basics of computer vision, multi-touch, how to build large mechanical things, how to write graphics-intense applications, and how to design and run a user study. We do not expect you to know any of these things in advance, but we do expect you to be interested in learning them.

create a projection system

Group structure

4-7 students. Roles, areas of responsibilities and specialization will be defined in the first week.

Questions?

Email us at wimi-baudisch@hpi.uni-potsdam
or come see us in the hci lab (seitlicher Neubau, E.2)
(While you are there, check out the Microsoft Surface in the SNB-E hallway for inspiration).