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r4 - 25 Jun 2008 - 21:39:57 - ColeAnagnost

RFID & Multitouch Project Description

The blog for the Multitouch project team can be found here: http://www.hci.iastate.edu/REU08/bin/view/Main/Multi-touchTableBlog

On our multitouch table, we need to be able to identify different users as they stand around the table and interact.

User identification, along with touch detection in a multi touch system, will open doors to a whole new domain of applications. For example, we can perform user-specific calibration, access control, and menu accessibility controls based on user orientation on the table. If the UI widgets can be associated with a user, a whole new field can be explored.

User identification on touch table is a not a trivial problem. Some of the contemporary multi touch systems use electrode based mechanisms to bind the user with the chair one is sitting on (for example Diamond Touch from MERL). Philips also uses somewhat similar technology.

Implementation of camera-based user identification systems has a certain level of complexity involved as both the face and fingers need to be tracked simultaneously to achieve user identification. There might be a need to use more than one camera to identify all the users simultaneously. Further image processing techniques are computationally intensive and the response might be slow. But the advantage with the system is that it provides high accuracy.

Short range RFID systems provide a simpler implementation scheme and need less computation than computer vision based systems. But this comes at a cost of reduced accuracy because of interference related issues. Here the table can be divided into multiple zones where in the presence of a particular user can be identified. This provides limited user identification but still it would be a good experimental testbed to explore several applications that can take advantage of user identification.

Our longterm goal is to incorporate user identification with Sparsh UI. This could probably in the form of intelligent UI widgets which have knowledge of the user interacting with them.

Team members are encouraged to suggest any new methods of user identification systems. Also some background reading on RFID technology would be good.

Your Challenge

1. User recognition system that can identify upto 4 users [and scalable] on the multi touch table.

Preferably the user recognition system should be integrated with sparsh UI so that apps can re – use the same.

1. Demo application to demonstrate the ability to distinguish users.

The Team

Stephen Gilbert	Faculty member	
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