Implementation of a Portable Display Screen in an Instrumented Environment

Diploma Thesis (6 months)

Project Description:
The Fluidum project investigates interaction with different types of information in instrumented environments. The instrumented room in the basement of Amalienstrasse 17 is equipped with several displays. One major question is how information can be transferred from one display to another. Therefore, several interaction techniques can be used. A new opportunity is to use the steerable projector mounted on the ceiling in the basement, which is able to display in all directions within the room. Additionally, it is possible to project onto moving objects such as a cardboard box.

The cardboard box (Portable Display Screen) can be tracked with a FireWire camera attached to the projector. This camera also needs to track the person's fingers to allow interactivity on the cardboard box. Once the screen has been initialized, the projector should be able to display correct distorted images onto it. For example, this display can then be used as a storage device that is able to copy information from the display wall and paste it onto the interactive table.

Furthermore, the system should support a second device such as a cell phone or a PDA. Of course, the information does not need to be displayed onto the device using the steerable projector. Thus, an output layer is needed to control the information shown on all devices, which is possible by knowing the devices' positions and orientations. Another task of it is to represent information in a way that it can be displayed by various devices.

For this diploma thesis, the student is expected to implement the Portable Display Screen and add an extension to allow connecting other devices (e.g. a PDA) to it. If two students are taking up this thesis, they are expected to create a concept of the output layer as well as implement it. This layer should be an abstraction of all devices and will be tested with the PDS and either a PDA or a cell phone.

Required skills:
Object-oriented programming language