
Transforming Ordinary Surfaces into Multi touch controllers

Sunil Kumar Gurram

1.Introduction

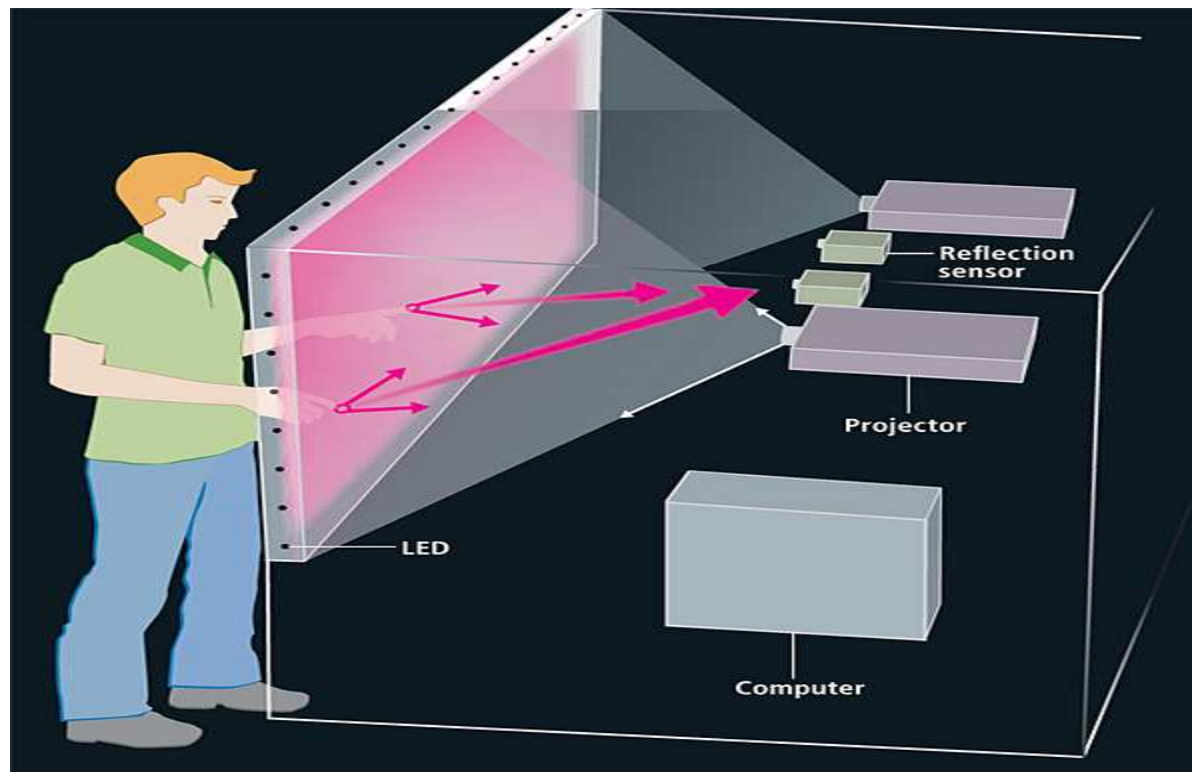
- Multi-touch screens respond to the motion and pressure of numerous fingers.

Finger touch can be identified by

- Stereoscopy.
- Infrared Cameras.

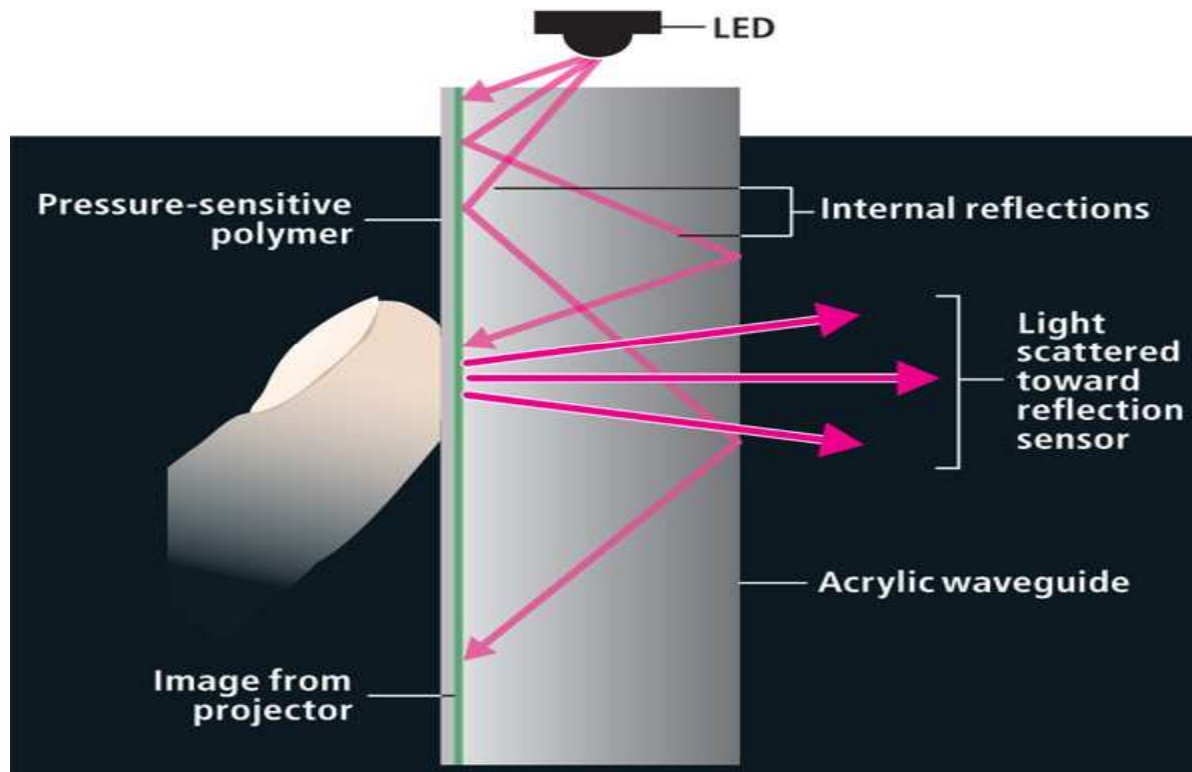
How multi-touch works

- LED's shine infrared light in to the acrylic sheet.
- Projectors are used to display the user interface on to the acrylic sheet.

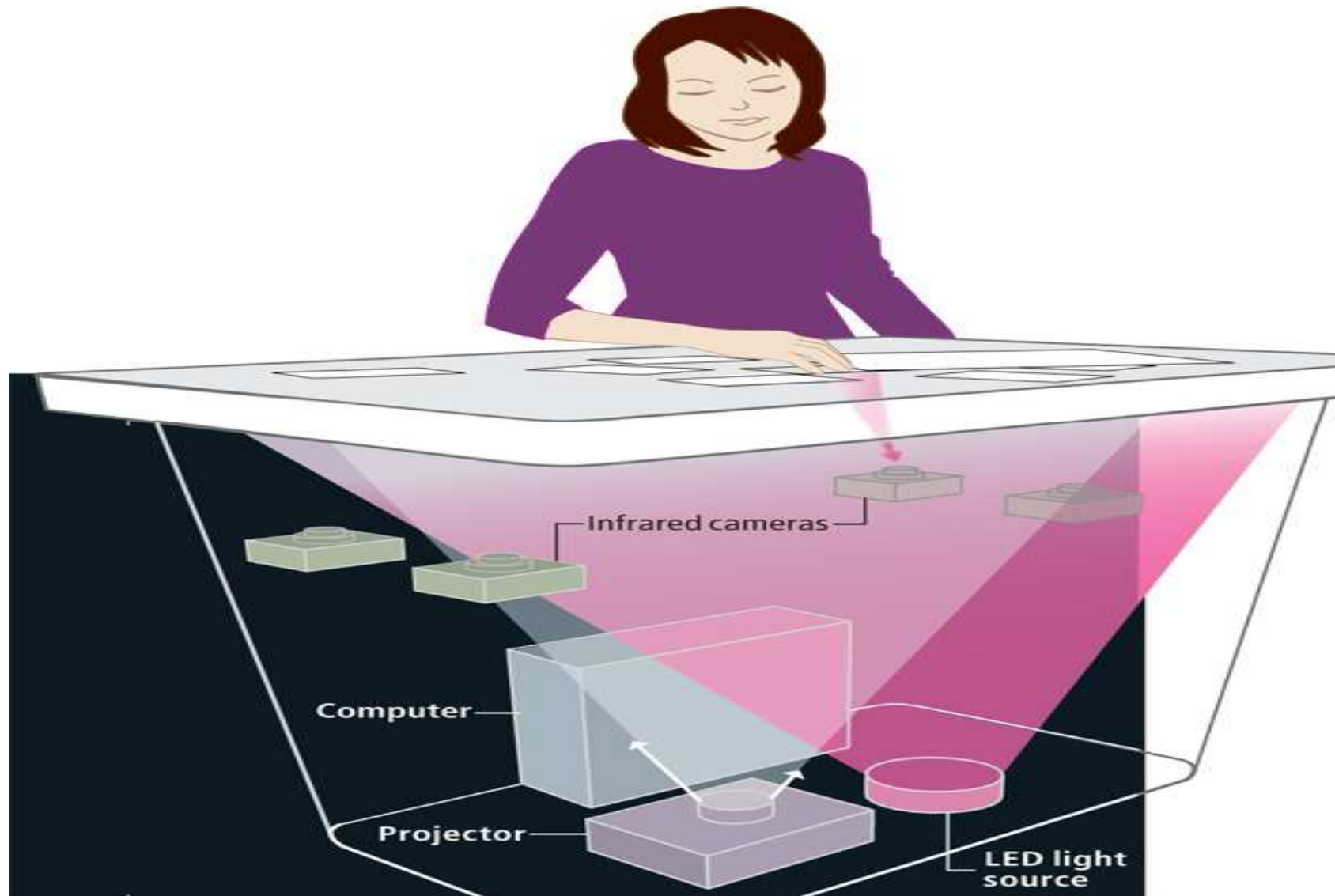


How multi touch works

- Software interprets data from the reflection sensors as finger movements.



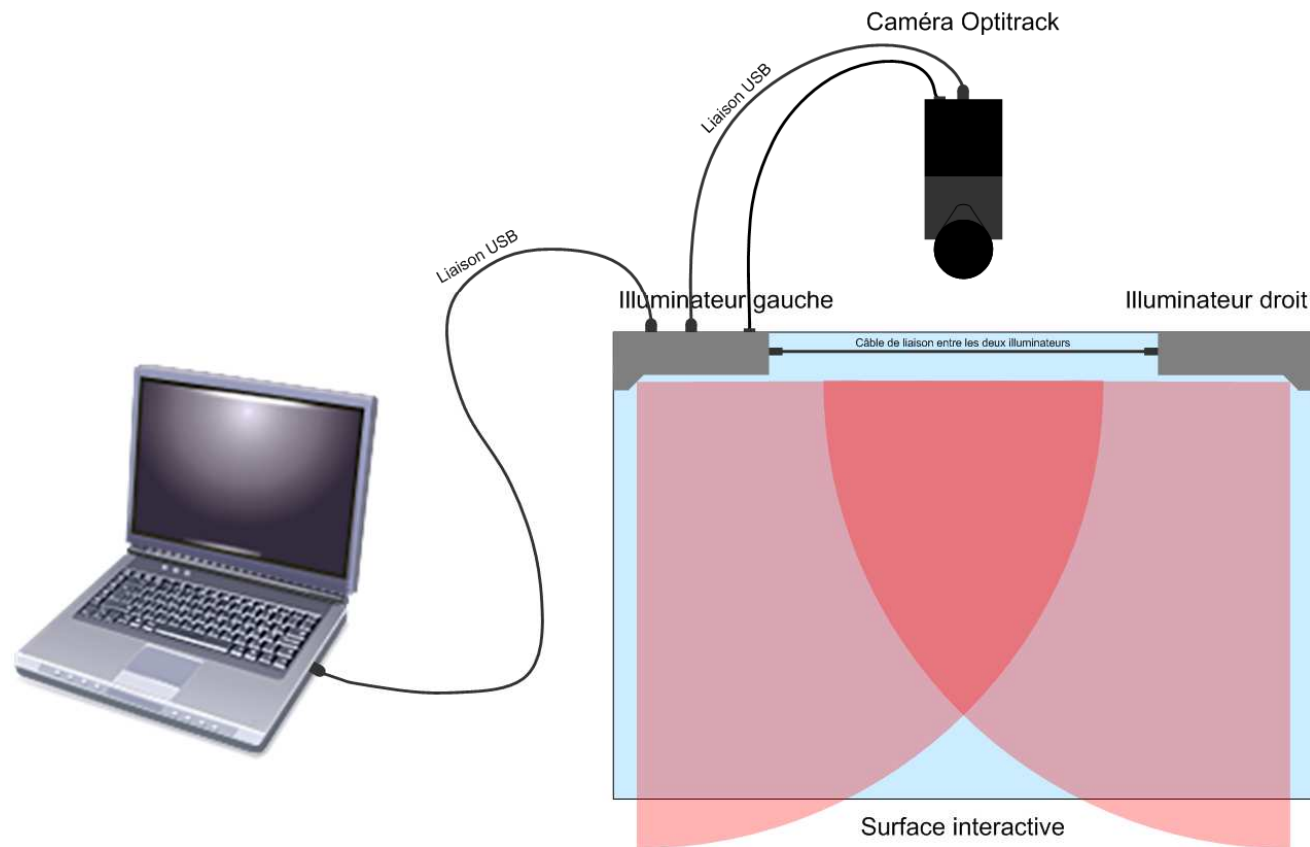
Touch Table



System setup

The system is comprised of

- Opti Track Slim : V100 infrared camera
- Two custom designed illuminators



Custom Designed Illuminators

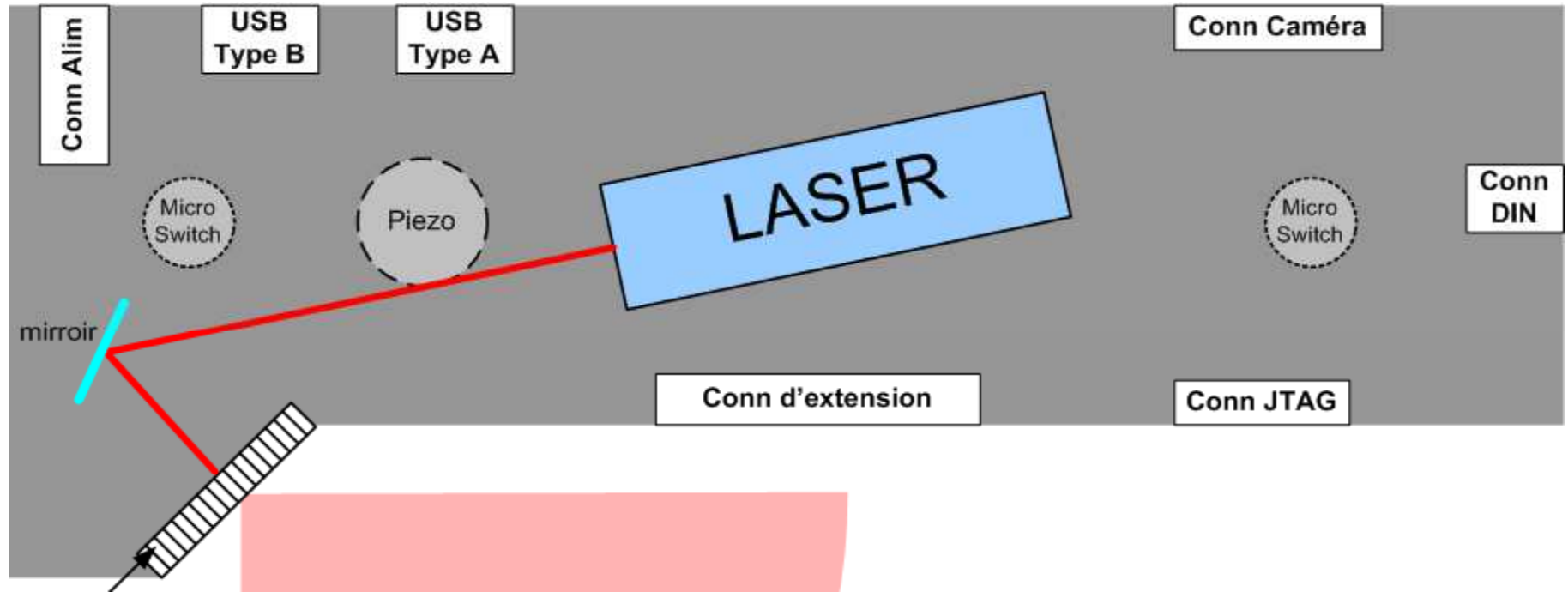
Some of the functions performed by the illuminators

- Generates a plane of infrared light above the surface
- Control of power of infrared laser



Integrated Illuminators

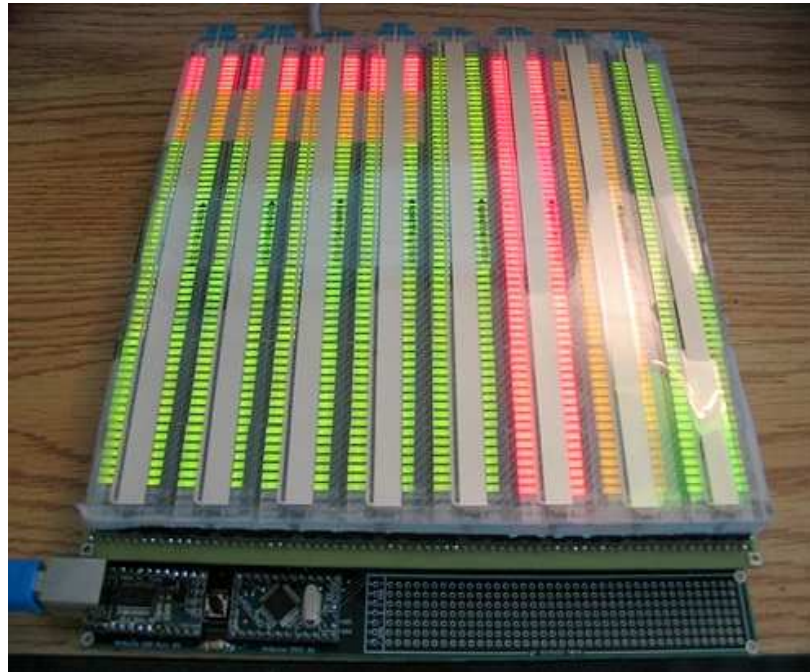
- Two USB connectors
- DIN connector for second illuminator



- Contact points and intensity information using OSC protocol

System Overview

- Touch Table as a Music controller



- The system creates musical controllers that produce no sound
- Musical Instruments Digital Interface(MIDI) protocol
- Open Sound Control (OSC) protocol

MIDI protocol

- Data with a set of instructions
- Internal Synthesizer software
- List of events or messages in .MID file
- .MID file sound different on different devices
- Can be modified
- Less space

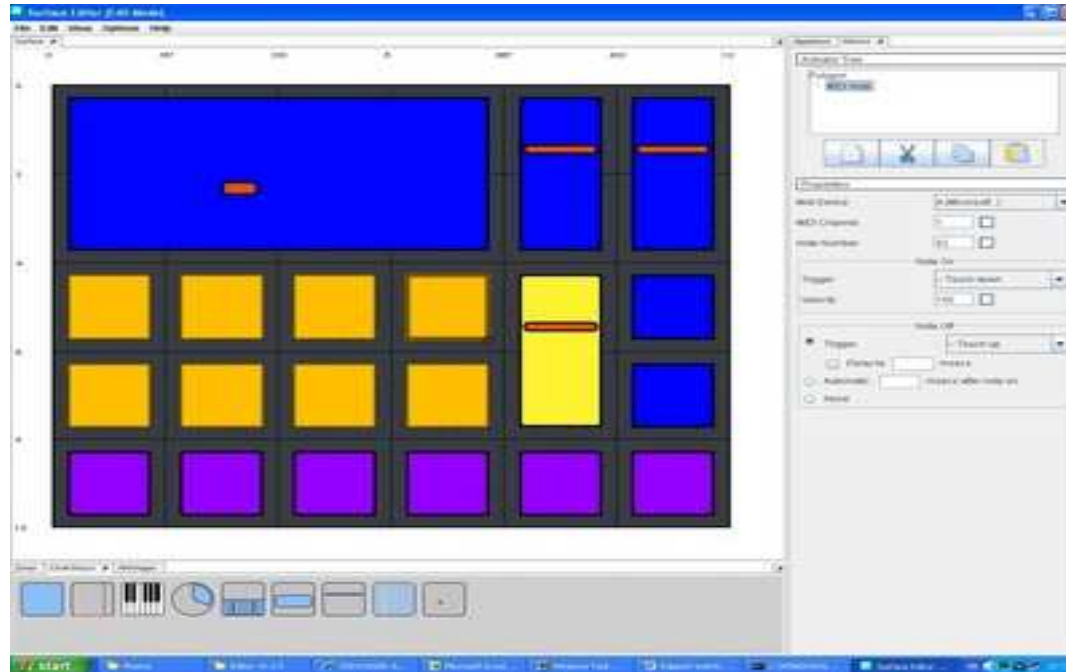
Open Sound Control Protocol

- Communication among computers , sound synthesizers and other multimedia devices
- Real-time control of sound and media processing environments
- Computer based interfaces for musical instruments
- OSC protocol message format
/touchEvent id touchState xPos yPos amplitude
frequency
- OSC compatible applications



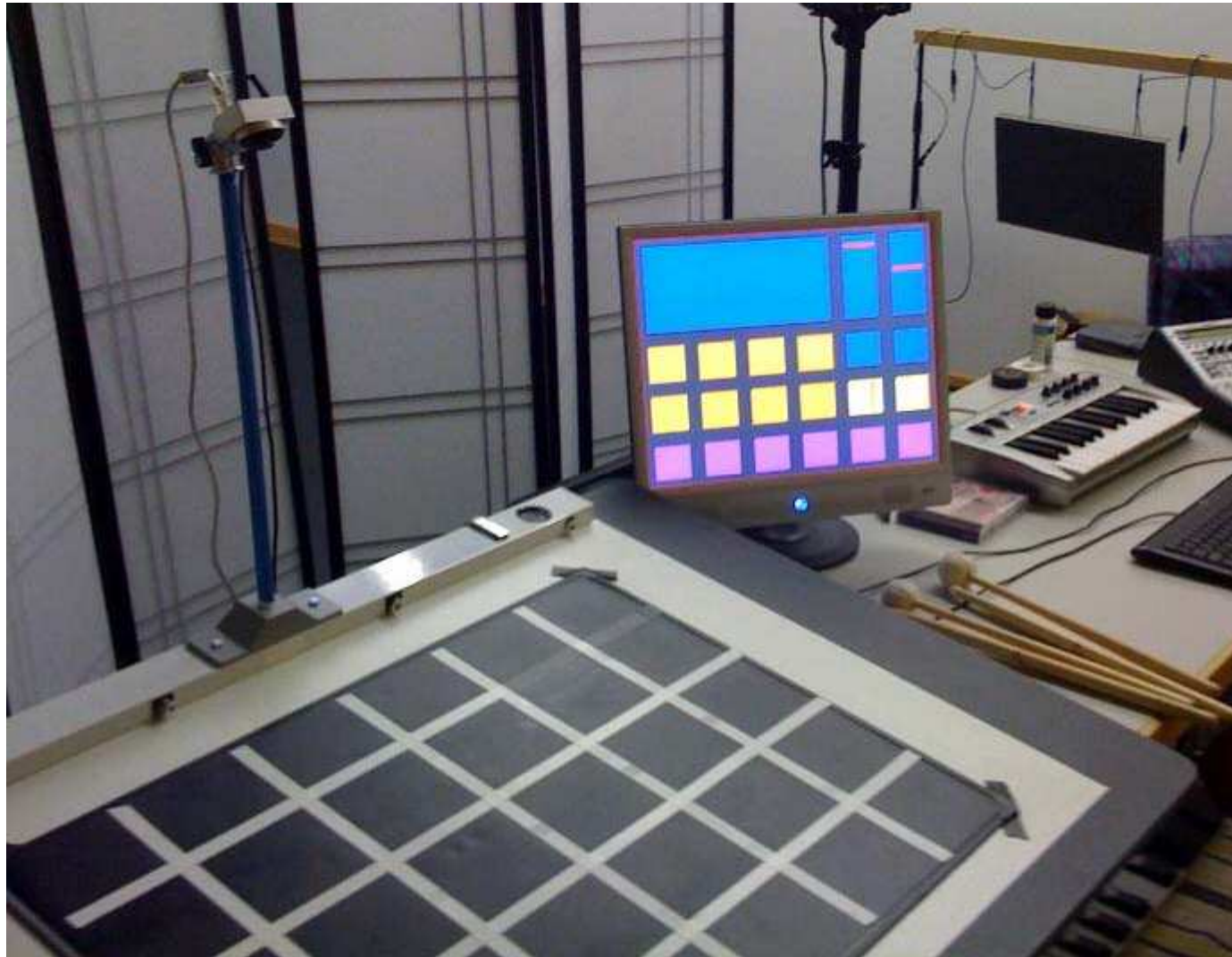
Surface Editor

- Drawing zones on the surface and assign them musical actions via MIDI and OSC commands.



- Users can write new mapping components in Java or using the Processing language.
- New mapping strategies can be created between input gestures on a multitouch surface and musical actions.

Auxiliary Screen



Conclusions and Future work

- Control layouts and sounds can be chosen so that non musicians can also enjoy using it.
- Multi touch everywhere
- Different controllers other than music controller can be designed as a control interface.