

tangible user interfaces

lecture 01: workshop planning

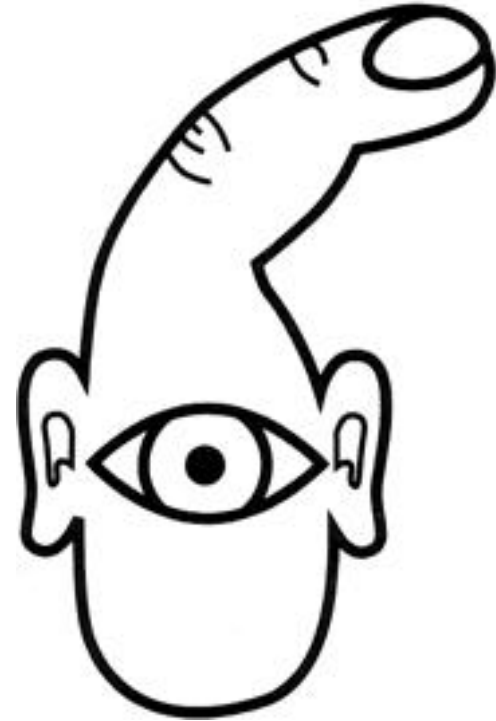


Illustration O'Sullivan/Igoe

++ workshop structure

+ theoretical & technical background

definition and examples of tangible user interfaces

tangible musical interfaces

tangible user interface concepts

protocols and environments, sensors & actuators

touch and haptic perception, multi-touch

+ concept development

development of an interactive installation concept, based on a table-top tangible user interface with and optional multi-touch interactive surface.

+ practical work

implementation of the interface concept using processing, max/msp, pure data, flash, java, c++ or c#

object and interface design

++ personal background

+ Martin Kaltenbrunner

researcher and Ph.D. candidate at the Music Technology Group, Audiovisual Institute, Universitat Pompeu Fabra, Barcelona, Spain.

teaching classes on Tangible User Interfaces within the Interface Culture Lab, Kunstuniversität Linz (Austria) and the School of Arts at the UCP Porto (Portugal)

working on the interaction design of the reactTable and developer of the tangible interaction framework reactTIVision.

+ education & work

1990-1994: studying landscape architecture, Vienna, Austria

1996-2000: FH Hagenberg, media technology & design, Austria

1999/2000: Centre for Electronic Arts, Middlesex University, London

2003/2004: Palpable Machines Group, Media Lab Europe, Dublin

2000-200x: Music Technology Group Barcelona, Spain

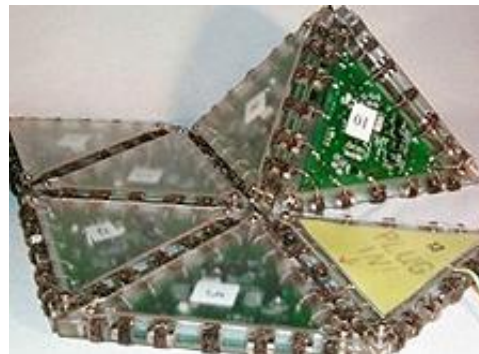
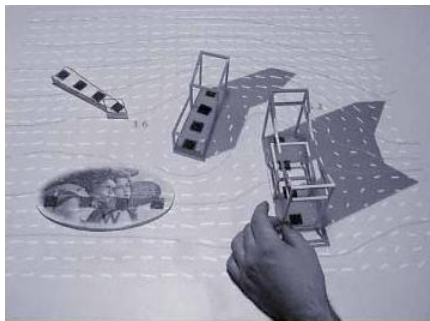
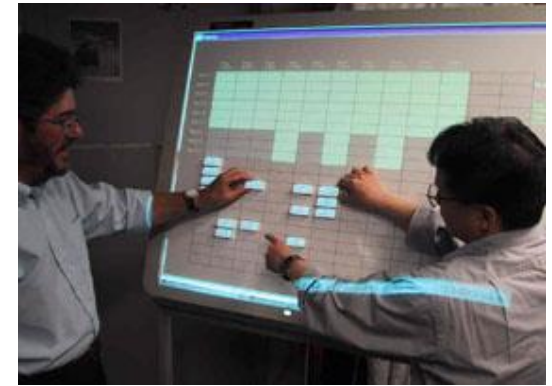
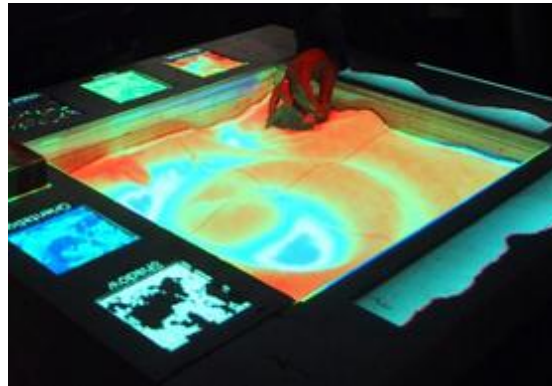
2004-200x: Interface Culture, Kunstuniversität, Linz, Austria

+ recent projects

reactTable: electronic instrument with a tangible user interface

reactTIVision: framework for tangible multi-touch surfaces

++ tangible user interfaces



++ project teams

-> **student introduction**

background & education

skills & interests

past & current projects

expectations

+ **programmer**

technical & implementation skills

+ **designer**

conceptual & aesthetic skills

+ **speaker**

presentation & communication skills

++ workshop tasks

+ TUI prototype

- * design: concept development
- * implementation: complete or partial implementation
- * documentation: written report on concept & implementation
- * presentation: demonstration of the final work to the class

+ group evaluation

TUI project & presentation

++ project topics

+ requirements

-> table-top tangible user interface

objects on flat surface are tracked by a camera sensor

multi-touch finger tracking

a) transparent surface, camera looking from underneath

b) opaque surface, camera looking from above, projection

+ suggestions

* musical applications (controller, drum computer, sequencer, DJ)

* educational games (mathematical, geography, language ...)

* planning tools (architecture, urban planning, traffic, ...)

* board games (chess, checkers, ...), arcade games (pong, breakout, ...)

* hardware/object design for tangible user interfaces

+ your own ideas are welcome ...

... but are restricted to table-top TUIs this time

++ technology

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++ reactIVision

fast and robust fiducial marker tracking, multi-touch finger tracking, tracks ID, location and rotation angle of any object on 2D surface, optimized for speed and accuracy in real-time interaction

developed and maintained by Martin Kaltenbrunner & Ross Bencina, engine developed by Ross Bencina inspired by E. Costanza's d-touch

+ free software

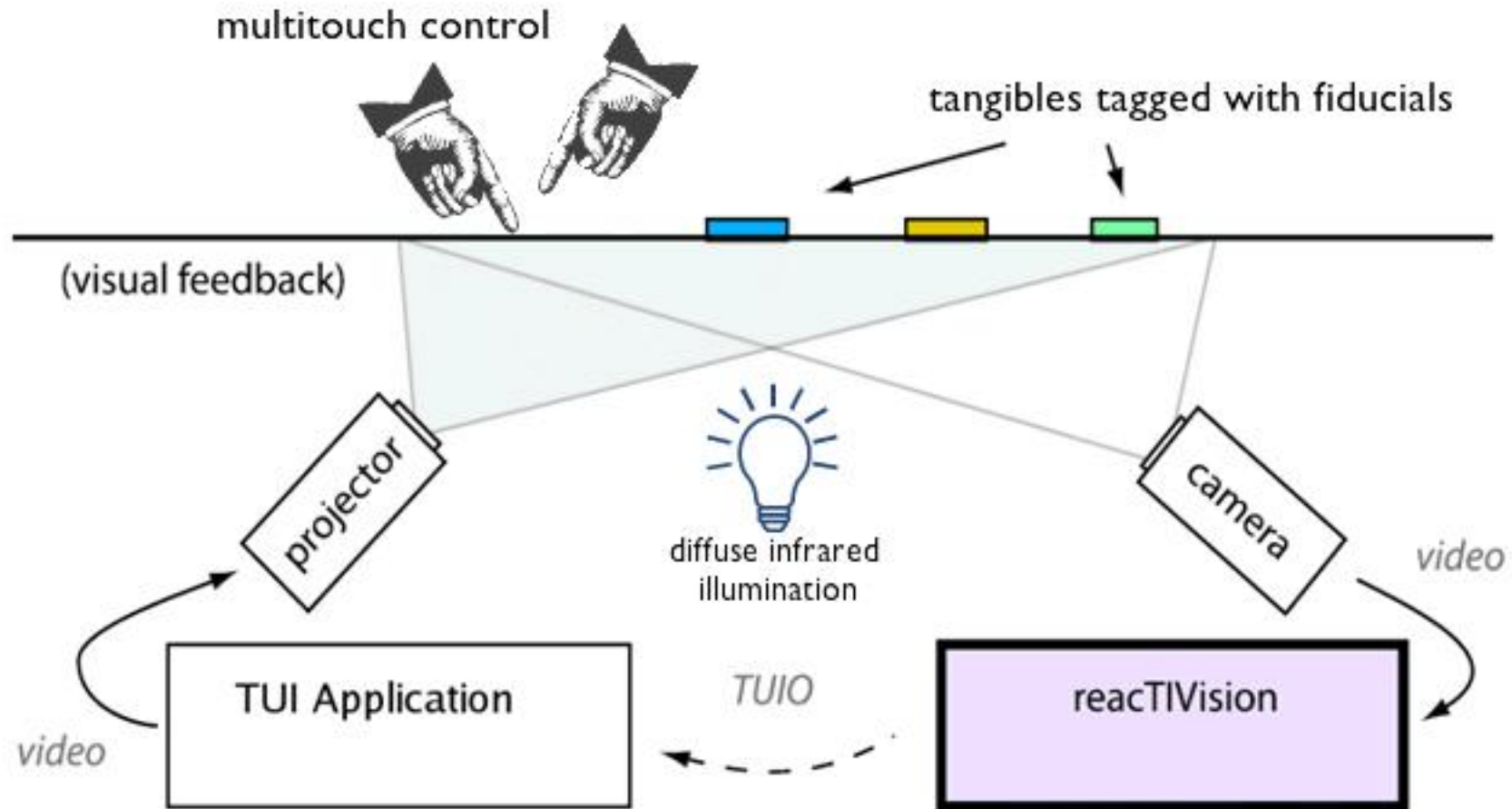
source released under a GPL licence, binaries available as well
multi-platform: Windows, Mac OS X, Linux

+ distributed system

reactIVision is a stand-alone application that communicates with the actual client application via an Open Sound Control (OSC) based protocol, TUIO.

The application developer can choose the suitable environment, such as C++, C#, Java, Processing, Pure Data, Max/MSP, Flash etc.

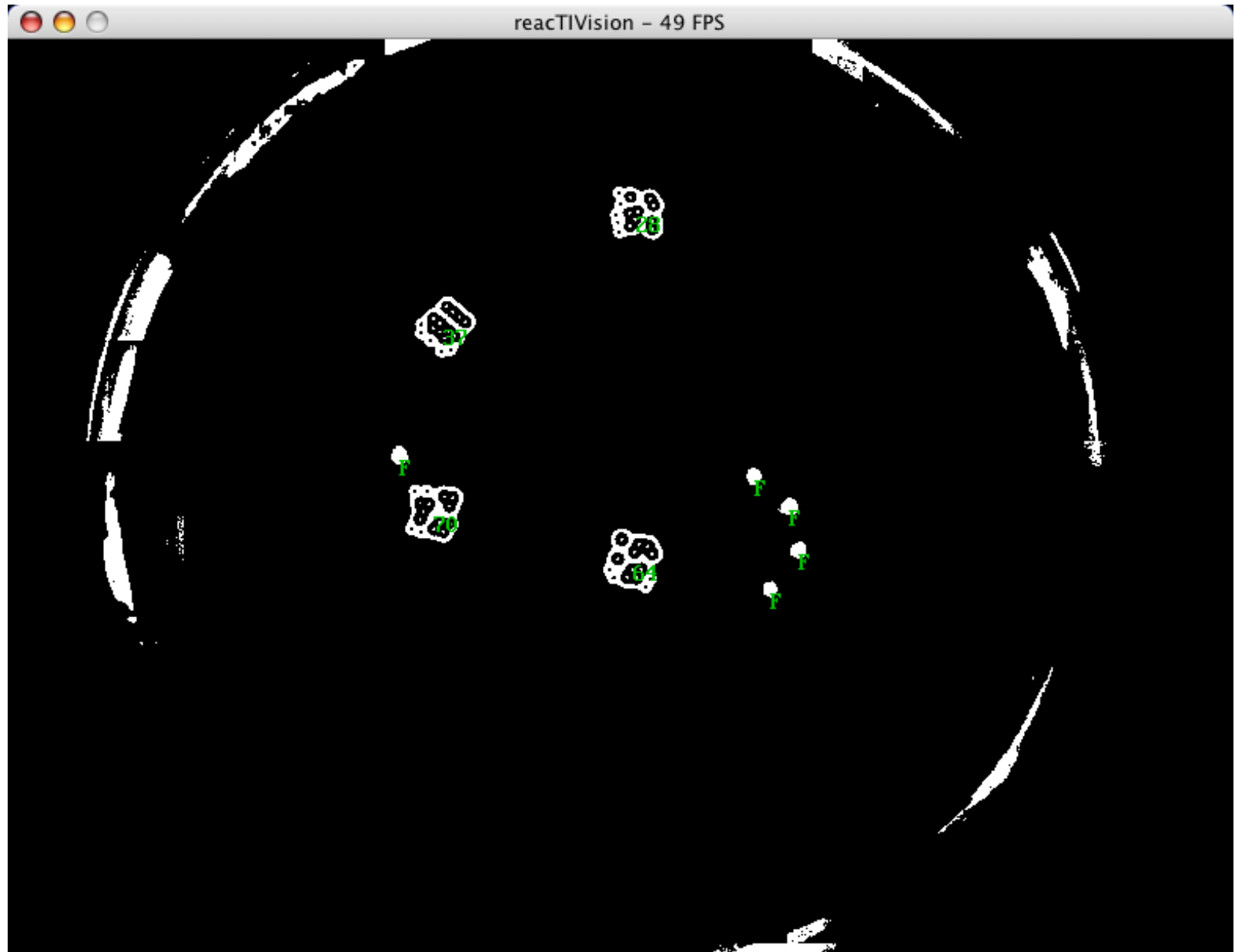
++ distributed framework



++ fiducial markers



++ finger tracking



++ example projects

