

MULTITOUCH

DIY - MULTITOUCH

DIY. Ihr sollt lernen es selber kostengünstig zu implementieren.

WE ARE...

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B.A. Student

JORDI TOST

M.A. Student

FABIAN MORÓN ZIRFAS

Interface Lab Supervisor

PROJECT AIM

PROJECT AIM

learn multitouch basics by using:

Computer Vision (Bare Bones)

Physical Computing (Capacitiv & Acoustic)

Open CV (Adadvanced)

TUIO

Exhibition 17.10.2014

PROJECT TIMETABLE

Day 1 || Mo 06.10 LW 126:

Introduction, Juri, Jordi, Fabian, MT, Examples

- Workshop
- Form groups
- Exercise

Day || 2 - 5 Di 07.10 - Do 10.10 LW 126:

- development and prototyping LW 126

Day 6 - 10 || Mo 13.10 - Do 16.10 Home & Hallway:

- development and prototyping home and LW hallway

Day 10 || Fr. 17.10 Exhibition

4 TYPES OF TOUCH(SCREEN) TECHNOLOGY

RESISTIVE

CAPACITIVE

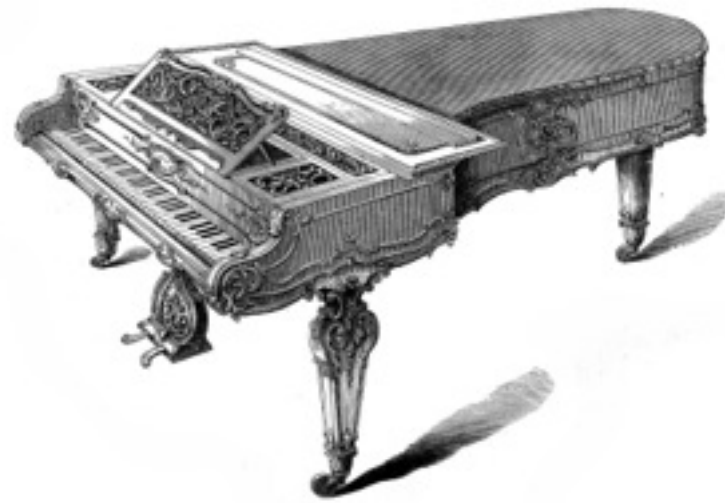
OPTICAL

ACOUSTIC

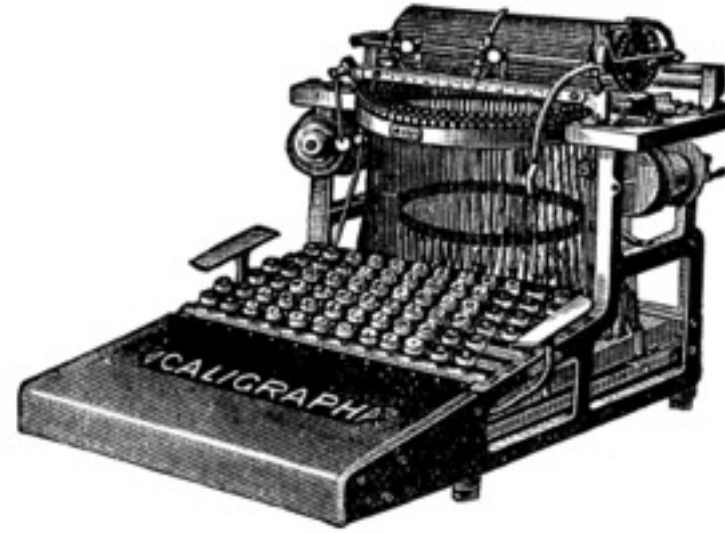
HISTORY OF (M)T

Bill Buxton: Multi-Touch Systems
that I Have Known and Loved

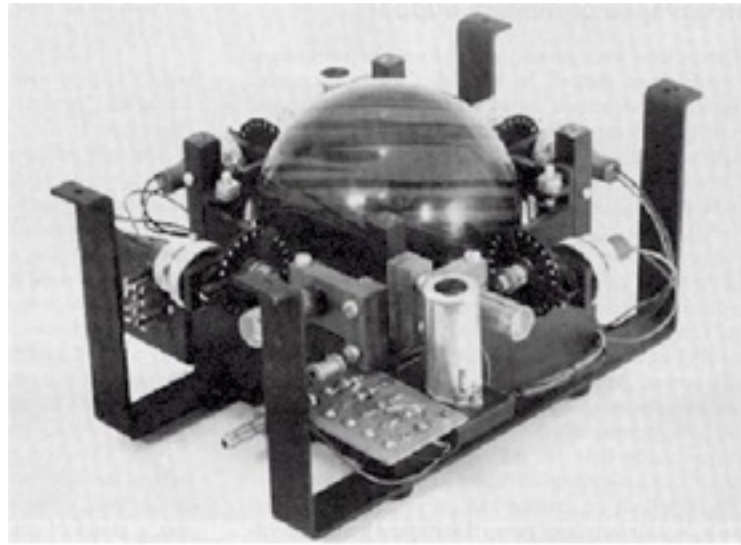
unvollständig



resistiv



resistiv



1945: Trackball (Ralph Benjamin)

trackball



capacitive



1960s: Mouse (Douglas Engelbart & Bill English)

mechanical



1965: Touch Screen Technology (E.A. Johnson of the Royal Radar Establishment)

single touch capacitive



Plato IV optical (IR)



optical Video <https://www.youtube.com/watch?v=dmmxVA5xhuo>



1984: Multi-Touch Screen (Bob Boie, Bell Labs, Murray Hill NJ)

capacitive



Multi-Touch Tablet (Input Research Group, University of Toronto Bill Buxton)

capacitive



The device used optical sensors in the corners of the frame to detect fingers.

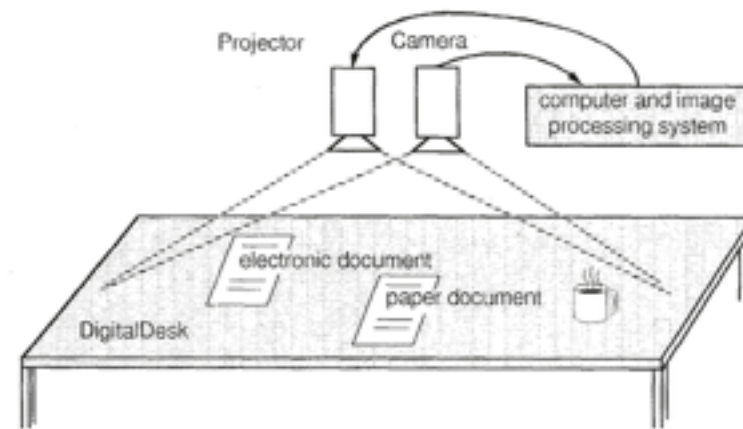


Figure 1. A DigitalDesk system

1991: Digital Desk (Pierre Wellner, Rank Xerox EuroPARC, Cambridge)

An early front projection tablet top system that used optical and acoustic techniques to sense both hands/fingers as well as certain objects, in particular, paper-based controls and data. https://www.youtube.com/watch?v=S8lCetZ_57g



IBM and Bell South release what was arguably the world's first smart phone, the Simon.

What is of historical interest is that the Simon, like the iPhone, relied on a touch-screen driven “soft machine” user interface.

While only a single-touch device, the Simon foreshadows a number of aspects of what we are seeing in some of the touch-driven mobile devices that we see today.

Sidebar: my two working Simons are among the most prized pieces in my collection of input devices.

AND MANY MORE

see Bill Buxtons [site](#) for further research

1992: Wacom, 1992: Starfire, 1994-2002: Bimanual Research, 1995: Graspable/Tangible Interfaces, 1995/97: Active Desk, 1997: T3, 1997: The Haptic Lens, 1998: Tactex Controls, ~1998: Fingerworks, 1999: Portfolio Wall, 2001: Diamond Touch, 2002: HandGear + GRT. DSI Datotech, 2002: Jun Rekimoto Sony Computer Science Laboratories, 2003: University of Toronto, 2003: Jazz Mutant, 2004: Neonode N1 Mobile Phone, 2004: TouchLight, 2005: Reactable, 2005: Blaskó and Steven Feiner, 2005: PlayAnywhere, 2005: Jeff Han, 2005: Tactiva, 2005: Toshiba Matsusita Display Technology, 2005: Tomer Moscovich & collaborators, 2006: Benko & collaborators, 2006: Plastic Logic, 2006: Synaptics & Pilotfish, 2007: Apple iPhone, 2007: Microsoft Surface Computing, 2007: ThinSight, 2008: N-trig, 2011: Surface 2.0

Ab hier werden die bisher eingeführten Techniken verbessert und erweitert

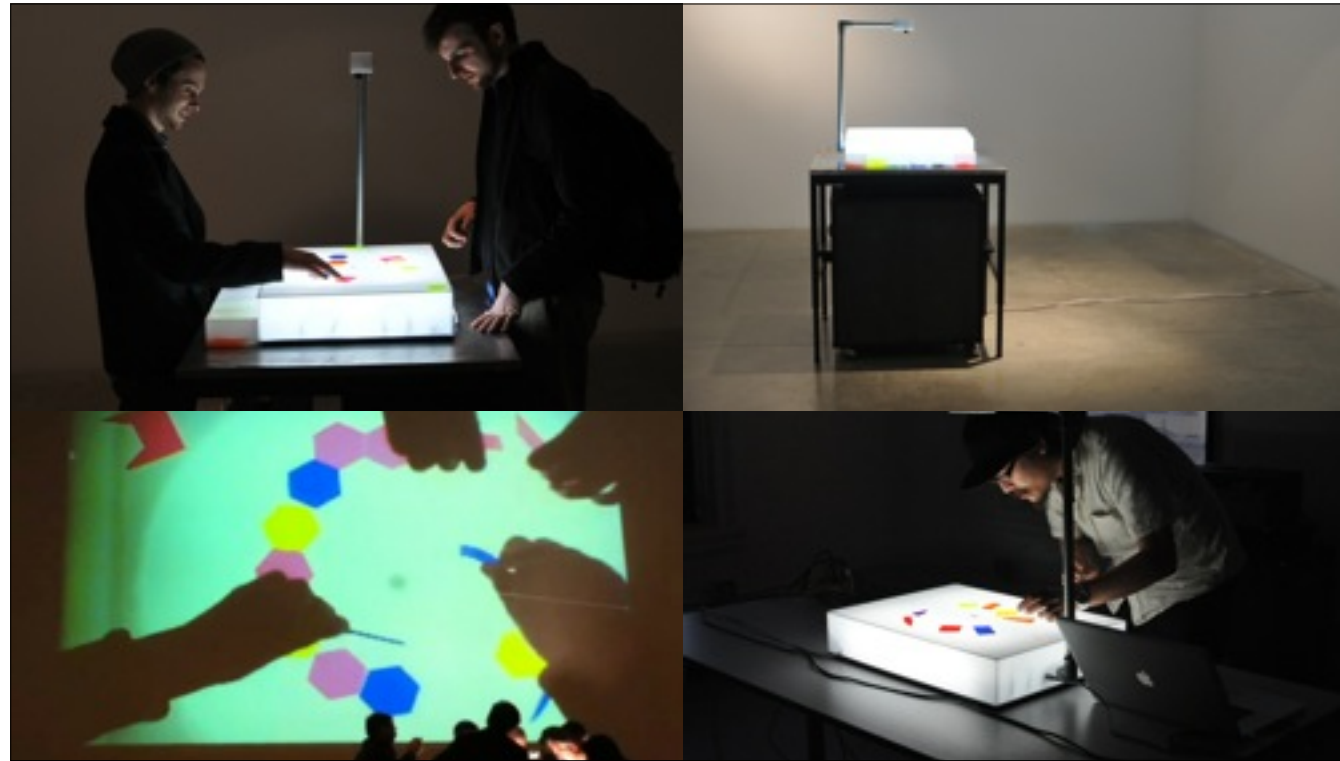
EXAMPLES

RHYTHMSYNTHESIS

by Ryan Raffa

<http://www.ryanraffa.com/parsons/thesis/category/concept/>

<https://vimeo.com/25090948>

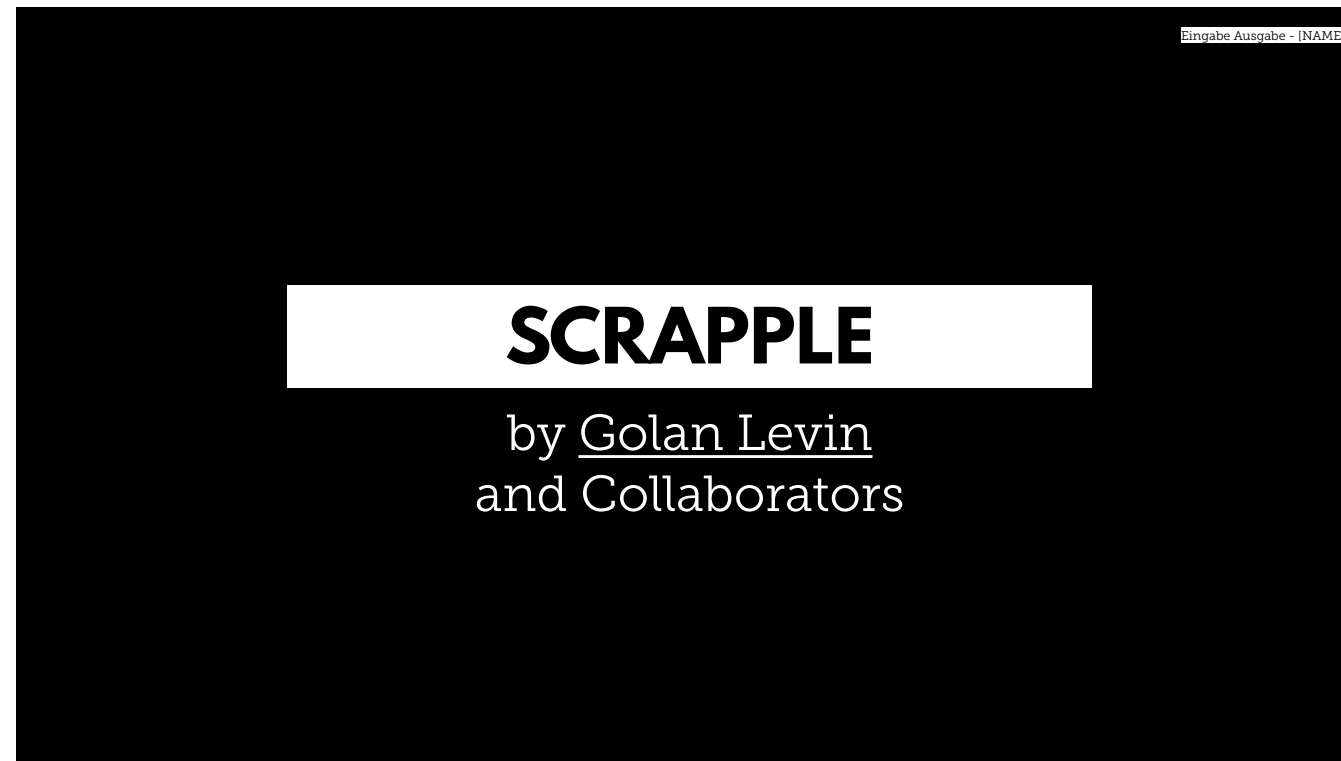


<http://www.ryanraffa.com/parsons/thesis/category/concept/>

<https://vimeo.com/25090948>

VIDEO

<https://vimeo.com/25090948>



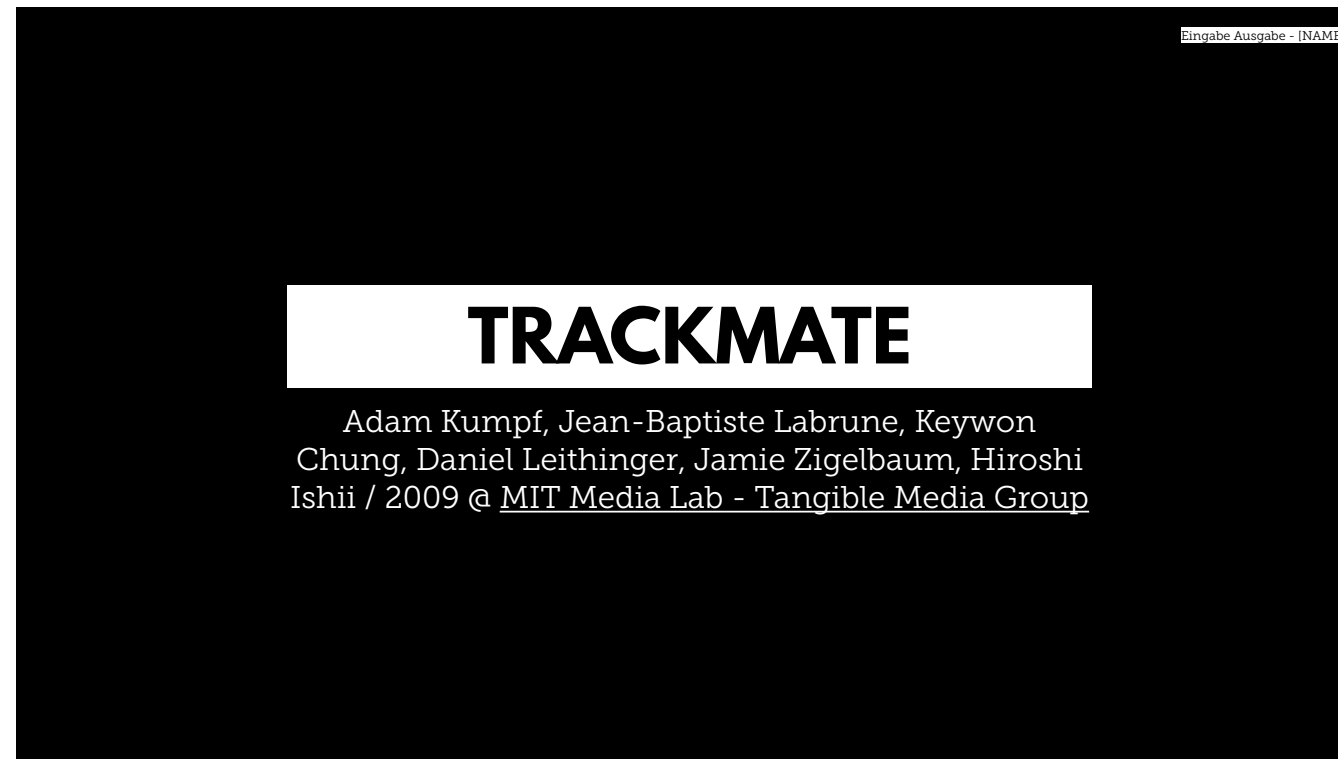
crapple (2005: Golan Levin) is an audiovisual performance in which everyday objects placed on a table are interpreted as sound-producing marks in an “active score.” The Scrapple system scans a table surface as if it were a kind of music notation, producing music in real-time from any objects lying there. The 3-meter long table produces a 4-second audio loop, allowing the performers to improvise audiovisual compositions in real-time.

<https://vimeo.com/2379890>



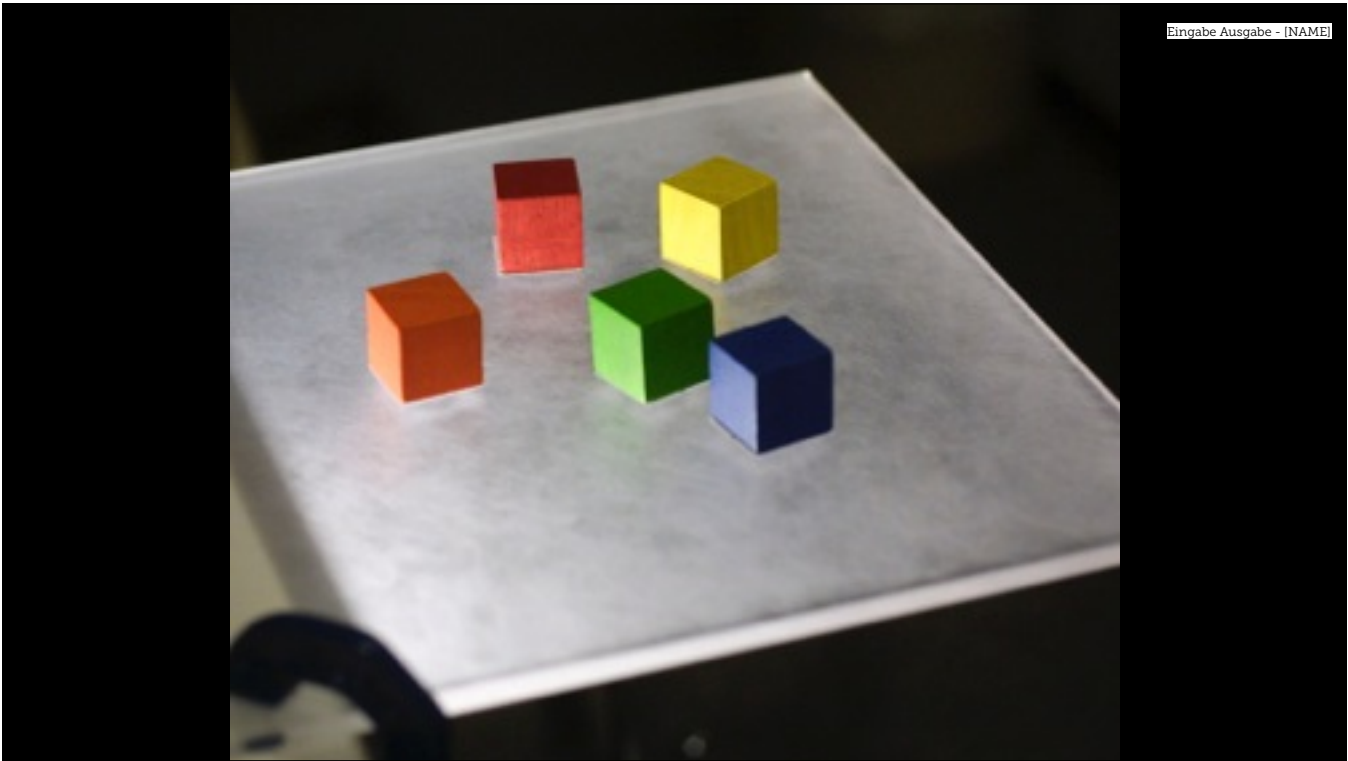
VIDEO & VIDEO

<https://vimeo.com/2379890> & <https://vimeo.com/2379389>



Optical system

Trackmate is an inexpensive, do-it-yourself tangible tracking system that allows your computer to recognize tagged objects and their corresponding position, rotation, and color information when placed on a surface. Trackmate sends all object data via LusedOSC (a protocol layer for unique spatial input devices), allowing any LusedOSC-based application to work with the system.



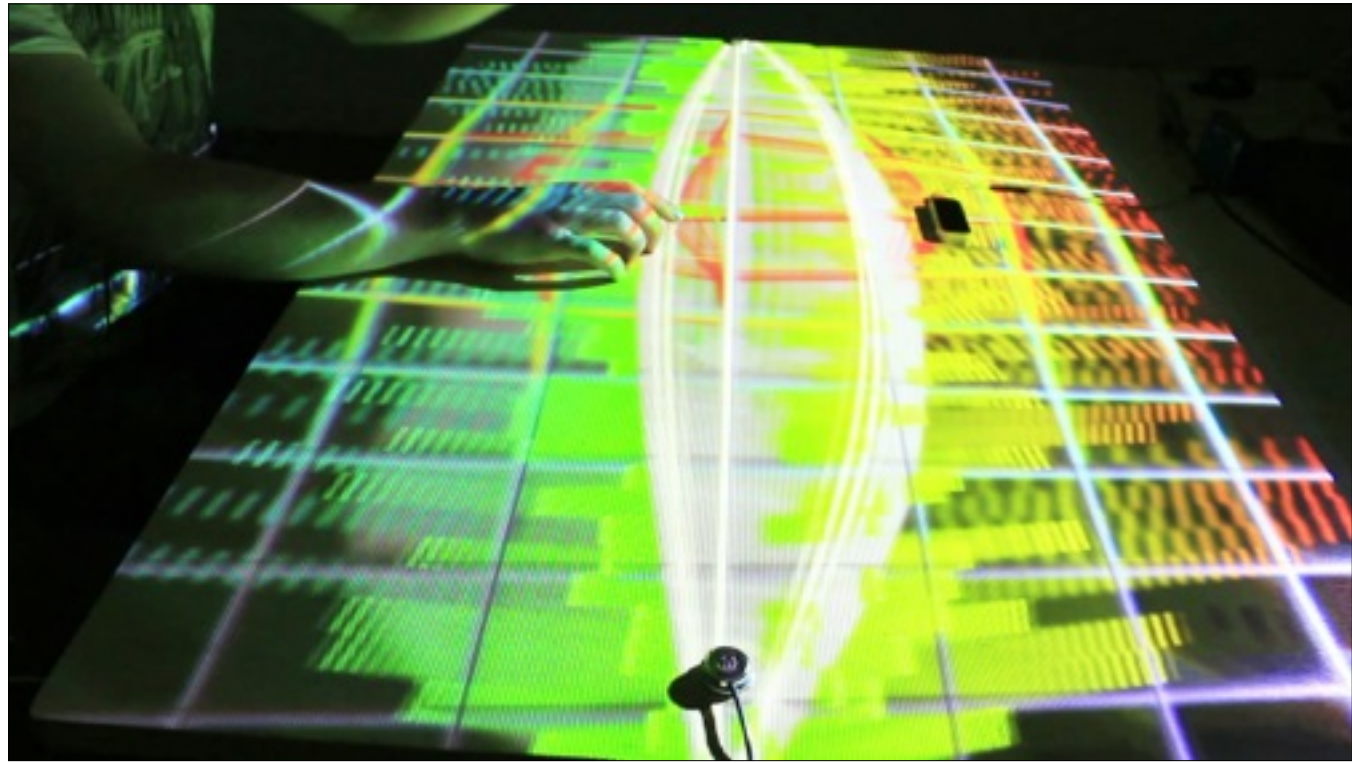
VIDEO

<https://vimeo.com/6730765>

CONTACT

by Felix Faire

<http://felixfaire.com/portfolio/contact/>



VIDEO

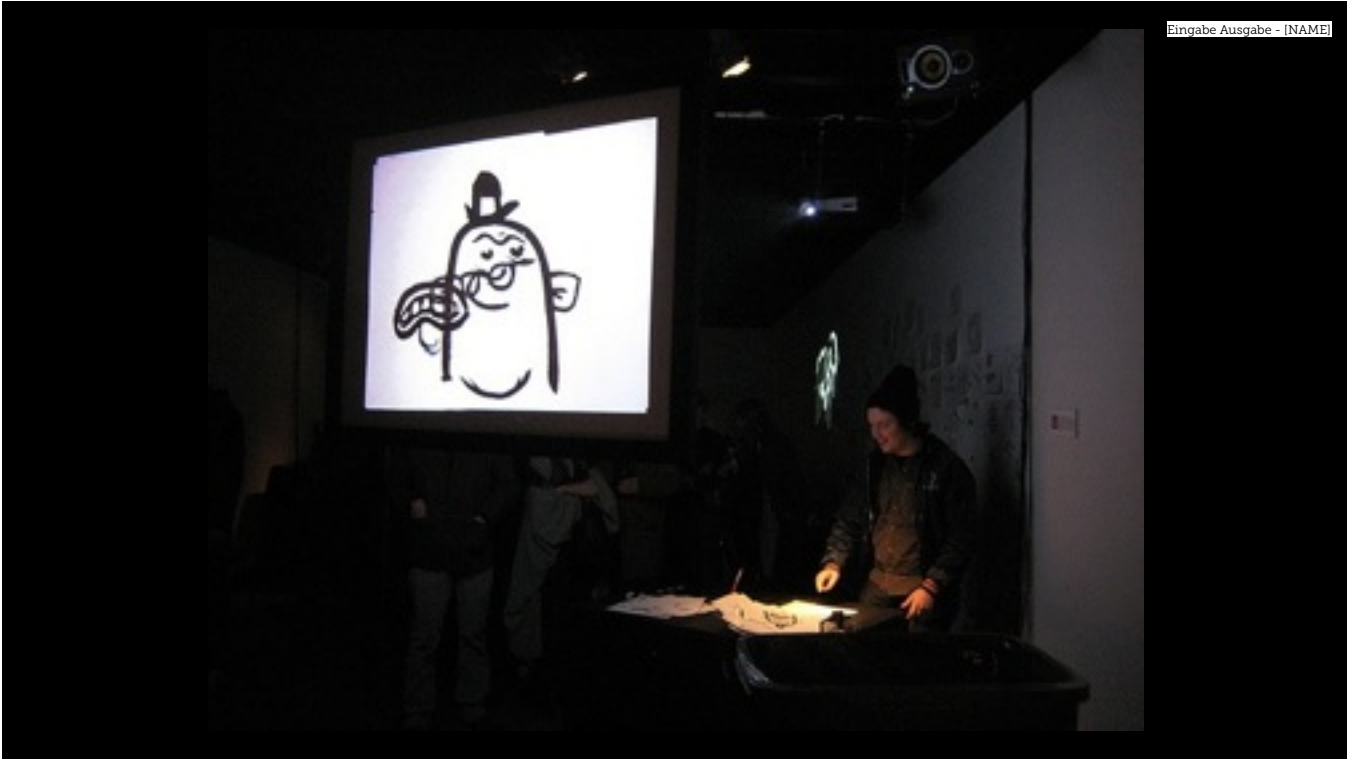
<https://vimeo.com/82107250>

DRAWN

by Zachary Lieberman

<http://thesystemis.com/projects/drawn/>

<http://v2.nl/archive/works/drawn>



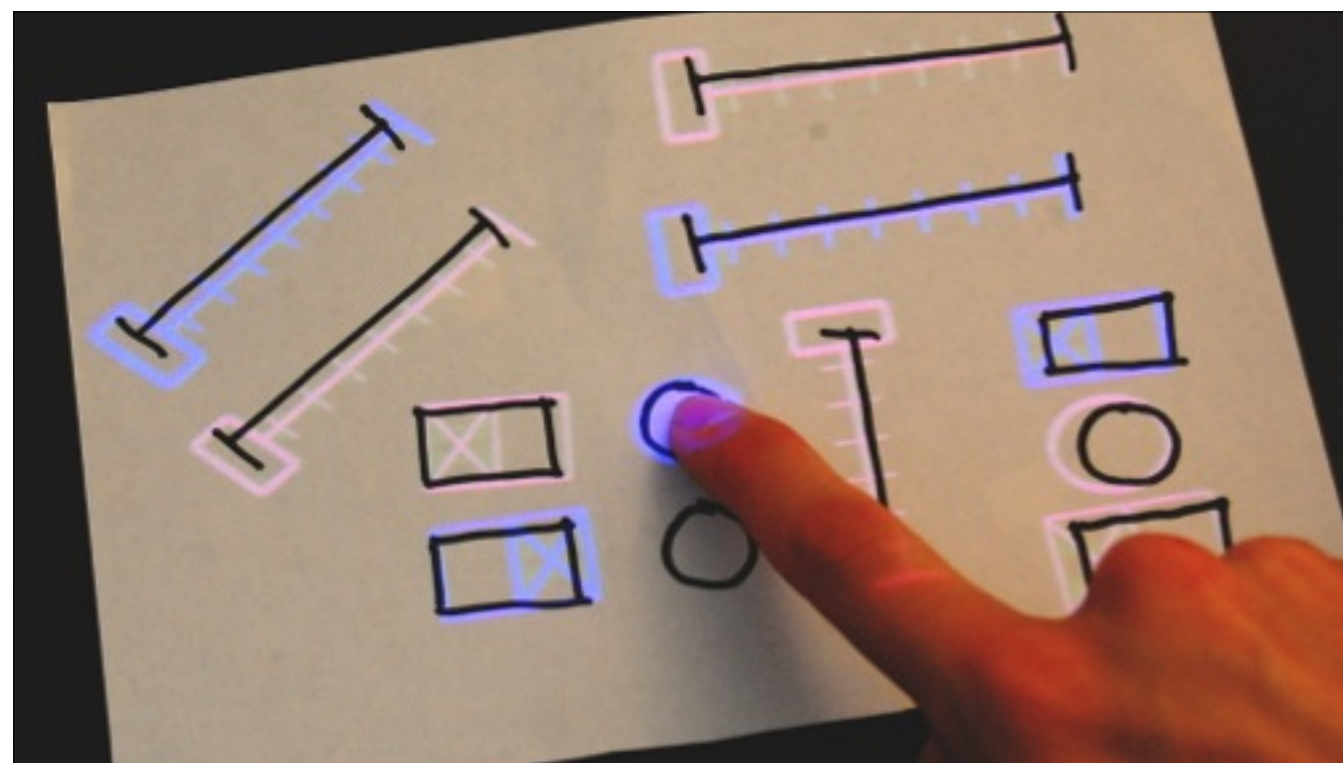
VIDEO

<https://vimeo.com/4732884>

SKETCHSYNTH

SketchSynth: A Drawable OSC
Control Surface by Billy Keyes

<https://github.com/bluekeyes>



VIDEO

<https://vimeo.com/42053193>

WORKSHOP

Bare Bones Computer Vision

Juri

WHAT ELSE IS IN THE BOX?

OPENCV

Jordi

OPENCV

(Open Source Computer Vision Library)

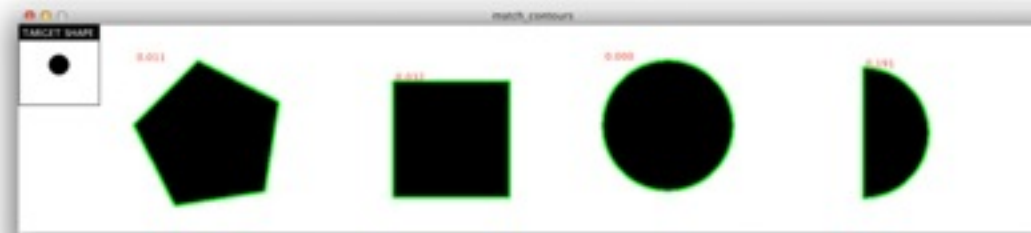
is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products.

<http://opencv.org/>

OPENCV-PROCESSING

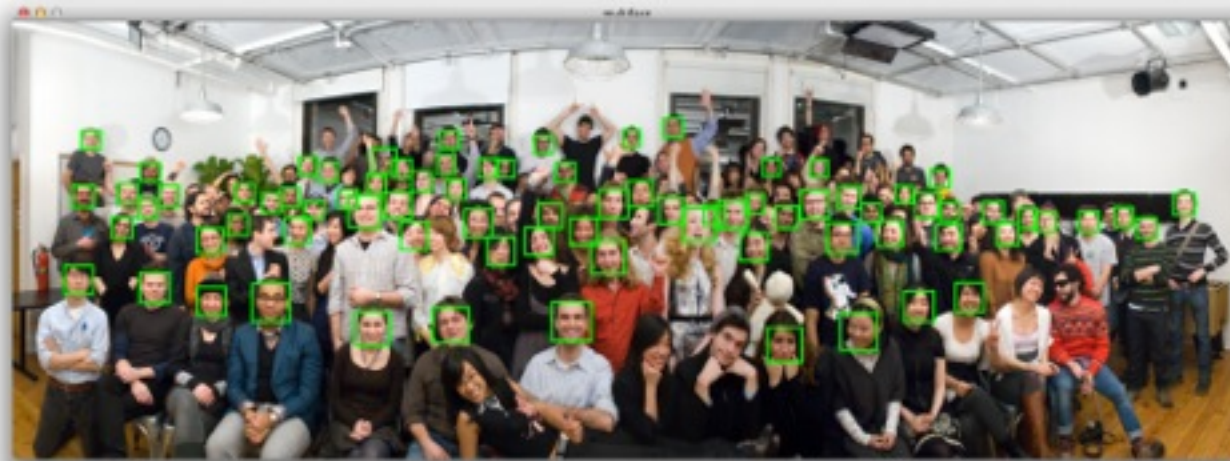
[https://github.com/atduskgreg/
openopencv-processing](https://github.com/atduskgreg/openopencv-processing) by [Greg Borenstein](http://gregborenstein.com/)

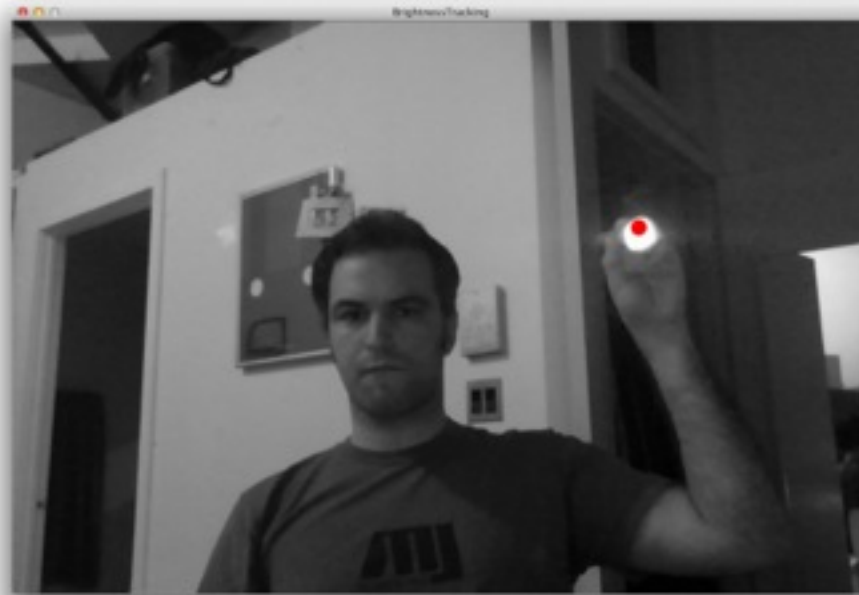
Jordi? <http://gregborenstein.com/>

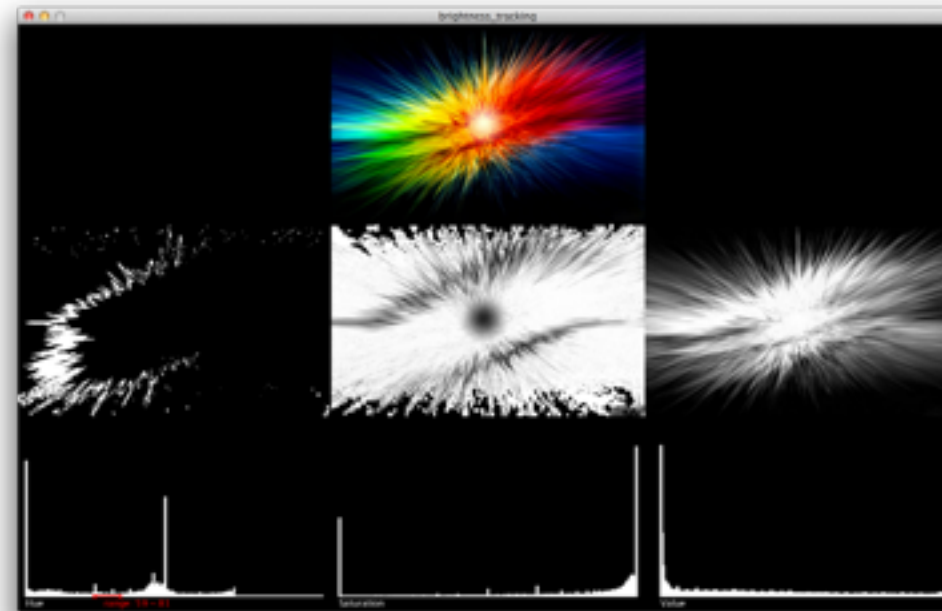


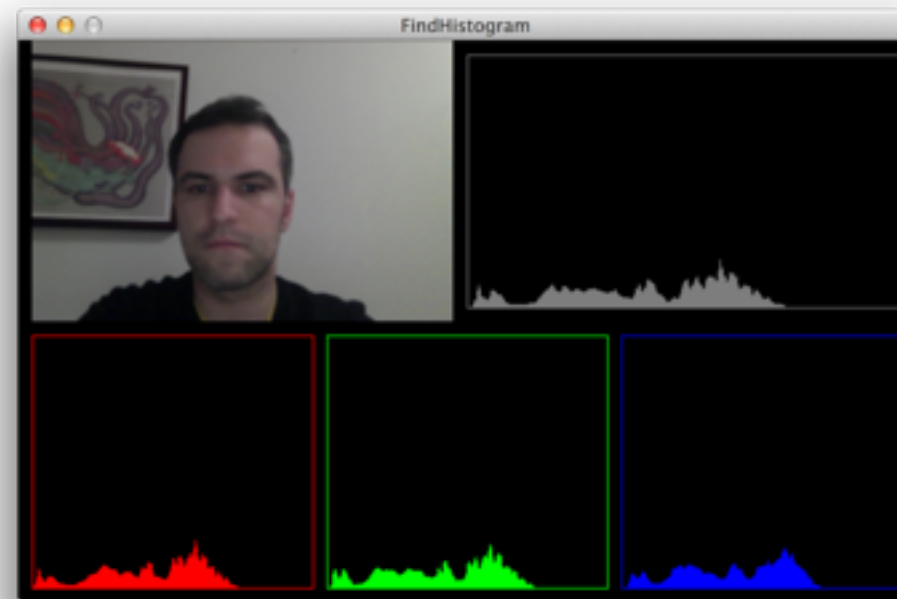






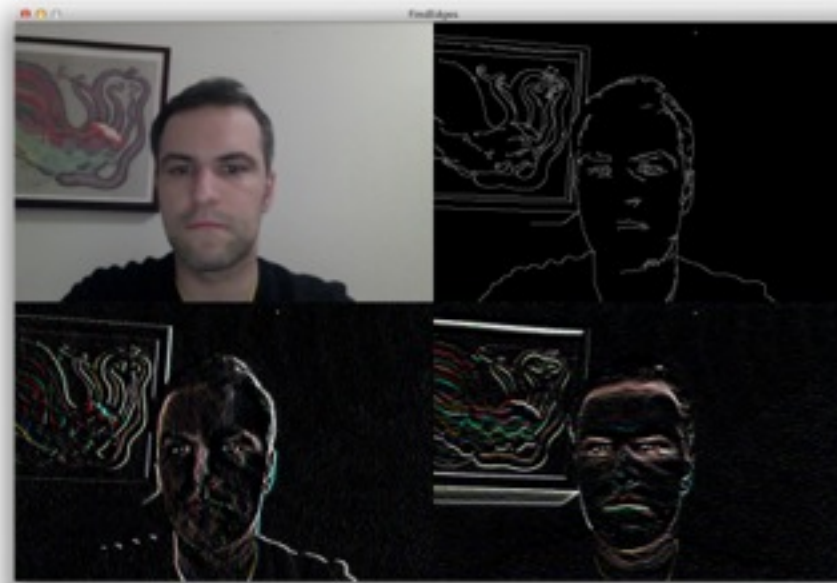






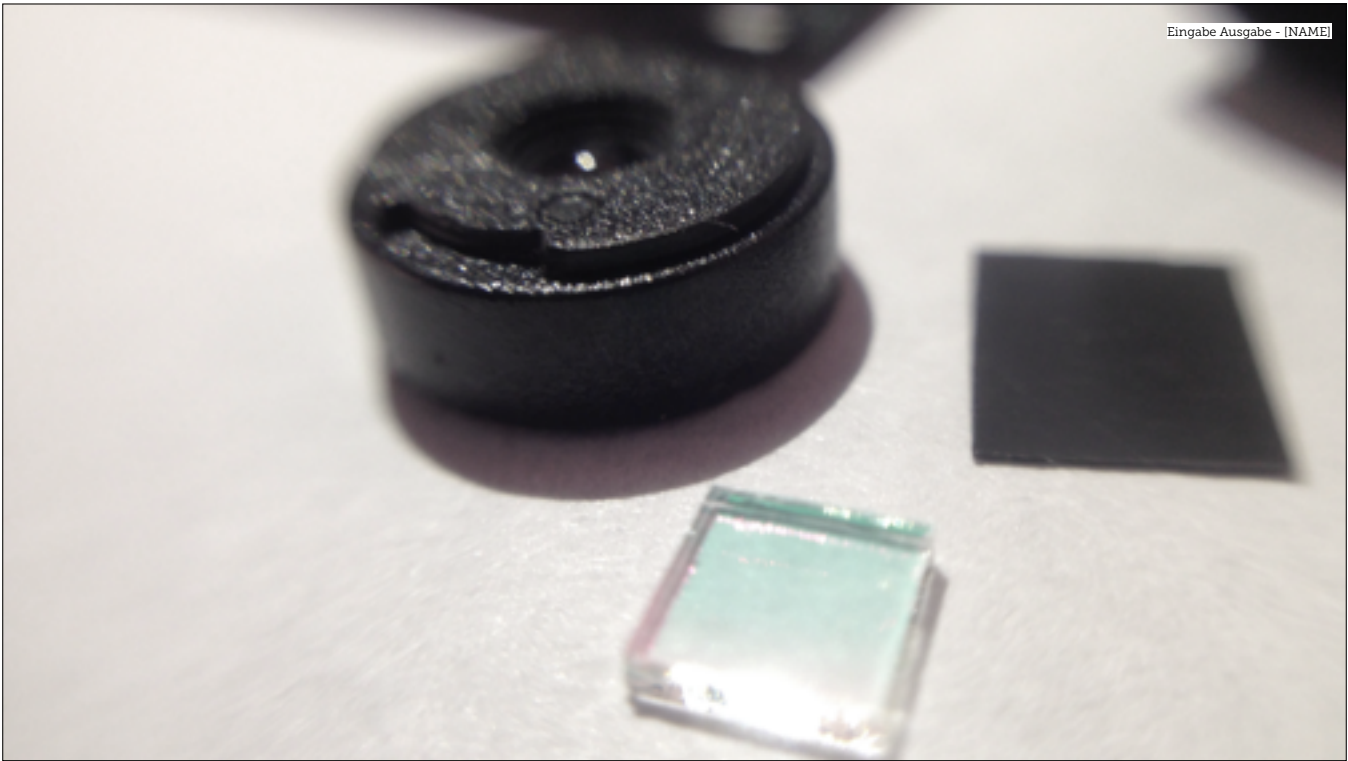


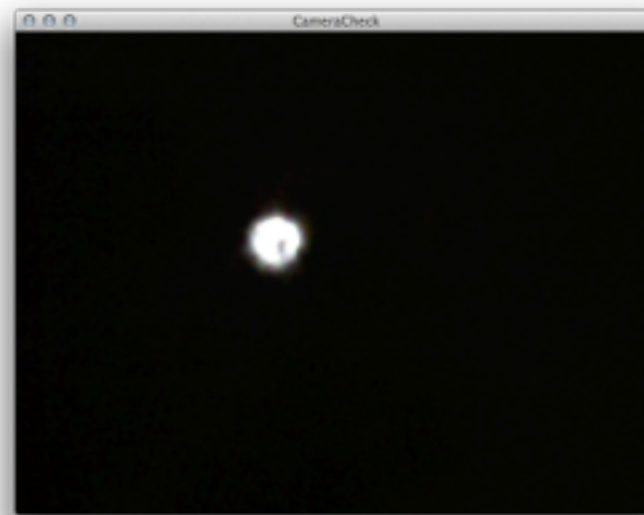




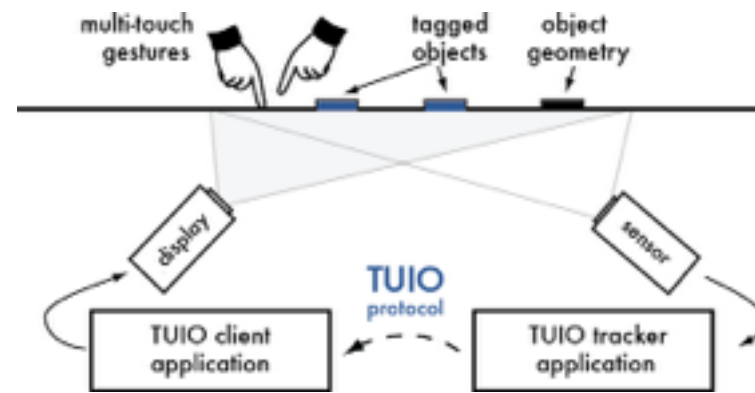
DIY IR CAMERA

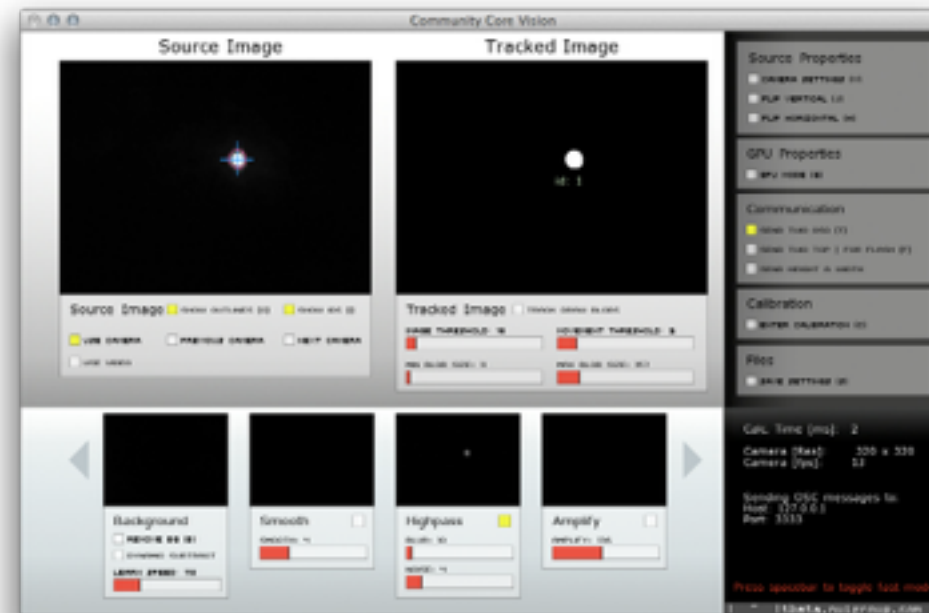
Juri & Fabian



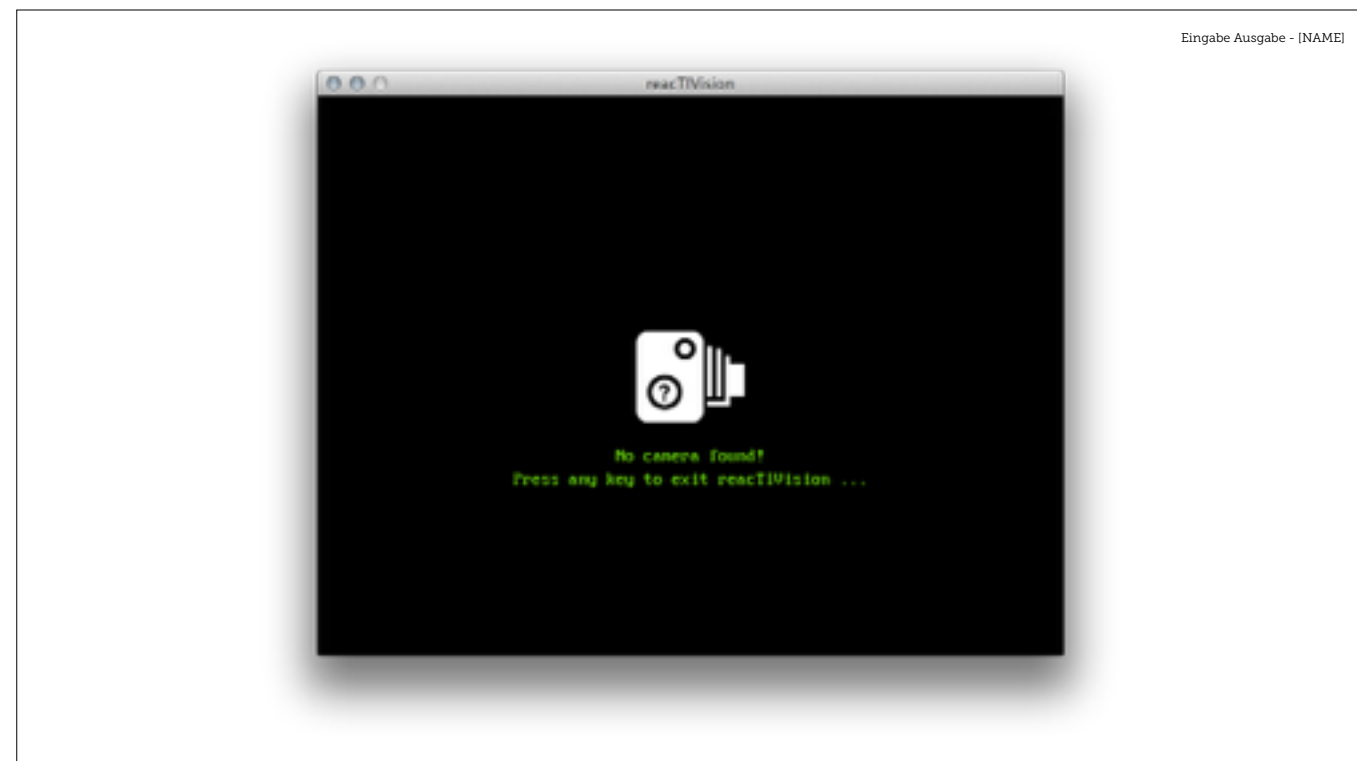


TUIO





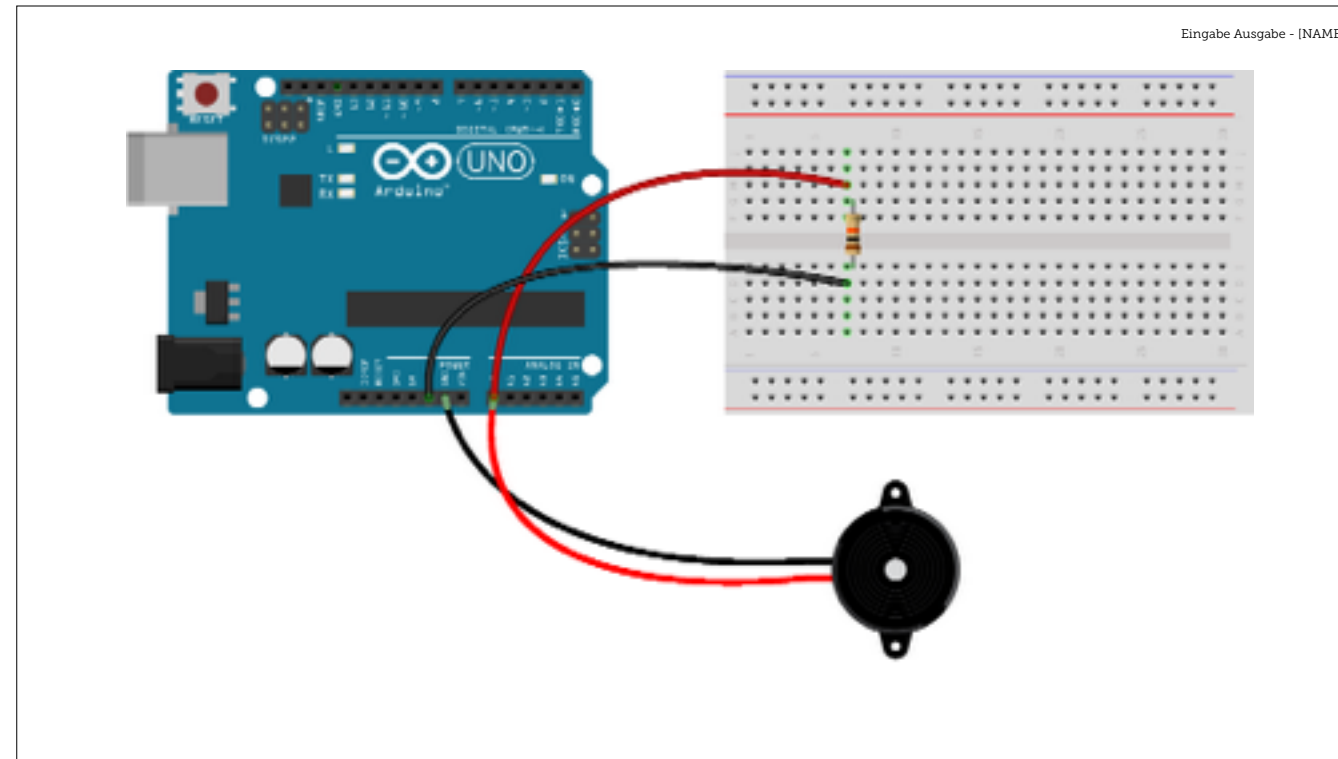
CCV app mit IR Camera



reactIVision app

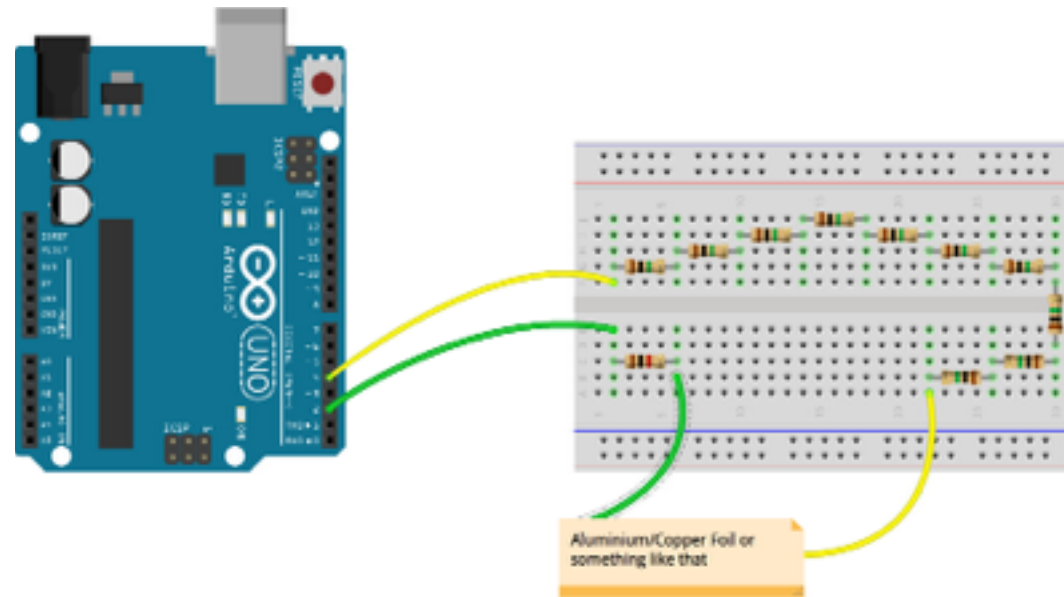
PHYSICAL COMPUTING

Fabian



Knock acoustic

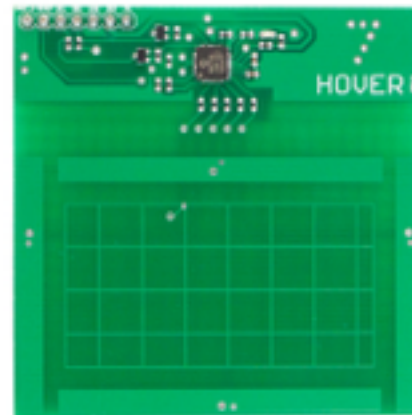
Capacitive Digital



Capacitive Analog



<https://www.olimex.com/Products/Duino/AVR/OLIMEXINO-85S/open-source-hardware>



<http://www.hoverlabs.co/#hover>

Dank an Phillip Pfingstag

IDEA GENERATOR

ACUSTICAL	
RESISTVE	

Color	Darkness
Position	Lightness
Proportion	Pressure Force
Volume	Blob Number

GROUPS

EXERCISE

Connect || Think || Present

Aufgabe zu morgen