



**DIY - MULTITOUCH**

**WE ARE...**

# JURI WOLF

B.A. Student

# JORDI TOST

M.A. Student

# FABIAN MORÓN ZIRFAS

Interface Lab Supervisor

# **WHO ARE YOU?**

# 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

# PROJECT AIM

learn multitouch basics by using:

Computer Vision (Bare Bones)

Physical Computing (Capacitiv & Acoustic)

Open CV (Advanced)

TUIO

Exhibition 17.10.2014

# **4 TYPES OF TOUCH(SCREEn) TECHNOLOGY**

<http://www.ijcaonline.org/volume6/number8/pxc3871433.pdf>

<https://ecs.victoria.ac.nz/foswiki/pub/Groups/Elvis/Multi-touchTable/schoening2008multitouch.pdf>

# RESISTIVE

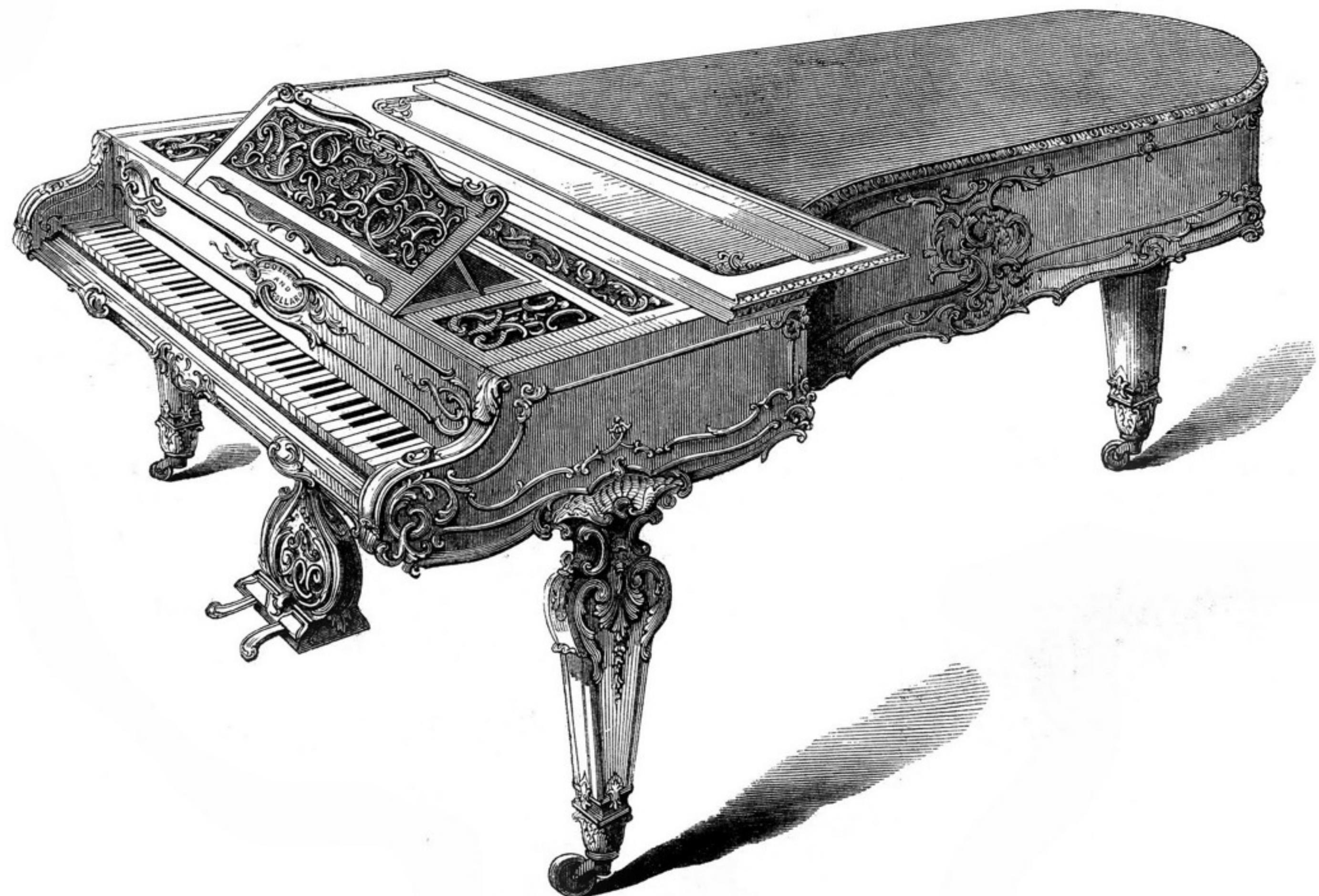
# CAPACITIVE

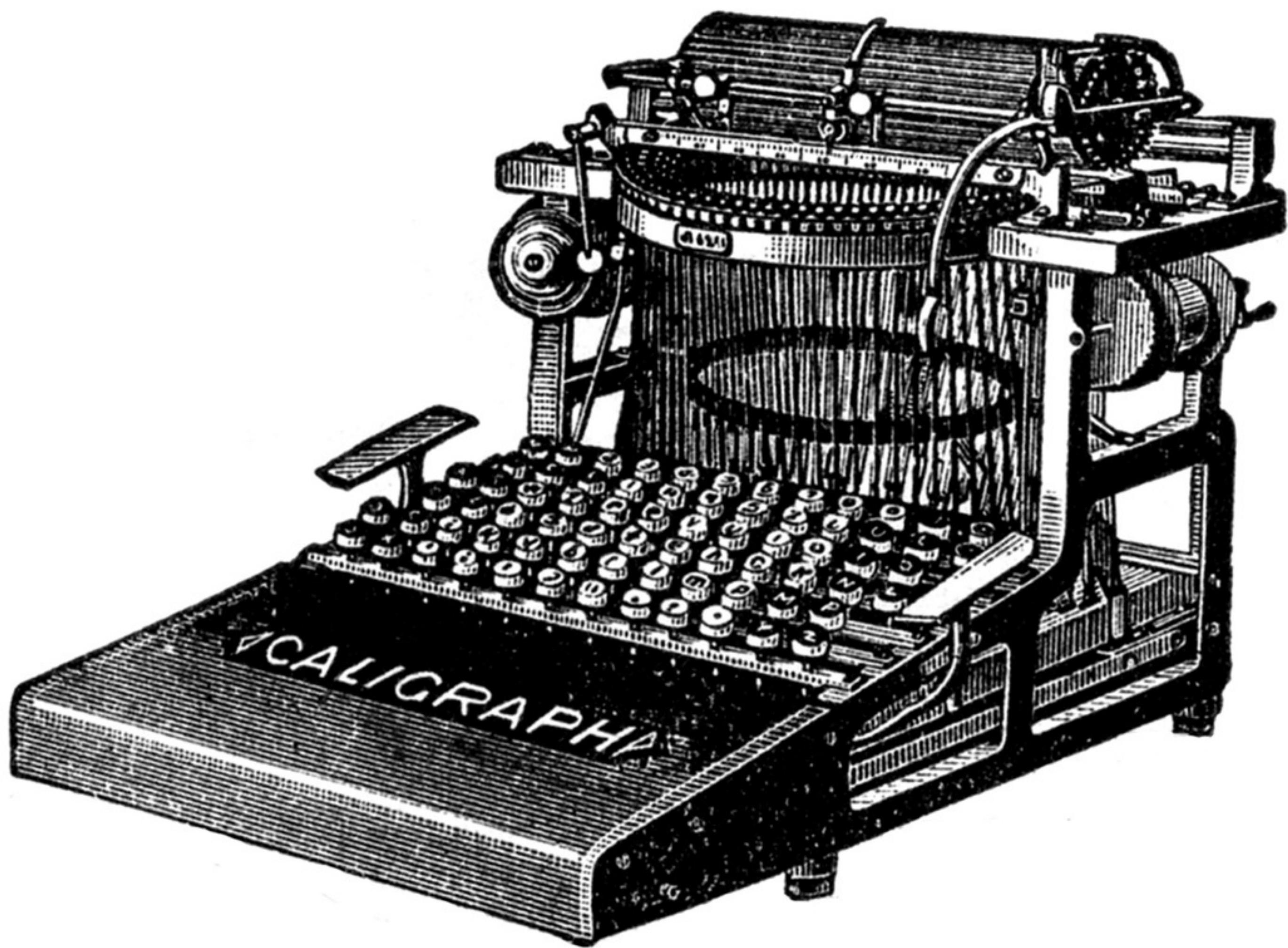
# OPTICAL

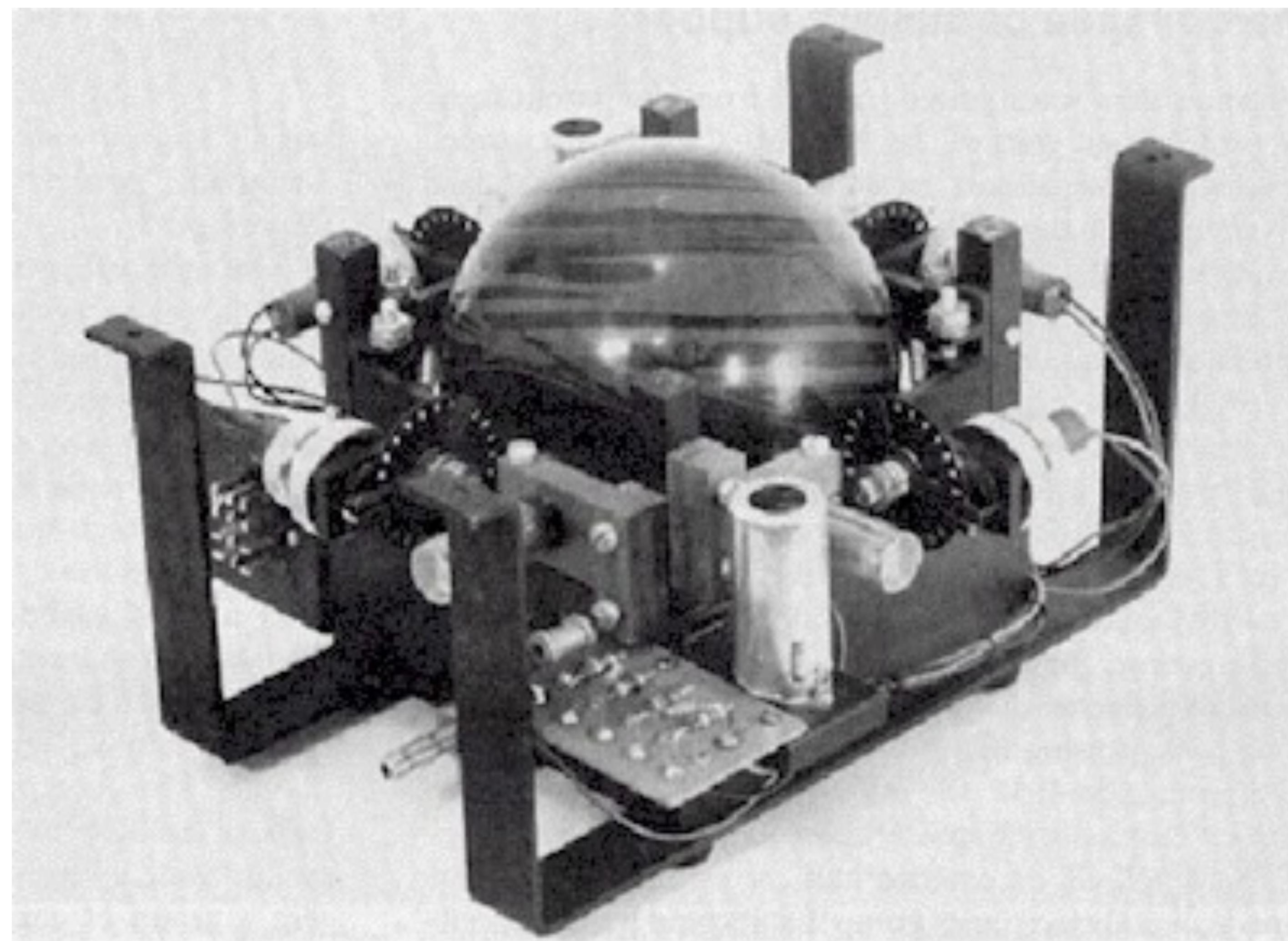
# ACOUSTIC

# HISTORY OF (M)T

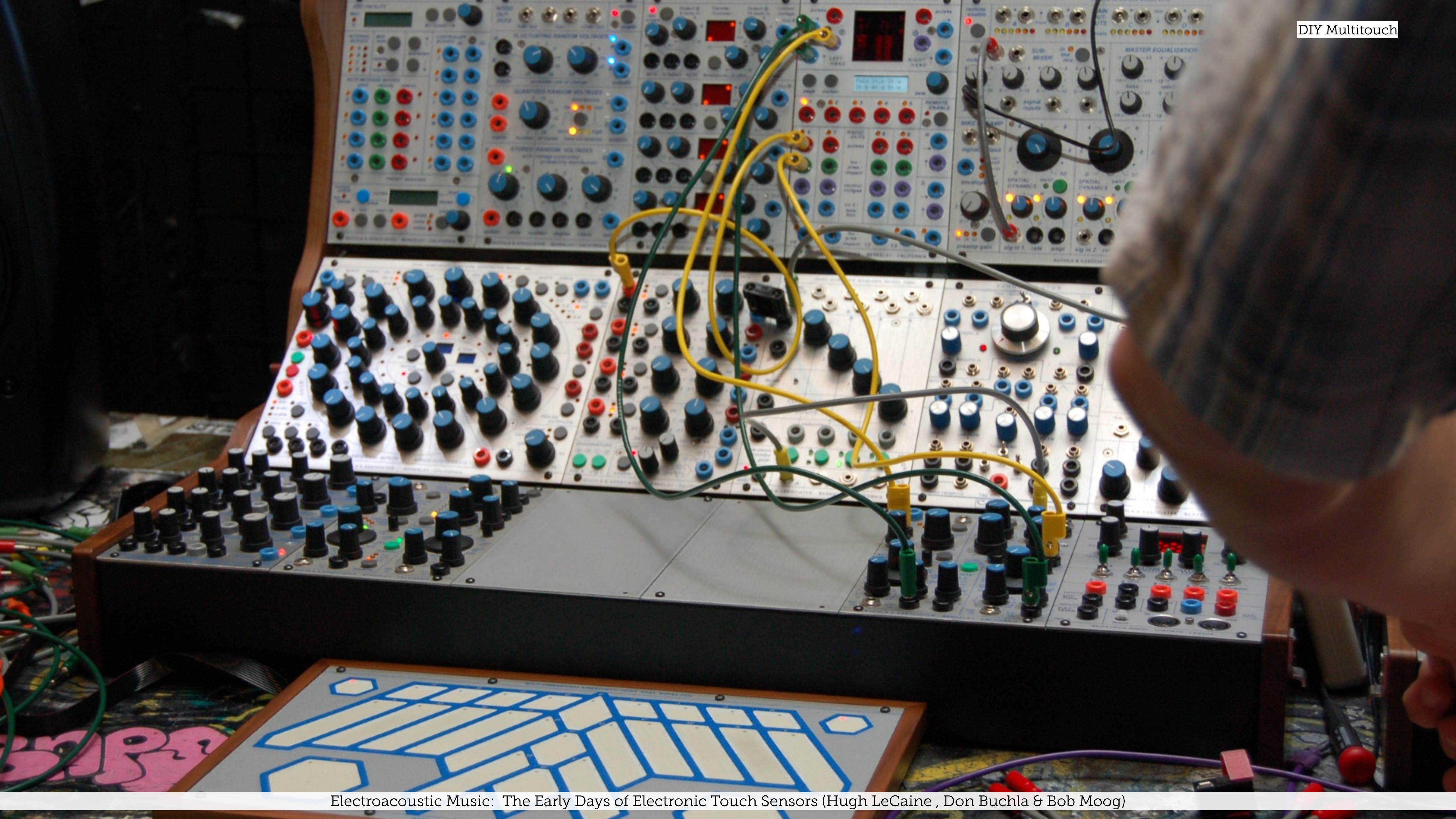
Bill Buxton: Multi-Touch Systems  
that I Have Known and Loved



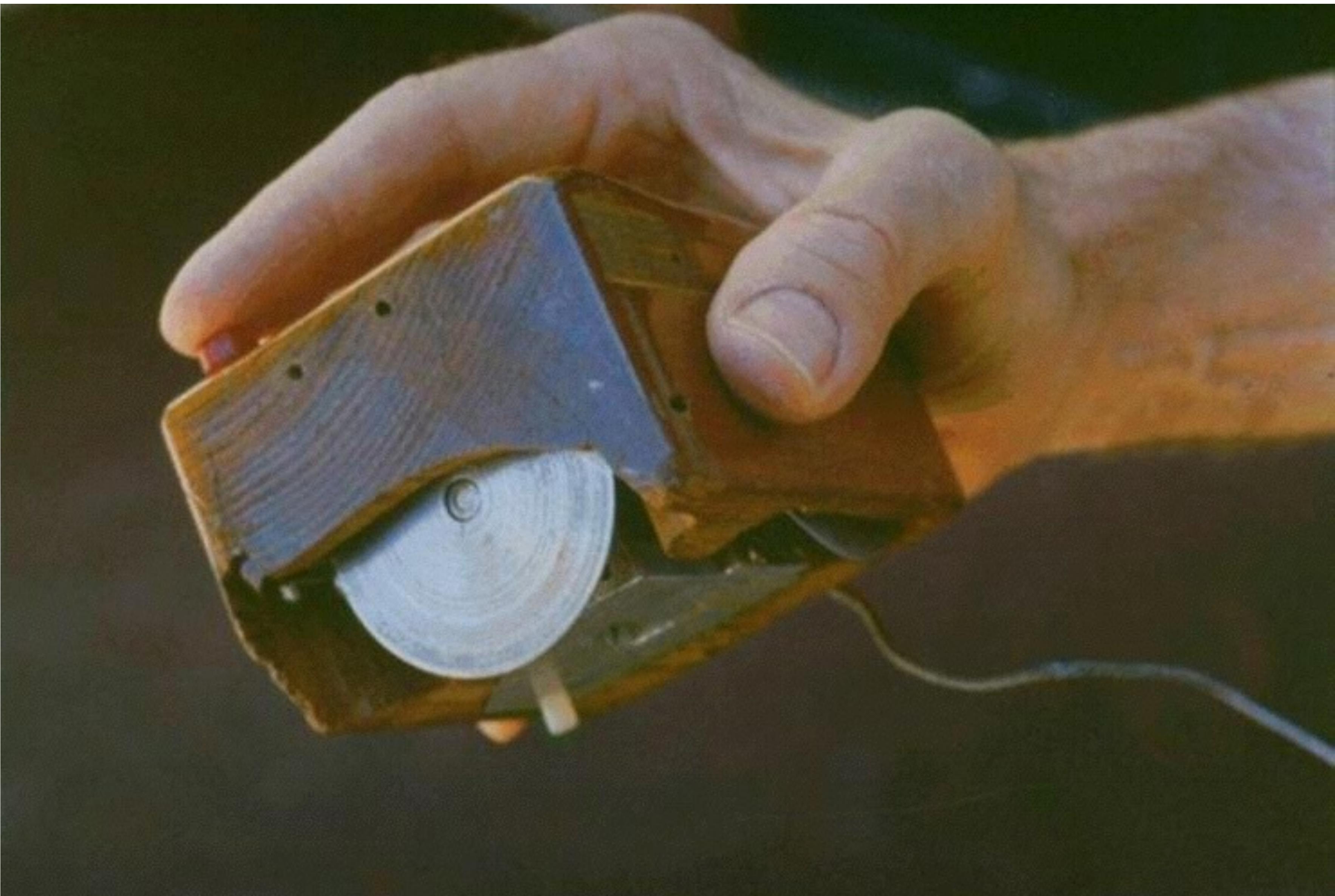




1945: Trackball (Ralph Benjamin)



Electroacoustic Music: The Early Days of Electronic Touch Sensors (Hugh LeCaine, Don Buchla &amp; Bob Moog)



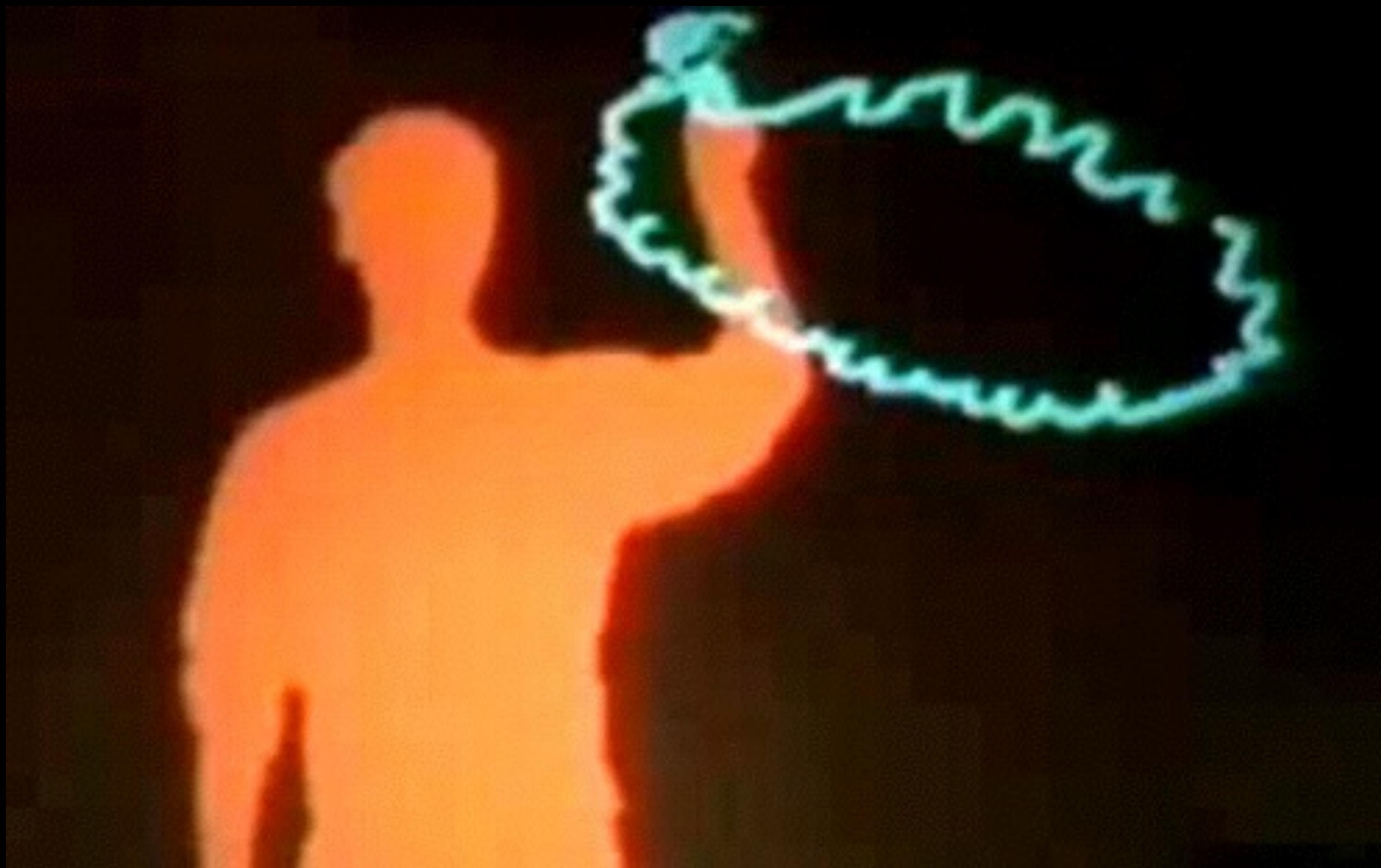
1960s: Mouse (Douglas Engelbart & Bill English)



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



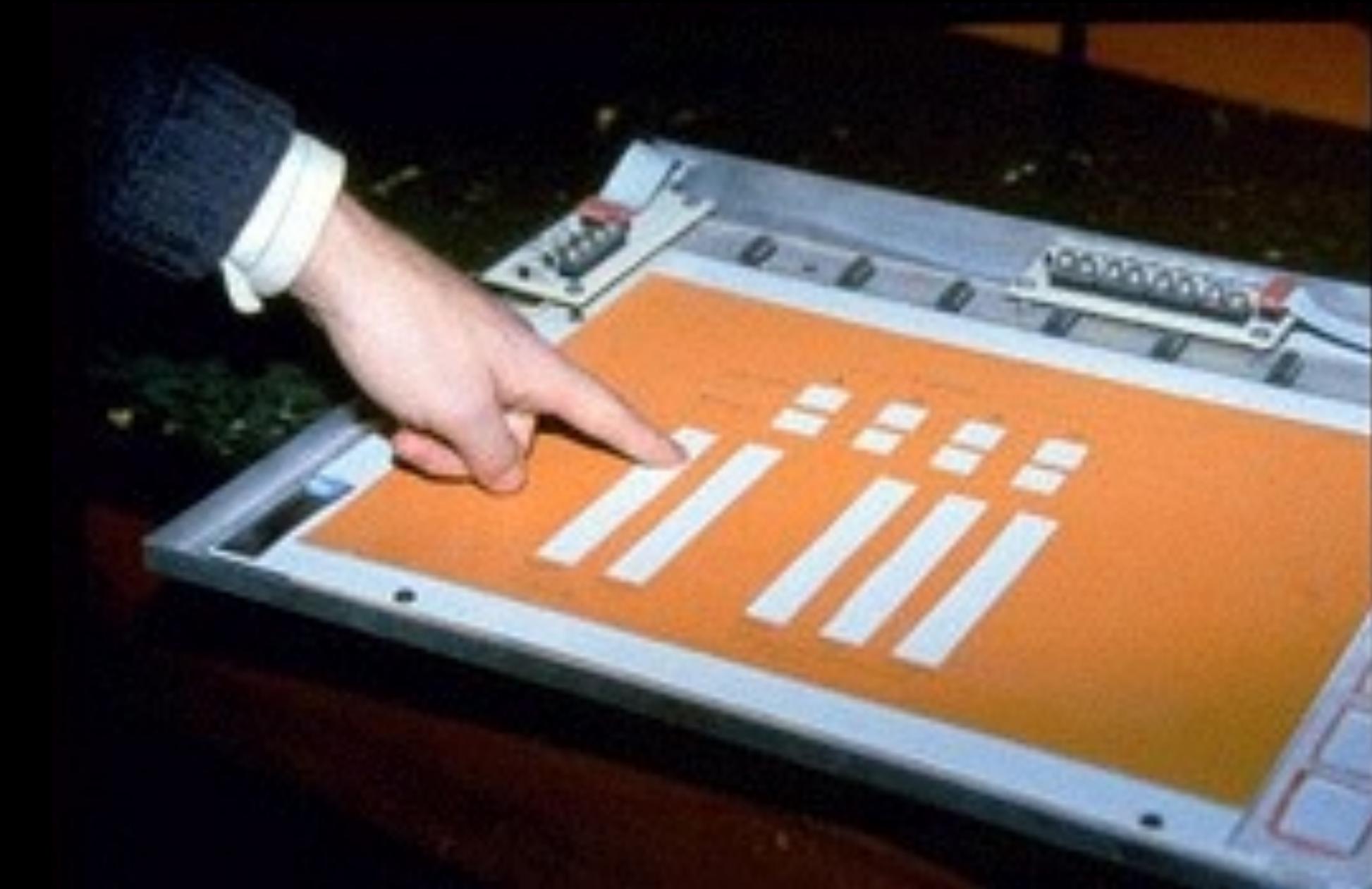
1972: PLATO IV Touch Screen Terminal



1983: Video Place / Video Desk (Myron Krueger)



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



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



1985: Sensor Frame (Carnegie Mellon University Paul McAvinney)

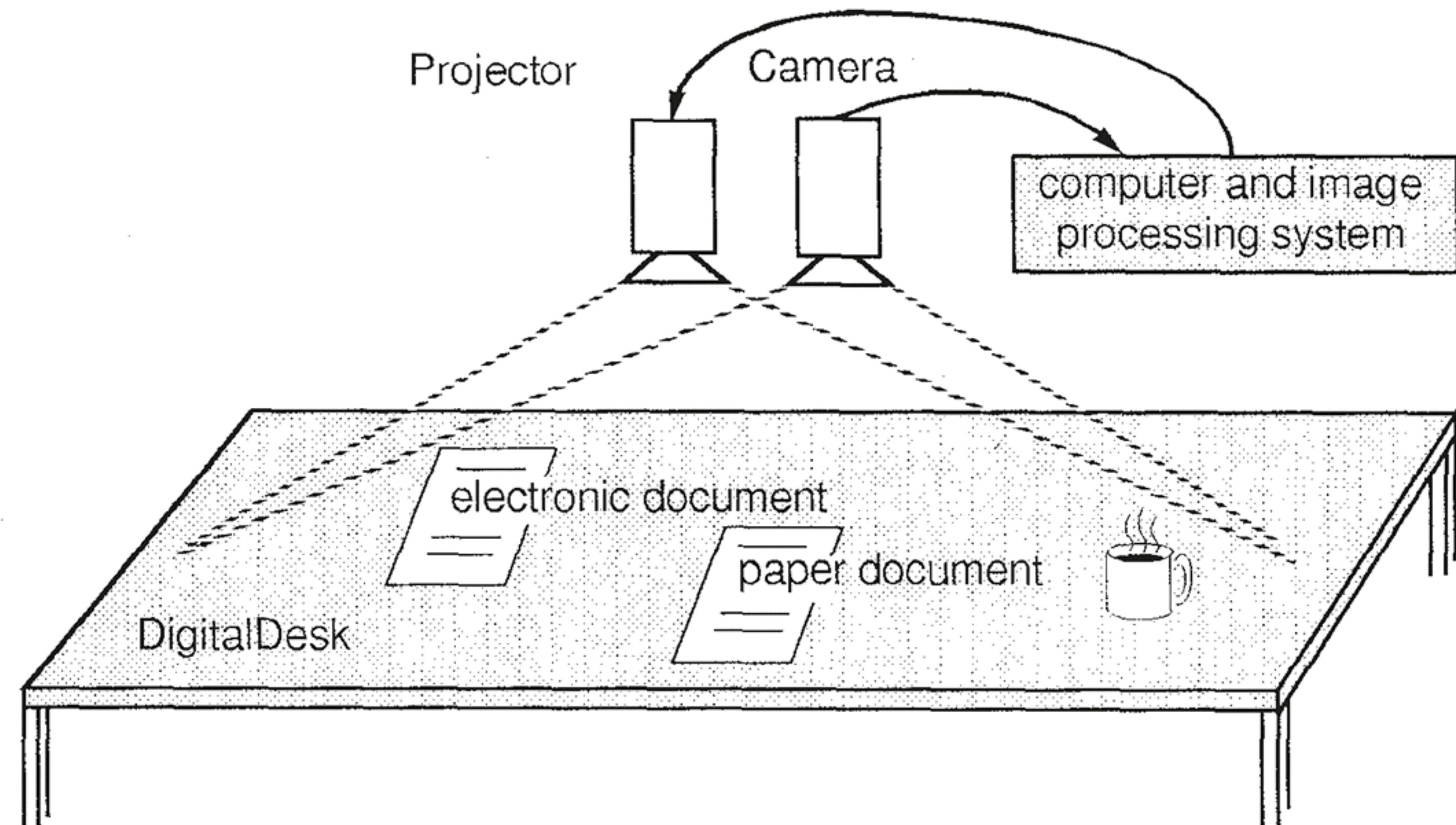


Figure 1. A DigitalDesk system



1992: Simon (IBM & Bell South)

# AND MANY MORE

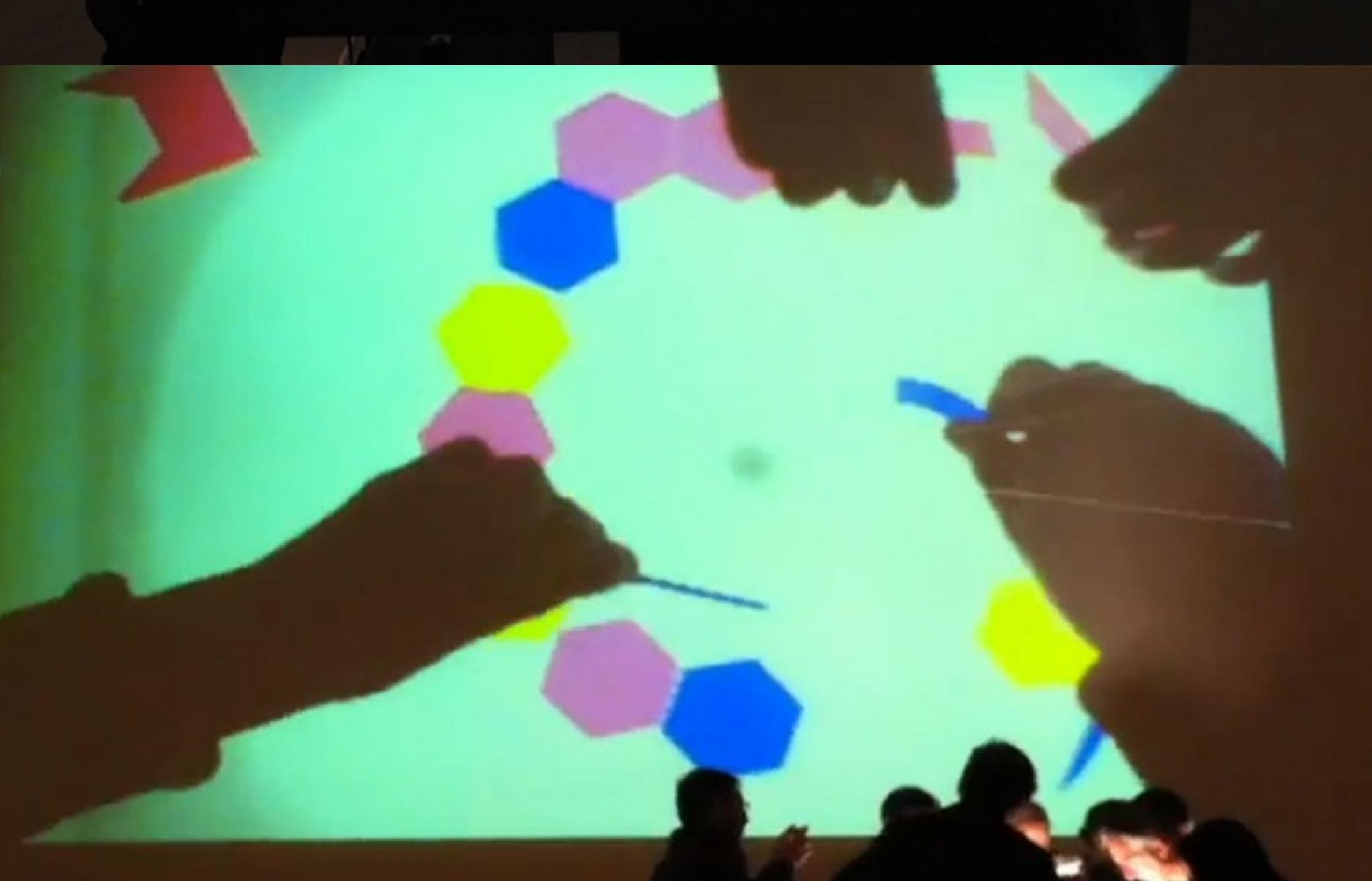
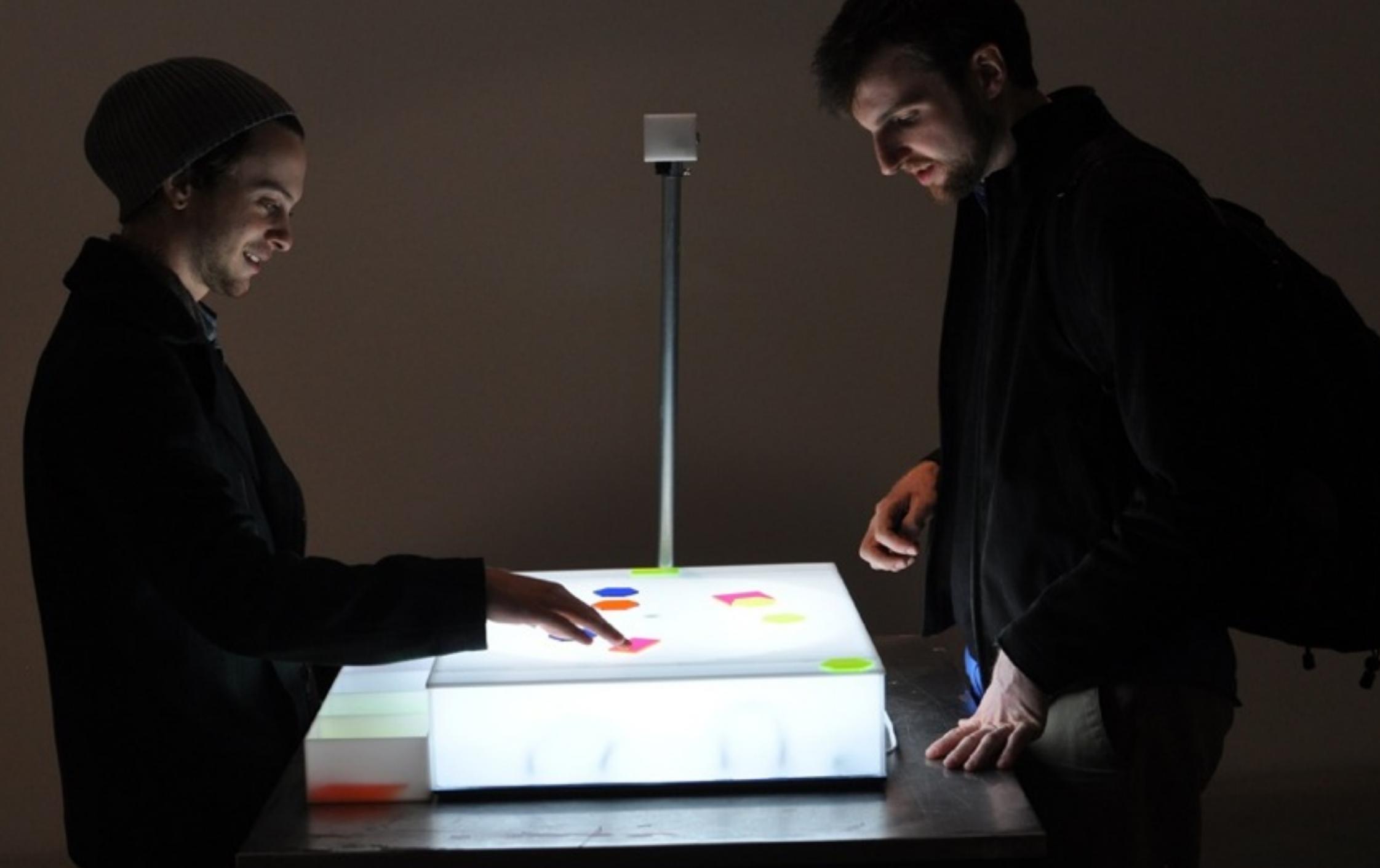
see Bill Buxtons [site](#) for further research

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

# EXAMPLES

# RHYTHMSYNTHESIS

by Ryan Raffa



VIDEO

# SCRAPPLE

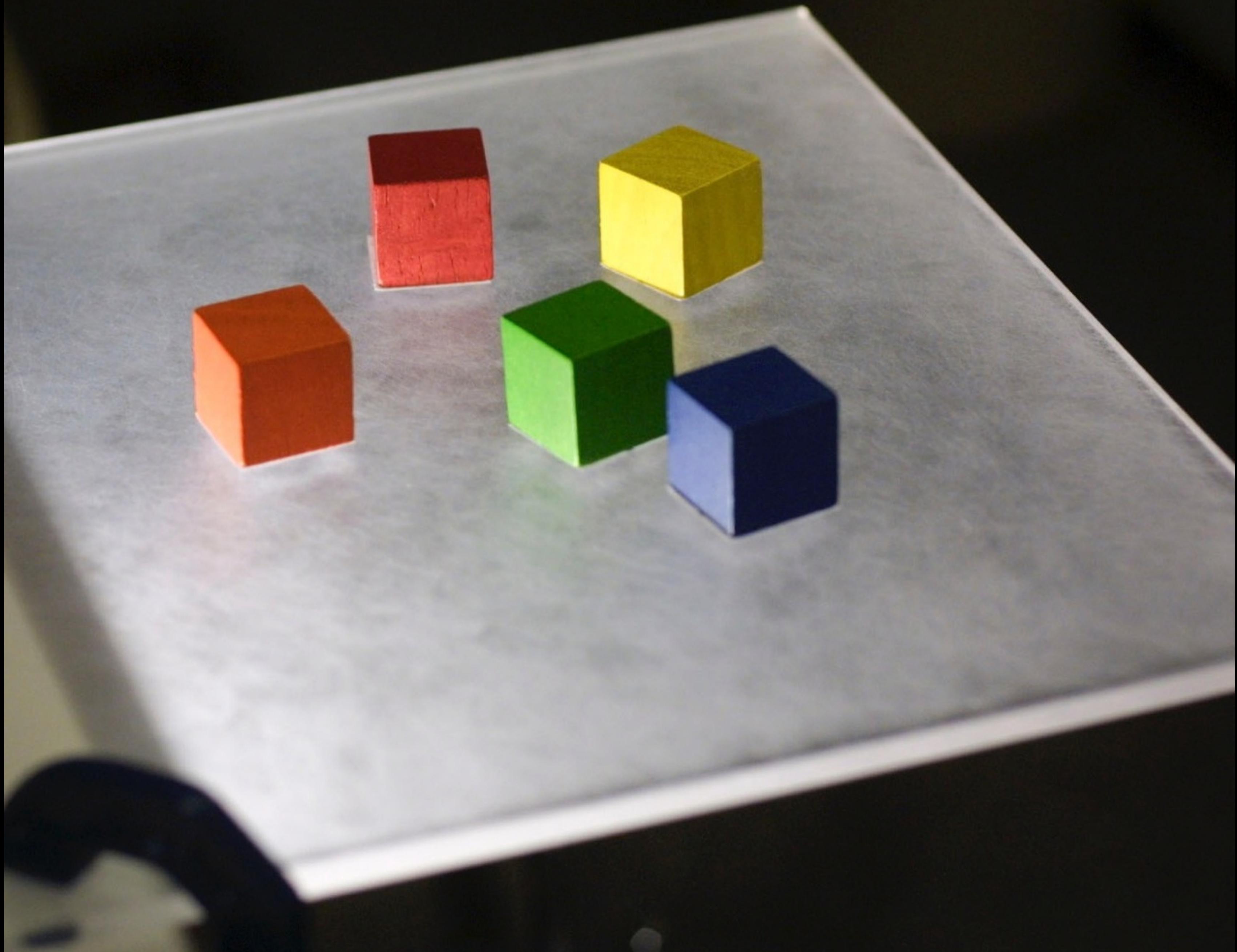
by Golan Levin  
and Collaborators



VIDEO & VIDEO

# TRACKMATE

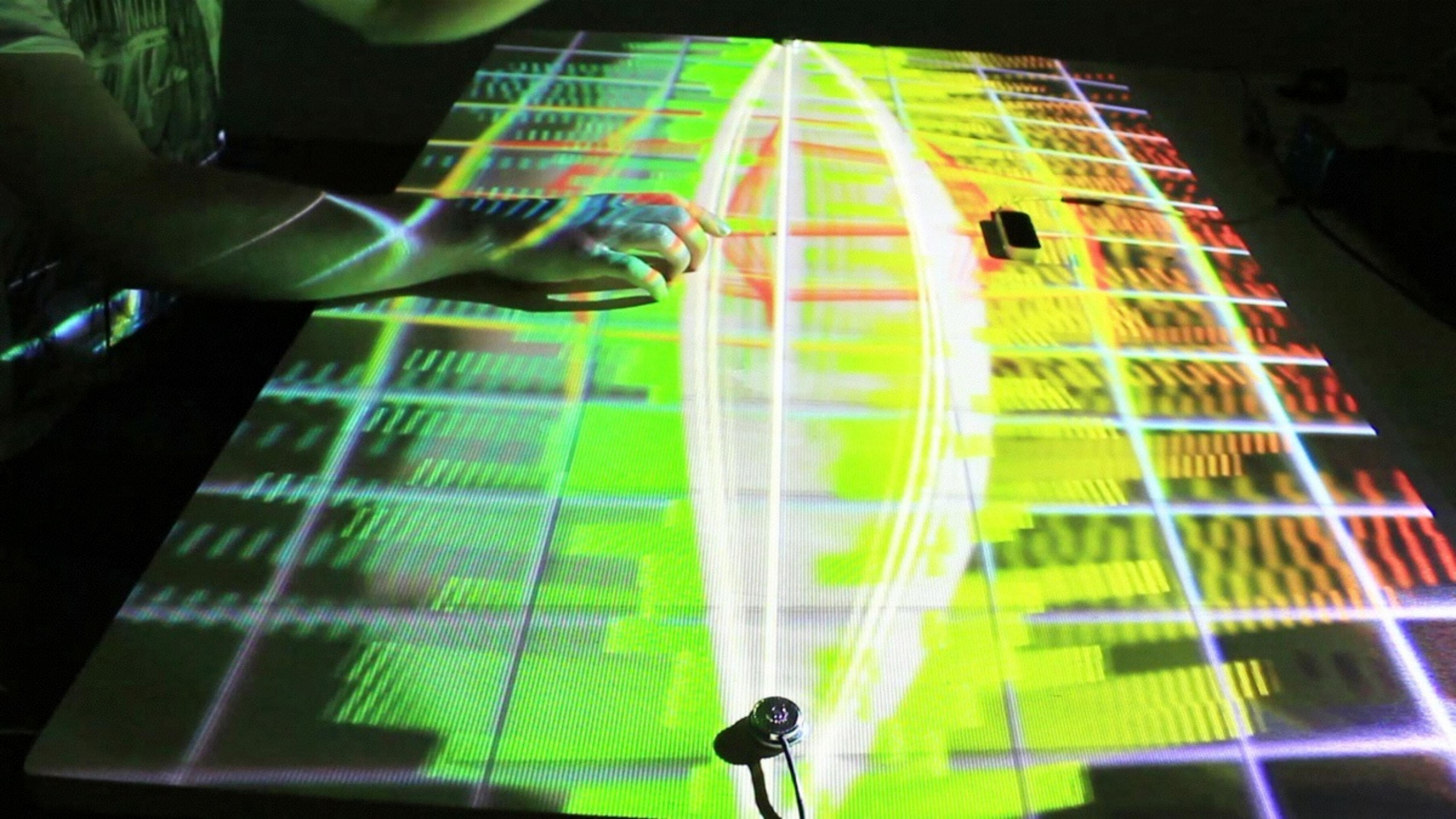
Adam Kumpf, Jean-Baptiste Labrune, Keywon  
Chung, Daniel Leithinger, Jamie Zigelbaum, Hiroshi  
Ishii / 2009 @ MIT Media Lab - Tangible Media Group



VIDEO

# CONTACT

by Felix Faire



VIDEO

# DRAWN

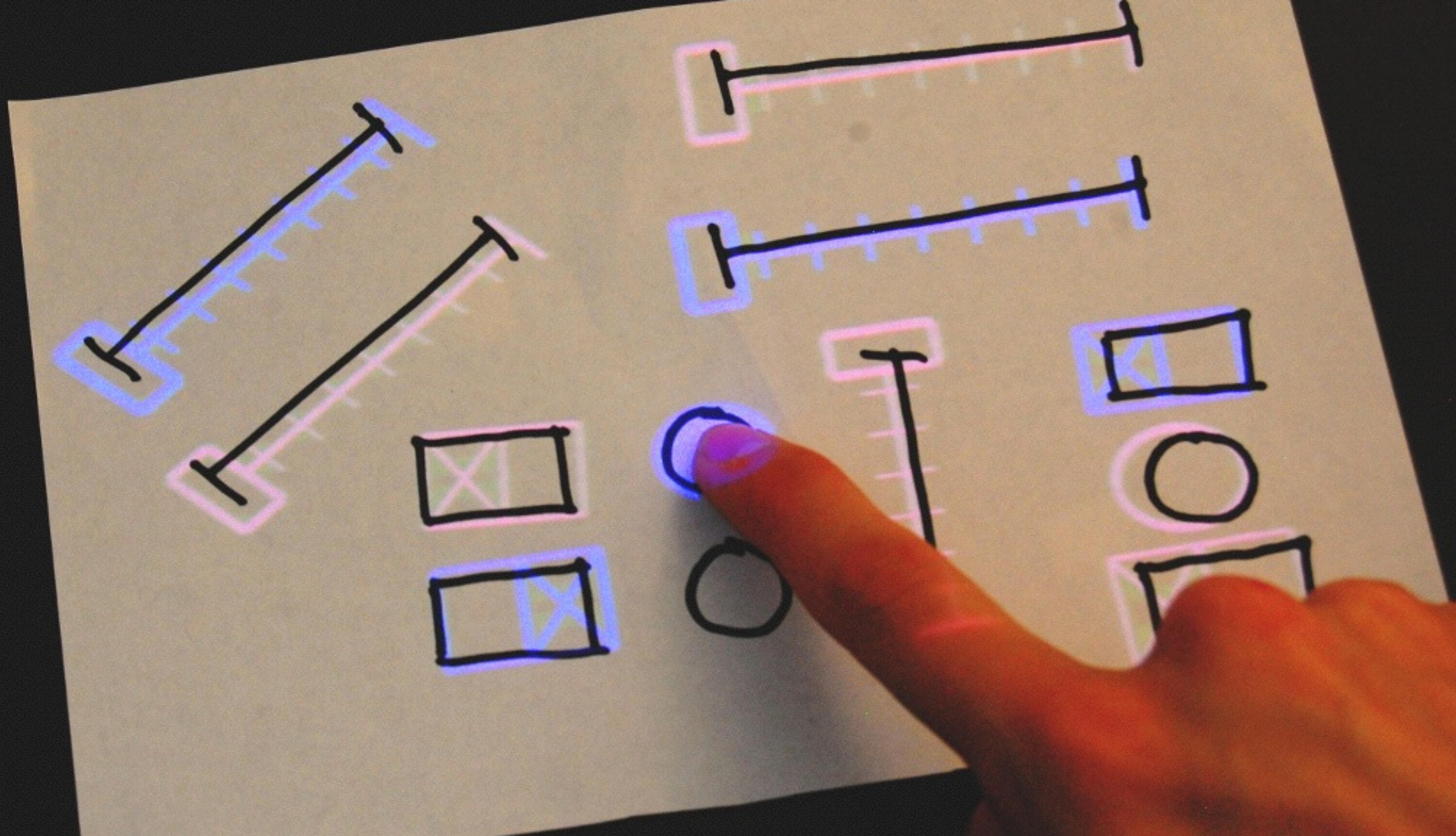
by Zachary Lieberman



VIDEO

# SKETCHSYNTH

SketchSynth: A Drawable OSC  
Control Surface by Billy Keyes



VIDEO

# WORKSHOP

Bare Bones Computer Vision

**HTTPS://GITHUB.COM/FH-POTSDAM/2014-2015-WISE-15PP-PW-DIY-MULTITOUCH**

**WHAT ELSE IS IN THE BOX?**

# OPENCV

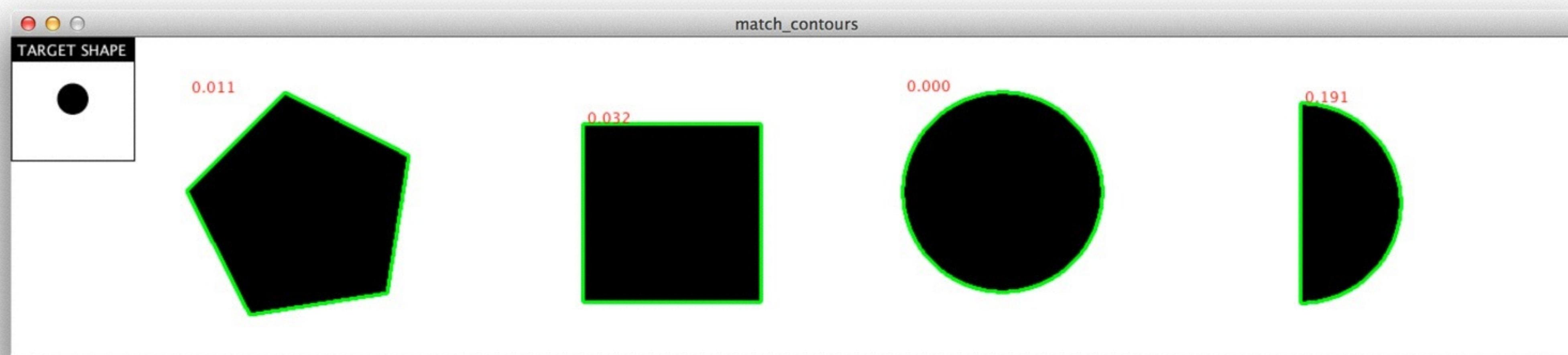
# OPENCV

(Open Source Computer Vision Library)

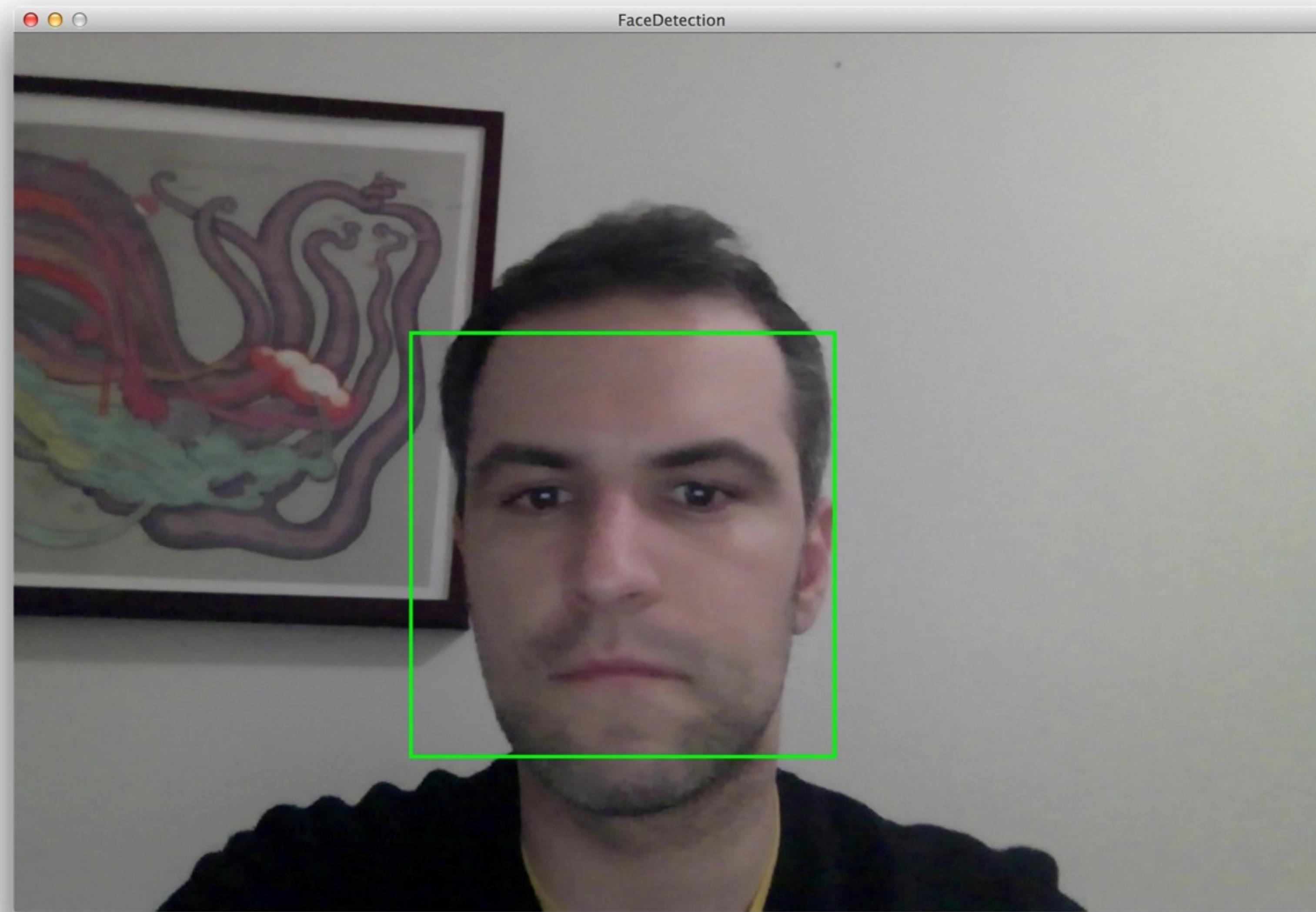
is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products.

# OPENCV-PROCESSING

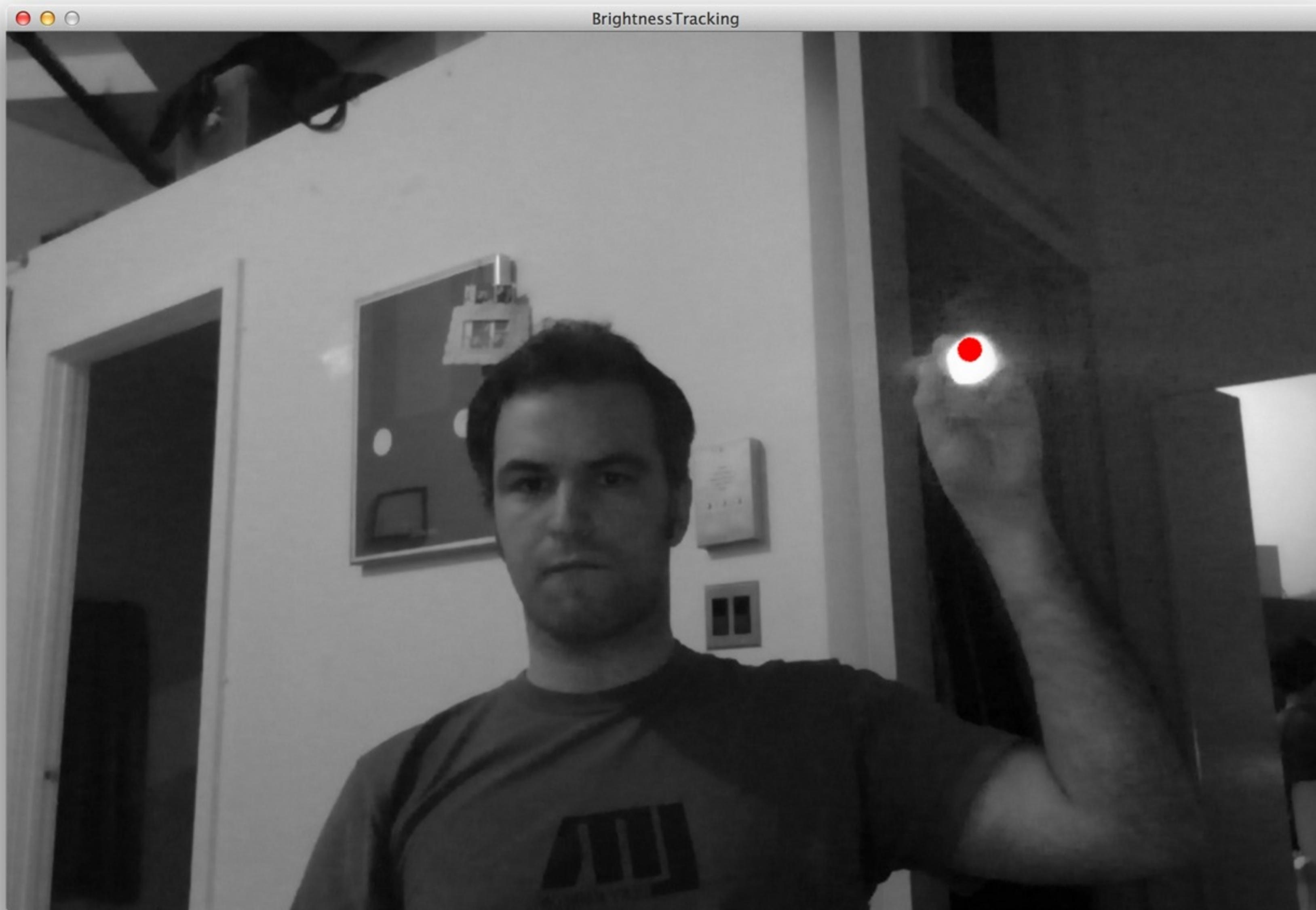
[https://github.com/atduskgreg/  
opencv-processing](https://github.com/atduskgreg/opencv-processing) by Greg Borenstein

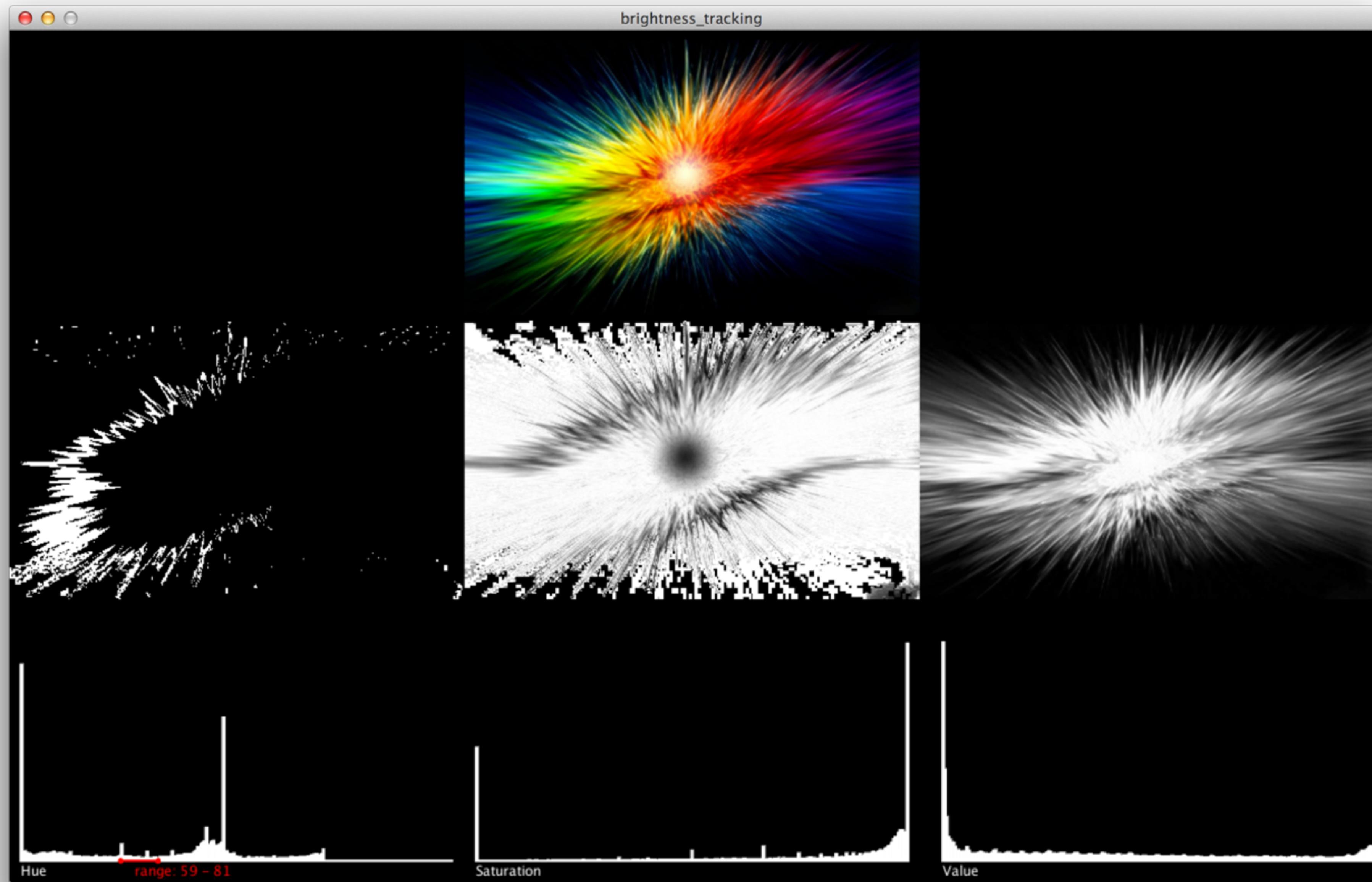


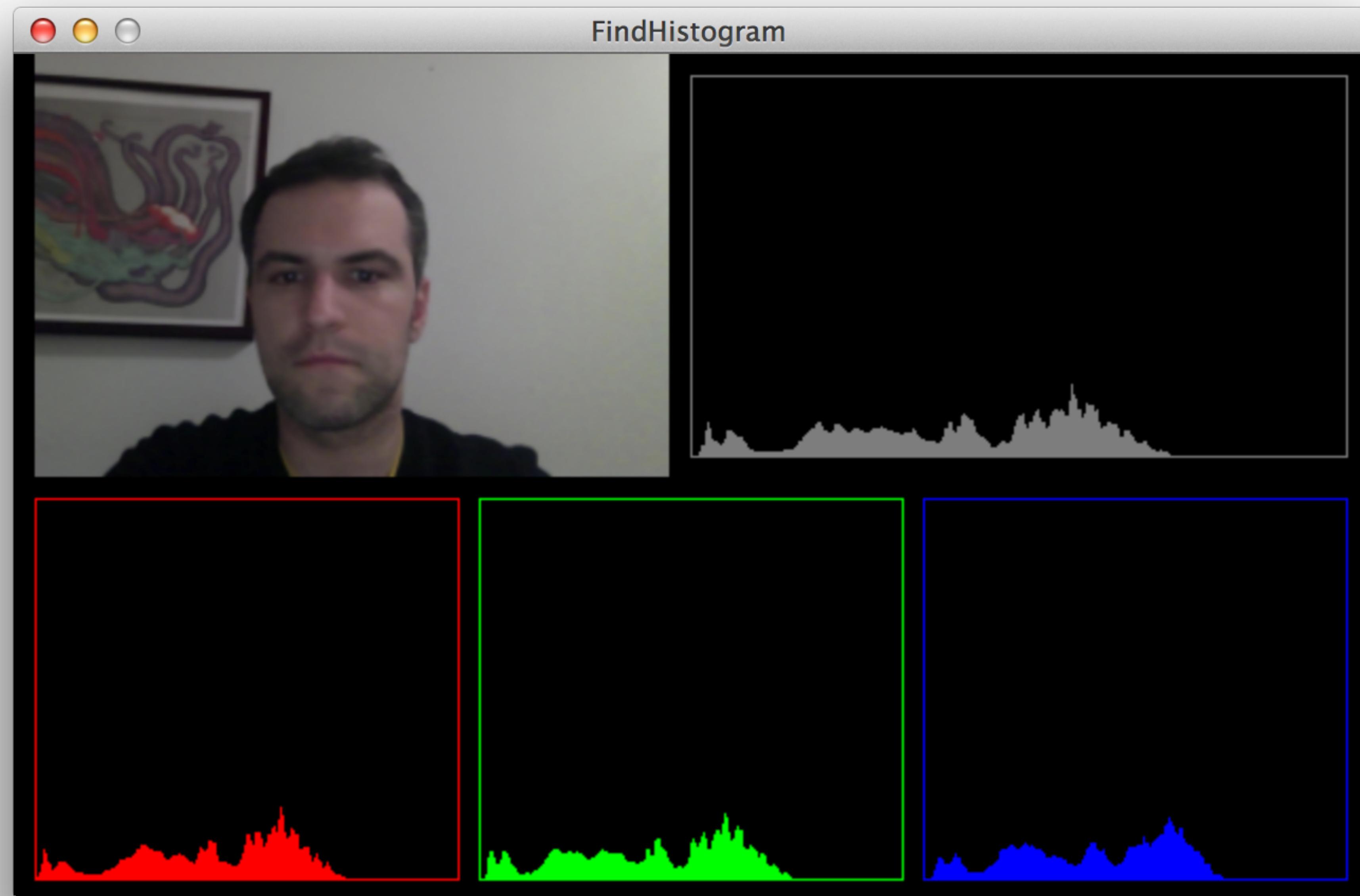






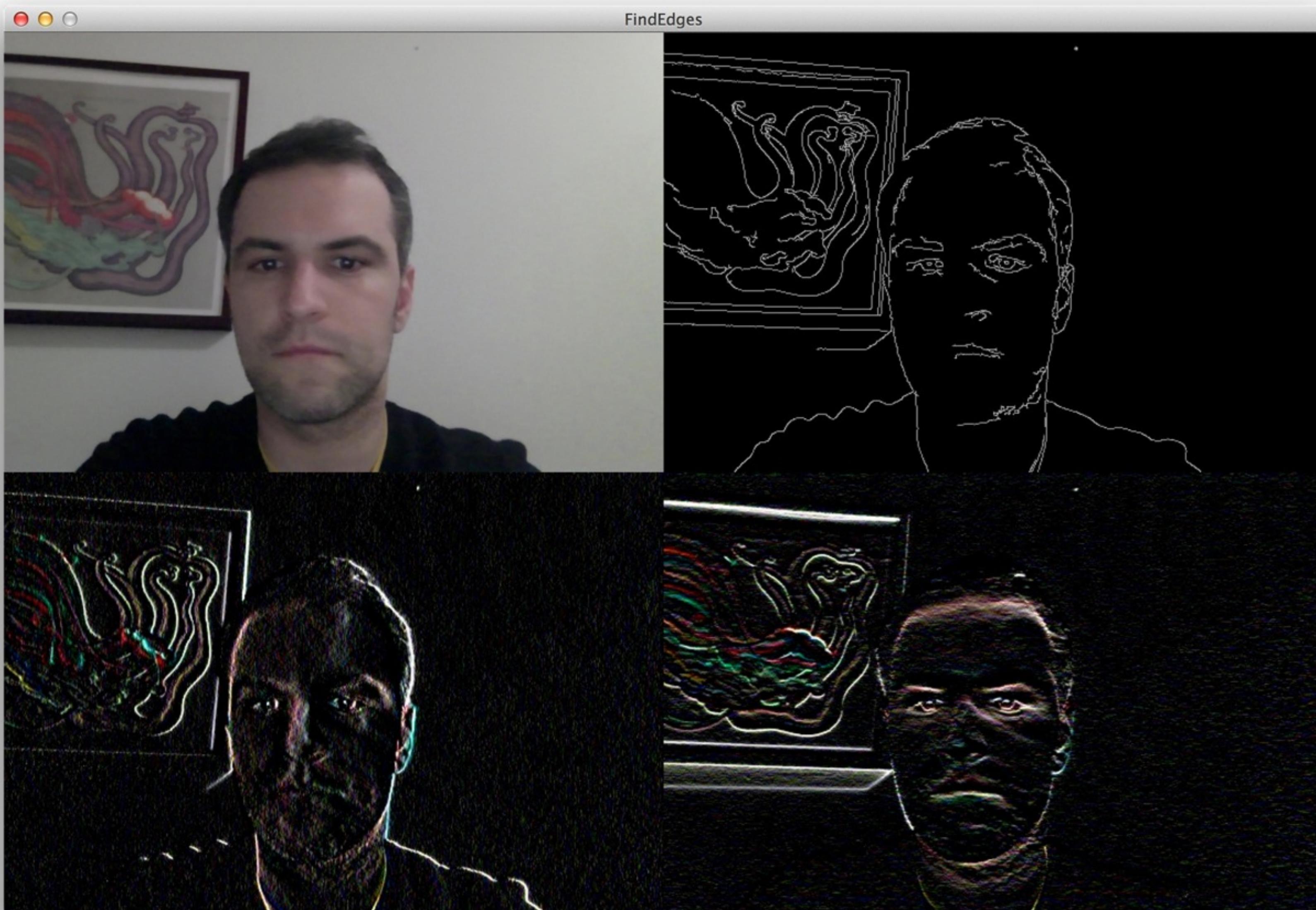




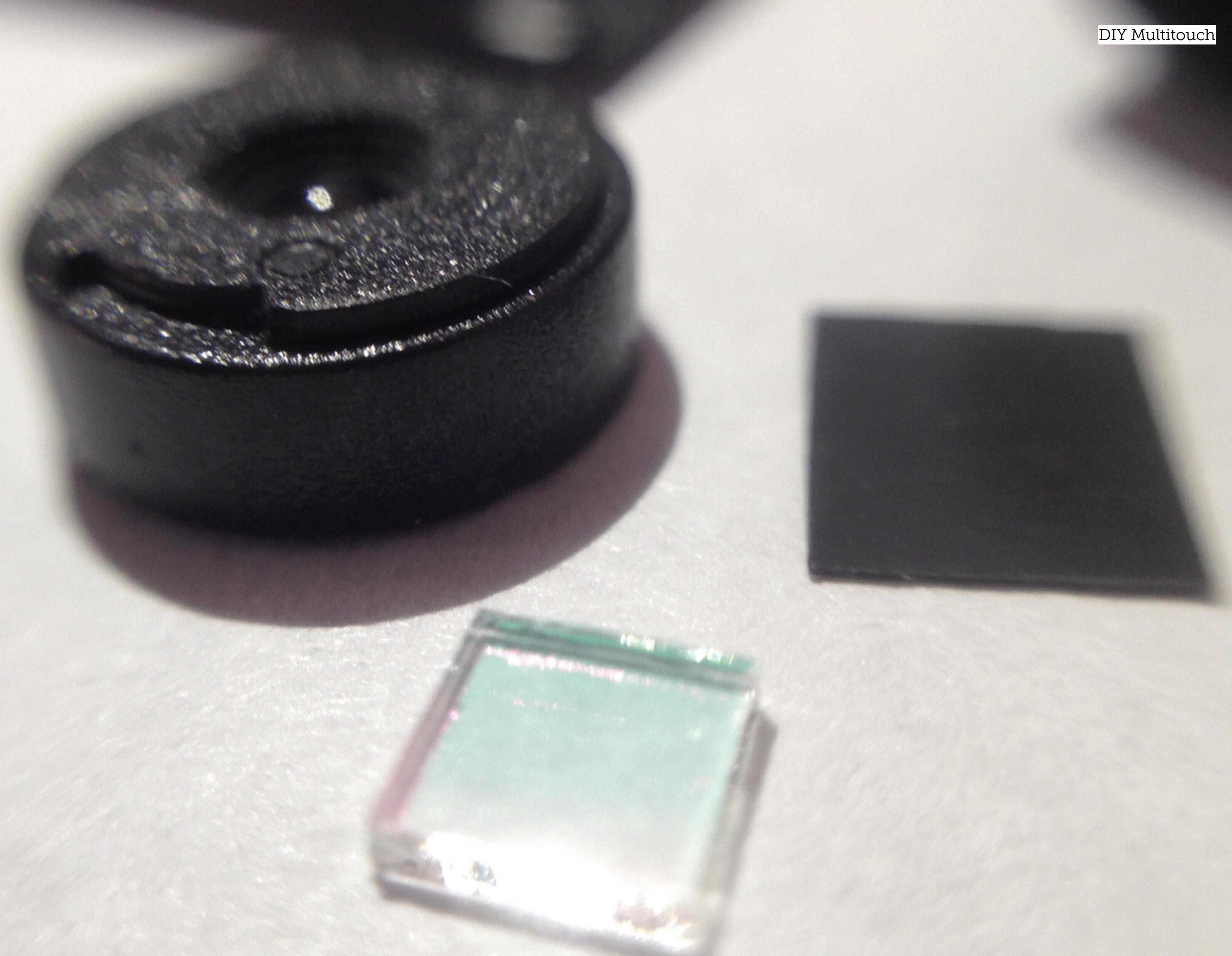


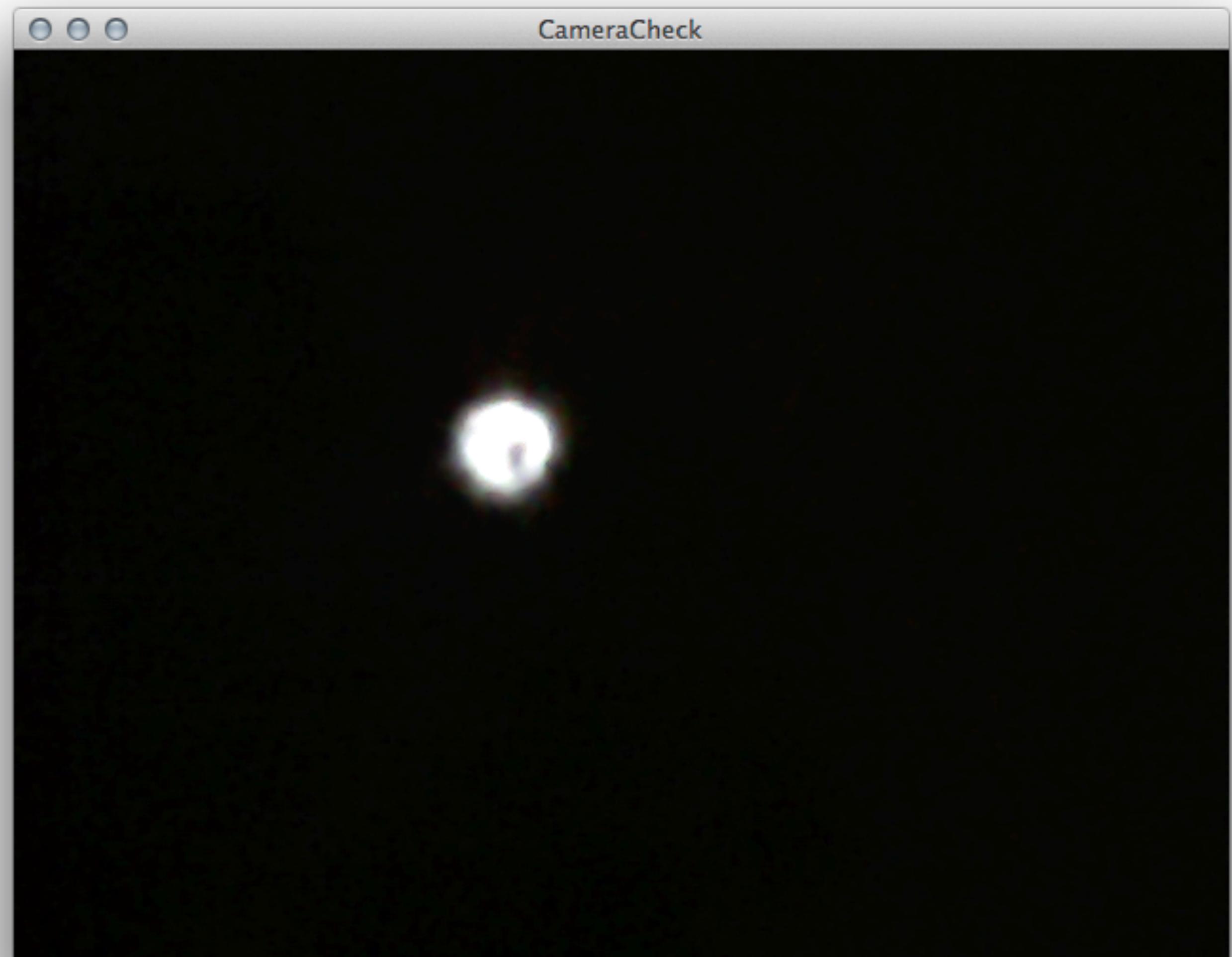




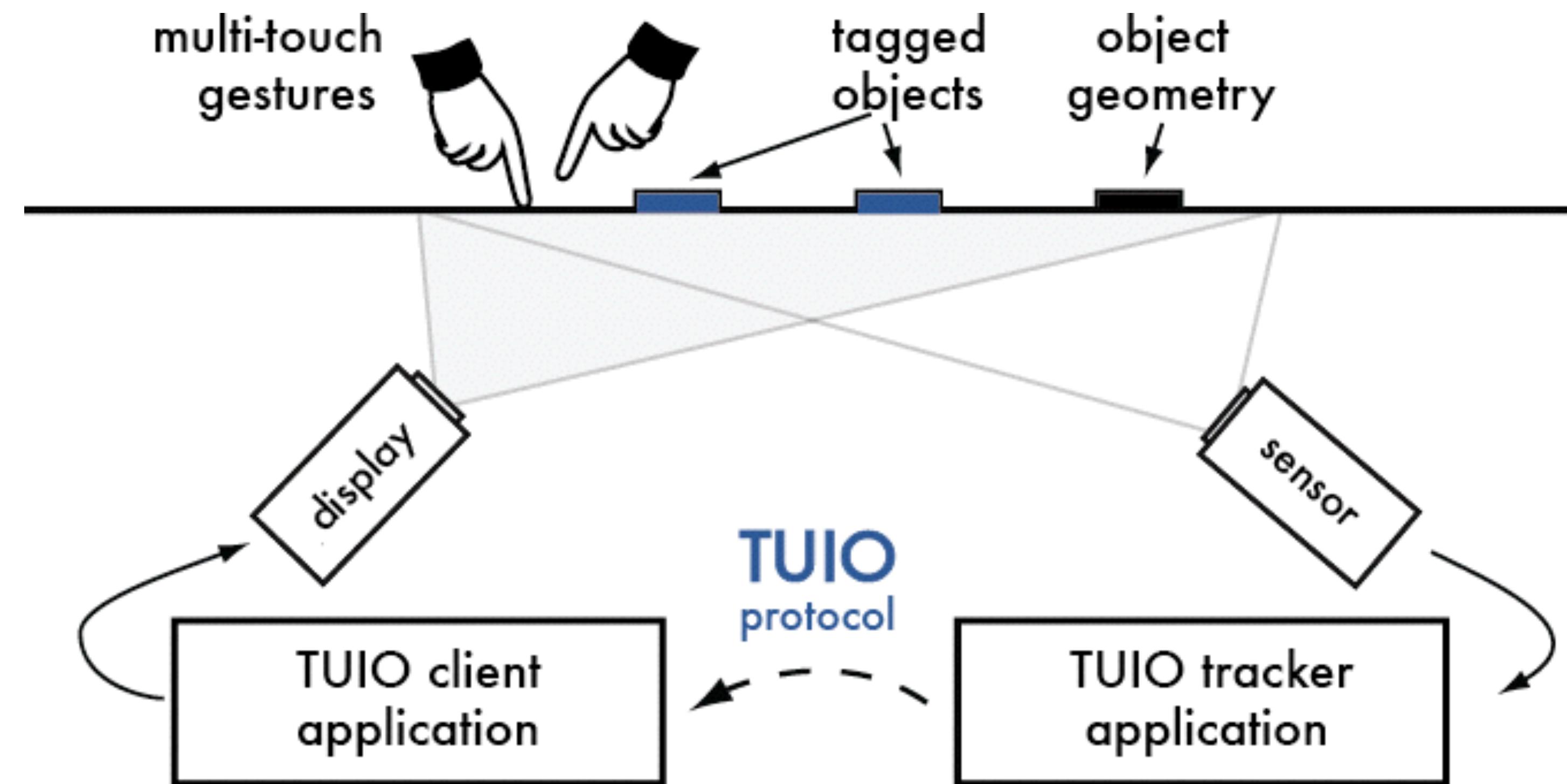


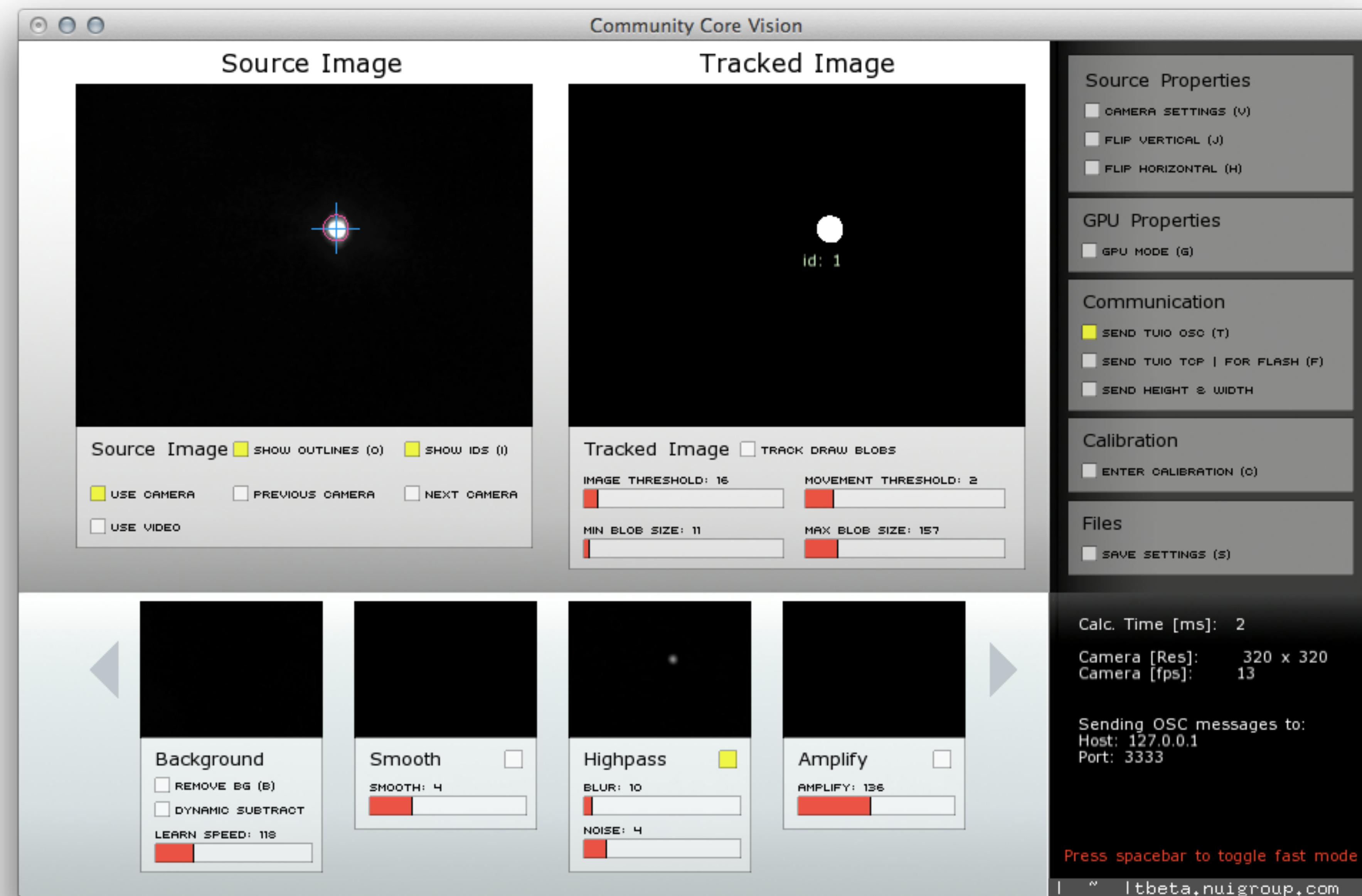
# DIY IR CAMERA

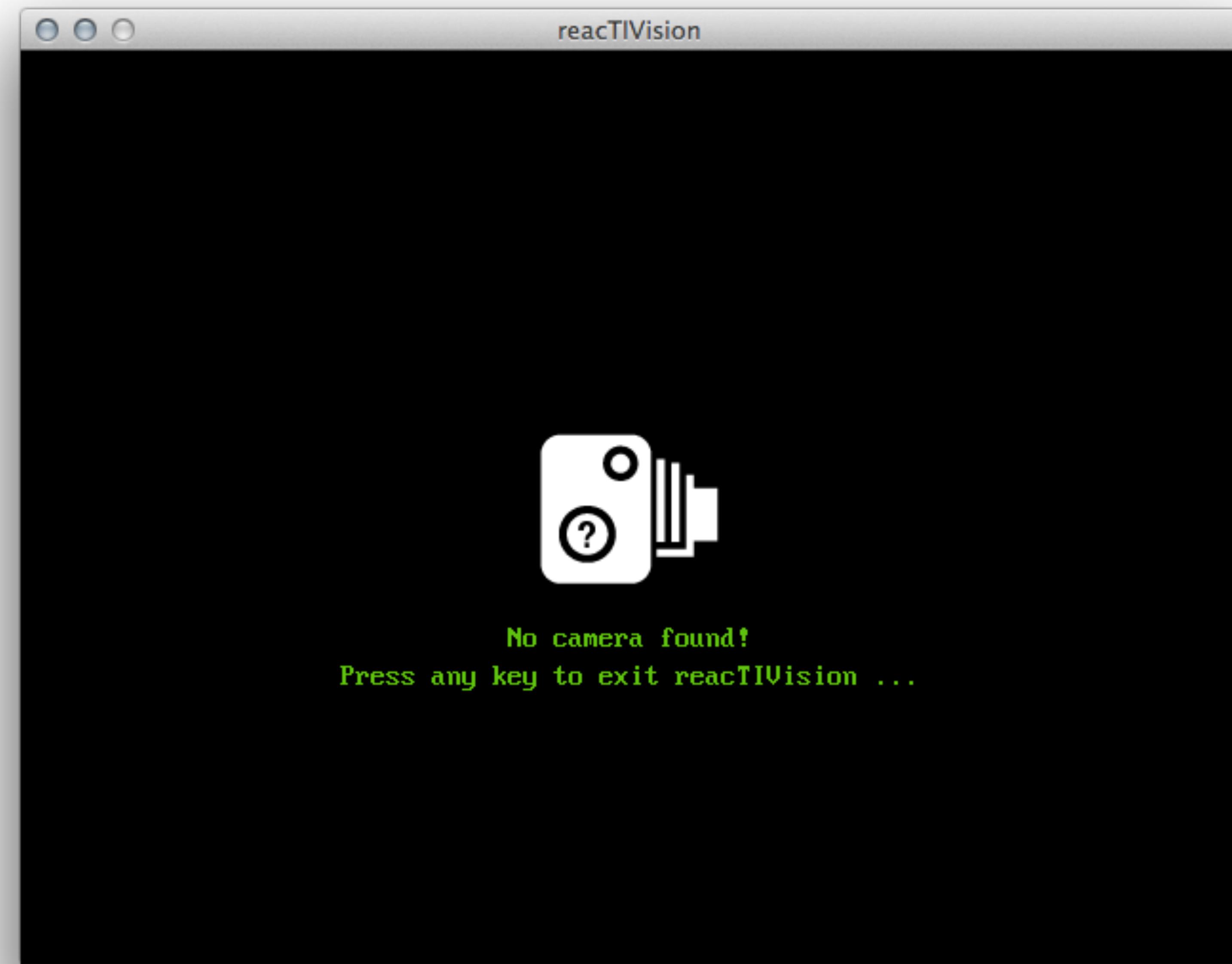




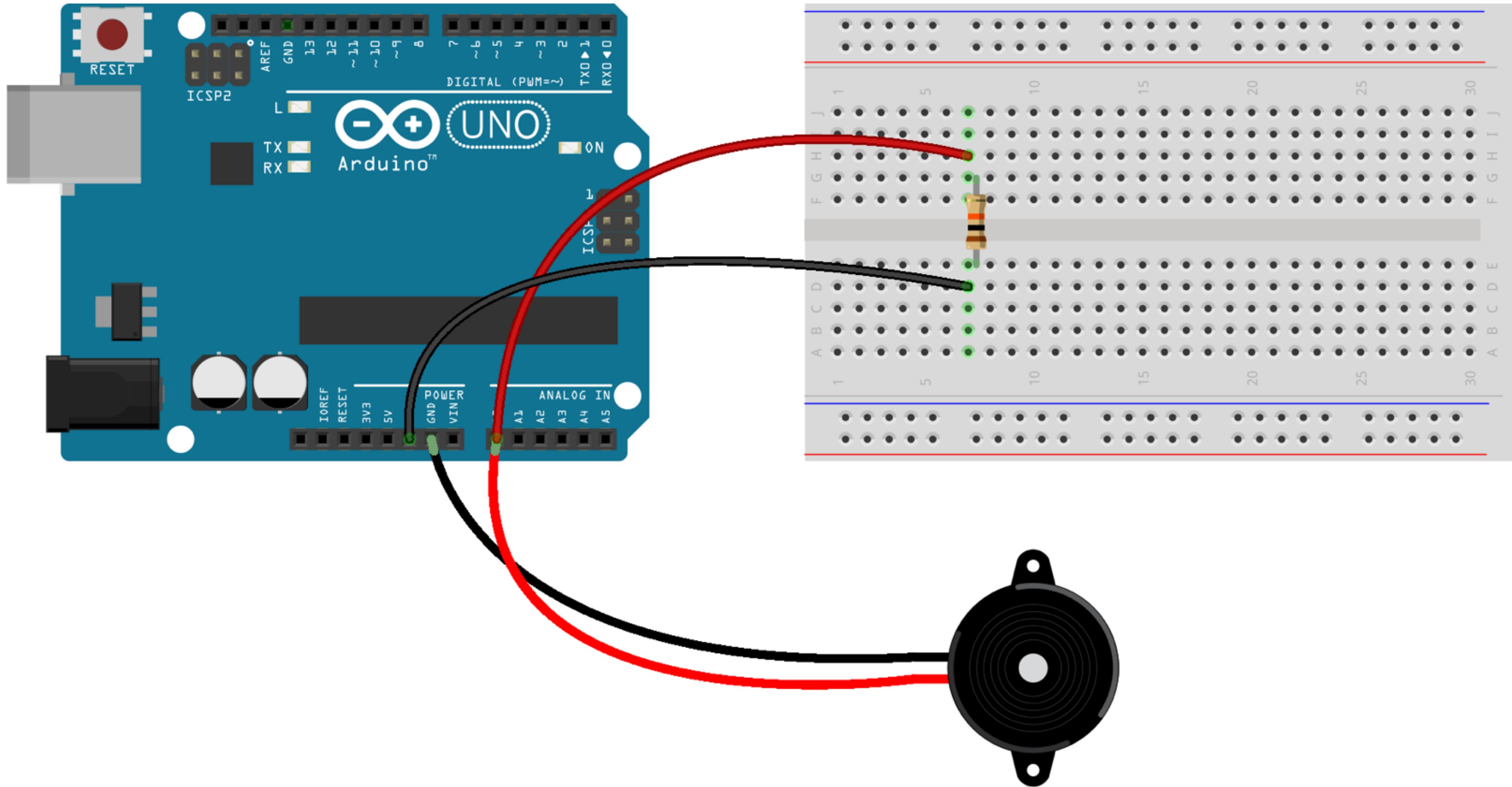
# TUIO

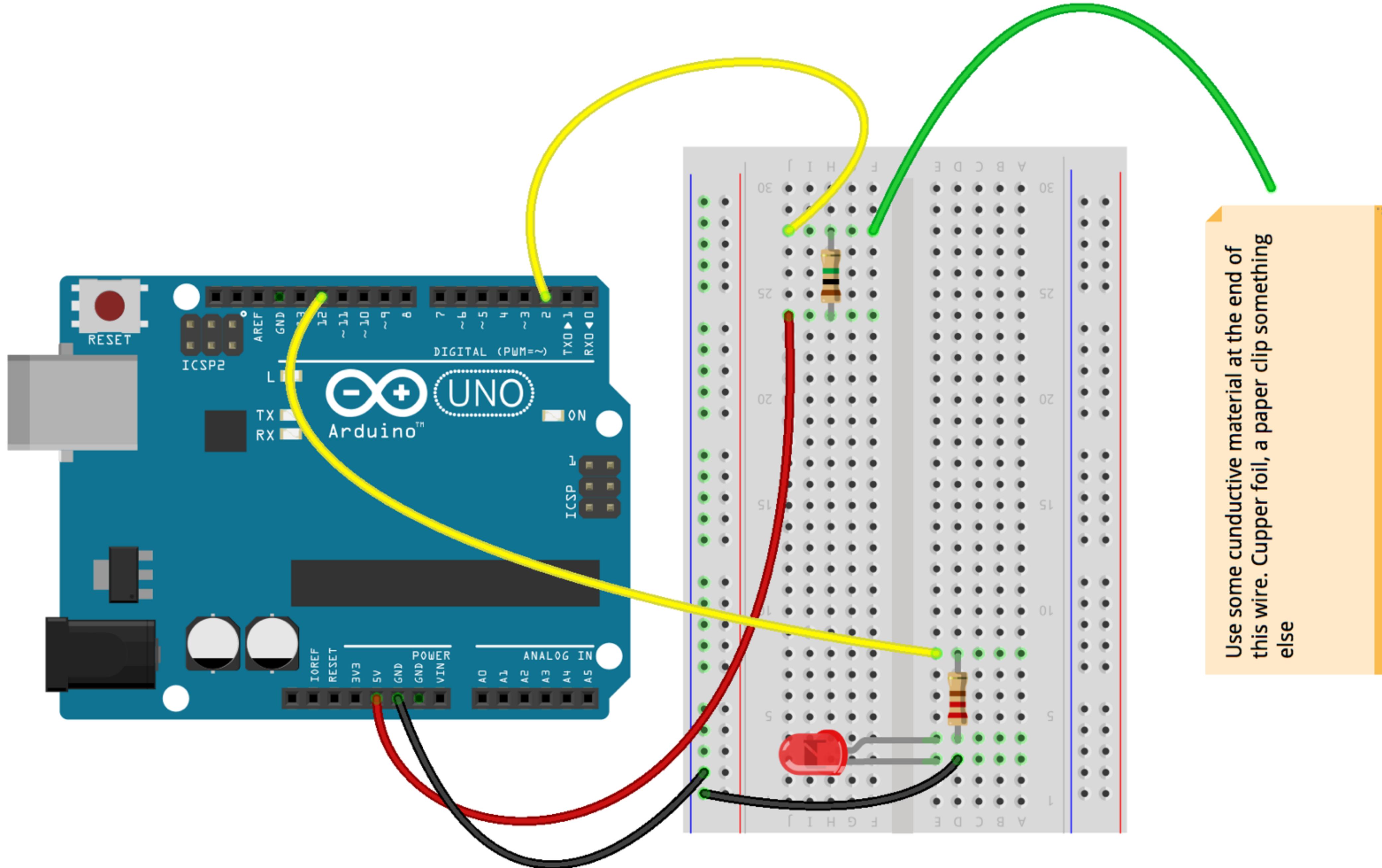


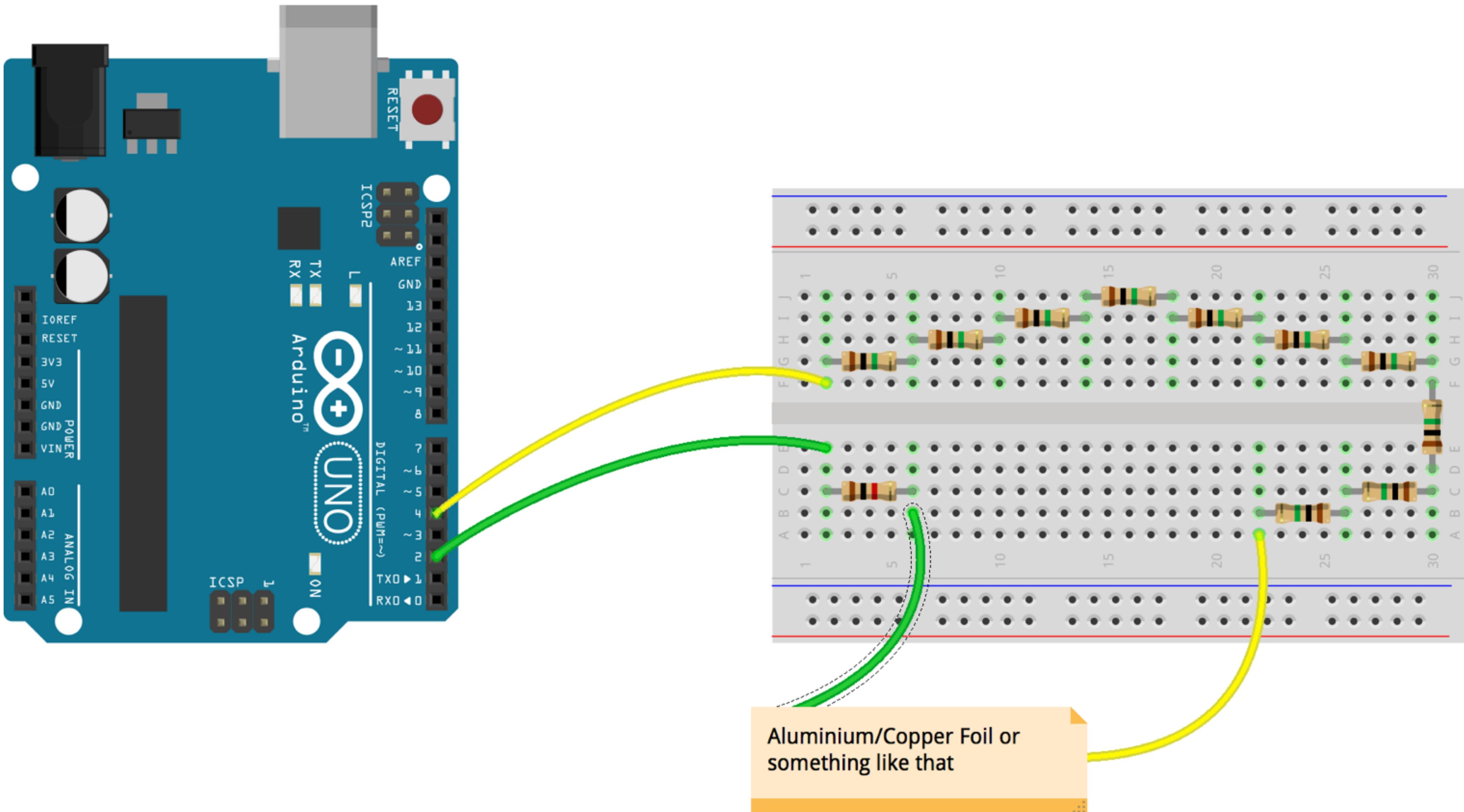




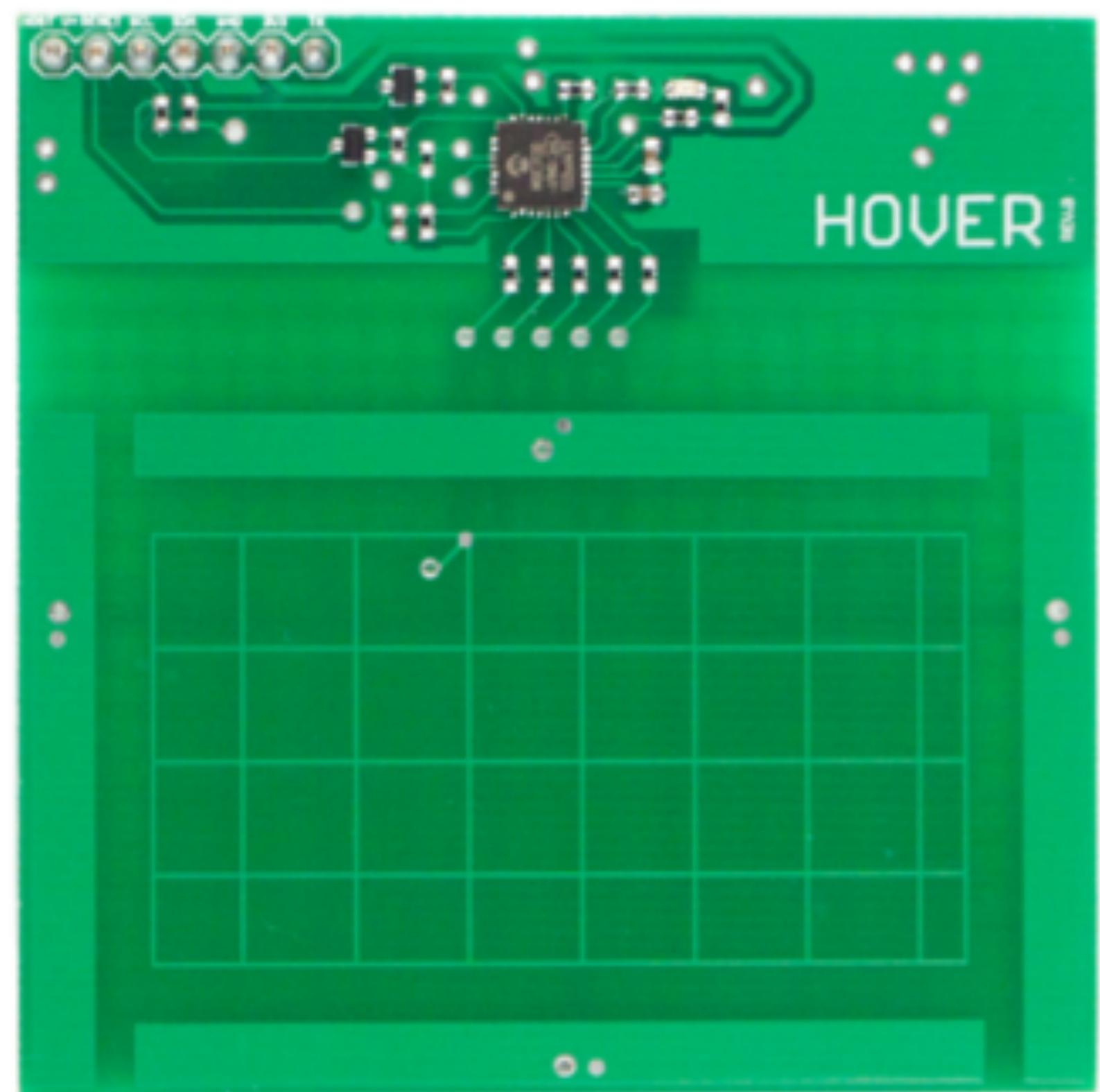
# PHYSICAL COMPUTING



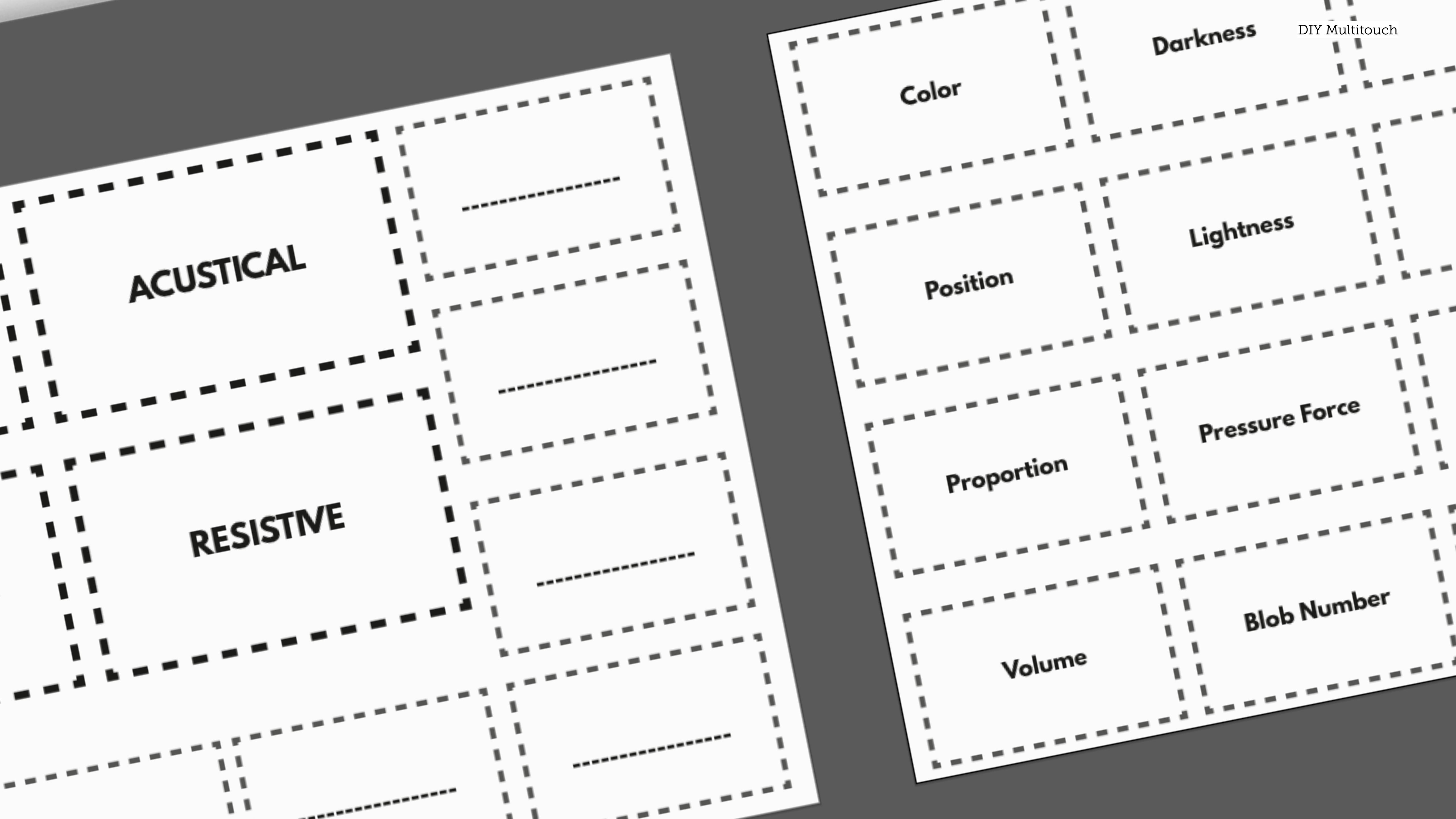








# IDEA GENERATOR



# GROUPS

# EXERCISE

Connect || Think || Present