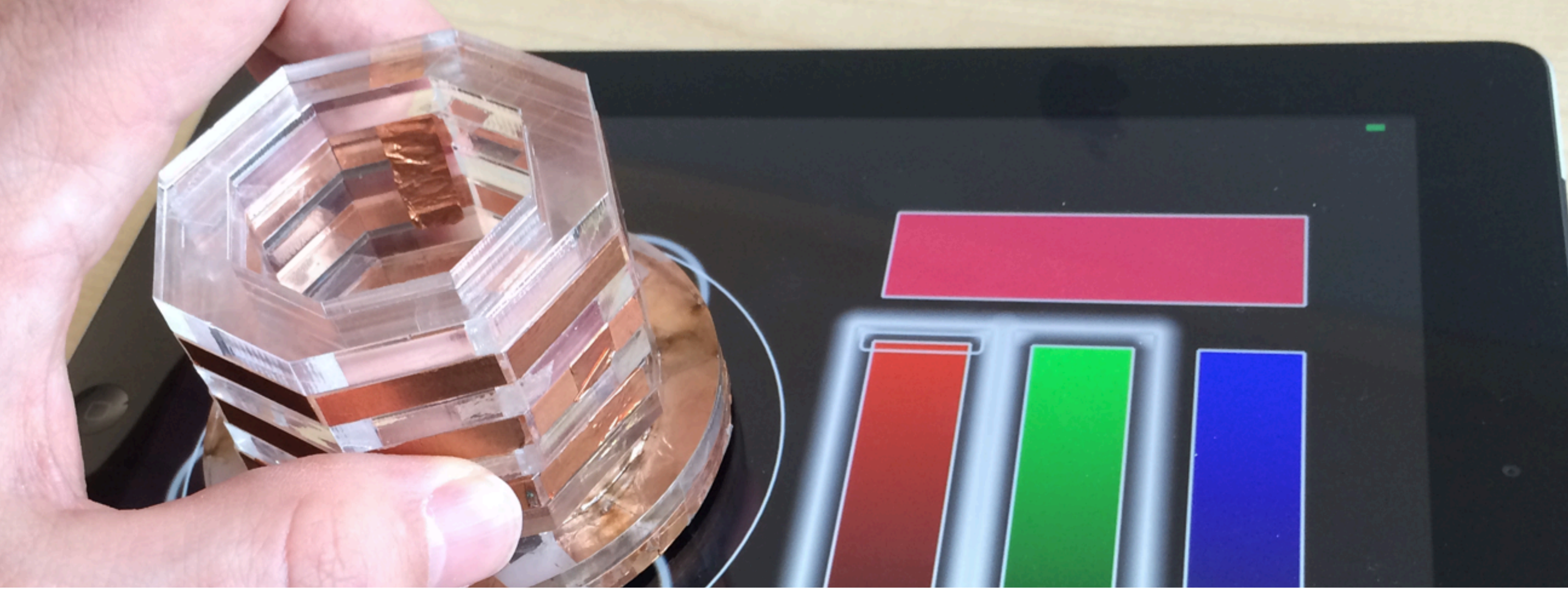


Tangibles

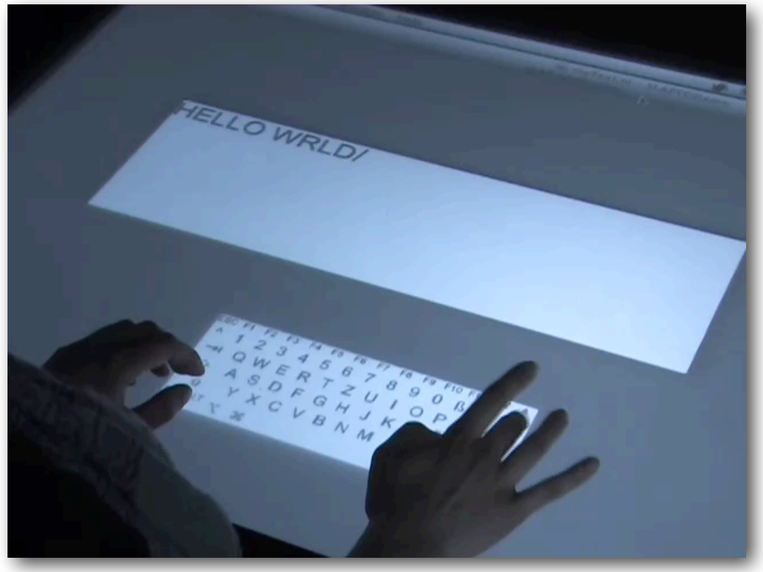
Anke Brocker

RWTH AACHEN UNIVERSITY

In-class Exercise: Typing Eyes-Free

Try to type on your smartphone without looking at the screen.

Limited Haptic Feedback



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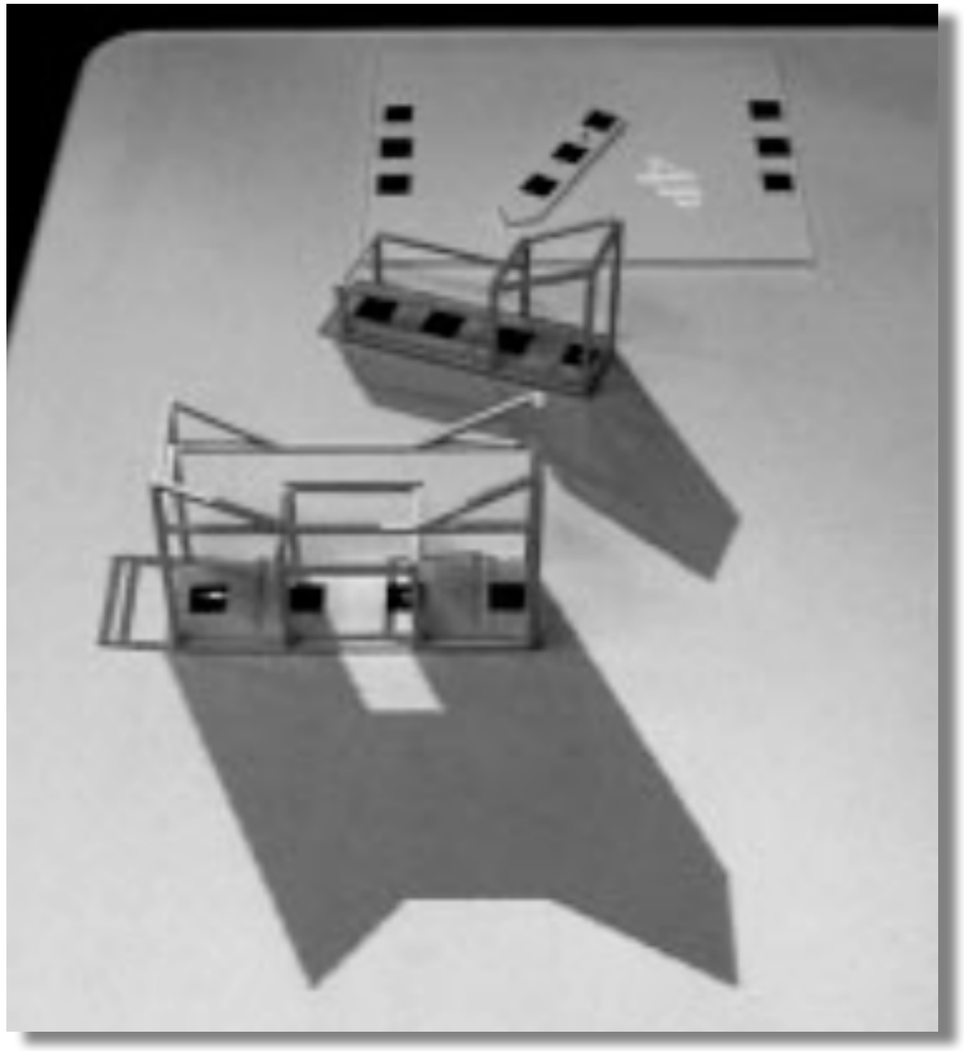
Tangibles on Interactive Surfaces

Tangible User Interfaces



Urban planing simulator

Urp
Underkoffler, Ishii
CHI' 99

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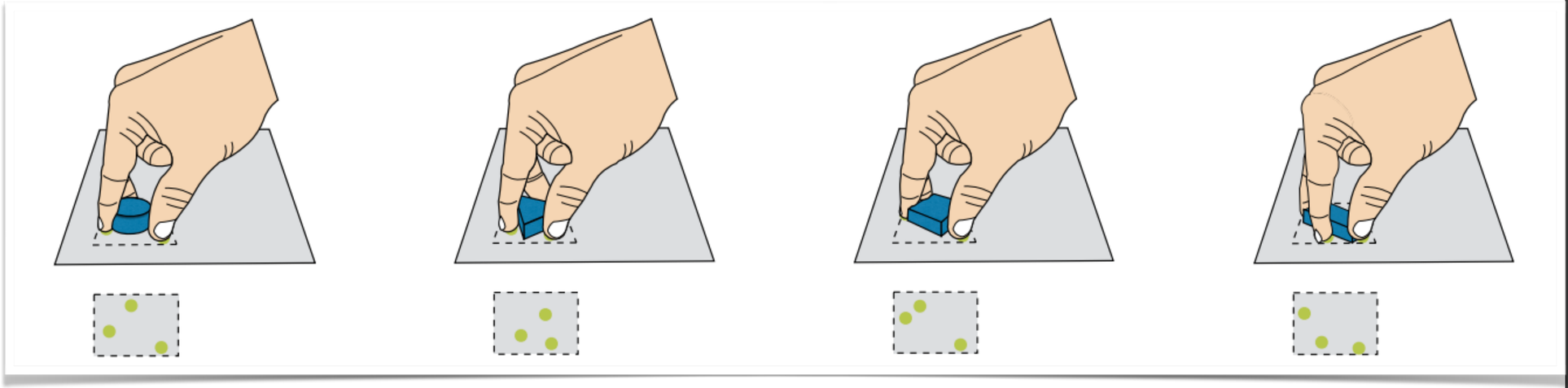
TouchesTokens



Guiding Touch Patterns with Passive Tokens

TouchTokens
Gonzalez et al.
CHI’ 16

[Gonzalez et al. CHI ’16]

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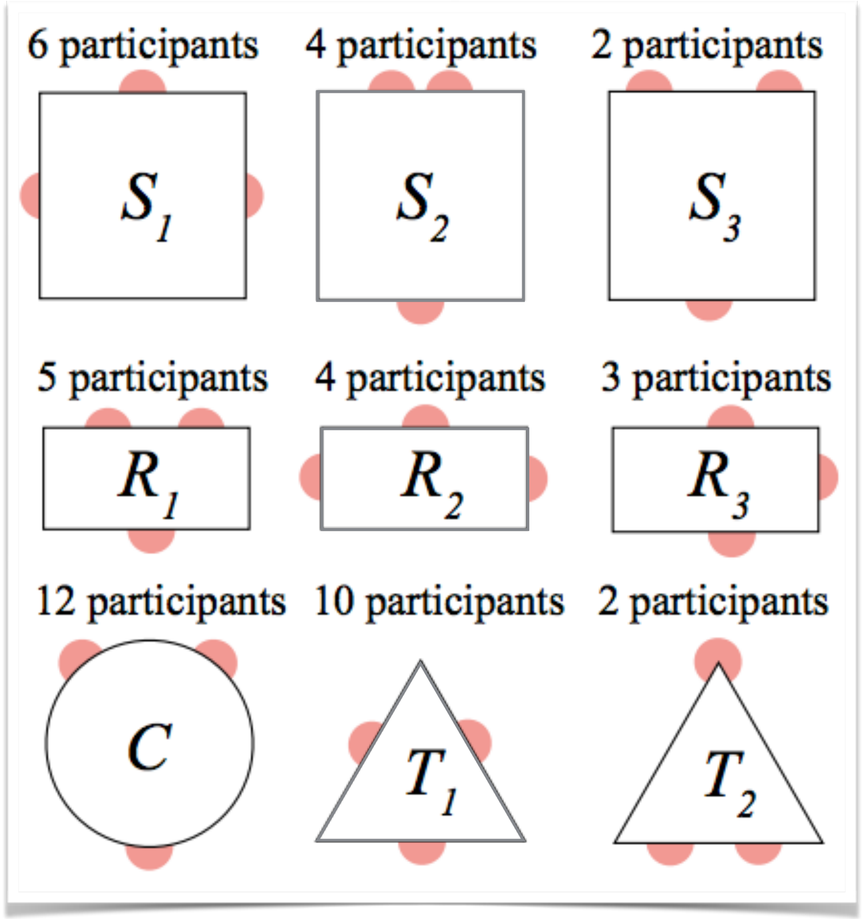
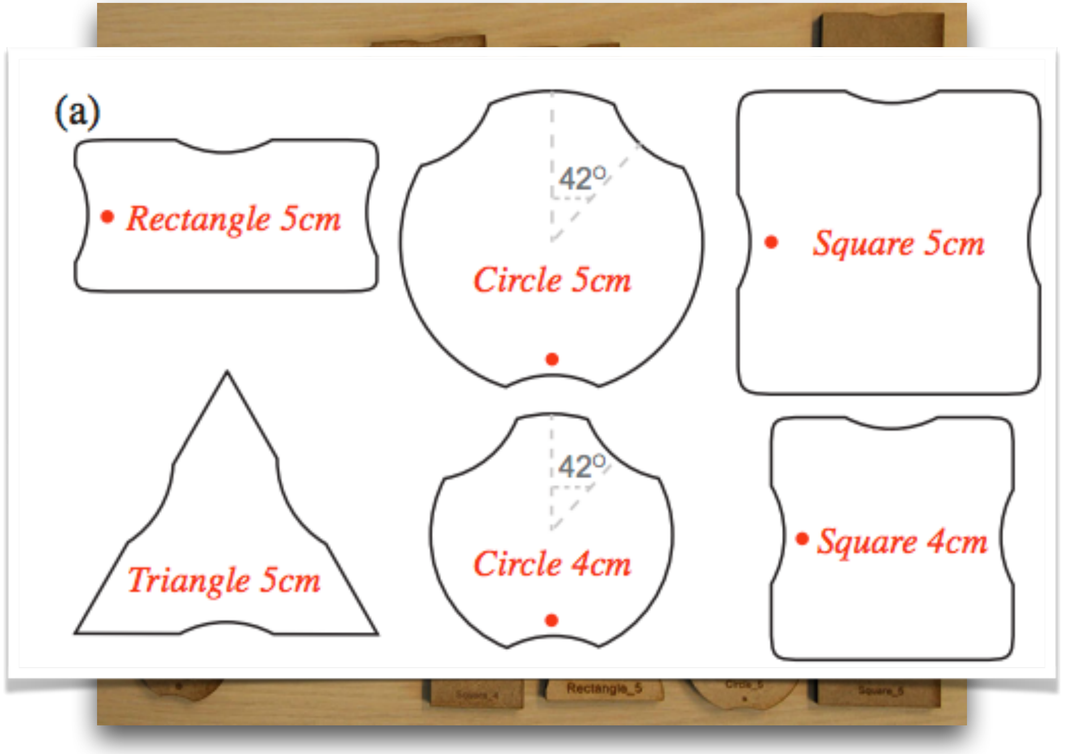
TouchesTokens





[Gonzalez et al. CHI '16]

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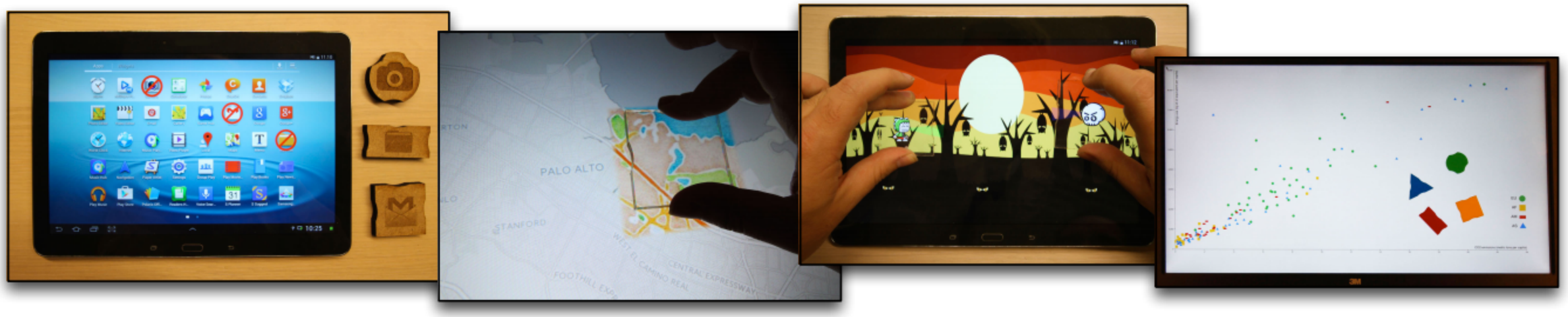
TouchesTokens



[Gonzalez et al. CHI ’16]

CHAPTER 1

Tangible Objects on Touchscreen

PERCs [Voelker et al. UIST 2015]

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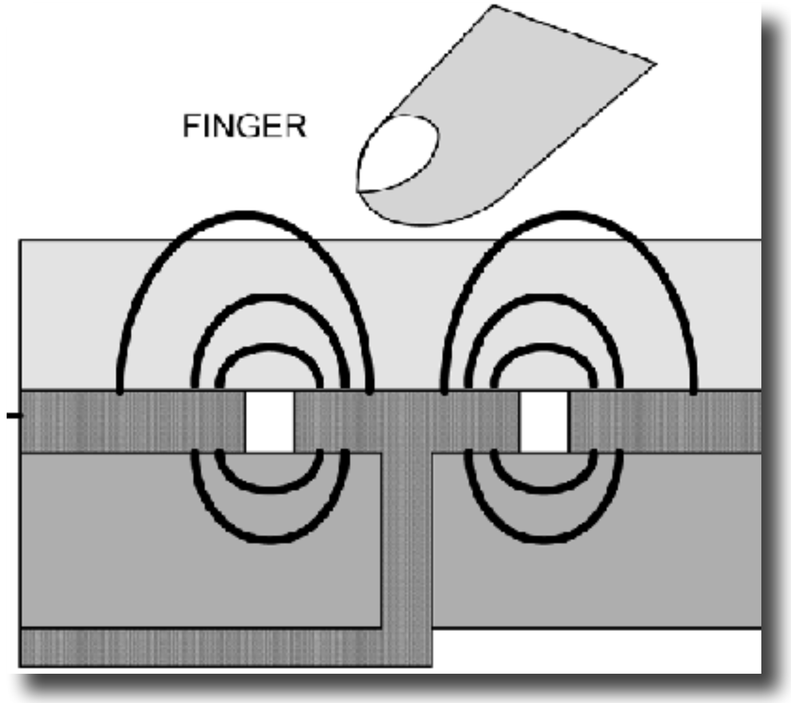
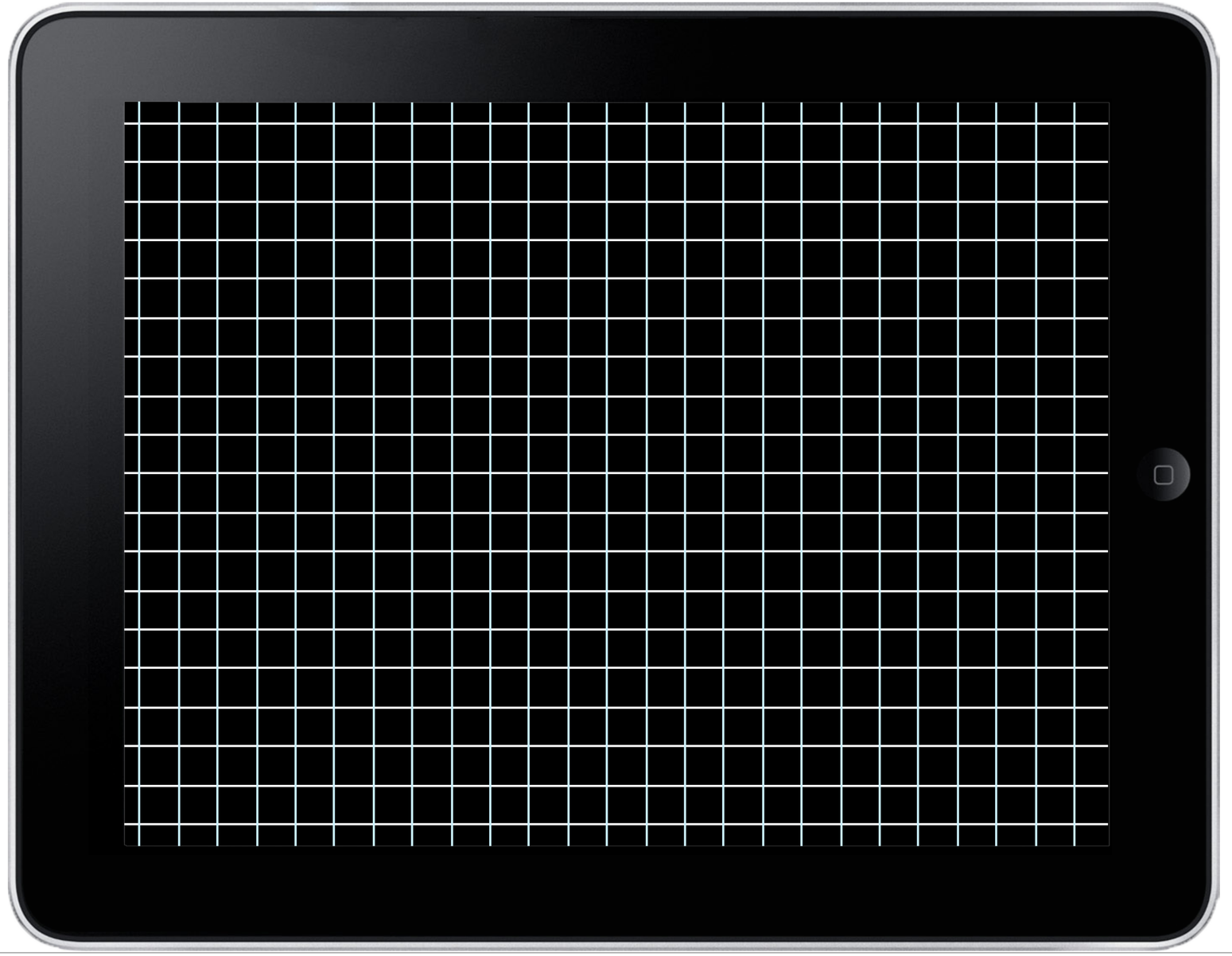
Capacitive touch



Receiving Electrodes

Transmitting Electrodes



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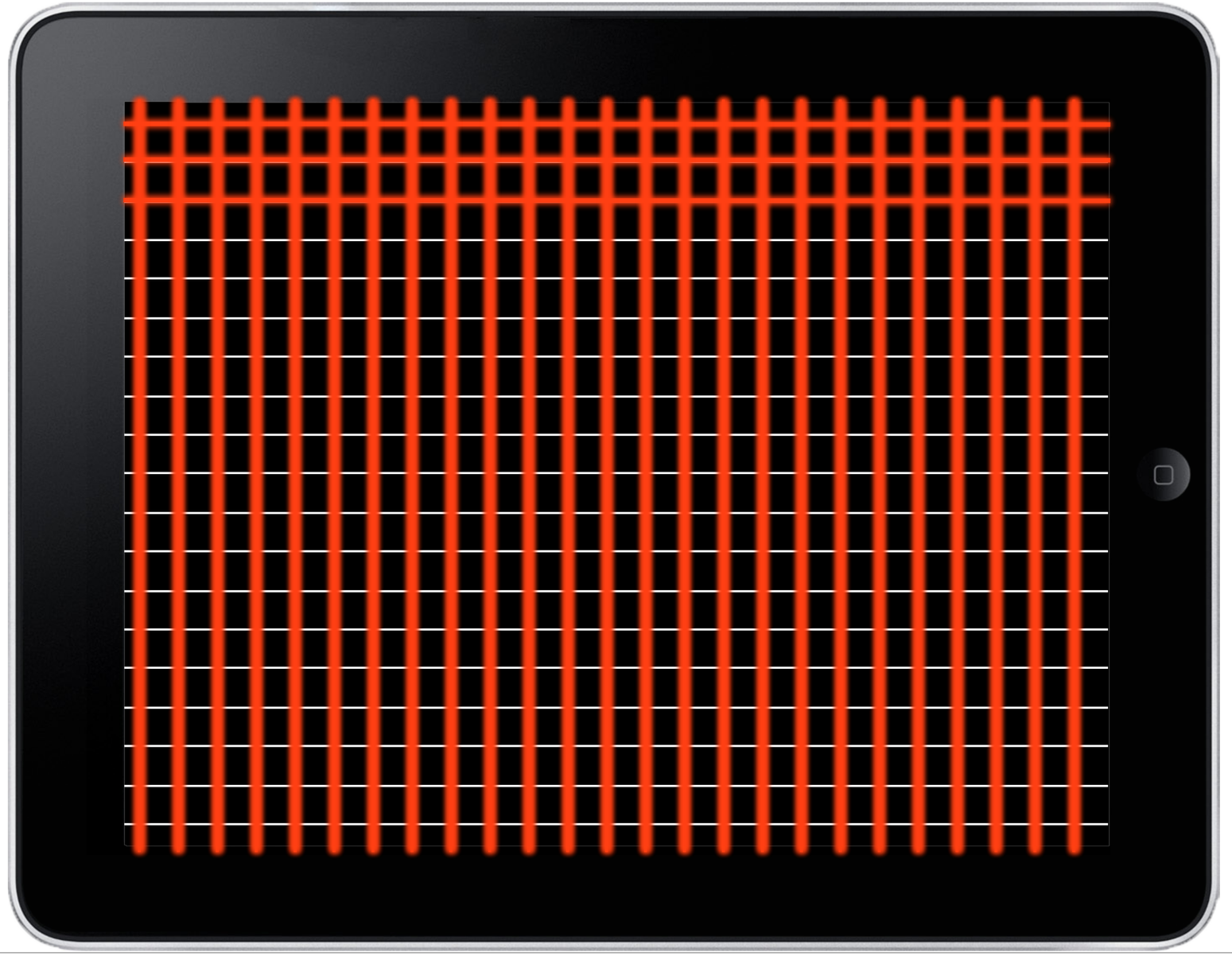
Receiving Electrodes

Transmitting Electrodes



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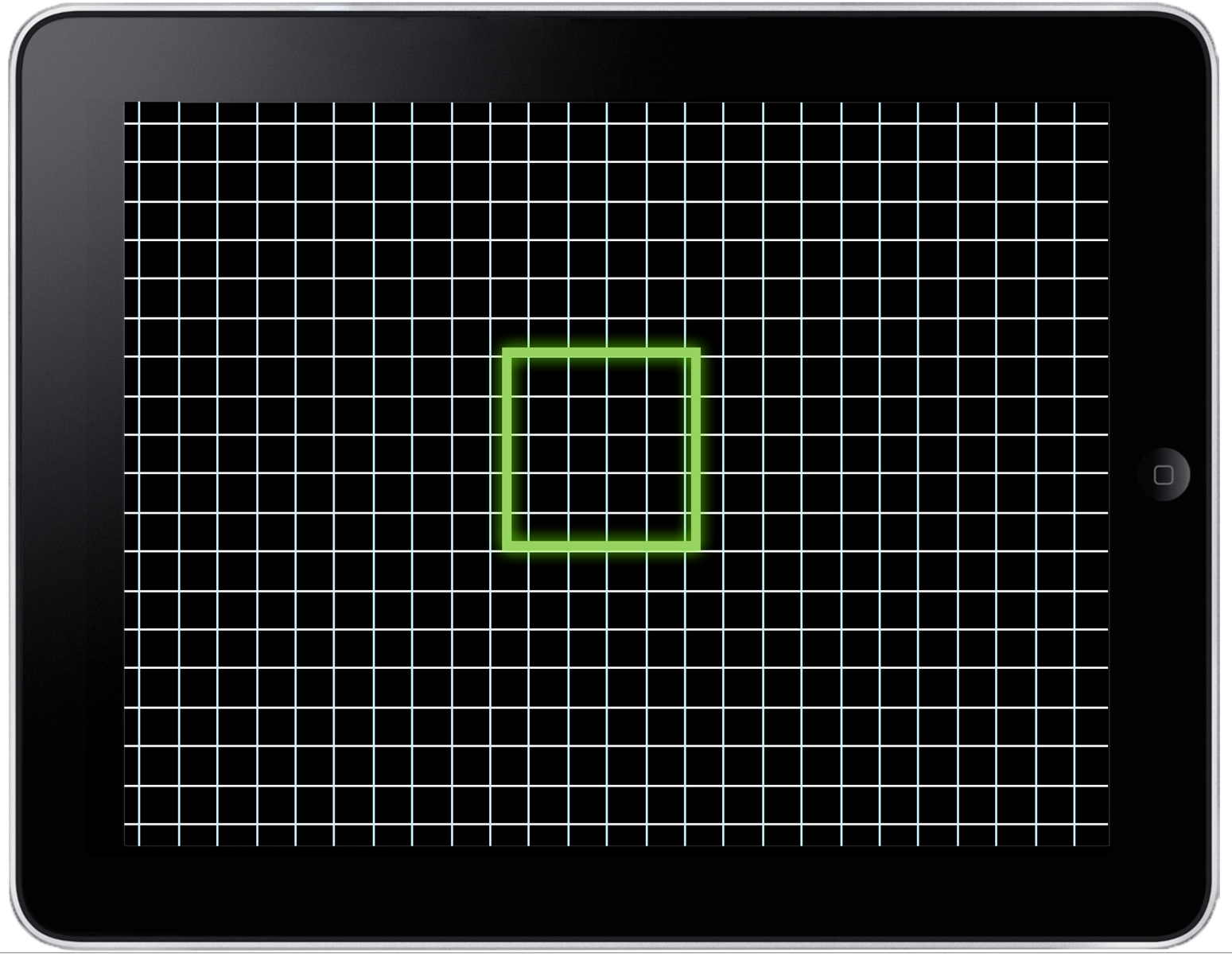

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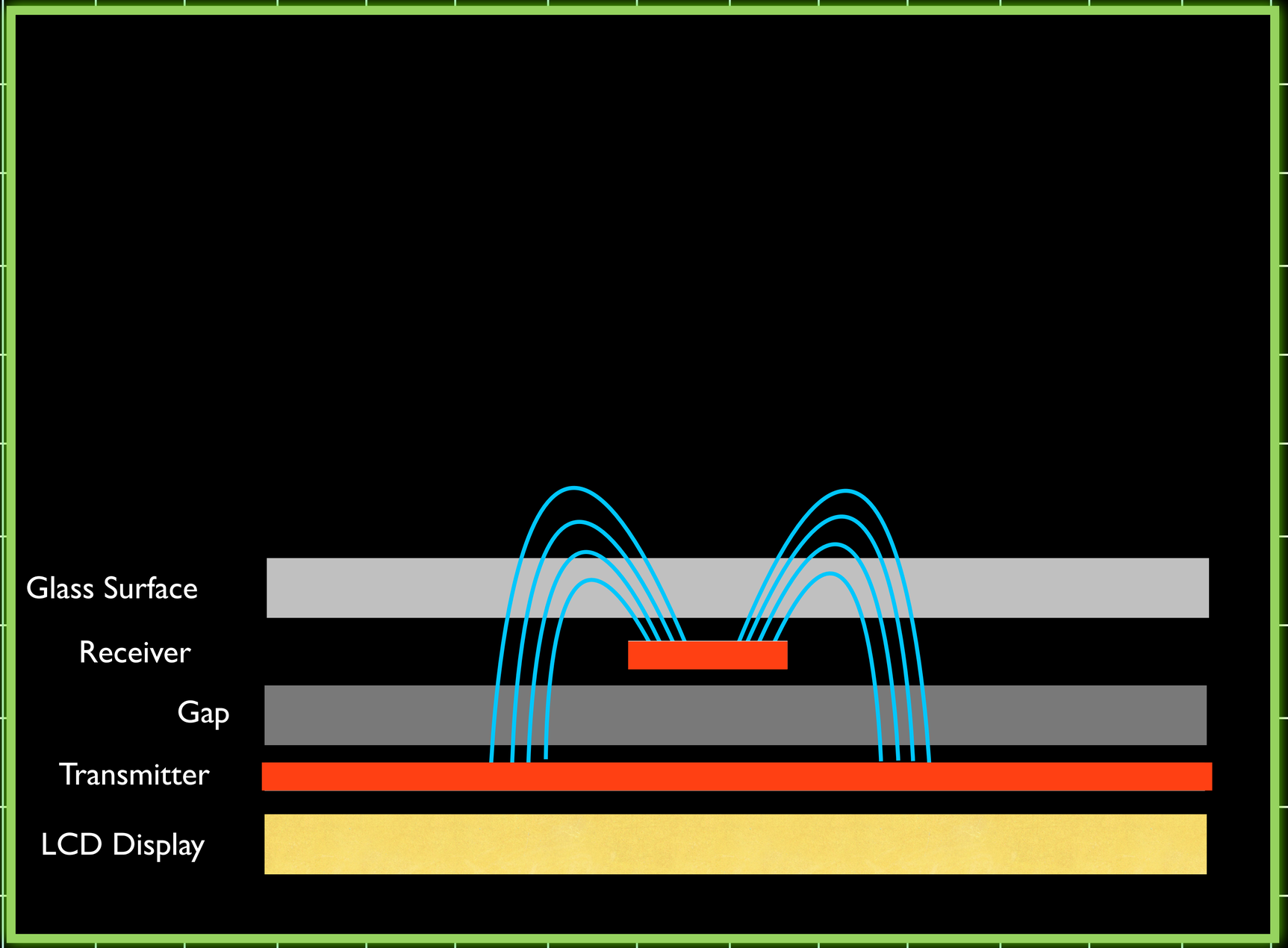
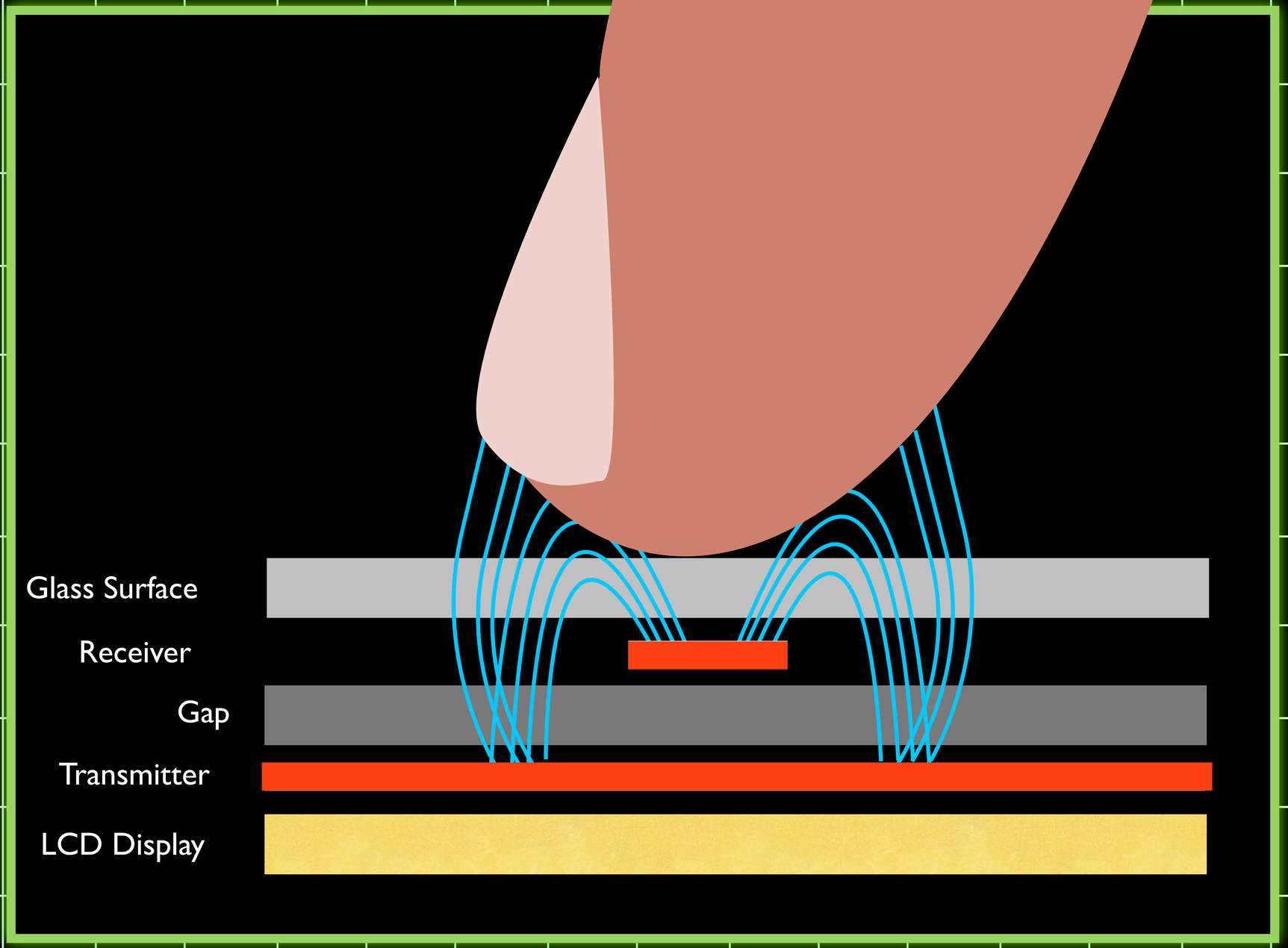

Glass Surface
Receiver
Gap
Transmitter
LCD Display


Glass Surface
Receiver
Gap
Transmitter
LCD Display

How to detect an object

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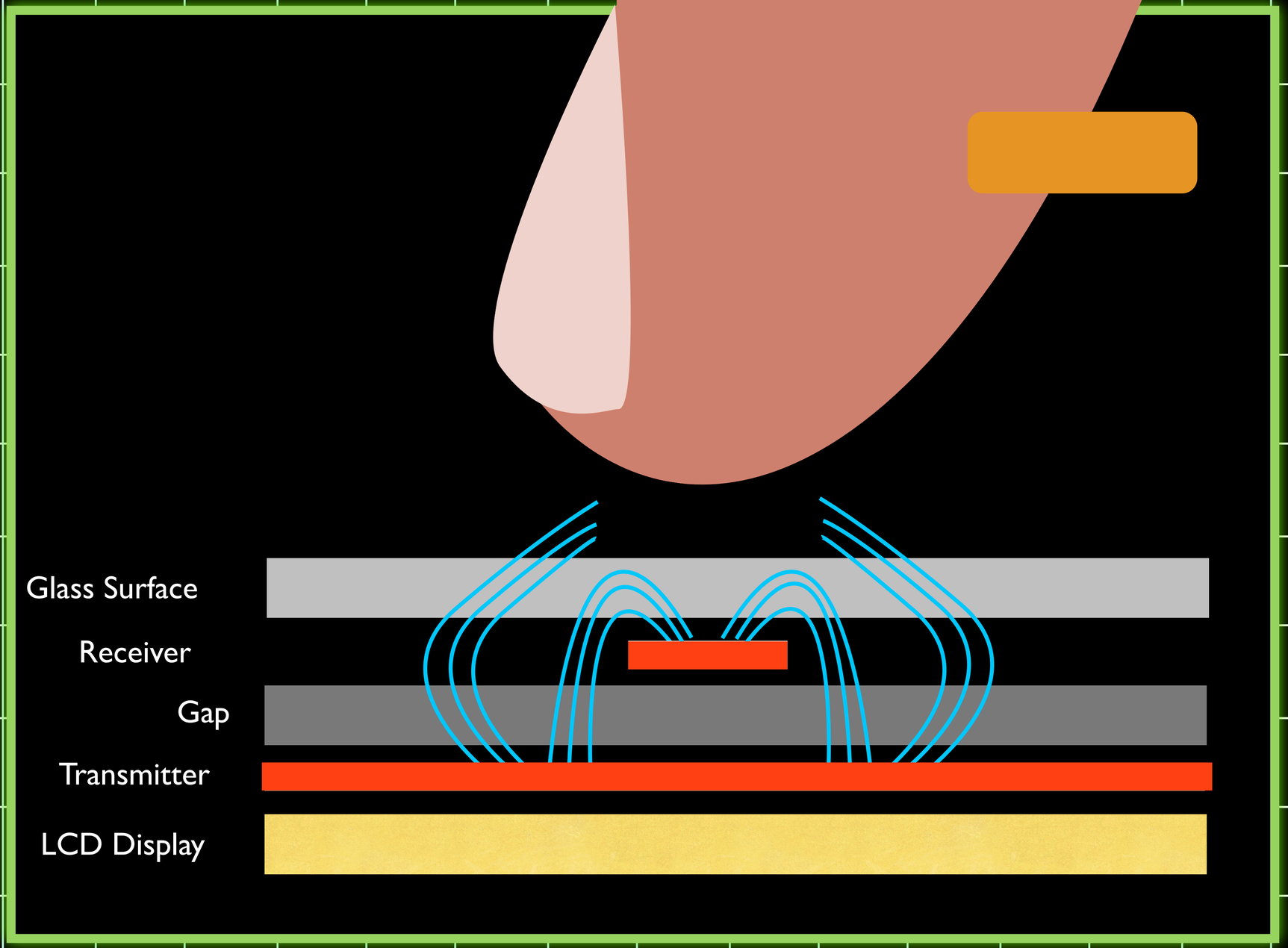
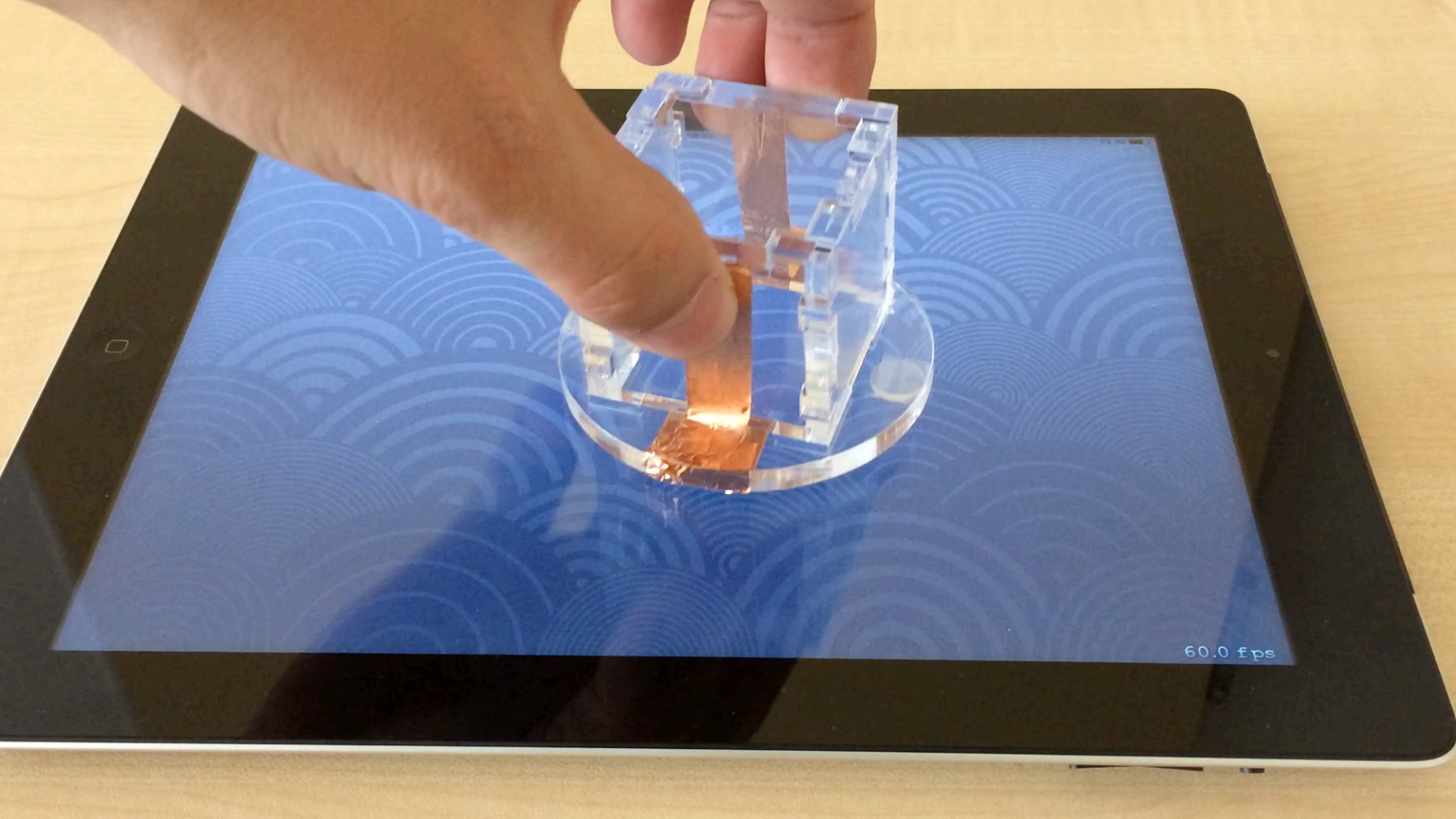

Glass Surface
Receiver
Gap
Transmitter
LCD Display


60.0 fps

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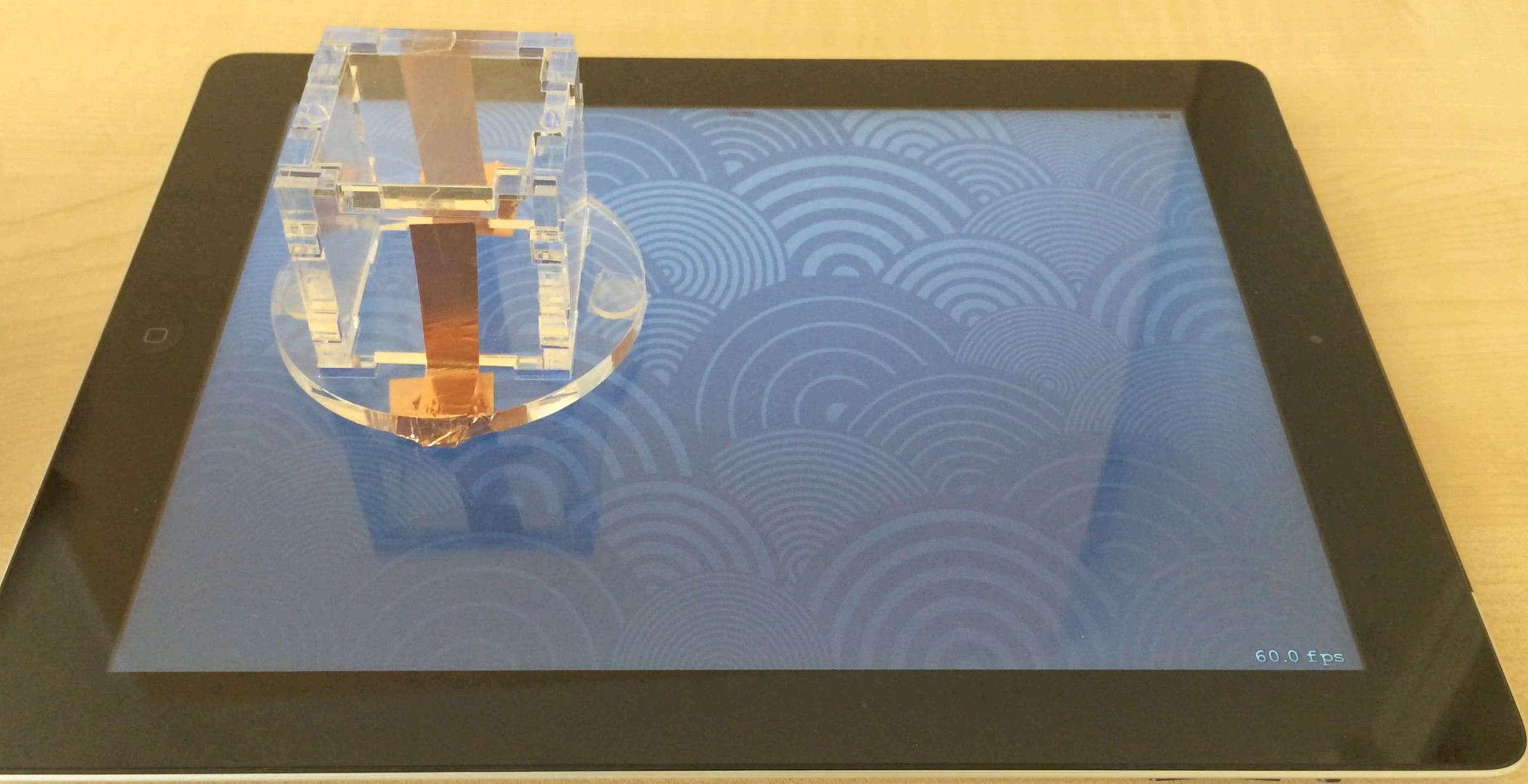
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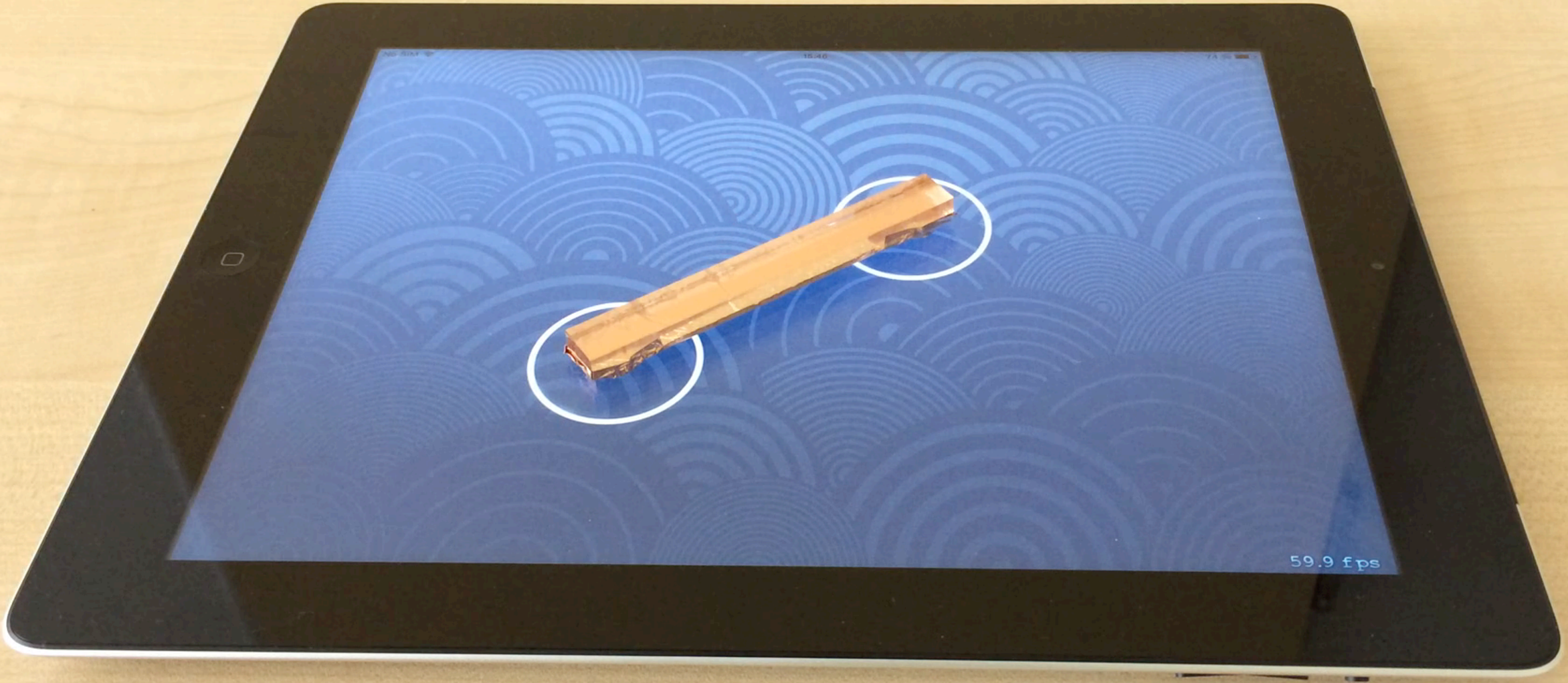
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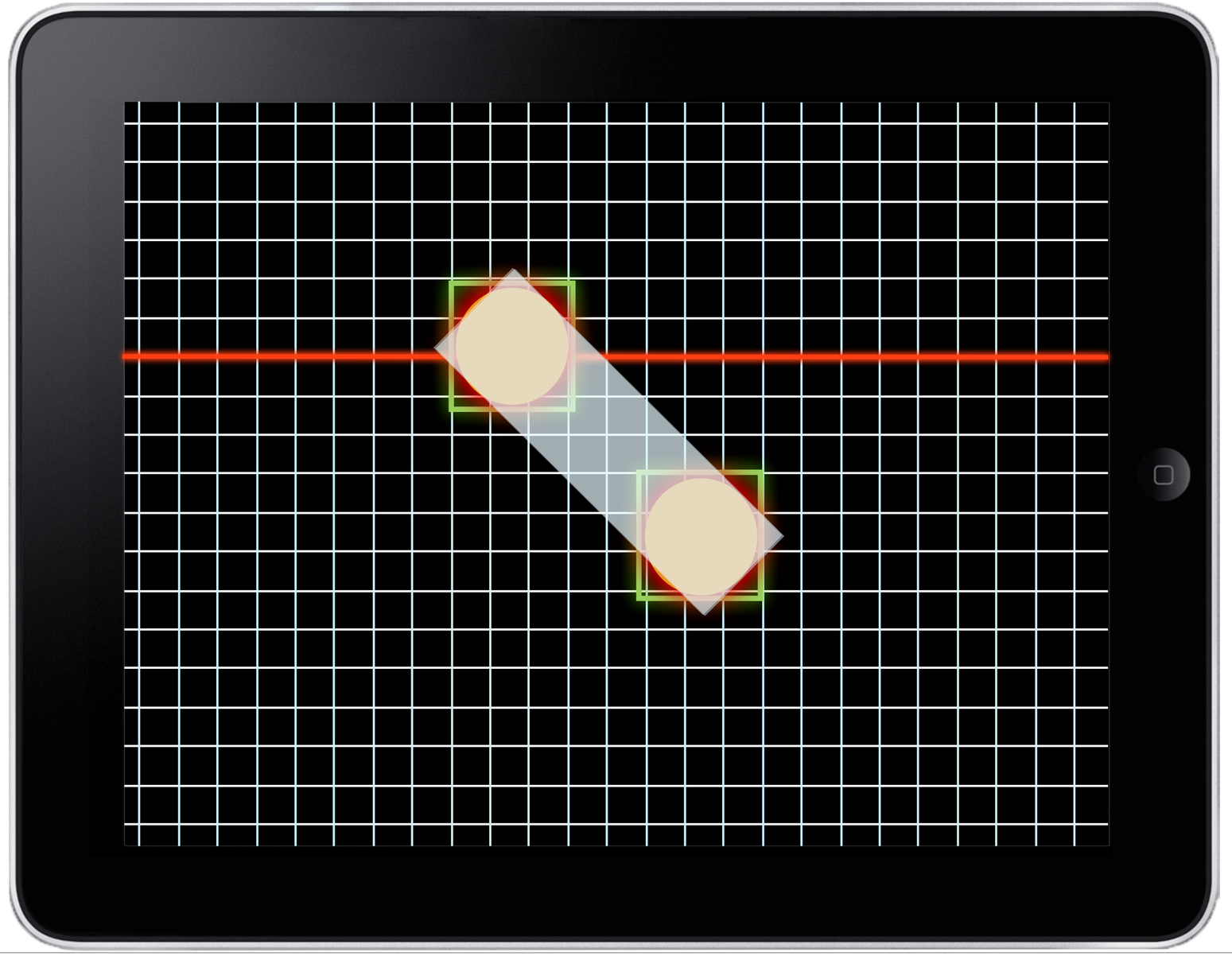

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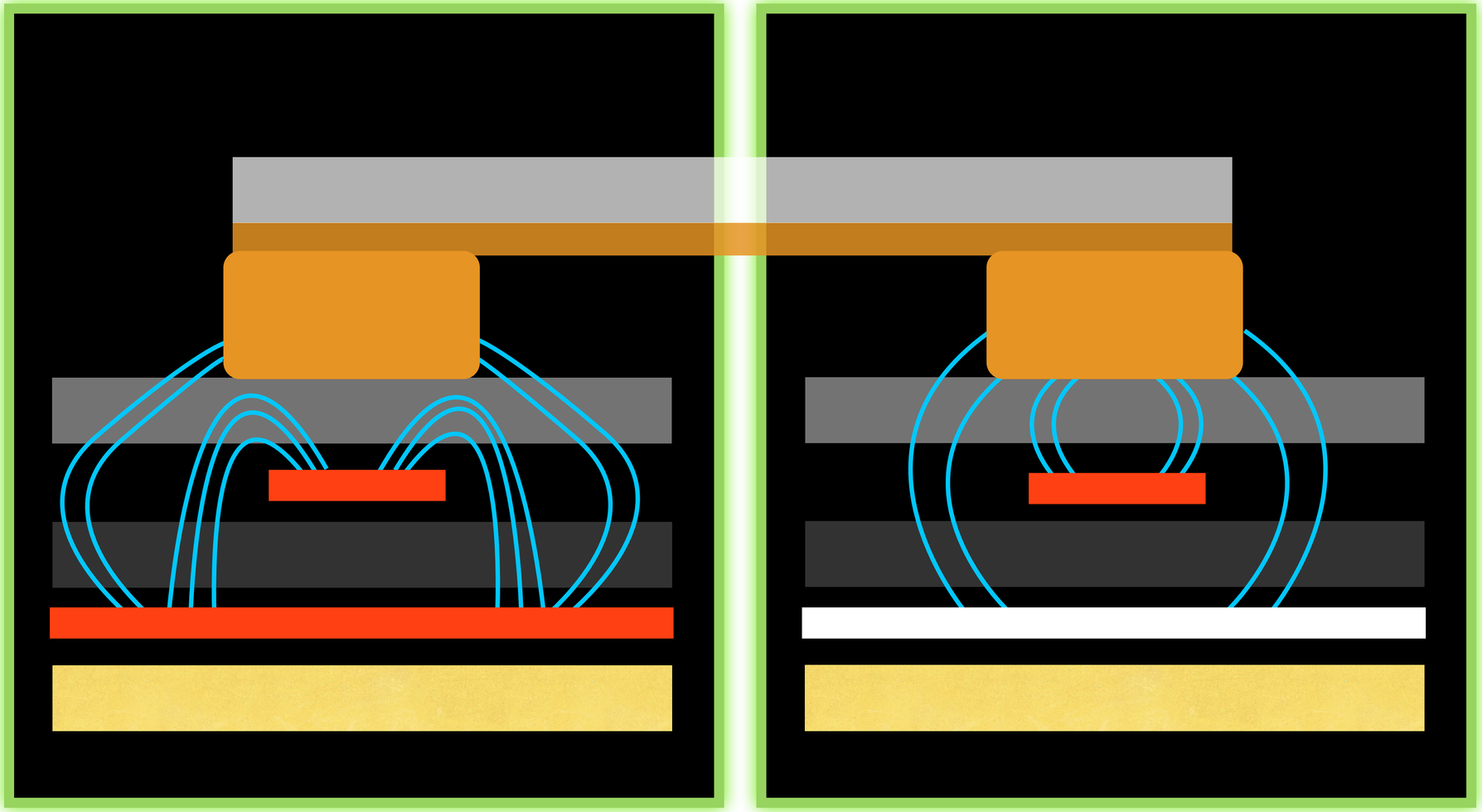

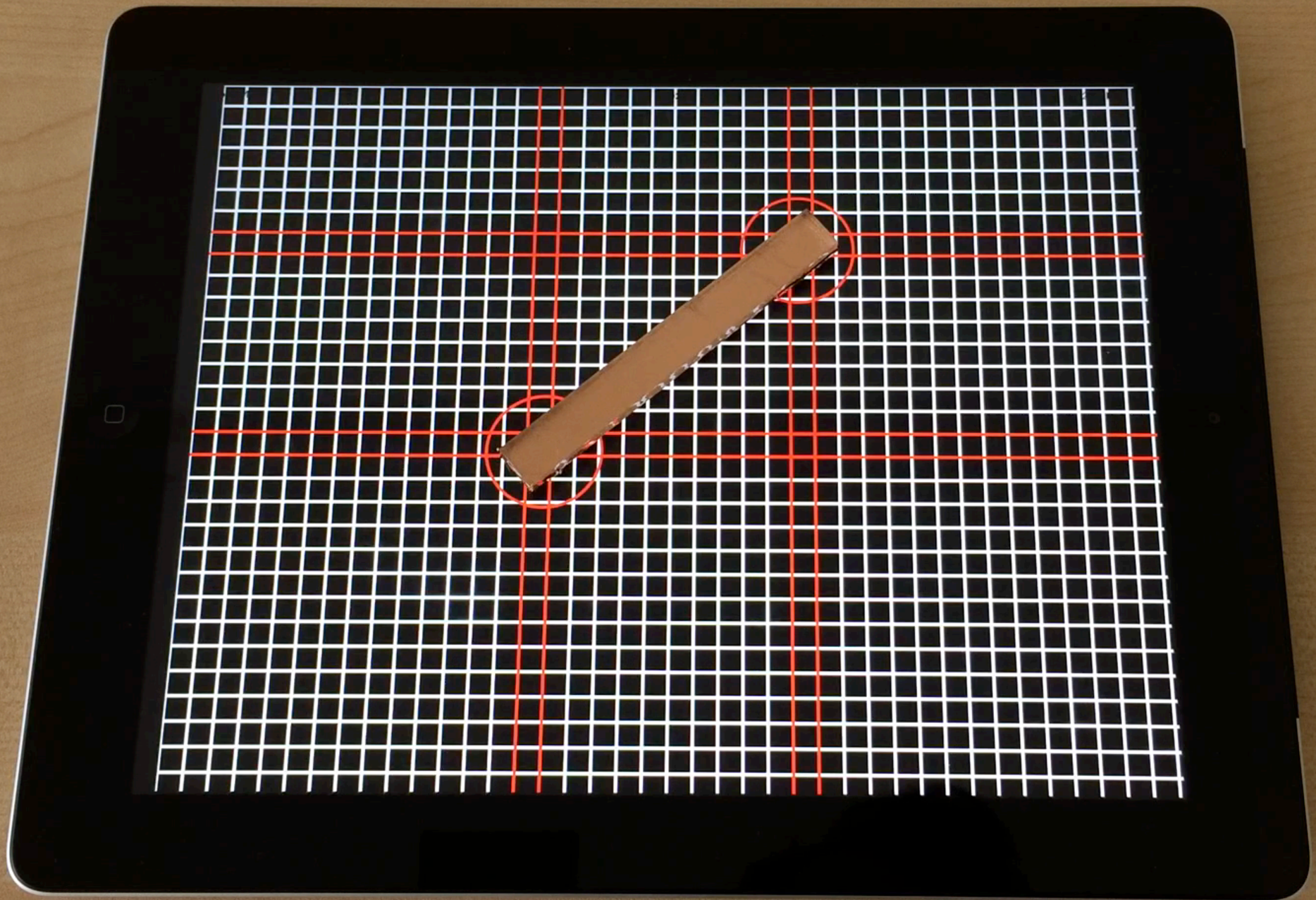

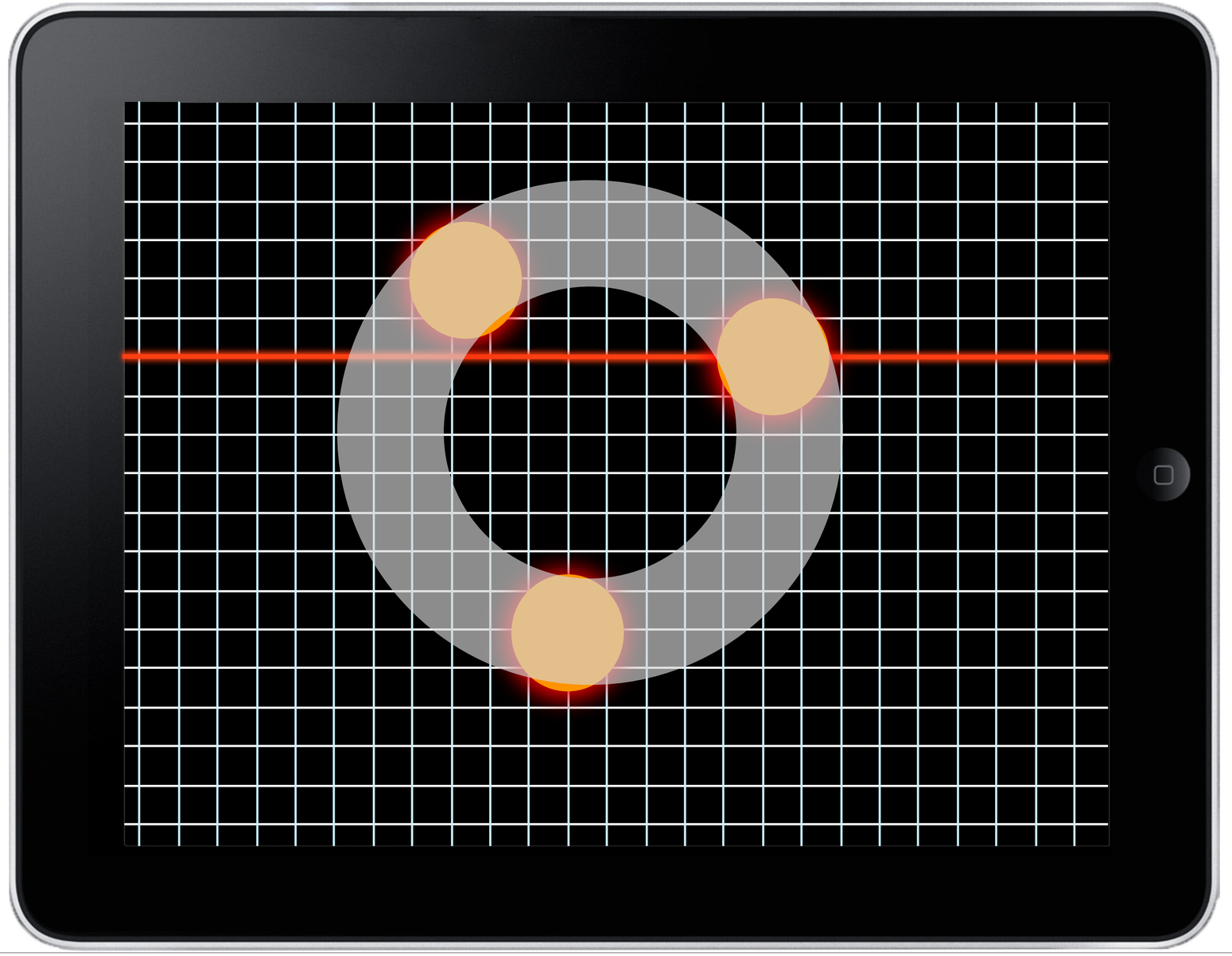

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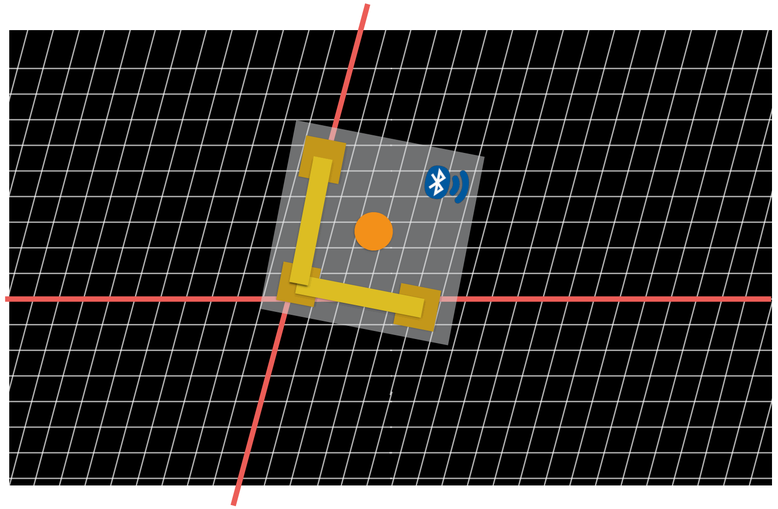
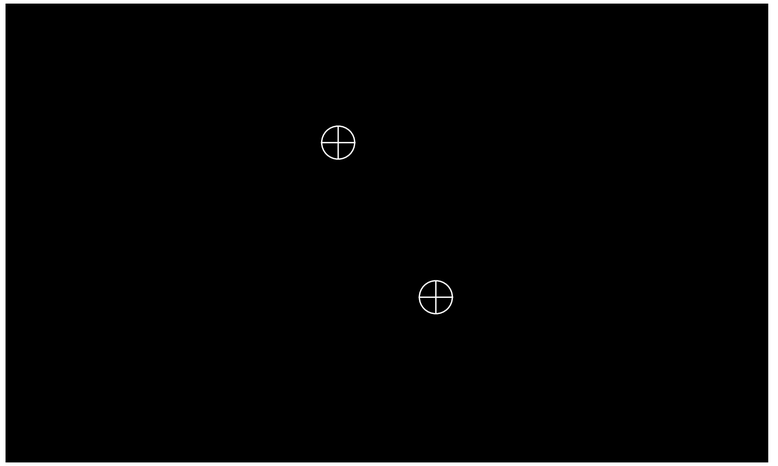
Problem: Adaptive filtering





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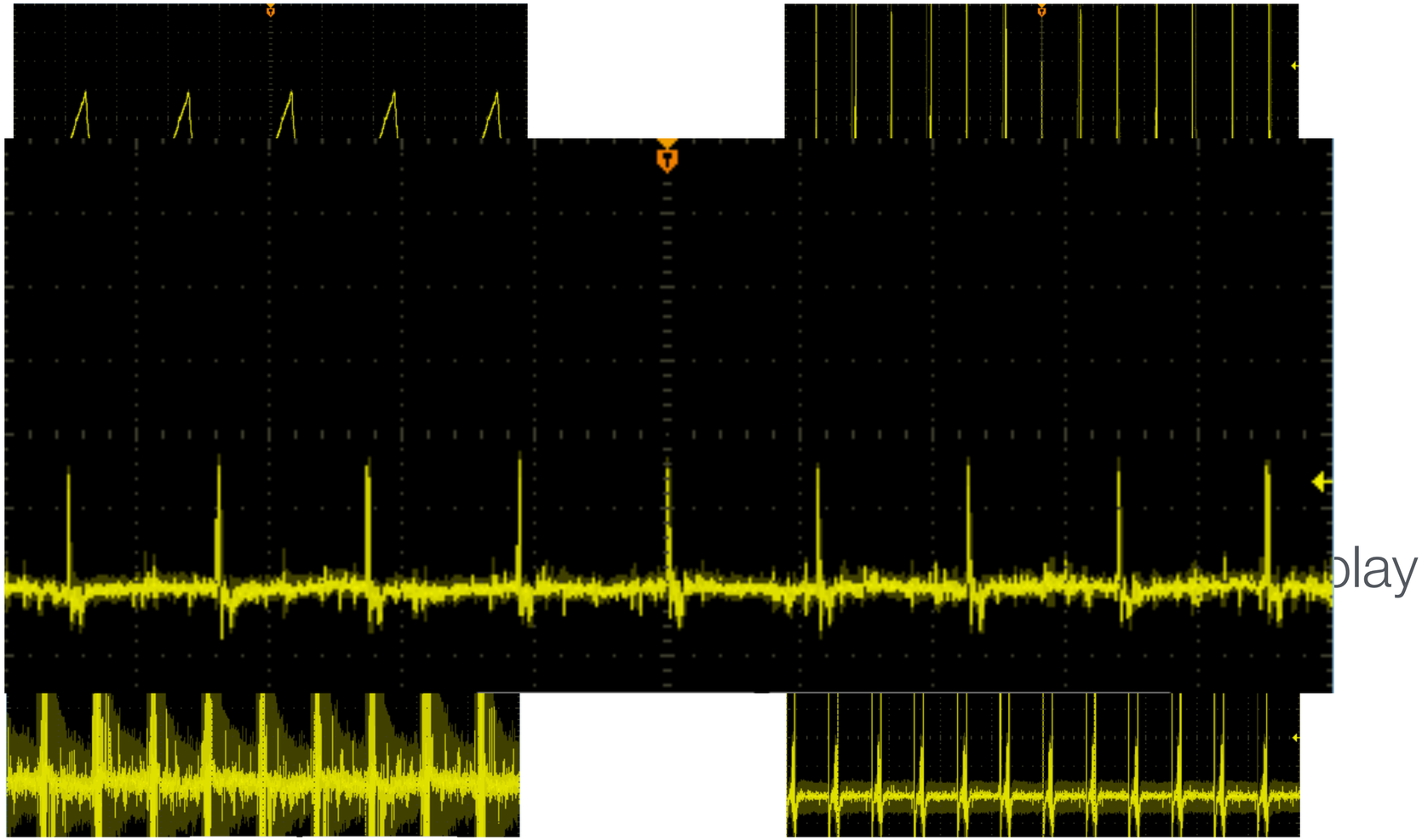
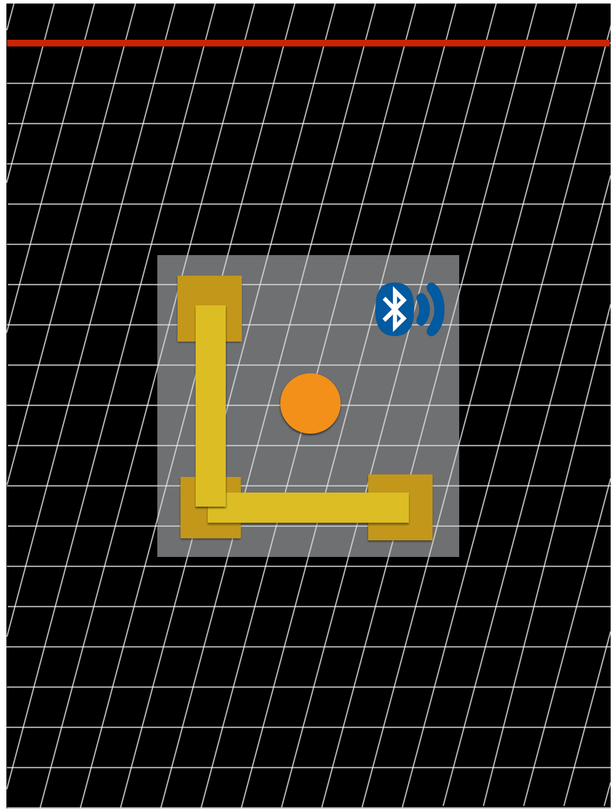
Scan line Signal

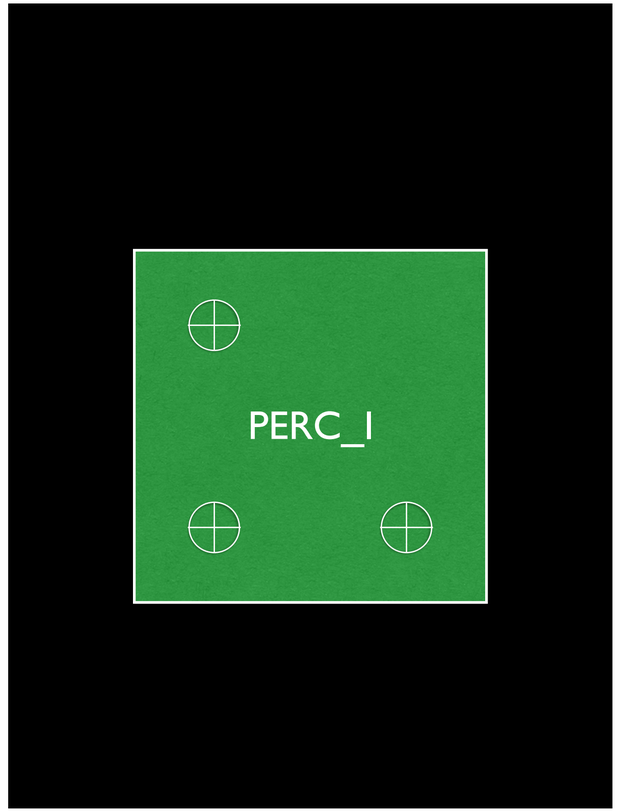


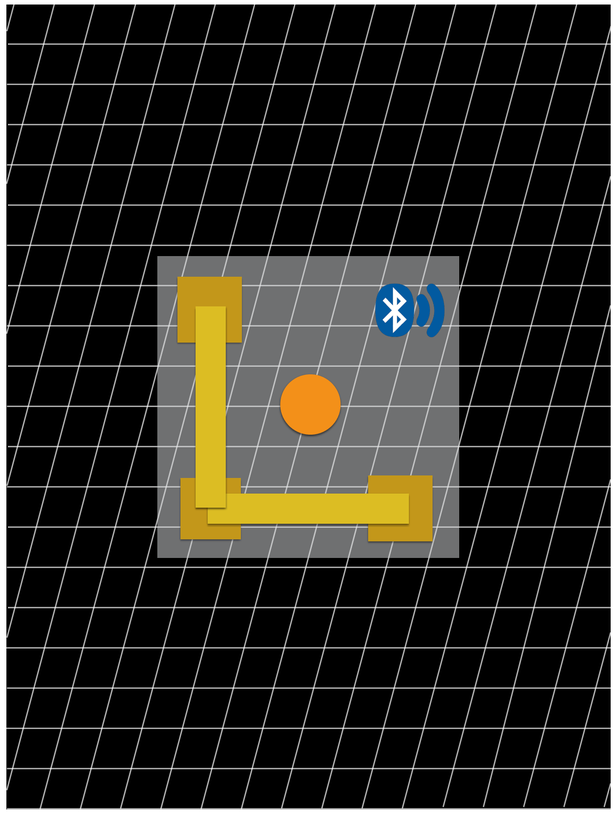
3M 46” Display

Microsoft 55” Display

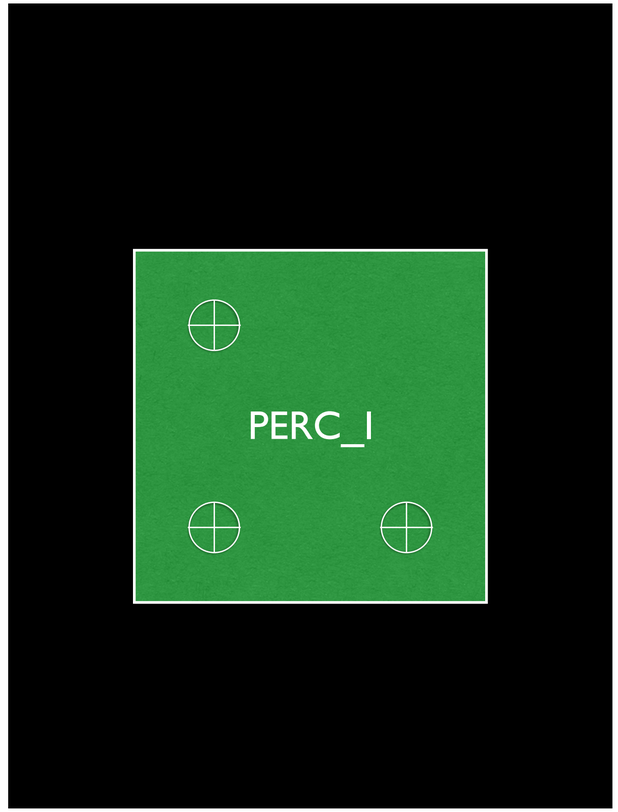


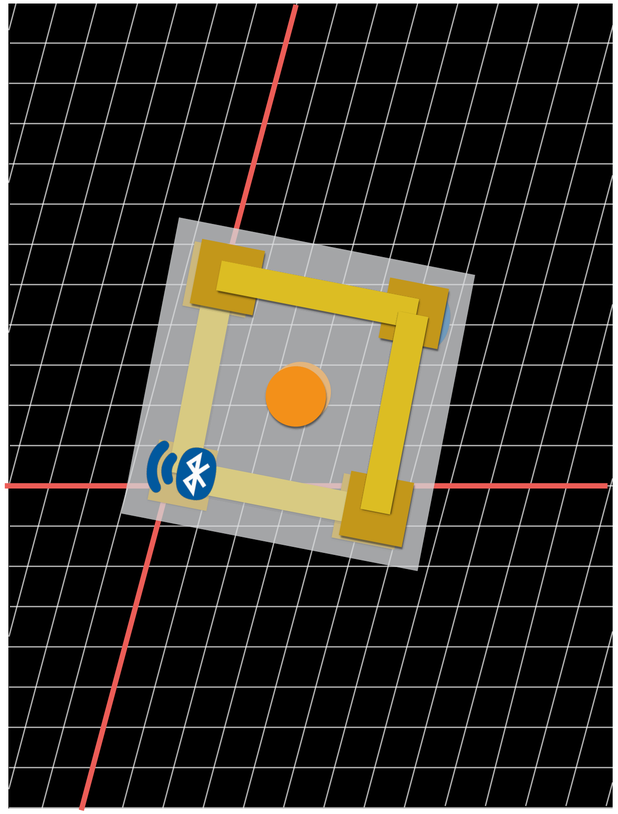
Tangible PERC_I **on** Surface



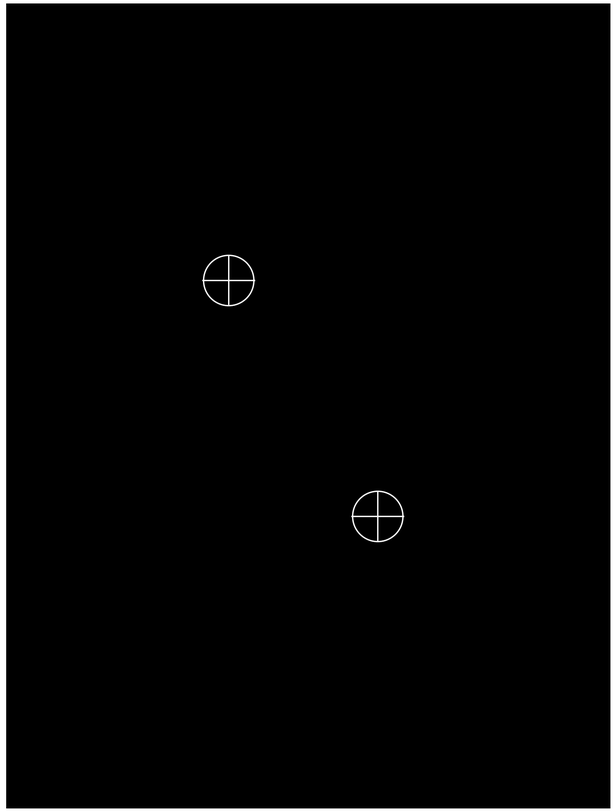


Tangible PERC_I **off** Surface





Tangible PERC_I **on** Surface



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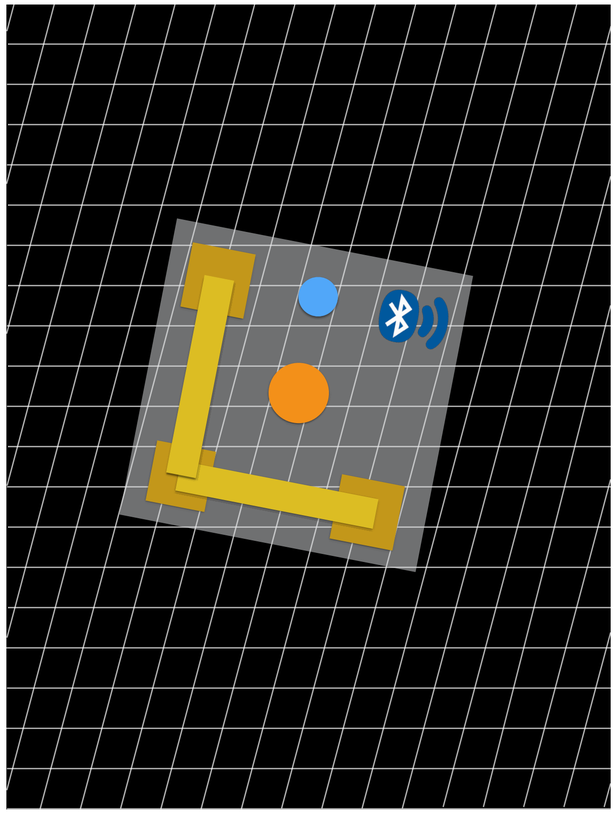
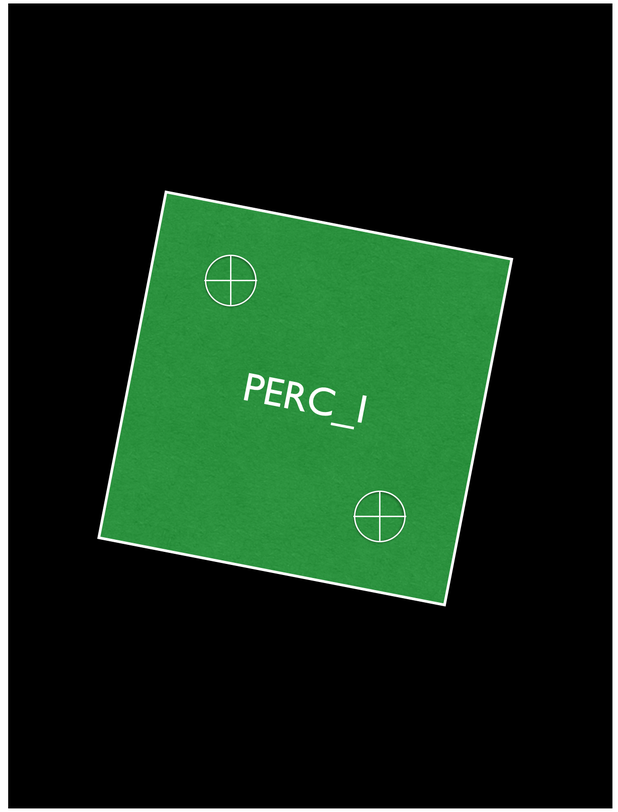
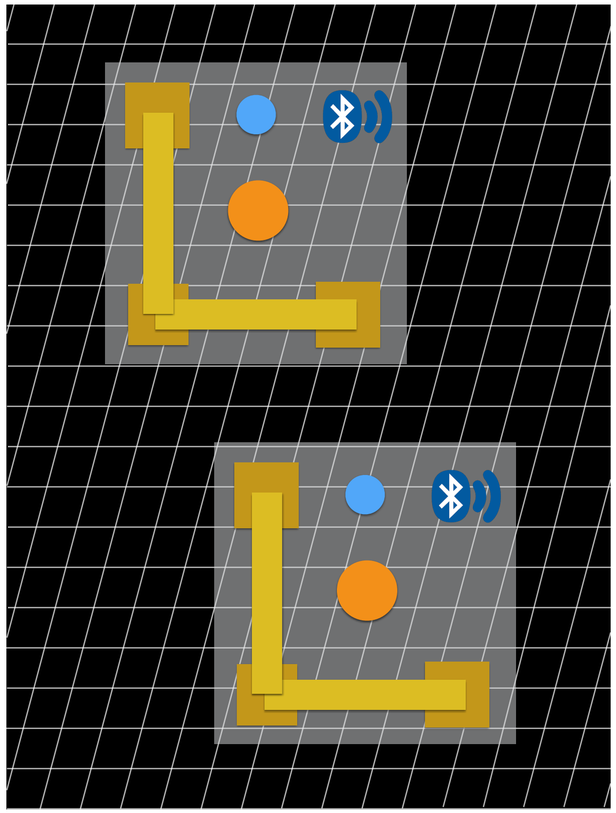


Tangible PERC_I **on** Surface

Color changed

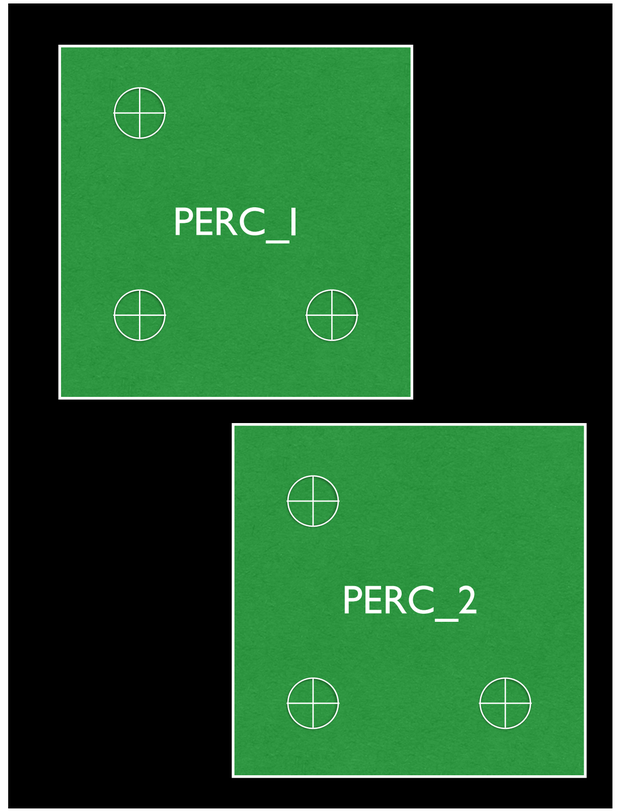




Tangible PERC_1 **on** Surface

PERC_1 **Color**

Tangible PERC_2 **on** Surface



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CHAPTER 2

Tangible Applications

Tangible Awareness
[Cherek et al. CHI 2018]

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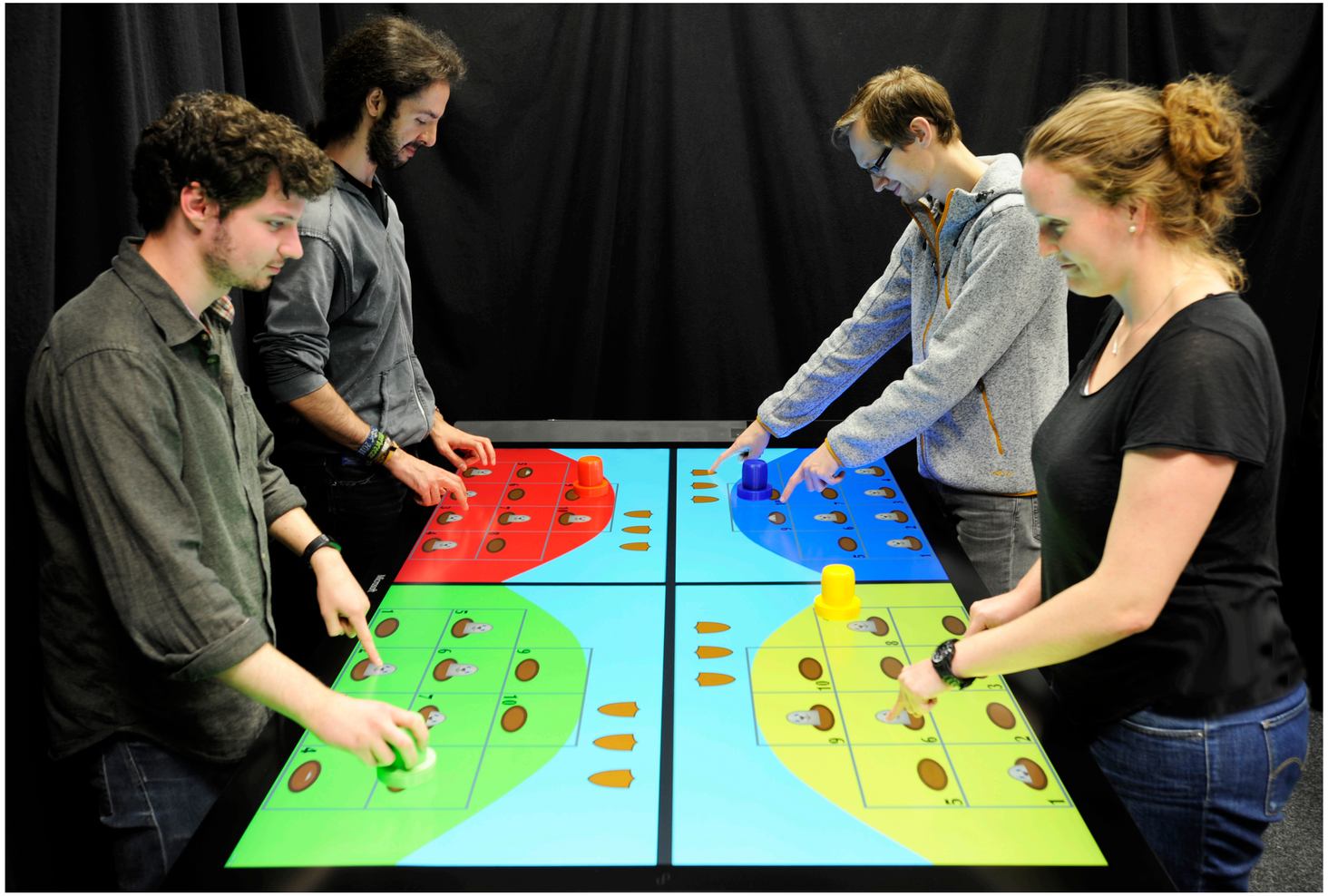
Tangible Awareness



Evaluating tangibles impact on user awareness

Tangible Awareness
Cherek et al.
CHI 2018

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Tangible Awareness:
How Tangibles on Tabletops Influence Awareness of Each Other's Actions

Christian Cherek — Anke Brocker — Simon Voelker — Jan Borchers

hci.rwth-aachen.de/TangibleAwareness

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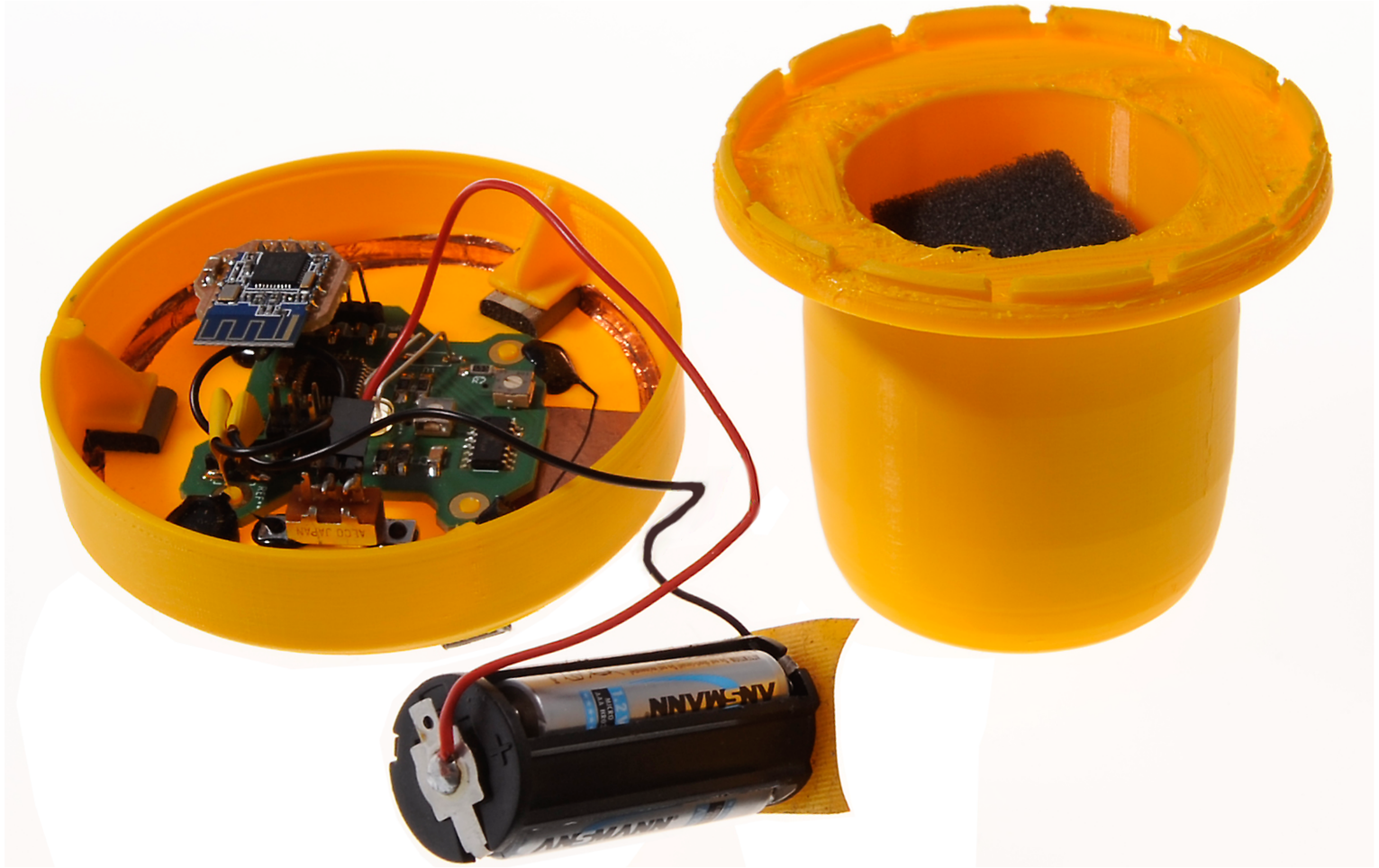
Tangible Awareness



Evaluating tangibles impact on user awareness

Tangible Awareness
Cherek et al.
CHI 2018

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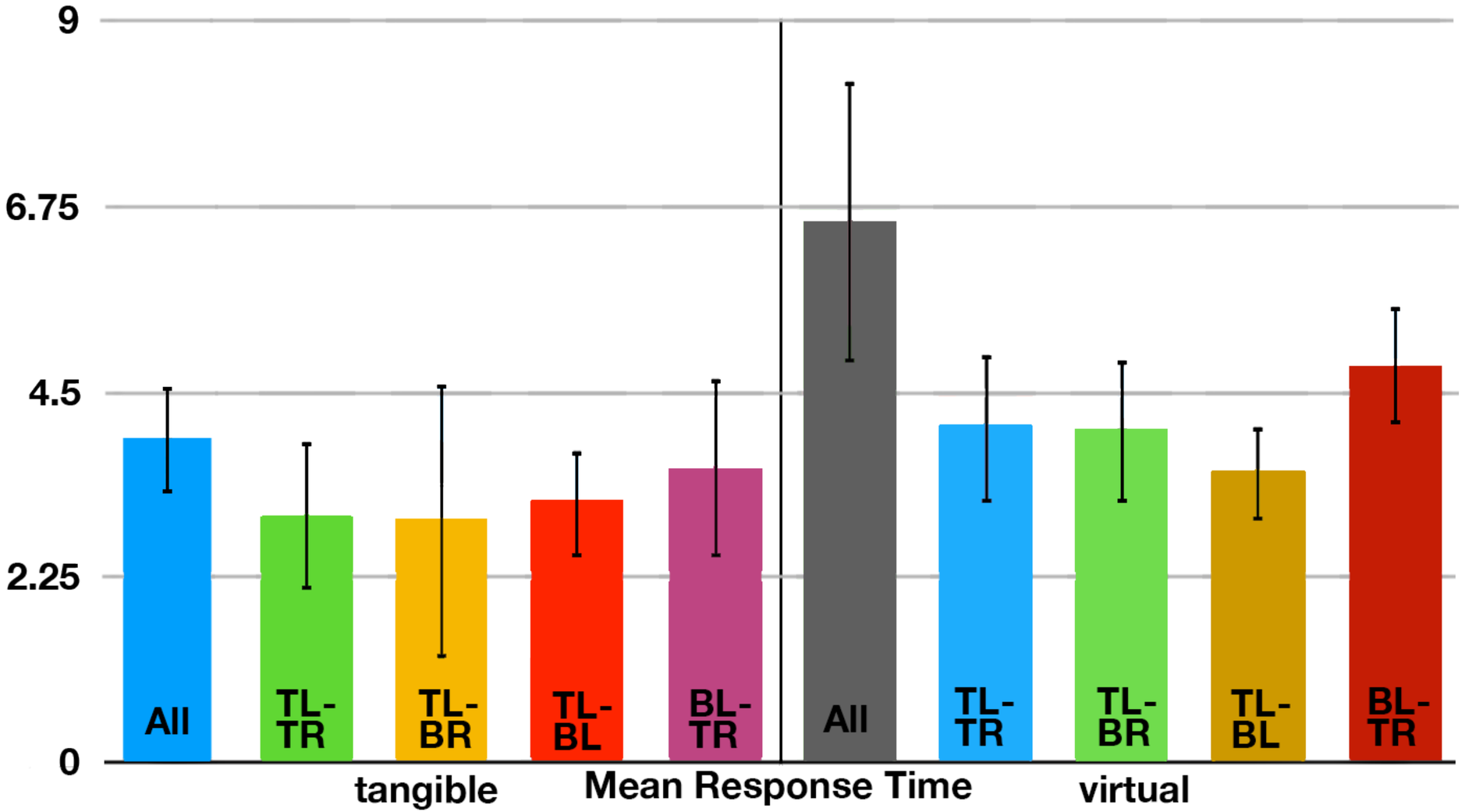
Tangible Awareness



People reacted significantly faster in the Tangible Conditions

Tangible Awareness
Cherek et al.
CHI 2018

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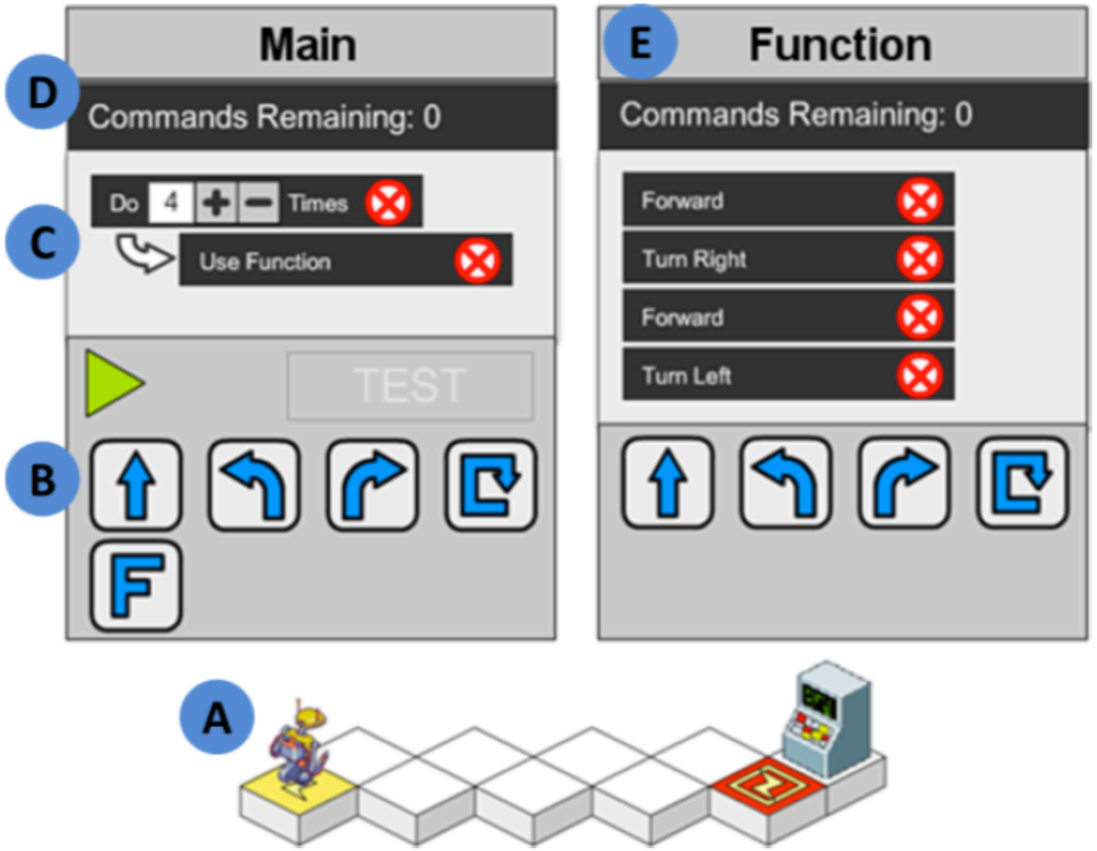
Bots & Mainframes



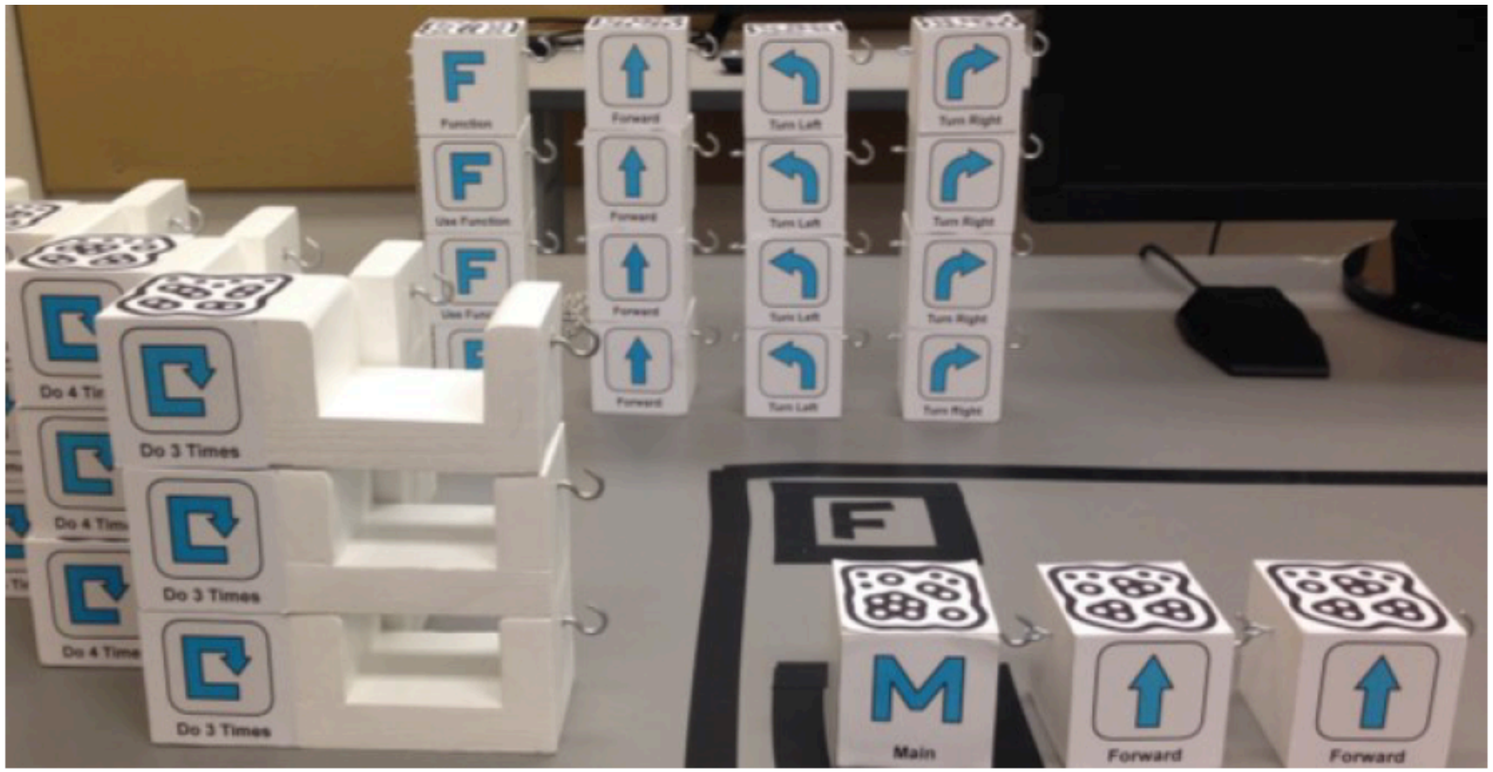
Programming Interface

Impact of Tangibles in an Educational Programming Game

Bots & Mainframes
Melcer, Isbister
CHI 2018

RWTH AACHEN UNIVERSITY

Bots & Mainframes



Tangible Version

Impact of Tangibles in an Educational Programming Game

Bots & Mainframes
Melcer, Isbister
CHI 2018

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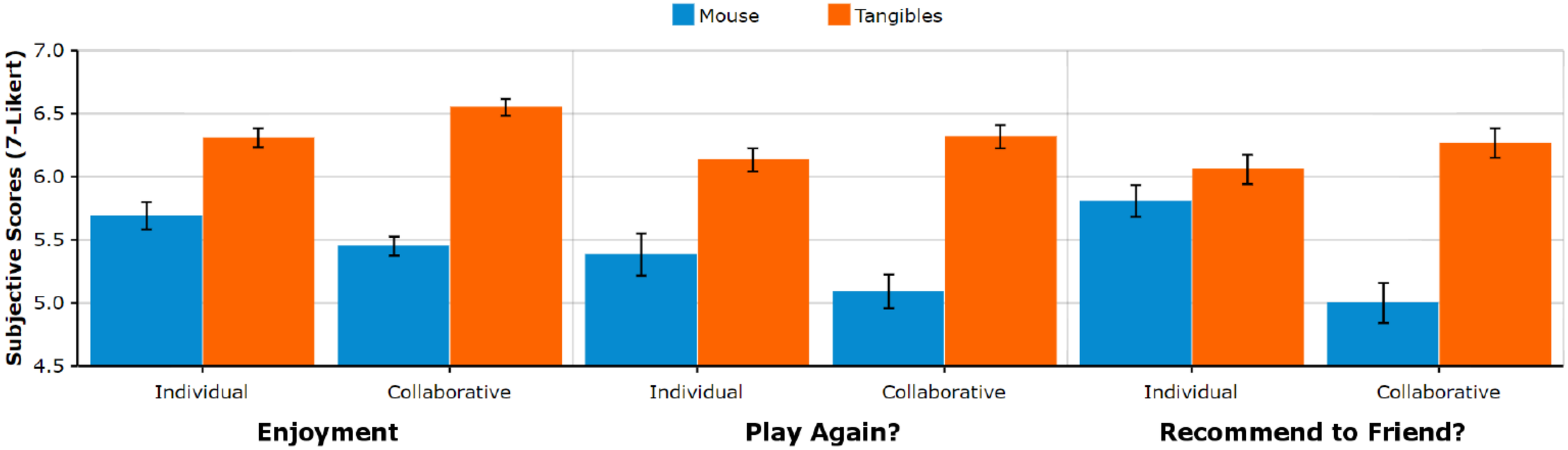
Bots & Mainframes



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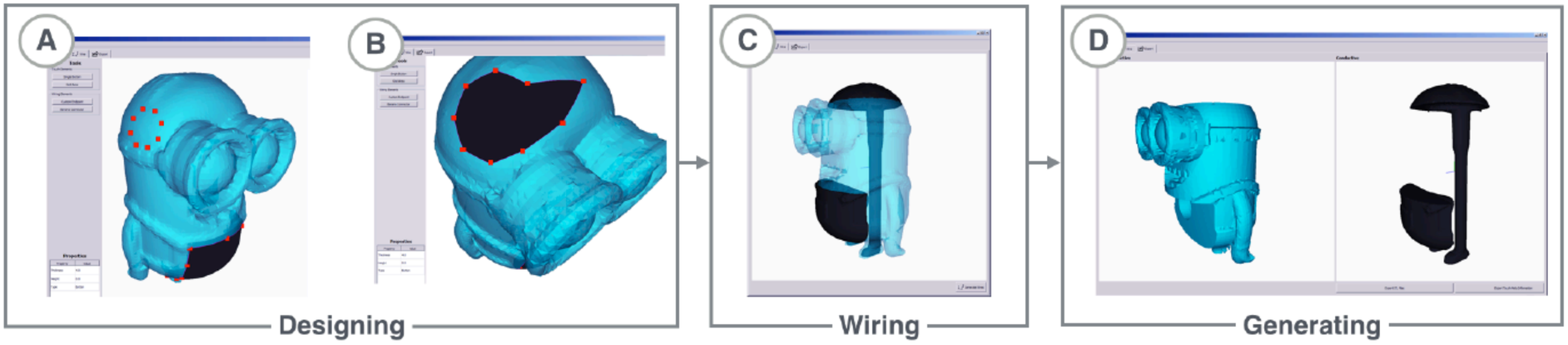
Capricate: Fabrication Pipeline



Design and 3D print capacitive Touch Sensors for interactive Objects

Capricate
Schmitz et al.
CHI 2018

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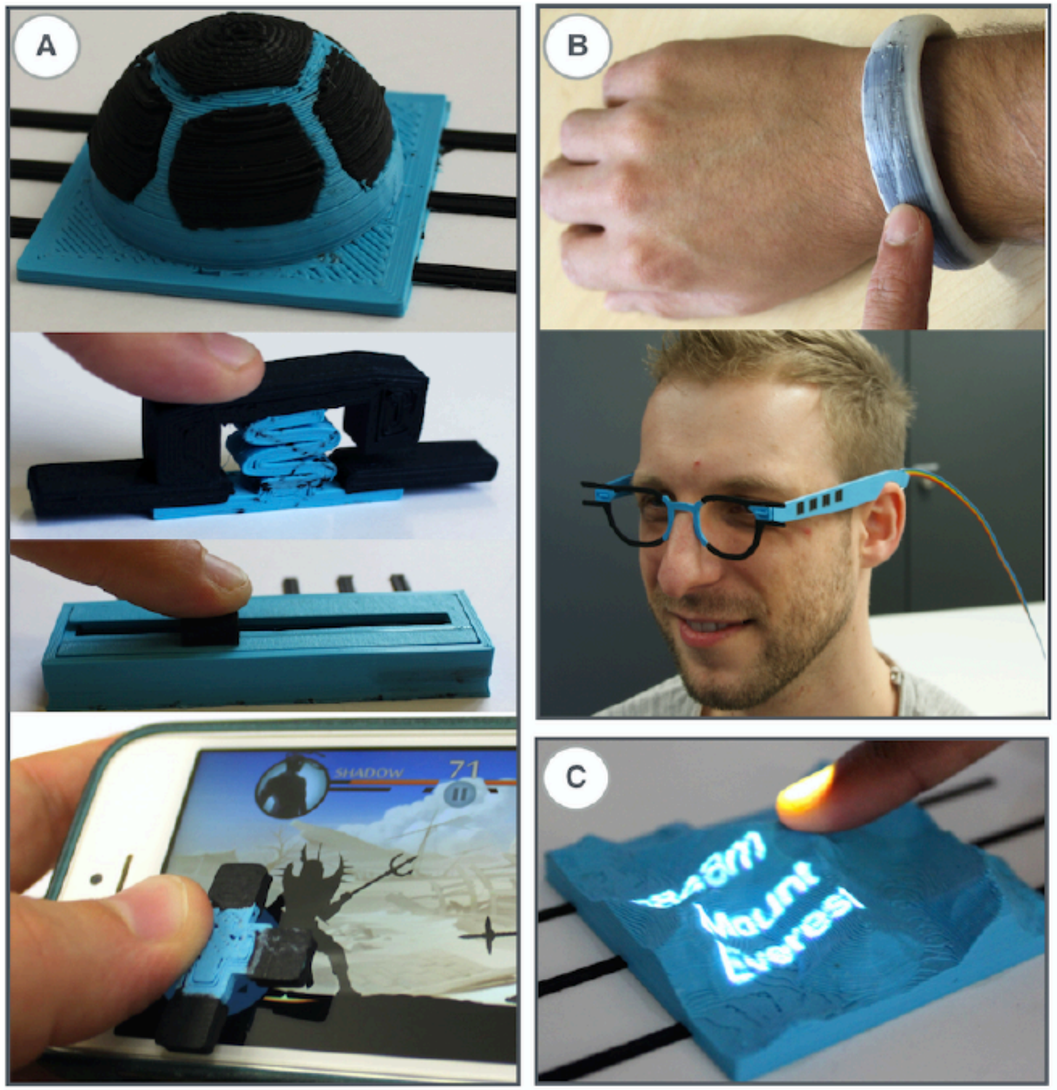
Capricate: Fabrication Pipeline



Example Objects: Input Devices, Wearables, printed TUIs

Capricate
Schmitz et al.
CHI 2018

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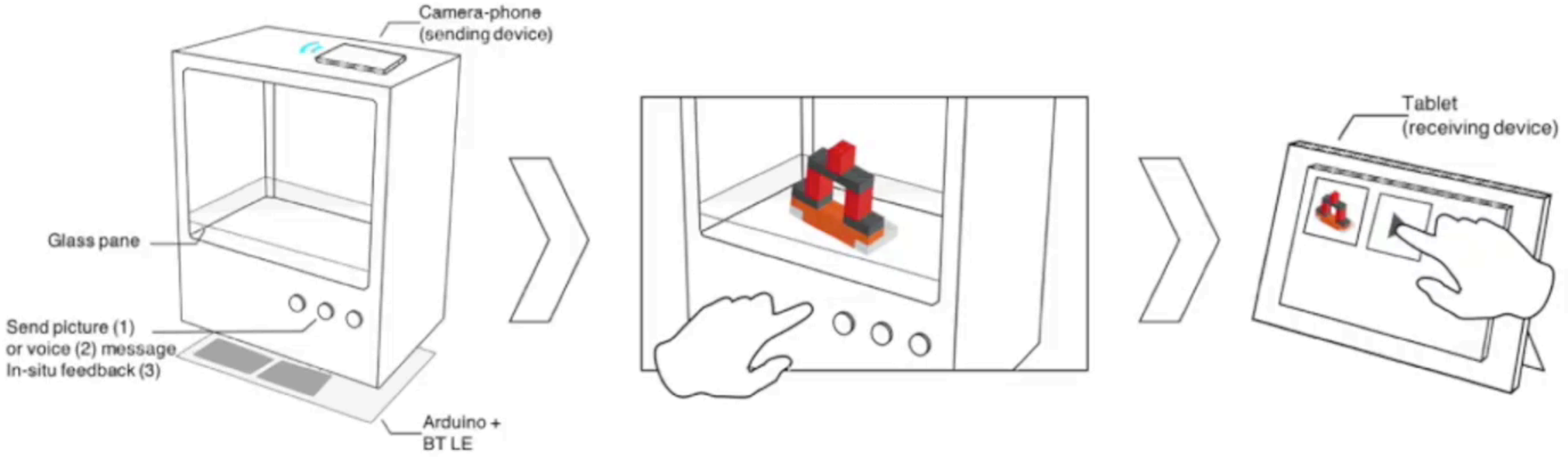
Supporting Communication between Grandparents and Grandchildren through Tangible Storytelling Systems

Torben Wallbaum, Andrii Matviienko, Swamy Ananthanarayan,
Thomas Olsson, Wilko Heuten, Susanne CJ Boll

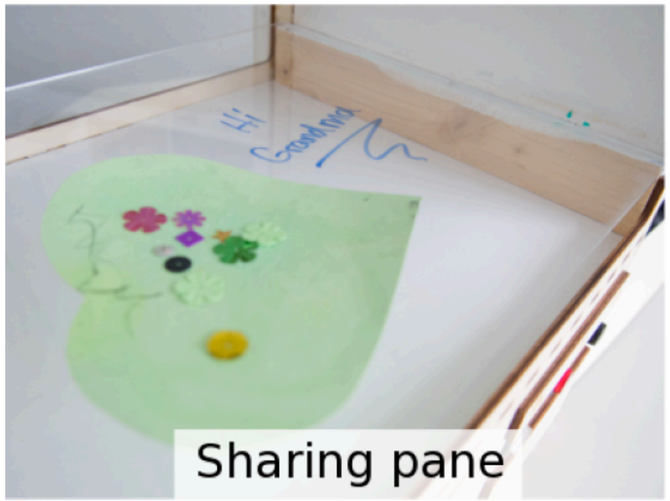


Music: https://www.bensound.com

Supporting Communication between Grandparents and Grandchildren

StoryBox setup

Control buttons


Sharing pane

StoryBox: top view

‘StoryBox’: Tangible storytelling system to ease communication

Supporting Communication
Wallbaum et al.
CHI 2018

RWTH AACHEN UNIVERSITY

Interested to join ongoing research in the area of Personal Fabrication?

Contact
Anke Brocker
brocker@cs.rwth-aachen.de