

Let's get Physical

Prof. Reto Wettach

Berlin, June 18, 2014

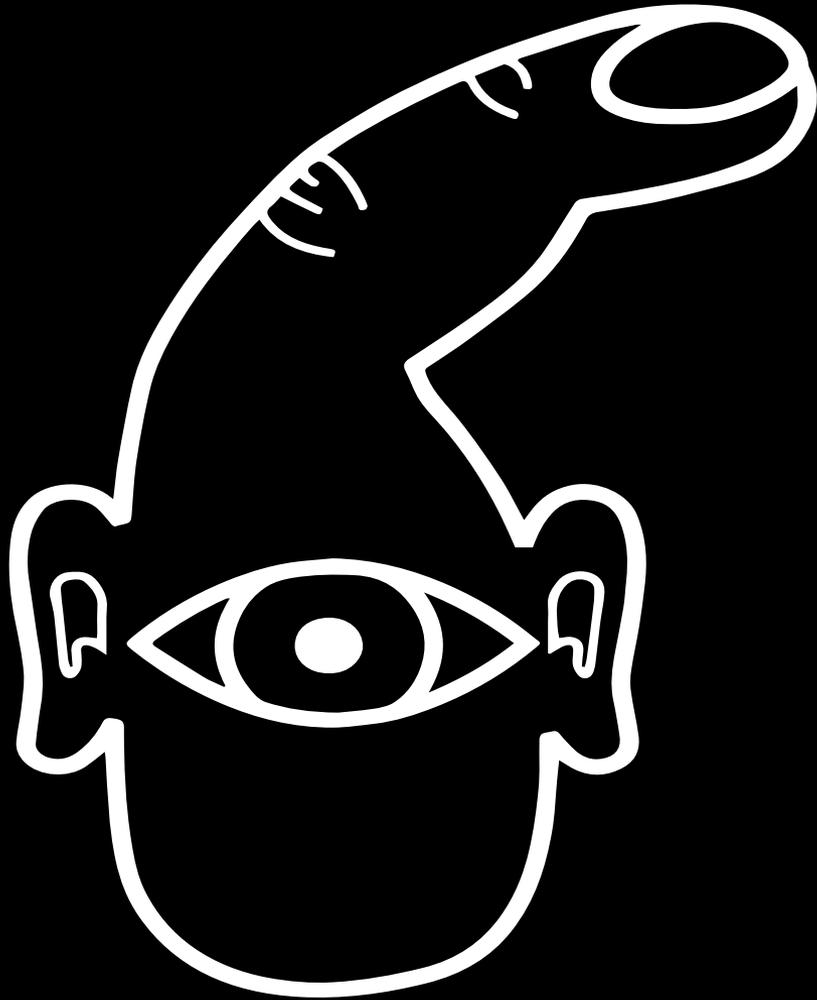
confidential content



Let's get Physical!

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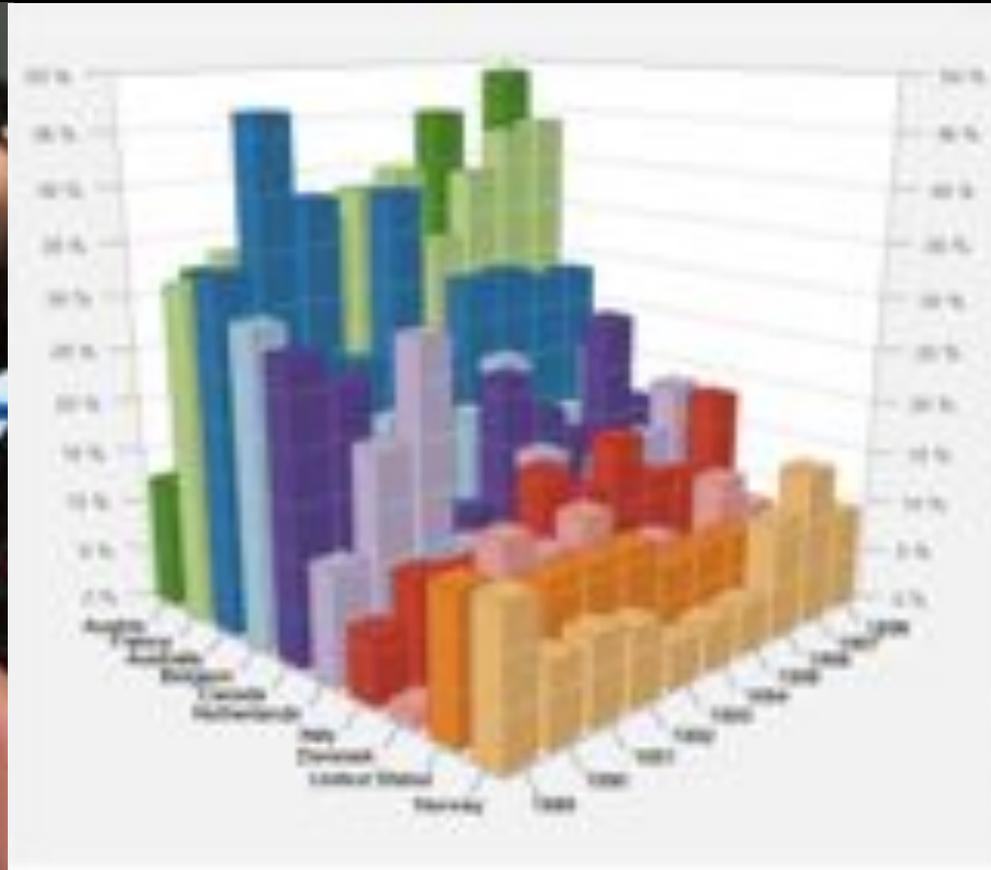
We are Humans!



T. Igoe: "What does a person look like to a computer?", 2000

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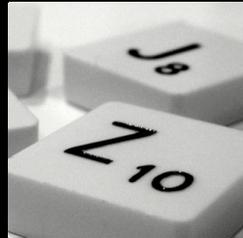
We act in the world with our entire body!



Yvonne Jansen et al.: Evaluating the Efficiency of Physical Visualizations , 2013

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7 Insights



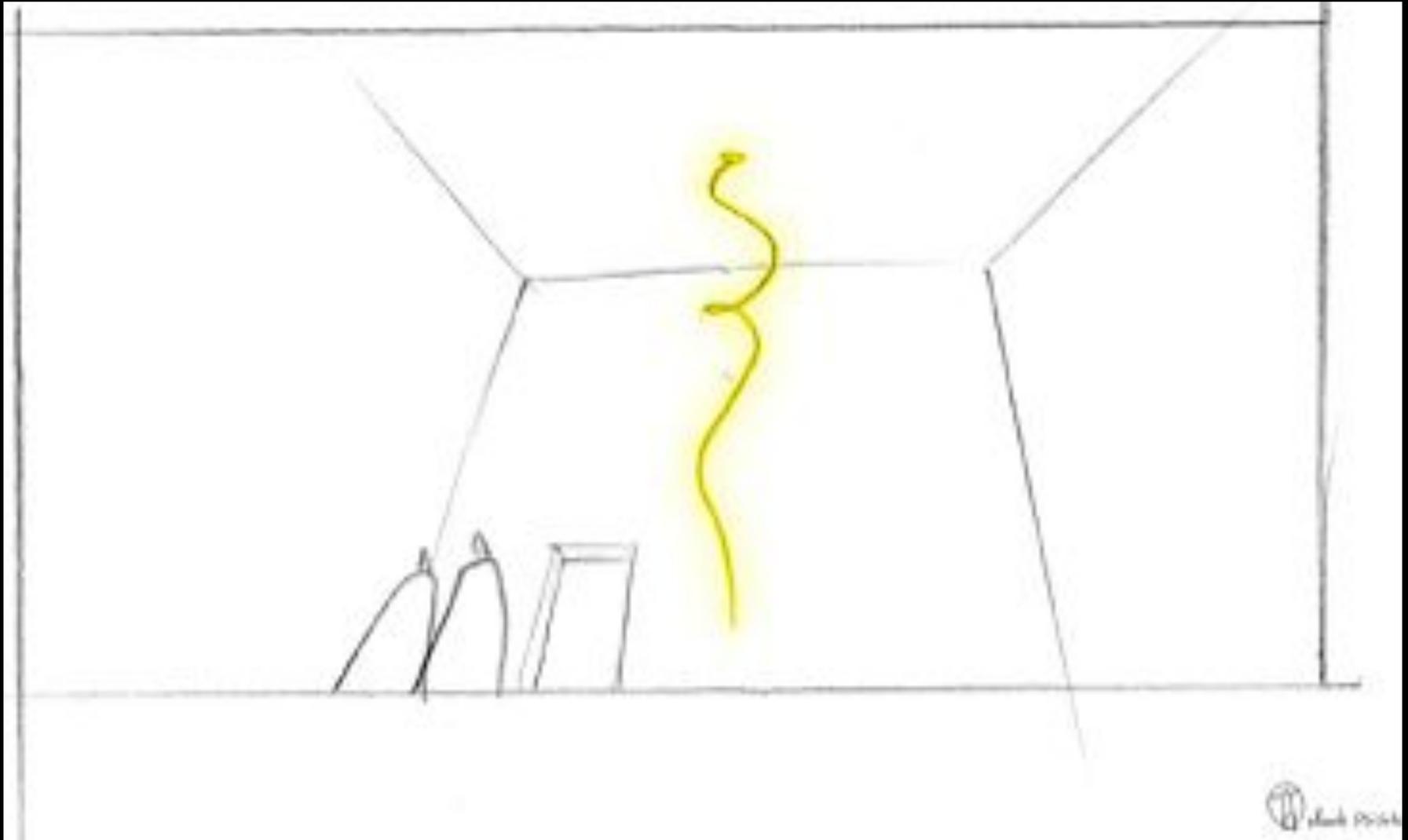
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Perception I – The Periphery



(<http://www.flickr.com/photos/larsdaniel/3195390494/>)

Ambient Displays - LiveWire



Natalie Jeremijenko, LiveWire 1995

Ambient Displays - Ambient Orb



Ambient Devices: Ambient Orb, 2002

Ambient Displays - Ambient Orb



Vitaly GlowCap., 2011

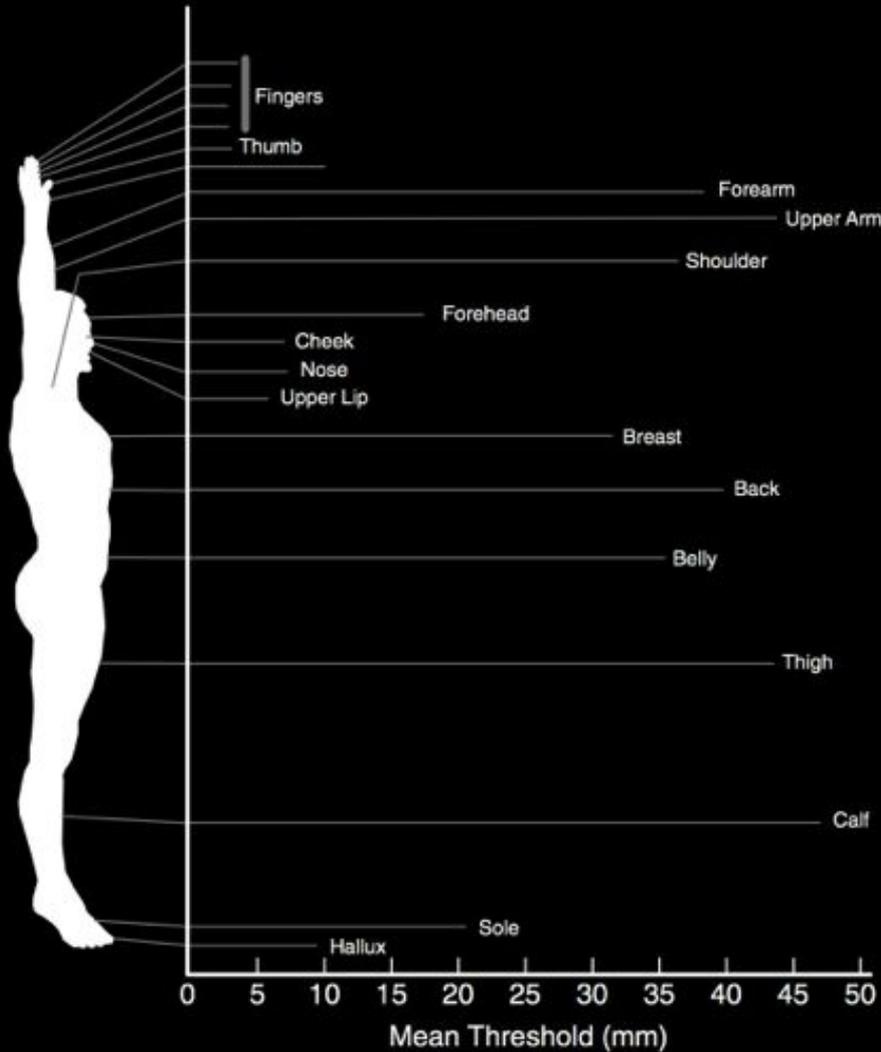
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Perception II – Our Tactile Abilities



(<http://www.flickr.com/photos/larsdaniel/3195390494/>)

Sensitivity

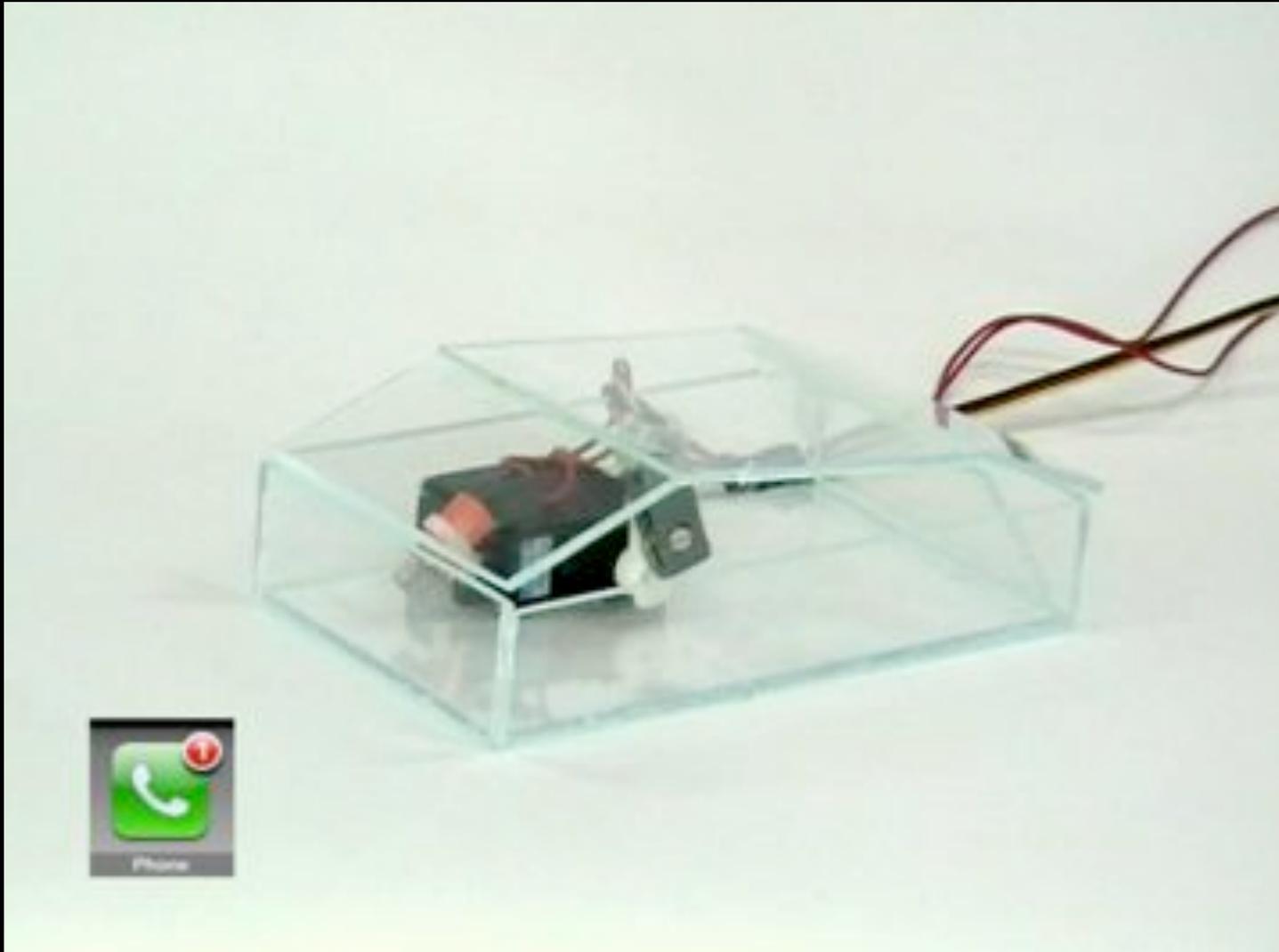


Kandel E. R., et al.: two-point tactile discrimination thresholds, 2000

Methods for tactile Displays

- Low frequency, low amplitude mechanical deformation
- Vibrotactile stimulation
- Electrotactile stimulation
- Thermal displays
- Air or liquid jets or currents
- Force feedback displays

Mechanical Deformation: Simple Shape-Changing UIs



Fabian Hemmert: Ambient Life, 2008

Mechanical Deformation: Complex Shape-Changing UIs



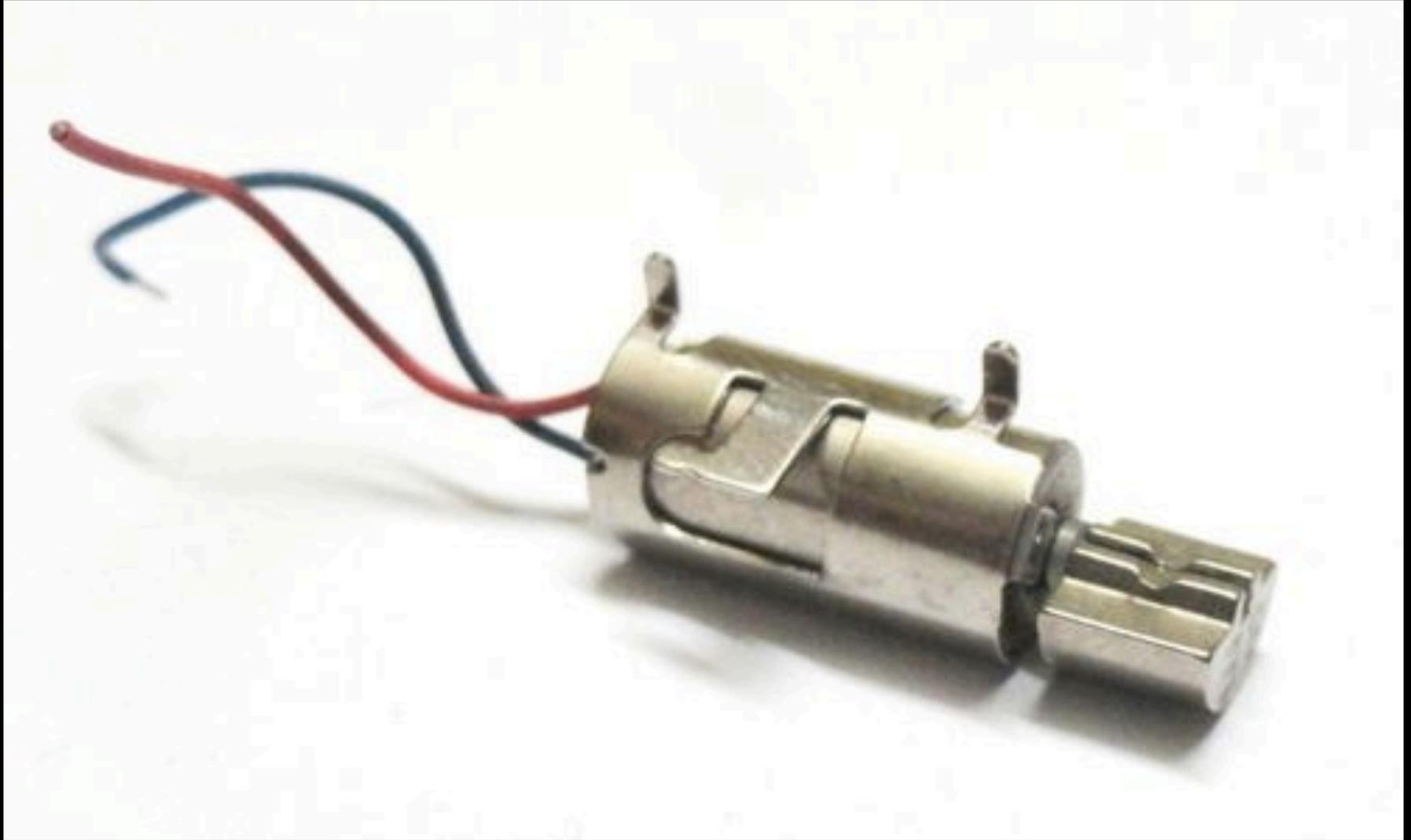
H. Ishii, et al.: inFORM: Dynamic Physical Affordances and Constraints through Shape and Object Actuation, 2013

Mechanical Deformation: Tunable Stiffness

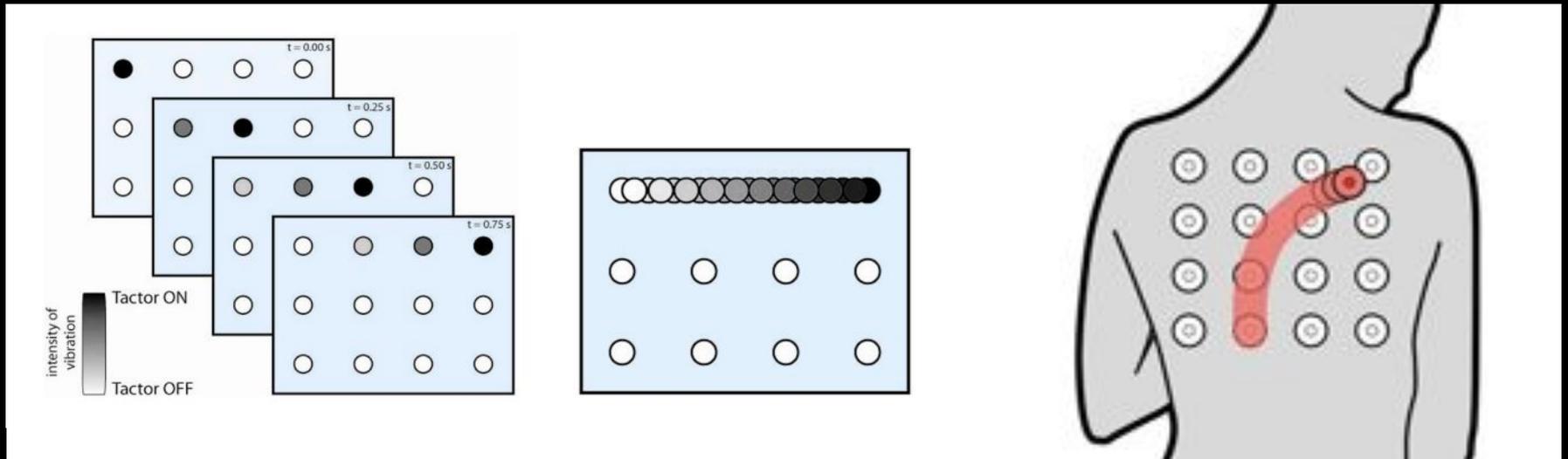


H. Ishii, et al.: jamSheets: Thin Interfaces with Tunable Stiffness Enabled by Layer Jamming, 2014

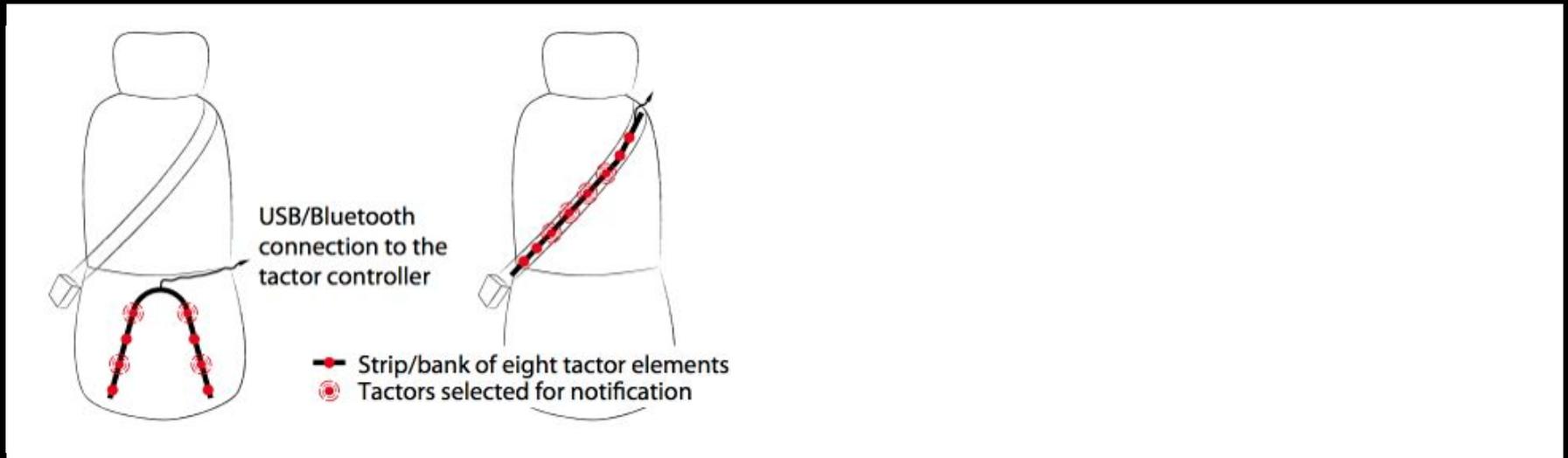
Vibrotactile Stimulation



Vibrotactile Stimulation: Surround Haptics



Vibrotactile Stimulation: Vibration in the Car



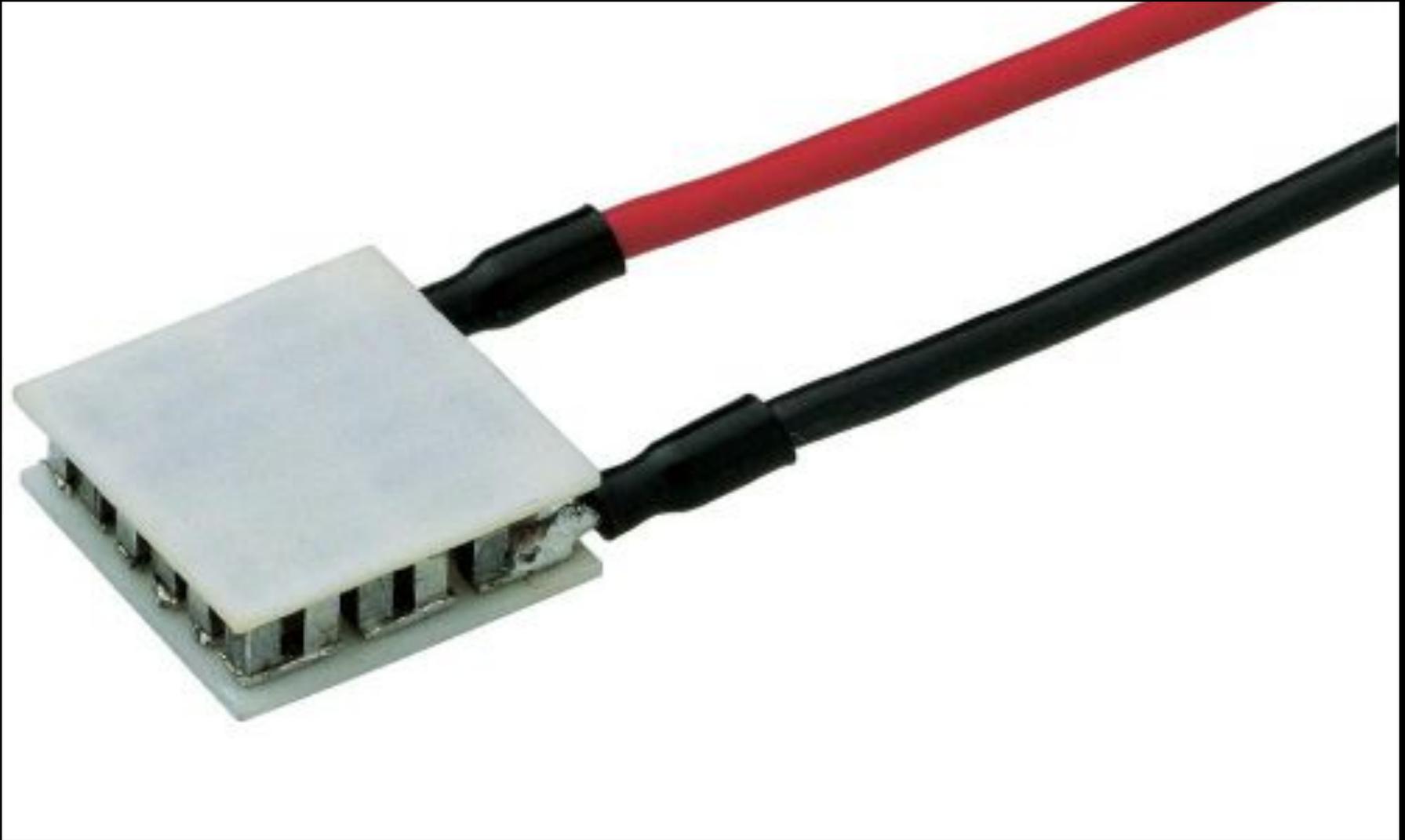
M. Kaltenberger: Subliminal vibro-tactile based notification of CO2 economy while driving, 2010

Vibrotactile Stimulation: Ultrasonic Vibrations



Fujitsu: Haptic Sensory Tablet, MWC 2014; image source: Huffington Post

Thermal Displays



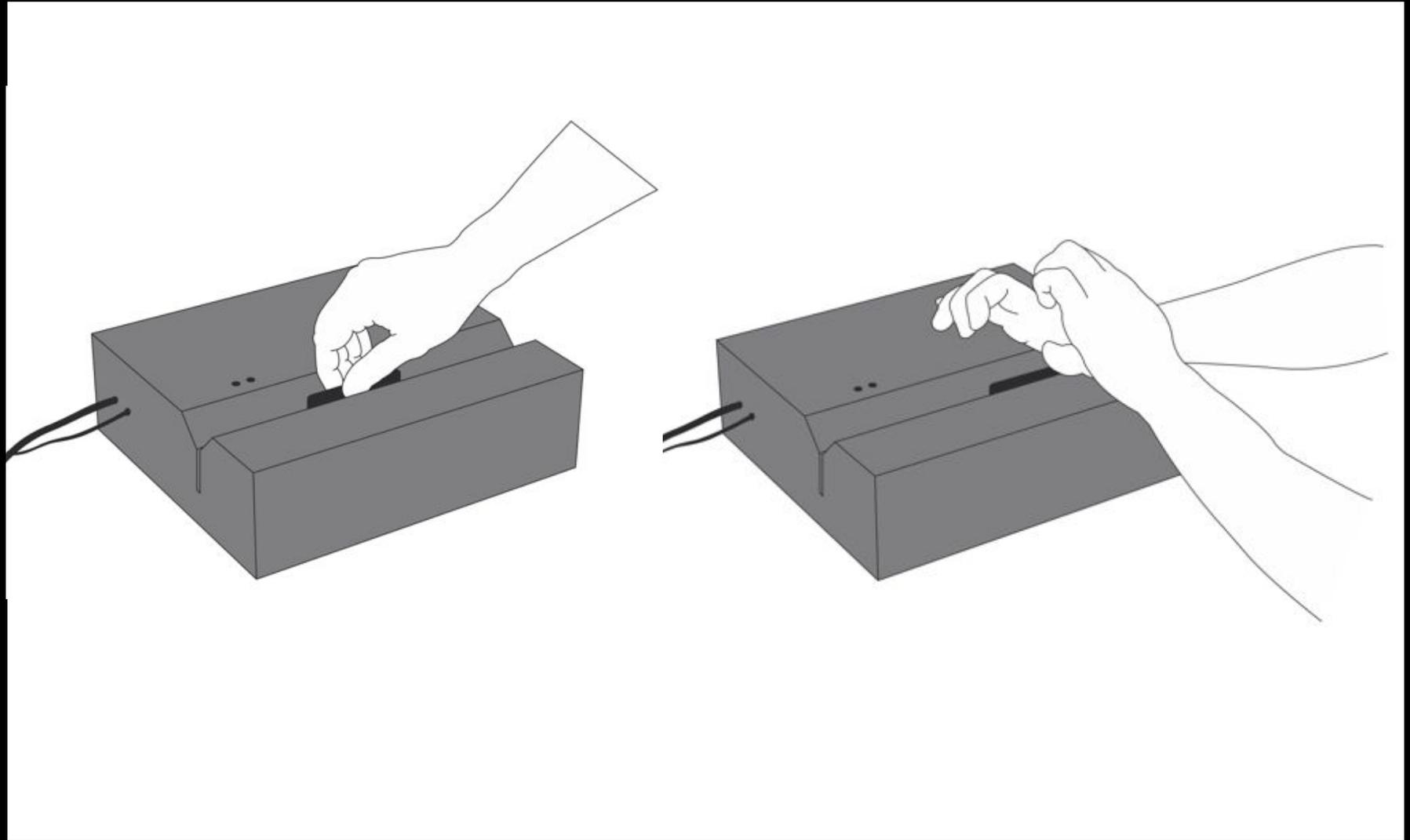
R. Wettach et al.: A Thermal Information Display for Mobile Applications, 2007

Air or liquid jets or currents



Ivan Poupyrev: AIREAL: Interactive Tactile Experiences in Free Air, 2013

Force Feedback



R. Wettach, Fabian Frischmann et al.: Heavy Cash, 2011

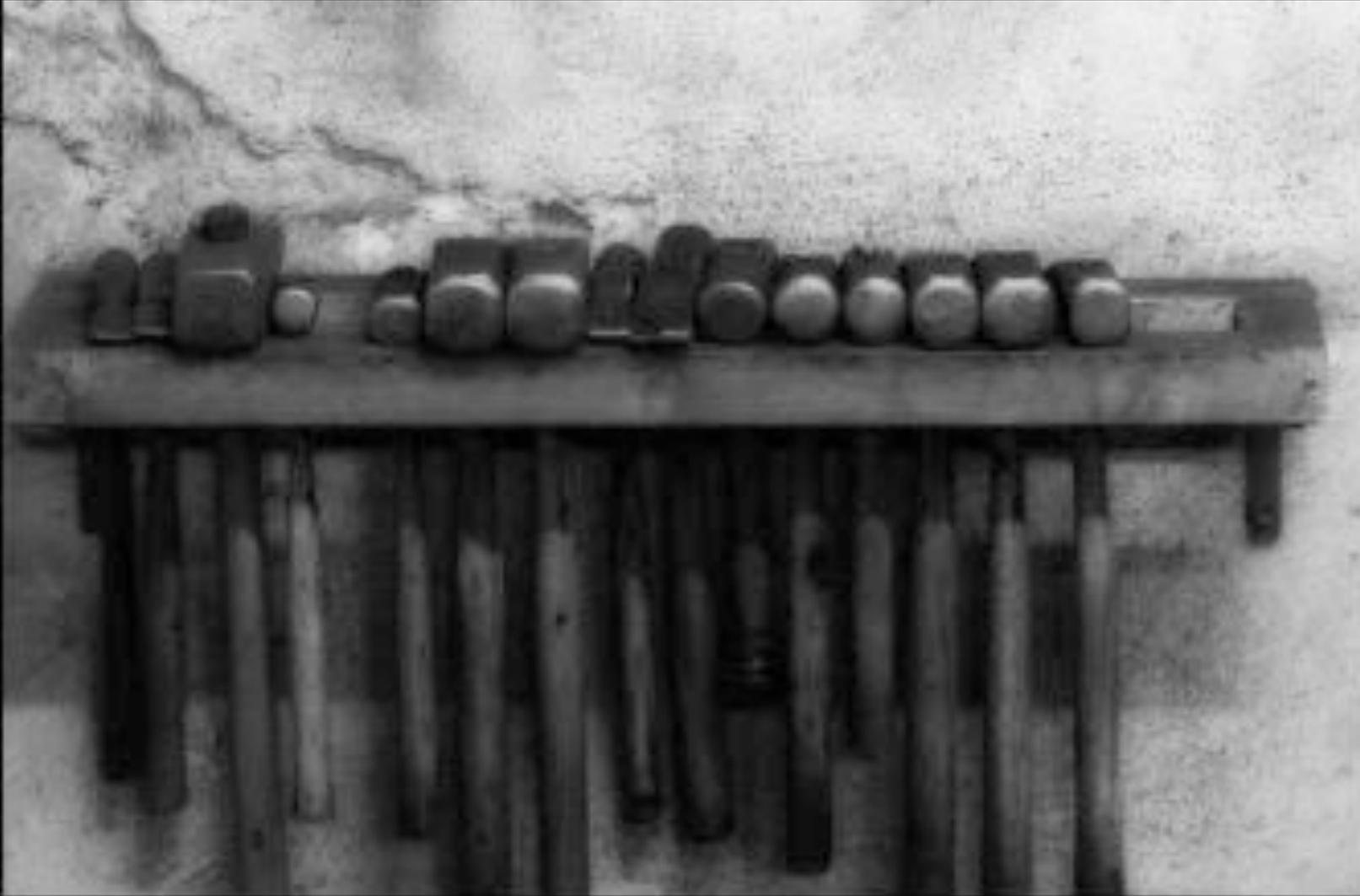
Force Feedback im Automobil



Continental: Accelerator Force Feedback Pedal (AFFP®), 2010

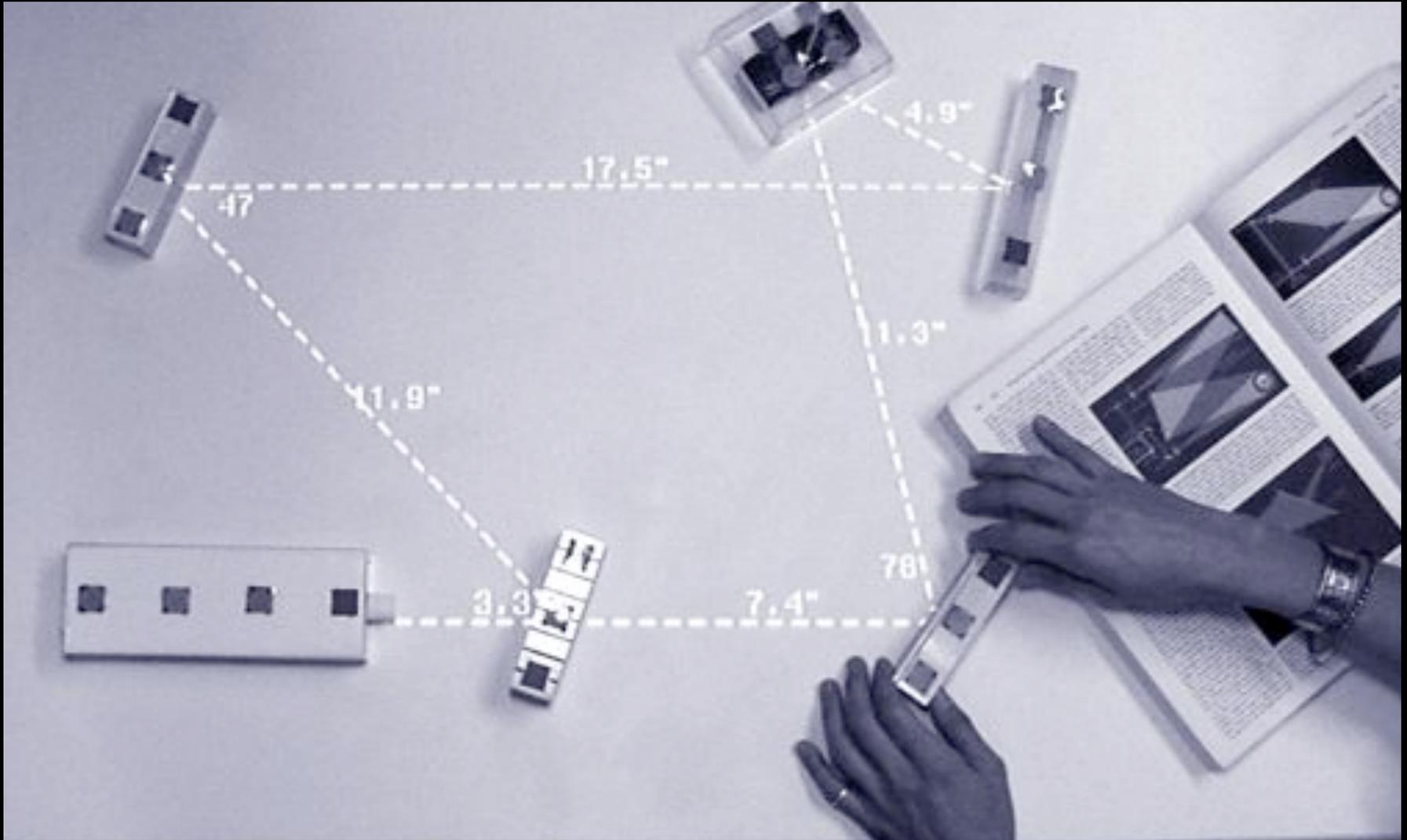
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Expressiveness



http://flickr.com/photos/sweden_otsti/2047658371/

Understanding Objects



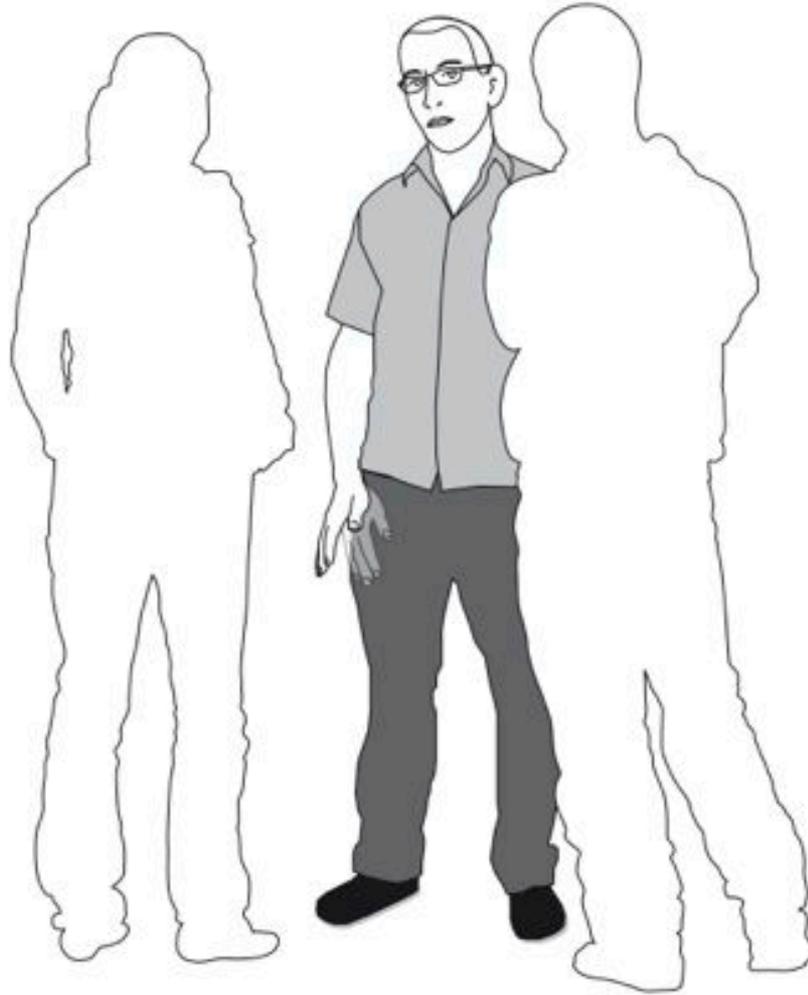
John Underkoffer, Hiroshi Ishii: Illuminating Light, MIT Boston, 1998

Understanding Objects



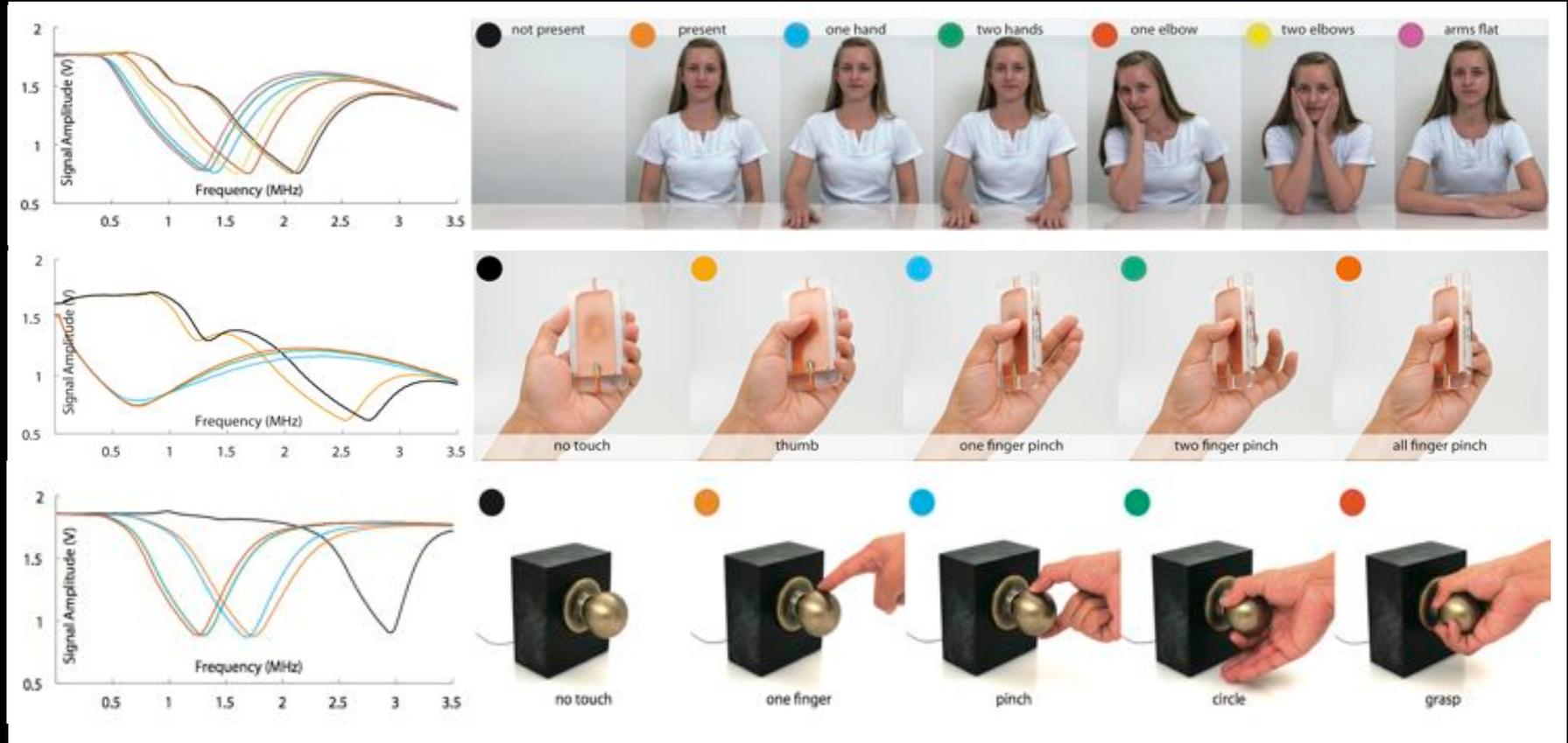
John Underkoffler, Hiroshi Ishii: Illuminating Light, MIT Boston, 1998

Expand Range of Expression



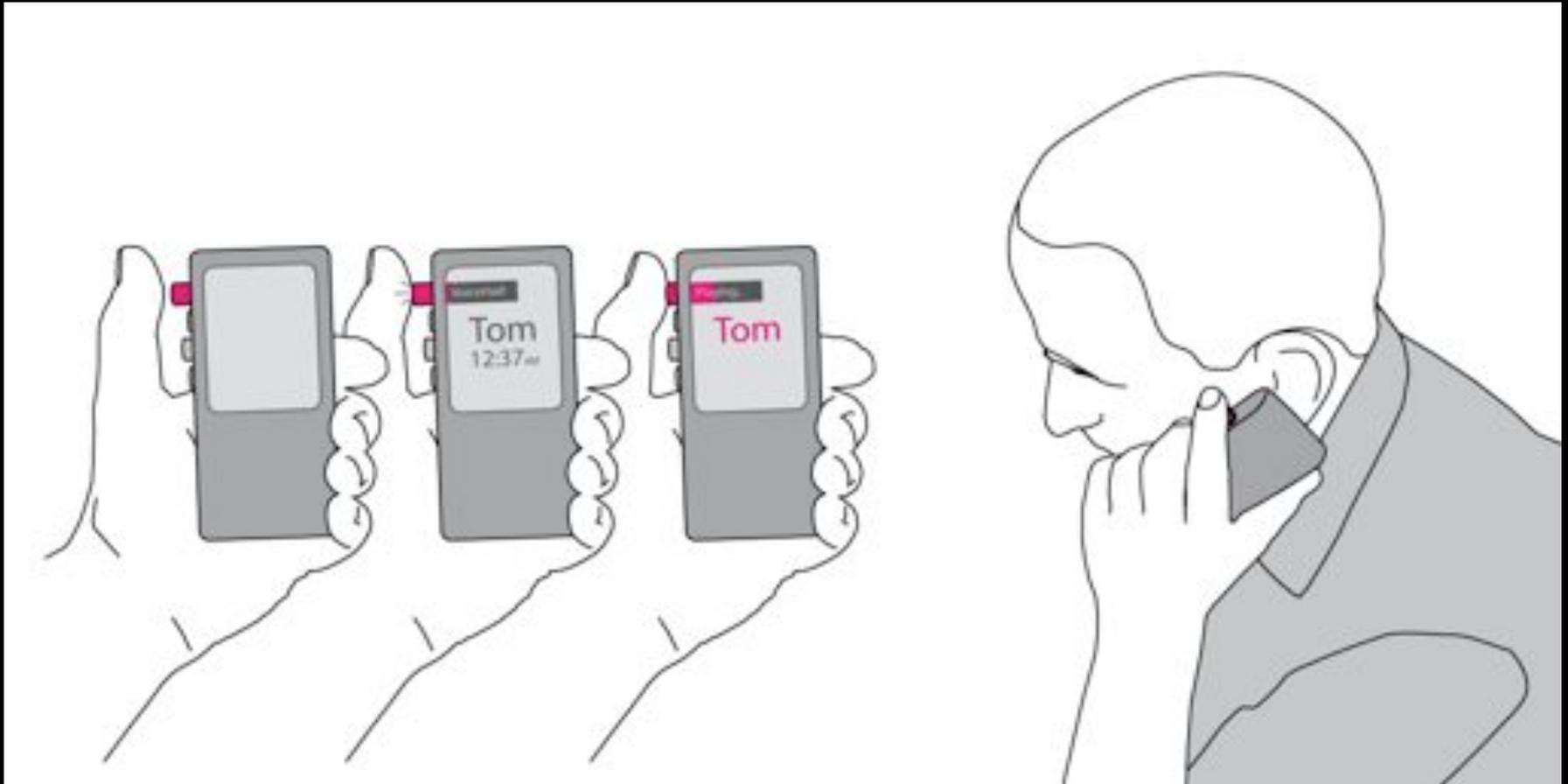
R. Wettach et al.: Slapping, 2007

Everything becomes an Input



Ivan Poupyrev, et al.: Touché: Enhancing Touch Interaction on Humans, Screens, Liquids, and Everyday Objects, 2012

Interactive Expressions



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Motor Memory & Extension



http://flickr.com/photos/sweden_otsti/2047658371

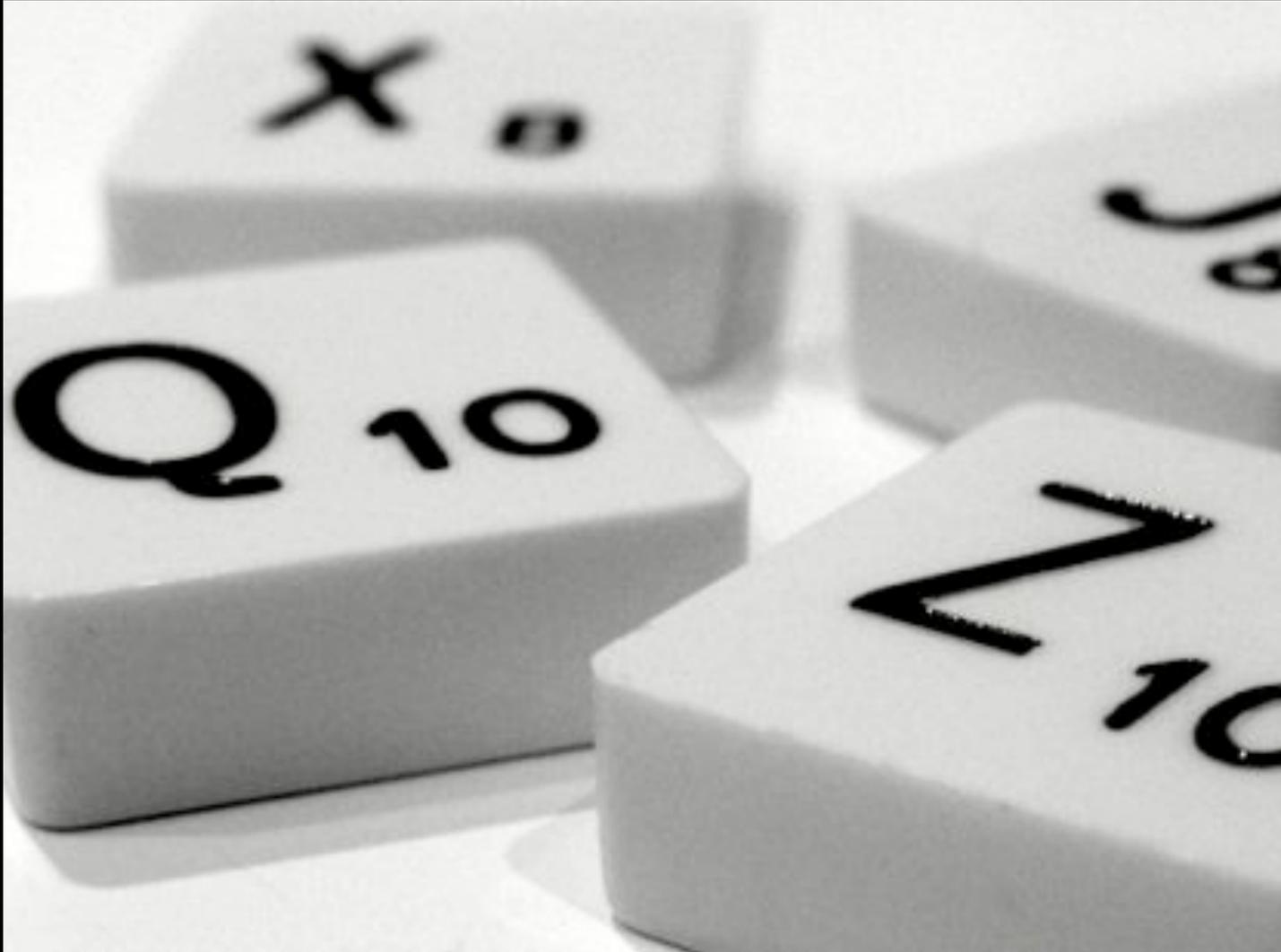
Hardware and Software Integration for more Expressiveness



Source: Native Instruments

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Epistemic Actions & Gestures



http://flickr.com/photos/d_vdm/530718933/

Modular Computing



David Merrill: Siftables, 2007

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Visibility



http://flickr.com/photos/d_vdm/530718933/

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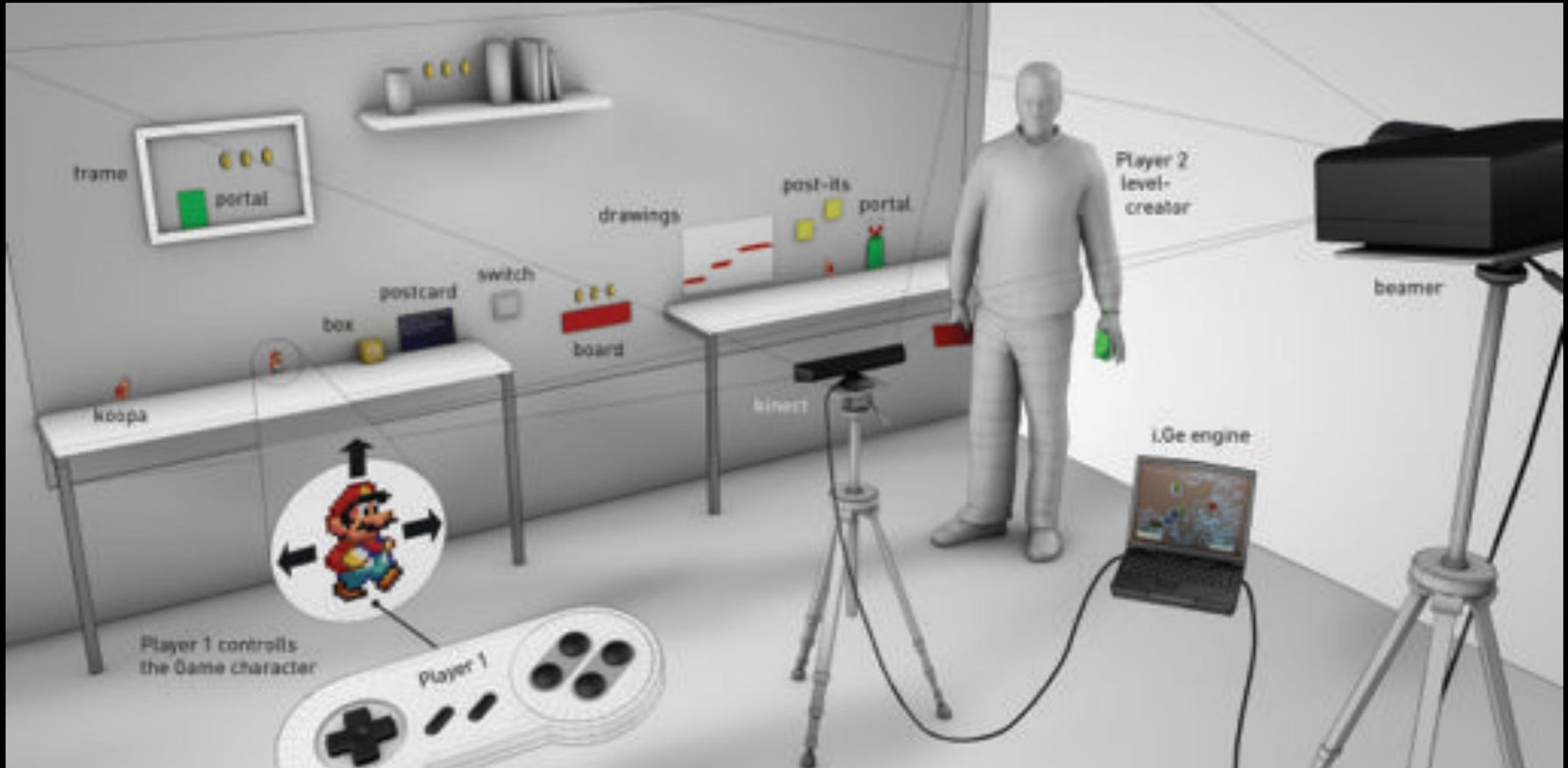
Visibility



Johan Berndtsson, Maria Normark: "The Coordinative Functions of Flight Strips", 1999

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Visibility



Patrick Oswald, Jordi Tost, R. Wettach: The Real Augmented Reality: Real-time game editor in a Spatial Augmented Environment, 2014

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Risk



http://flickr.com/photos/d_vdm/530718933/

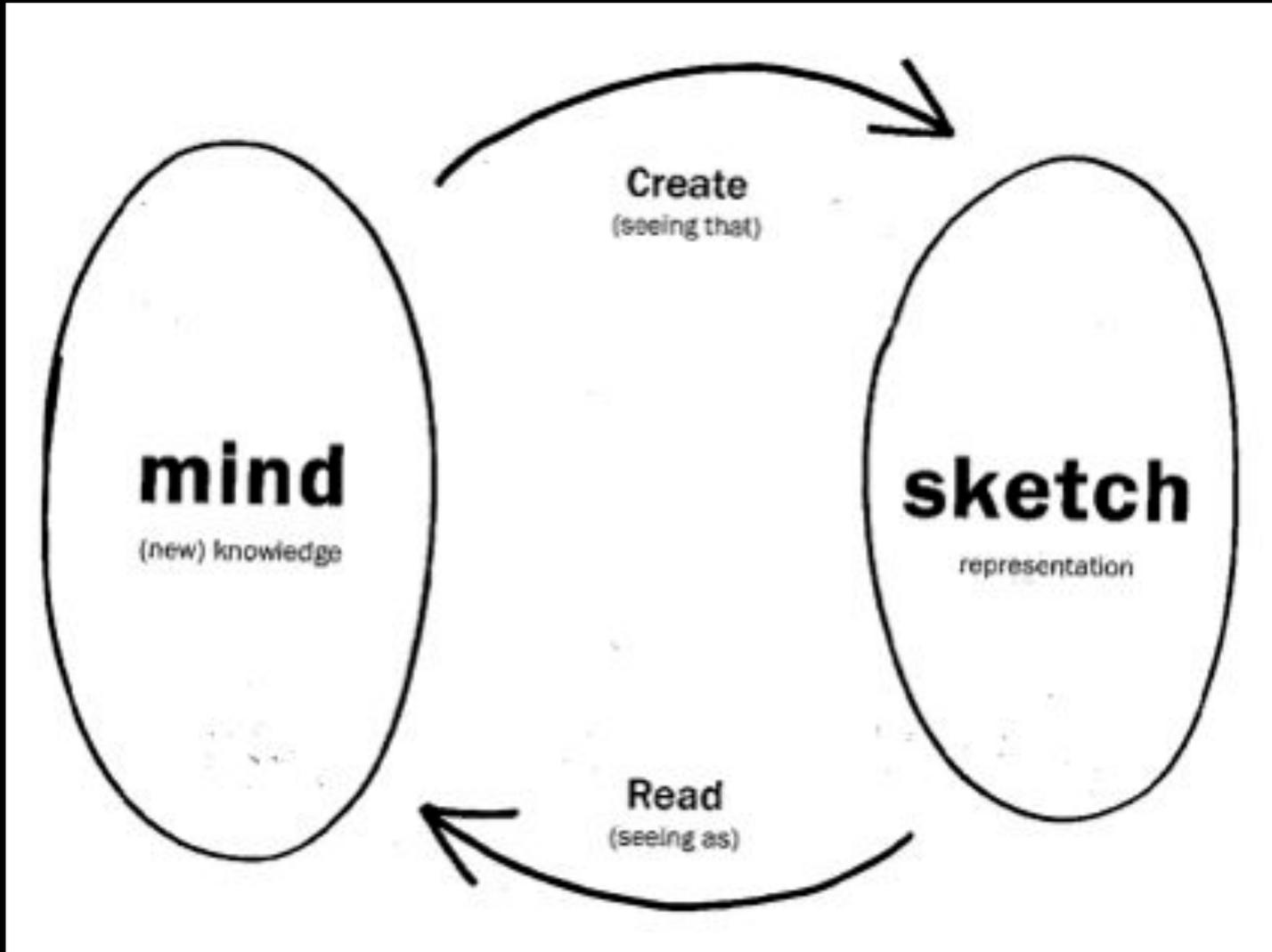
“Risk, Attention, and Engagement are intertwined” (H. Dreyfus)



Roman Kirschner, Volker Morawe, Tilmann Reiff, www.fursr.com 2003

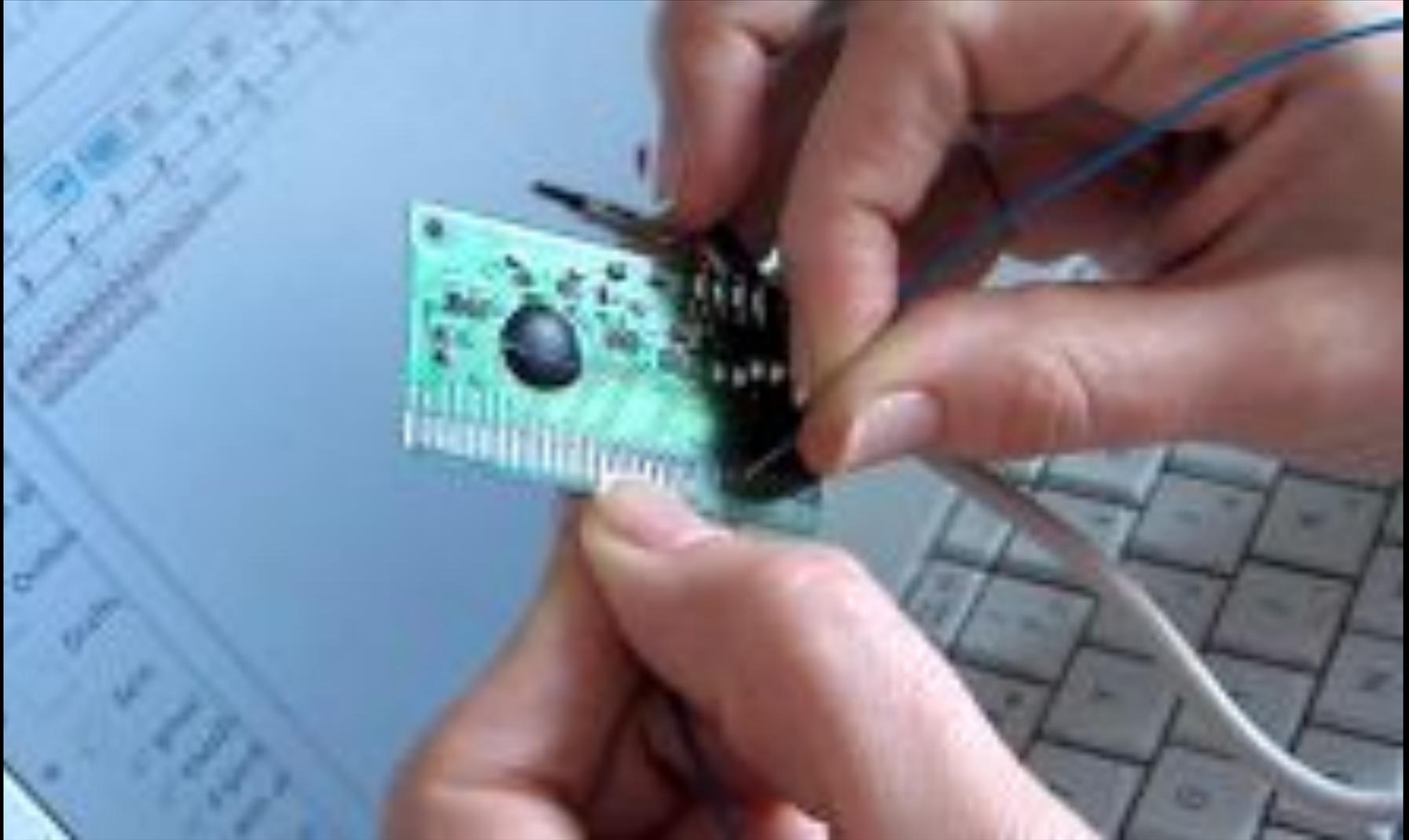
Just-Enough-Prototyping

Hacking



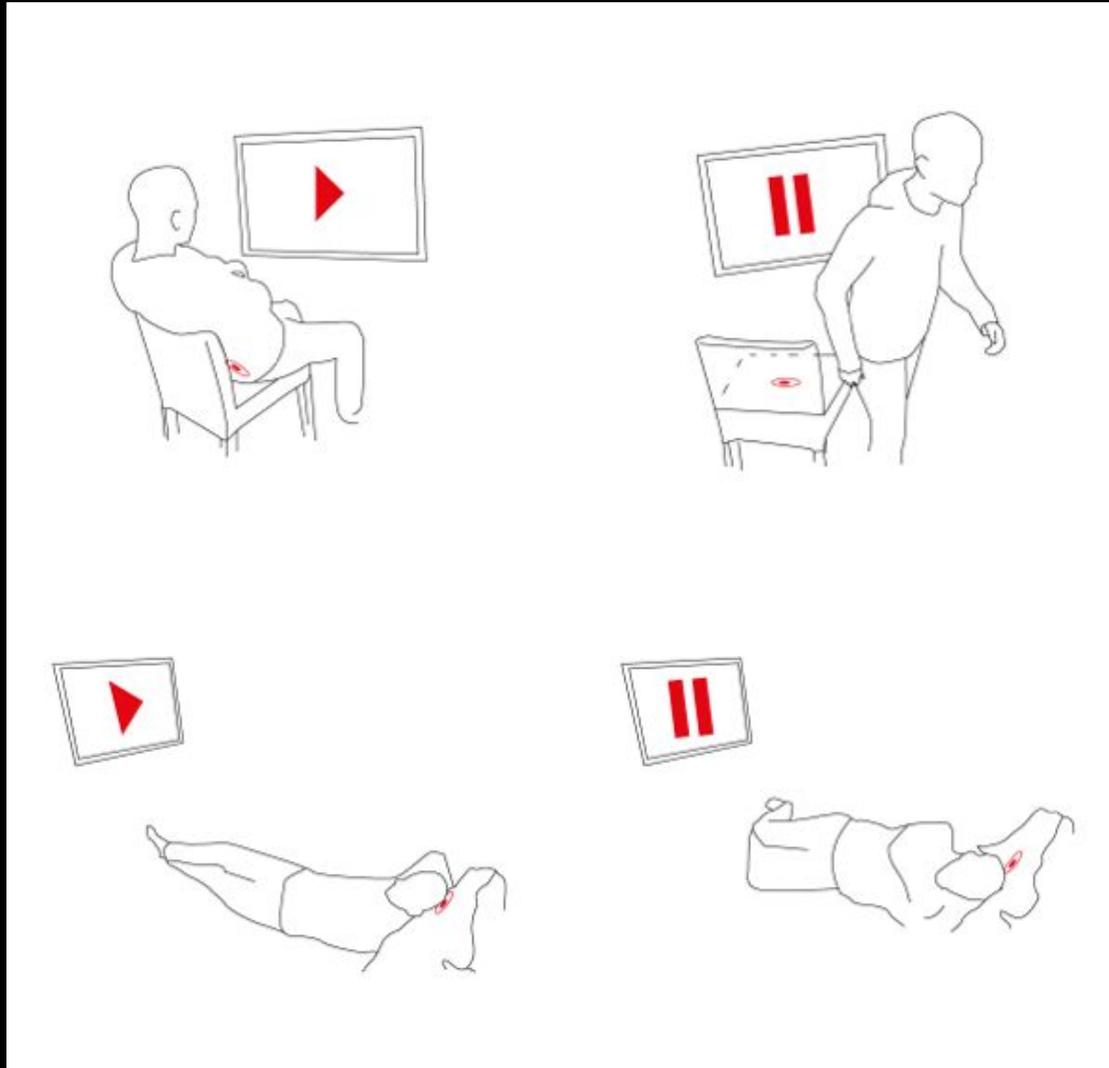
Bill Buxton: Sketching User Experiences: Getting the Design Right and the Right Design, 2007

Hacking



Key-Board-Hack

Hacking



Kien Nguyen , 2011

Hacking



Stefanie Neumann, 2010

Hacking



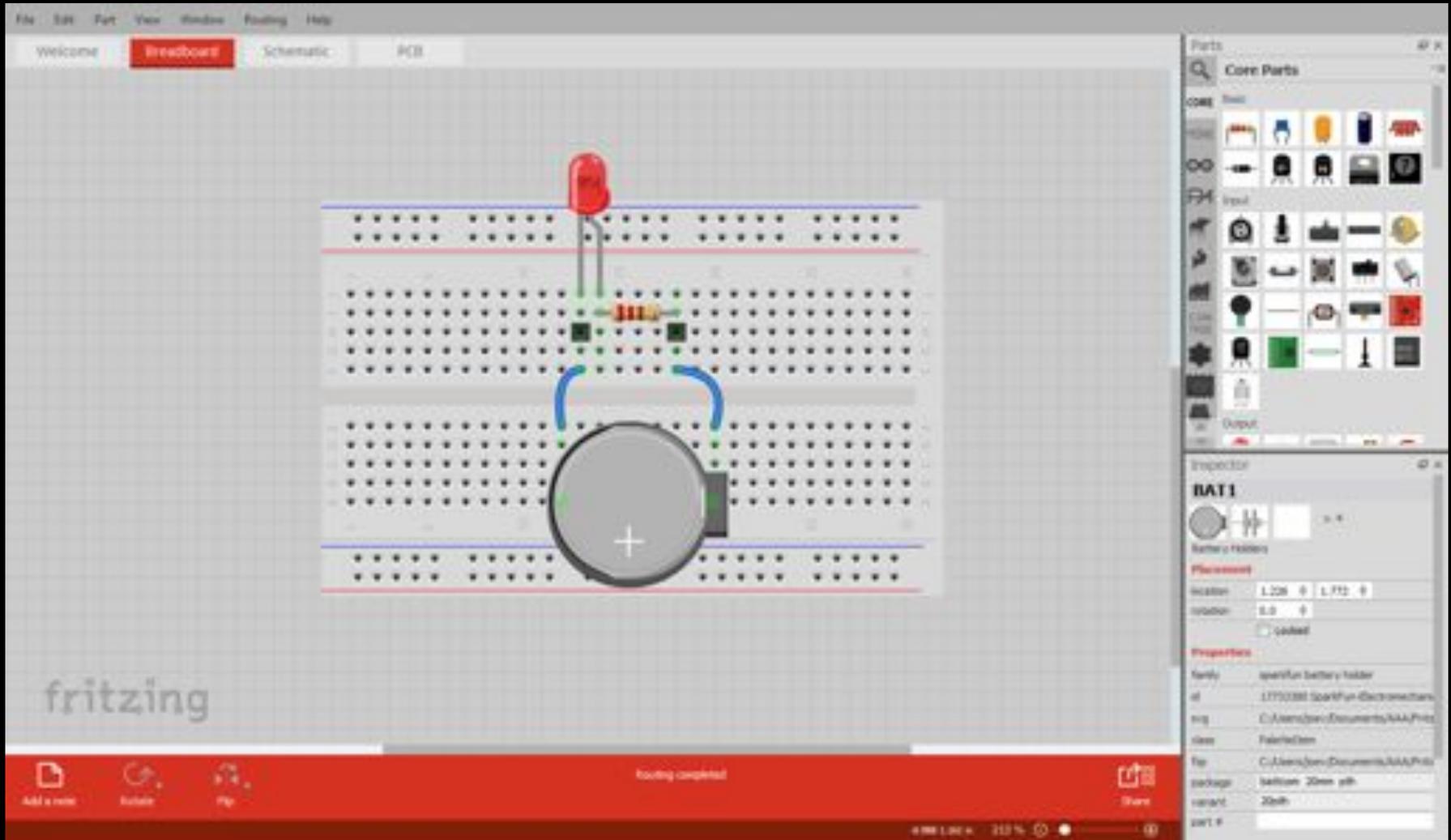
Stefanie Neumann, 2010

Wizard of Oz - Technique

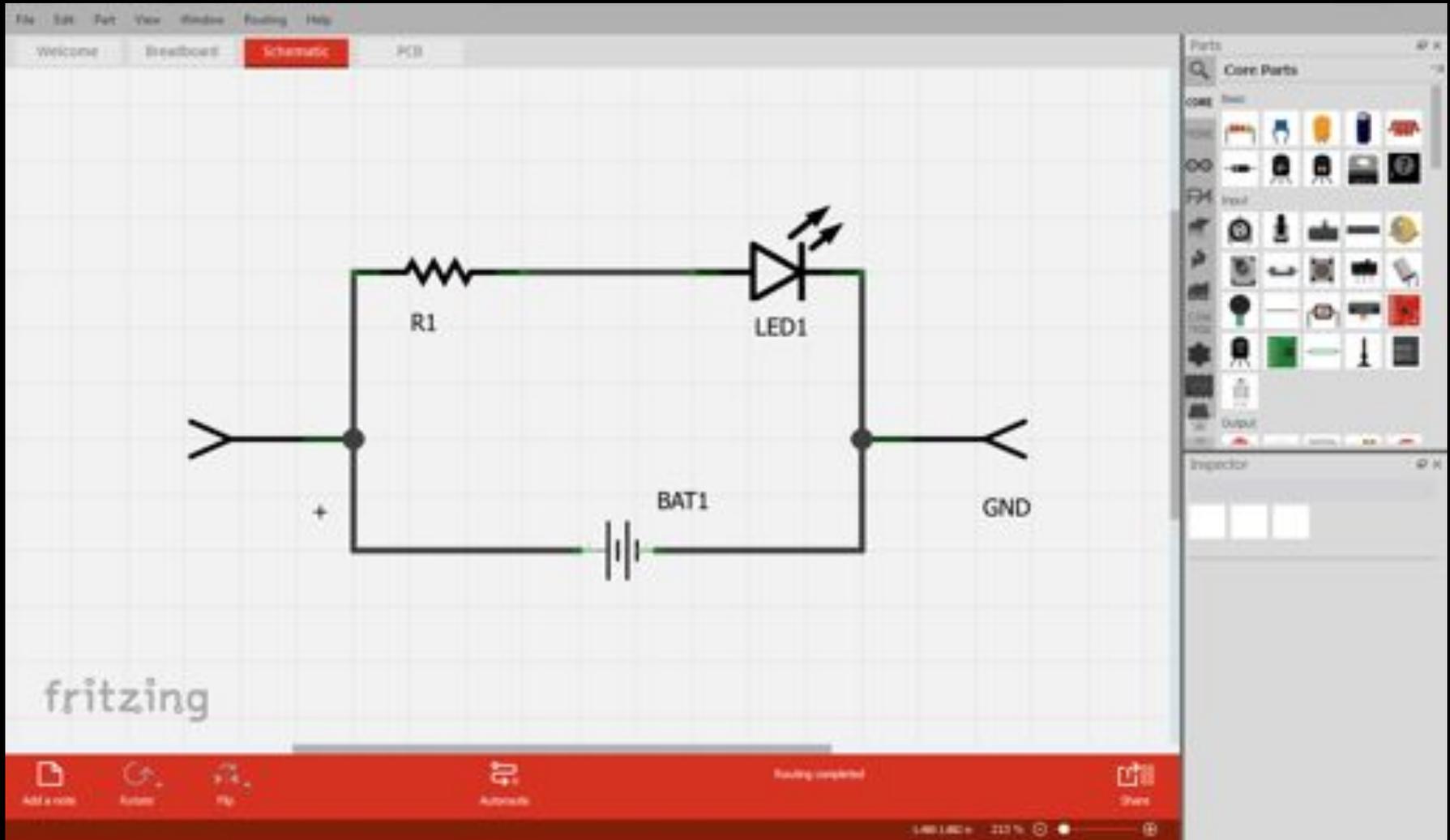


S. Meier, R. Wettach, et al.: A Real-world Mobile Prototyping Framework for Location- and Context-based Services, 2012

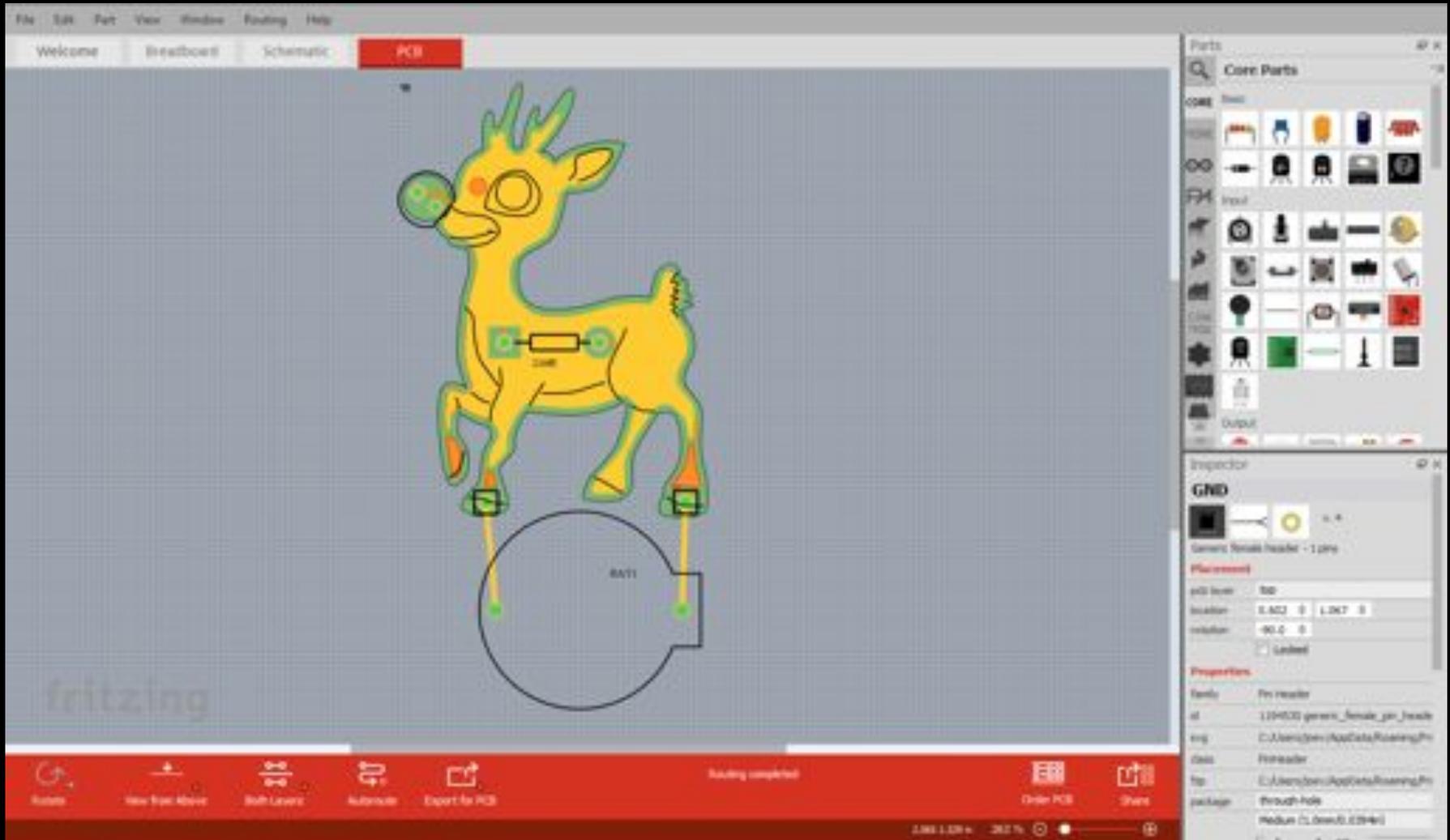
Fritzing - Breadboard-View



Fritzing - Schematic-View



Fritzing - PCB-View



Fritzing - Production



Fritzing – Project Gallery

The screenshot shows the Fritzing website interface. At the top, there is a navigation bar with links for 'Home', 'Blog', 'FAQ', and 'About'. The main header features the 'fritzing' logo with the tagline 'electronics made easy'. Below the header, there are navigation tabs for 'PROJECTS', 'PARTS', 'LEARNING', 'FORUM', 'SERVICES', 'CONTRIBUTE', and 'ABOUT'. The main content area displays a project titled 'Rudolph PCB' with a green cartoon reindeer illustration. A red button labeled 'DOWNLOAD' is visible. To the right, there is a user profile for 'Andreas_Hermann' with a 'DOWNLOAD' button. Below the project image, there is a text description and a link to a tutorial. At the bottom, there is a footer with contact information and a copyright notice.

Home Blog FAQ About

Workshop Sign up Login

fritzing electronics made easy

PROJECTS PARTS LEARNING FORUM SERVICES CONTRIBUTE ABOUT

Rudolph PCB

DOWNLOAD

Andreas_Hermann
last updated 1 Jahr ago
DOWNLOAD
RudolphSketch.fzz

The 'Rudolph the red-nosed reindeer' PCB comes with a LED footprint (guess where :)). With two male pinheaders soldered to the feet you can put Rudolph on your Breadboard. Merry Christmas Time!
Learn how to draw a Rudolph here:
<http://www.dragoon.com/tuts/773/7/7/how-to-draw-rudolph-the-red-nosed-reindeer.htm>

Contact us? Fritzing was inspired at the [E] PoetsLab, and is now licensed by the [E]vents of Fritzing Foundation and 2014.

Fritzing - Project Gallery



Was ich noch vergessen habe...

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Der Studiengang ‚Interface Design‘ an der FH Potsdam hat im BA und MA eine „künstlerische Eignungsprüfung“: bitte lasst Euch von diesem Begriff nicht erschrecken. Diese Prüfung kommt aus der Design-Tradition des Fachbereichs. Bei Interface Design wollen wir vor allem sehen, dass Ihr versteht, was Interface Design sein kann, welche Rolle der Gestalter einnimmt und was Euch sonst noch begeistert und antreibt! Statt schlechten Aktzeichnungen liebe Code-Fragmente und interessante Beobachtungen!

Potsdam ist ein Vorort von Berlin. Nahe zu alle Studenten und Lehrenden leben in Berlin und pendeln nach Potsdam. Wer also seinen Master bei uns macht, hat auch das Glück, eine richtige Großstadt zu erleben! Und schönen Seen gibt es zusätzlich auch noch!

Bei IXDS suchen wir immer neugierige Werkstudenten oder Praktikanten, sowohl in München als auch in Berlin. Bei Fragen, meldet Euch bitte bei mir oder work@ixds.com

Fritzing ist ein Open-Source-Tool: bitte benutzt es! Und eventuell hat ja der ein oder andere Lust, an der Weiterentwicklung mitzuwirken...

Über Fragen und Anregungen zu meinem Talk freue ich mich sehr!
Vergesst nicht, Euch für unseren Newsletter anzumelden!

War toll bei Euch. Gruß, reto wettach

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