Beyond Flat Displays

Hrvoje Benko – Microsoft Research

ACM CHI 2013 Workshop – Displays Take New Shape

April 28, 2013

Workshop goals

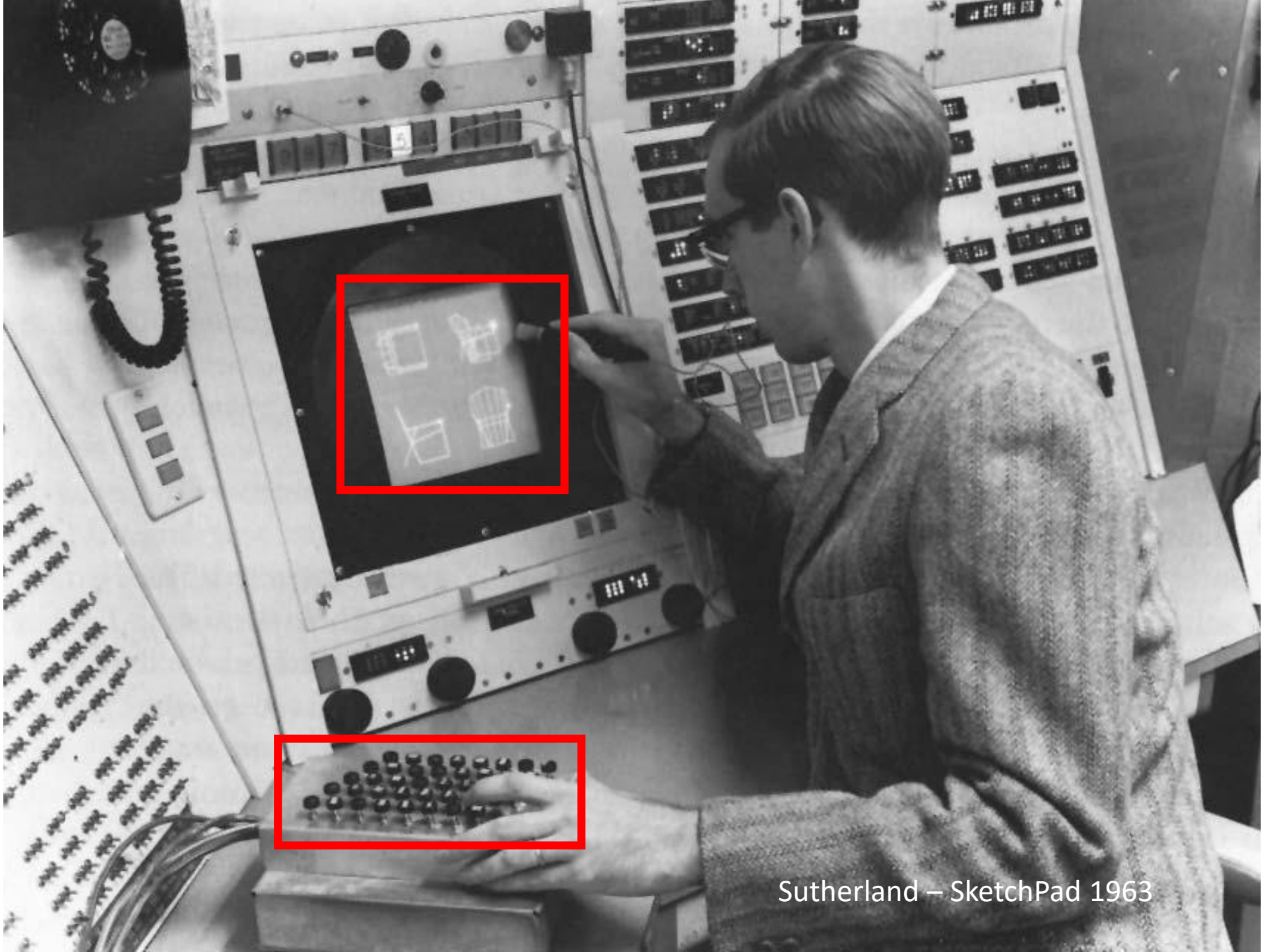
1. To explore the emerging research in alternative display types and form factors, with the goal of generating an agenda for future interactive surfaces.

2. Foster a research community interested in formed, flexible, haptically actuated, projected, non-flat displays.

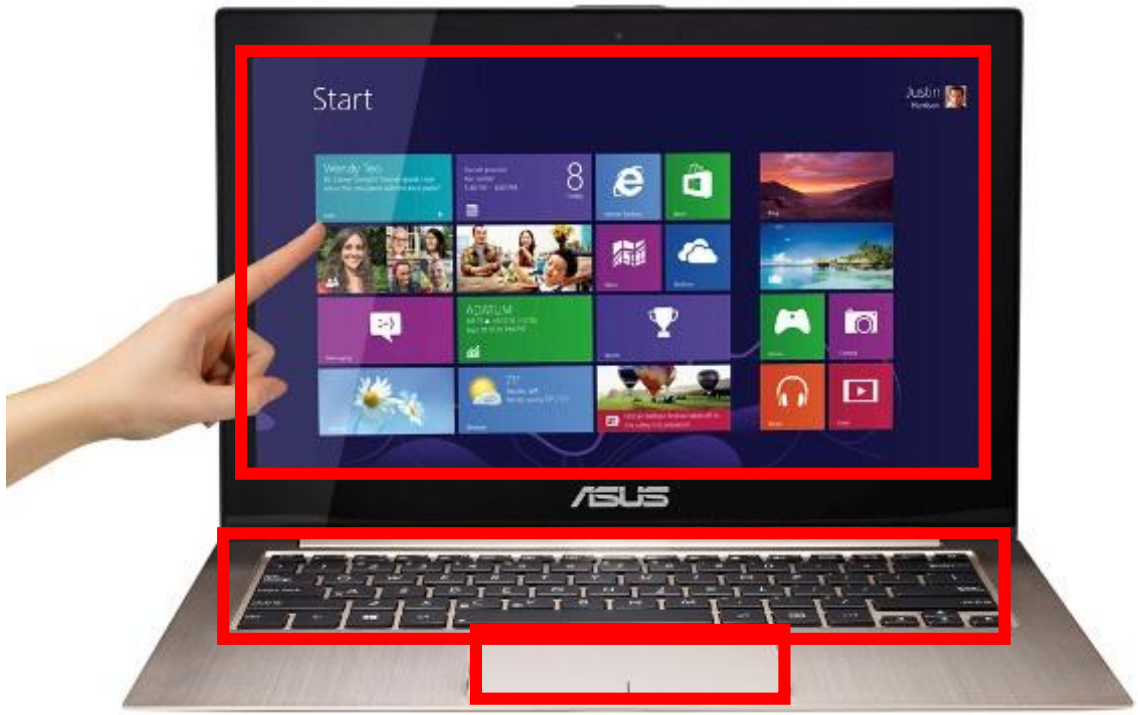
http://displayworkshop.media.mit.edu/

Three trends

1. Interaction needs (not computational needs) defines the form of the computing device



Sutherland – SketchPad 1963


Start
ASUS

AT&T
People
Music+Videos
Nokia City Lens
Redmond, WA

2. Displays are becoming more diverse

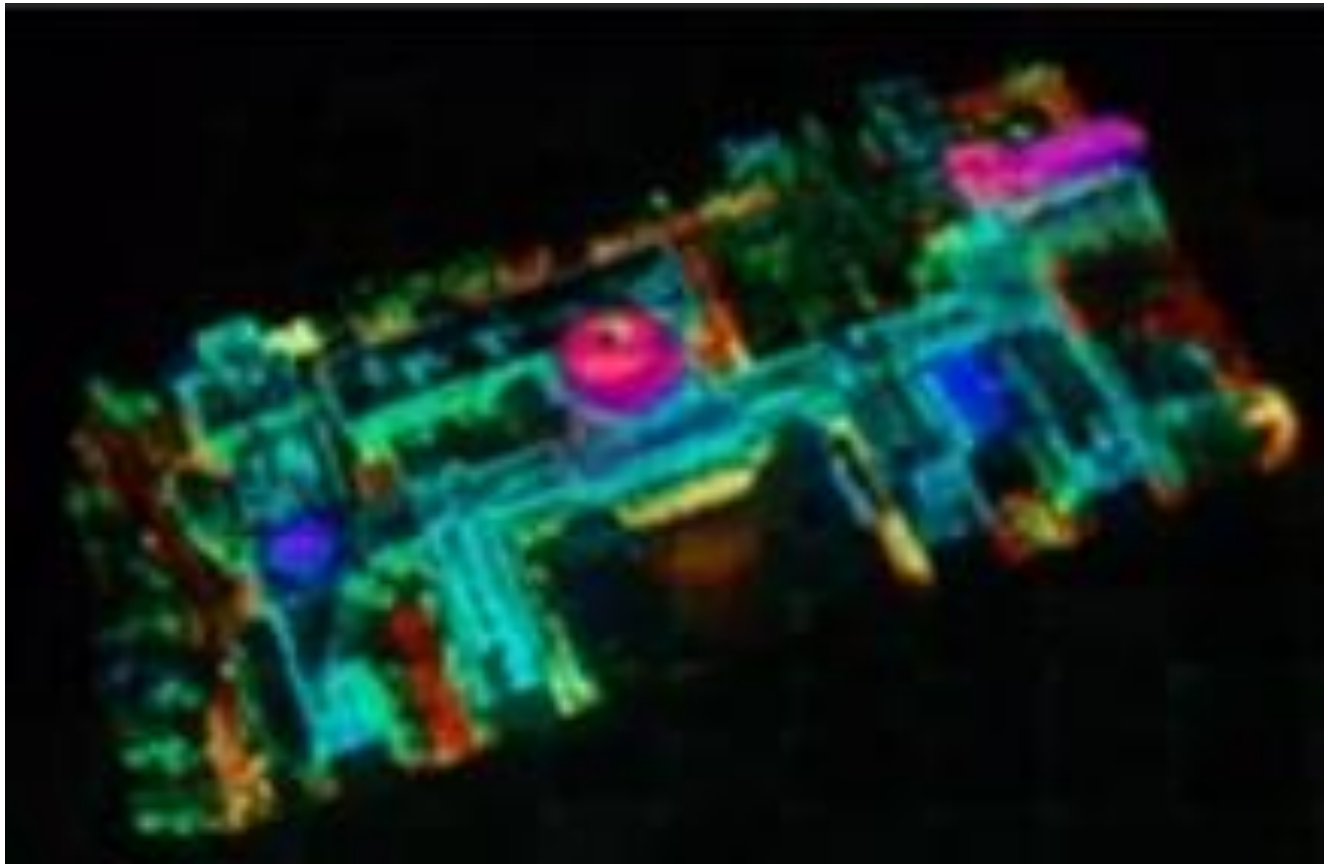
Variety of displays

- Smaller, bigger
- Higher resolution
- Brighter
- Visible in sunlight
- 3D
- Interactive (touch & pen)

Flexible

Jan. 2013. Photo by Jae C. Hong, The Associated Press

Holographic

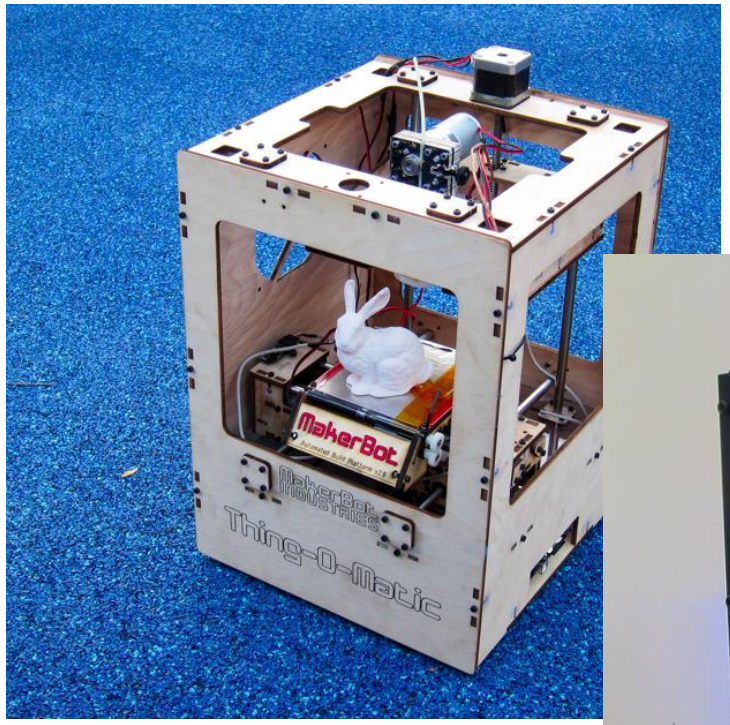


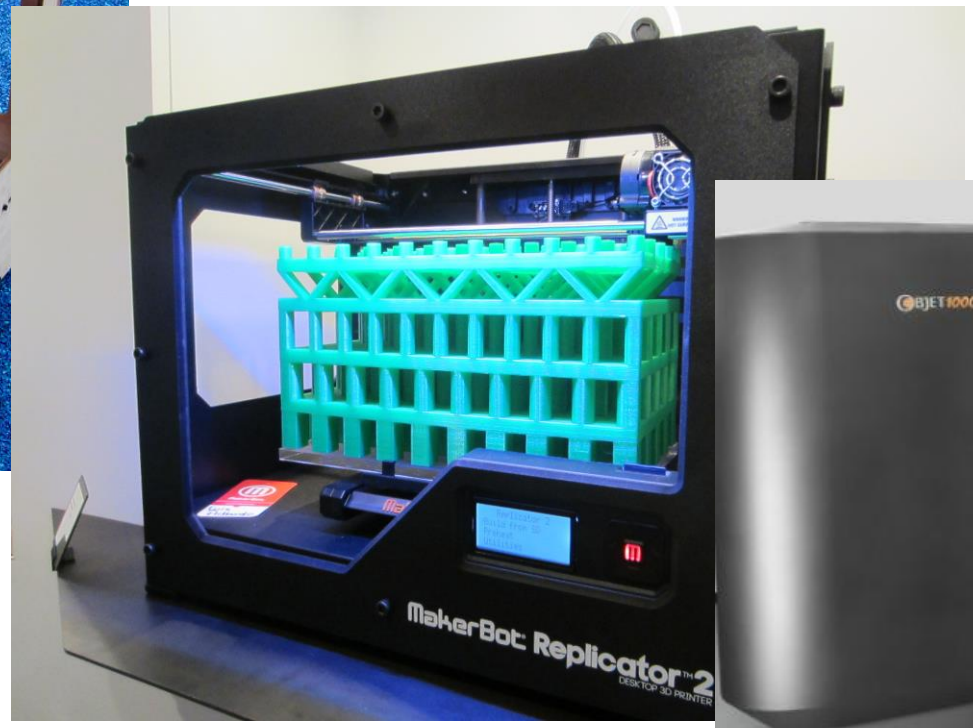
Zebra Imaging Holographic Motion Display

Ephemeral?

FogScreen

3. Digital fabrication


MakerBot
Thing-O-Matic

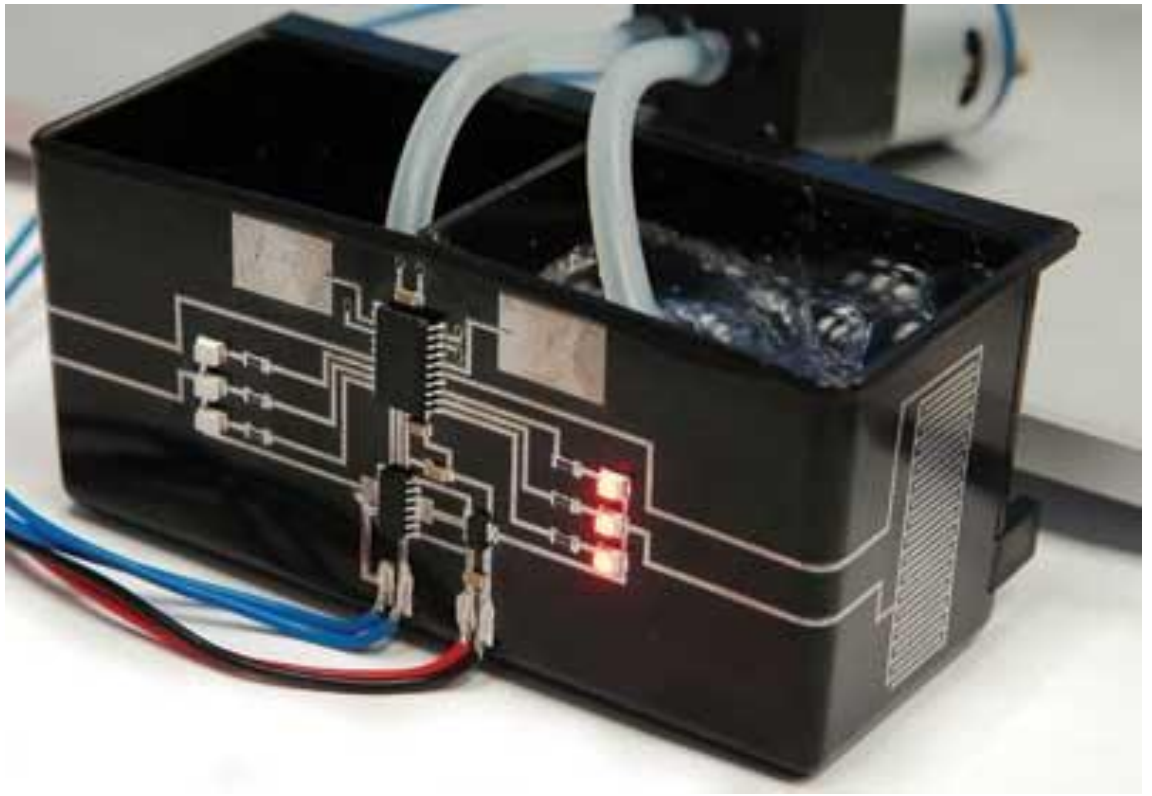

MakerBot Replicator™2
DESKTOP 3D PRINTER

OBJET1000

3D printed models

Solidoodle 2 (<$500 printer)
(Photo courtesy of gizmag.com)

3D printed electronic circuits



Optomec (>$250,000 printer)
(Photo courtesy of Neotech Services)

Three trends

1. Interaction needs (not computational needs) defines the form of the computational device

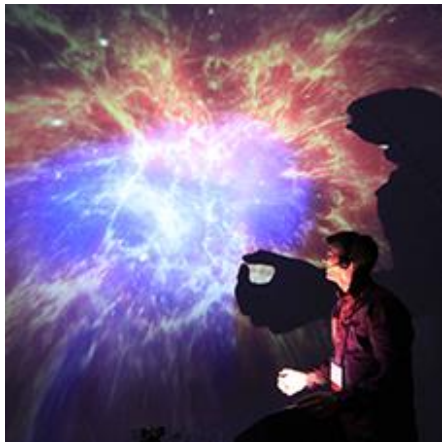
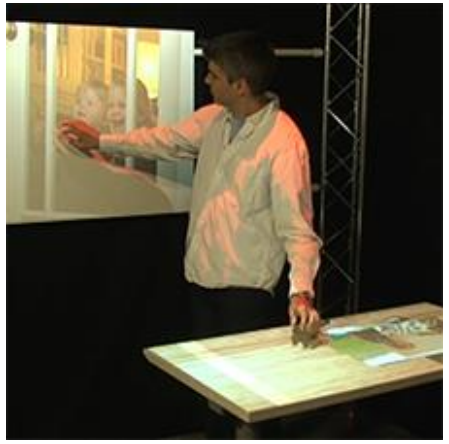
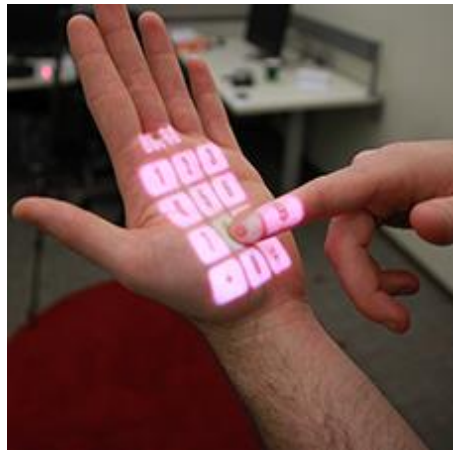
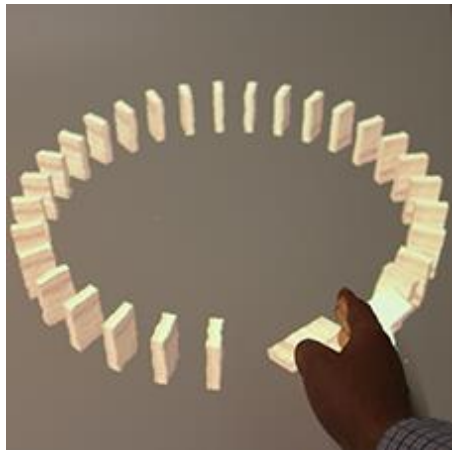
2. Displays are becoming more diverse

3. Digital fabrication

Soon, we will be able to transform any surface of any object into an interactive display.

We already can!

Enabling interactivity on every surface

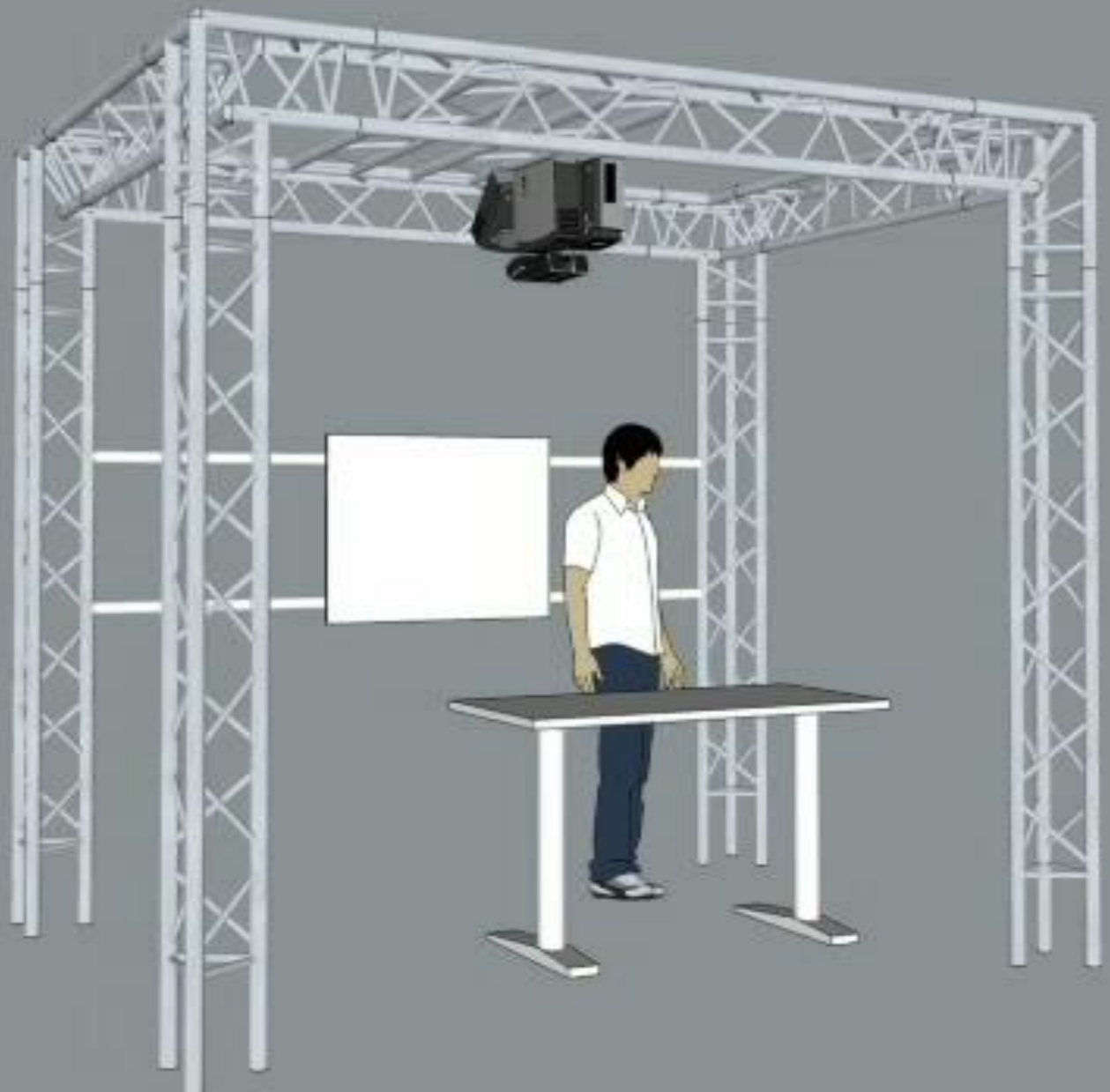
Sphere

Benko, Wilson, & Balakrishnan, ACM UIST 2008

Pinch-the-Sky Dome

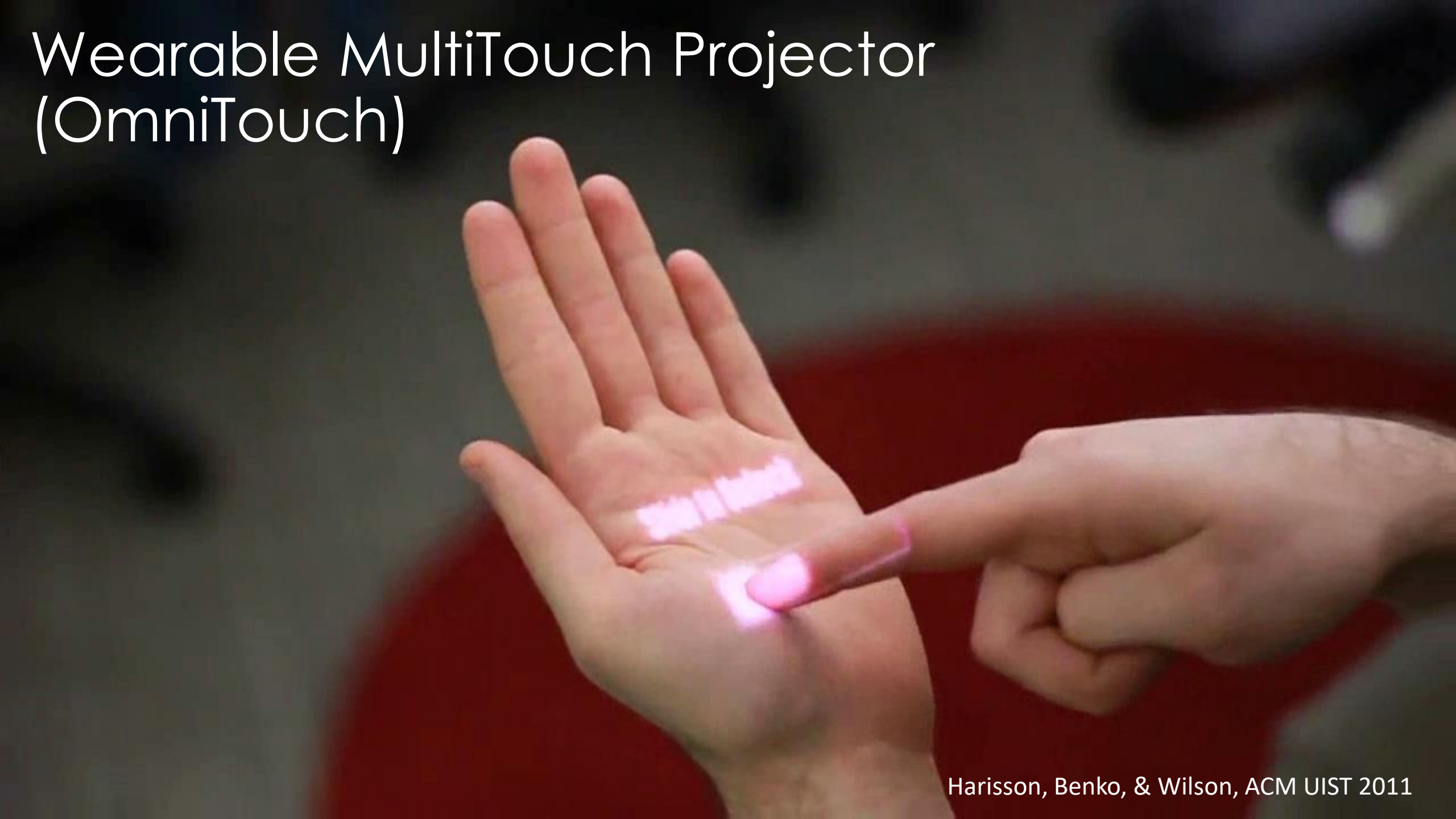
Benko & Wilson ACM ITS 2010

LightSpace



Wilson & Benko ACM UIST 2010

Wearable MultiTouch Projector (OmniTouch)



Harisson, Benko, & Wilson, ACM UIST 2011

MirageTable

Benko, Jota & Wilson, ACM CHI 2012

Beamatron

Wilson, Benko, Izadi and Hilliges, ACM UIST 2012

Depth Camera

Projector

Enable interactivity on any available surface and between surfaces.

Thanks to my collaborators

Andy Wilson (MSR)
Chris Harrison (CMU)
Ricardo Jota (U. Toronto)
Ravin Balakrishnan (U. Toronto)
Shahram Izadi (MSR Cambridge)
Otmar Hilliges (ETH Zurich)
Brett Jones (UIUC)
Eyal Ofek (MSR XCG)

Call for papers: IEEE CG&A
Interacting Beyond the Screen

The special issue of IEEE Computer Graphics & Applications

CFP:
http://www.computer.org/portal/web/computingnow/cgacfp3

Dates:
- Submission Date: September 7, 2013
- Publication Issue: May/June 2014

Suggested topics of interest include, but are not limited to:

- display, rendering, sensing technologies and frameworks that enable interaction beyond the screen
- projection and haptic augmentation of surfaces
- spatial and augmented reality
- computational illumination
- interactive 3D displays
- above the surface interaction
- imbuing everyday physical objects with interactivity and display capability
- depth camera-based interactions
- head-mounted and near-to-eye displays
- on-body interaction and display
- natural user interface interaction design and evaluation
- applications utilizing interactions and display beyond the screen

Come see the latest installment in our research…

IllumiRoom talk on Tuesday at 9am @ room BLUE.

IllumiRoom

Jones, Benko, Ofek and Wilson, CES Las Vegas, January 2013

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