

# Vision-Driven Design

GUI ▶ Tangible Bits & Radical Atoms  
Telepresence ▶ TeleAbsence

AVI 2026, Venice, Italy

June 10, 2026

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# Venezia

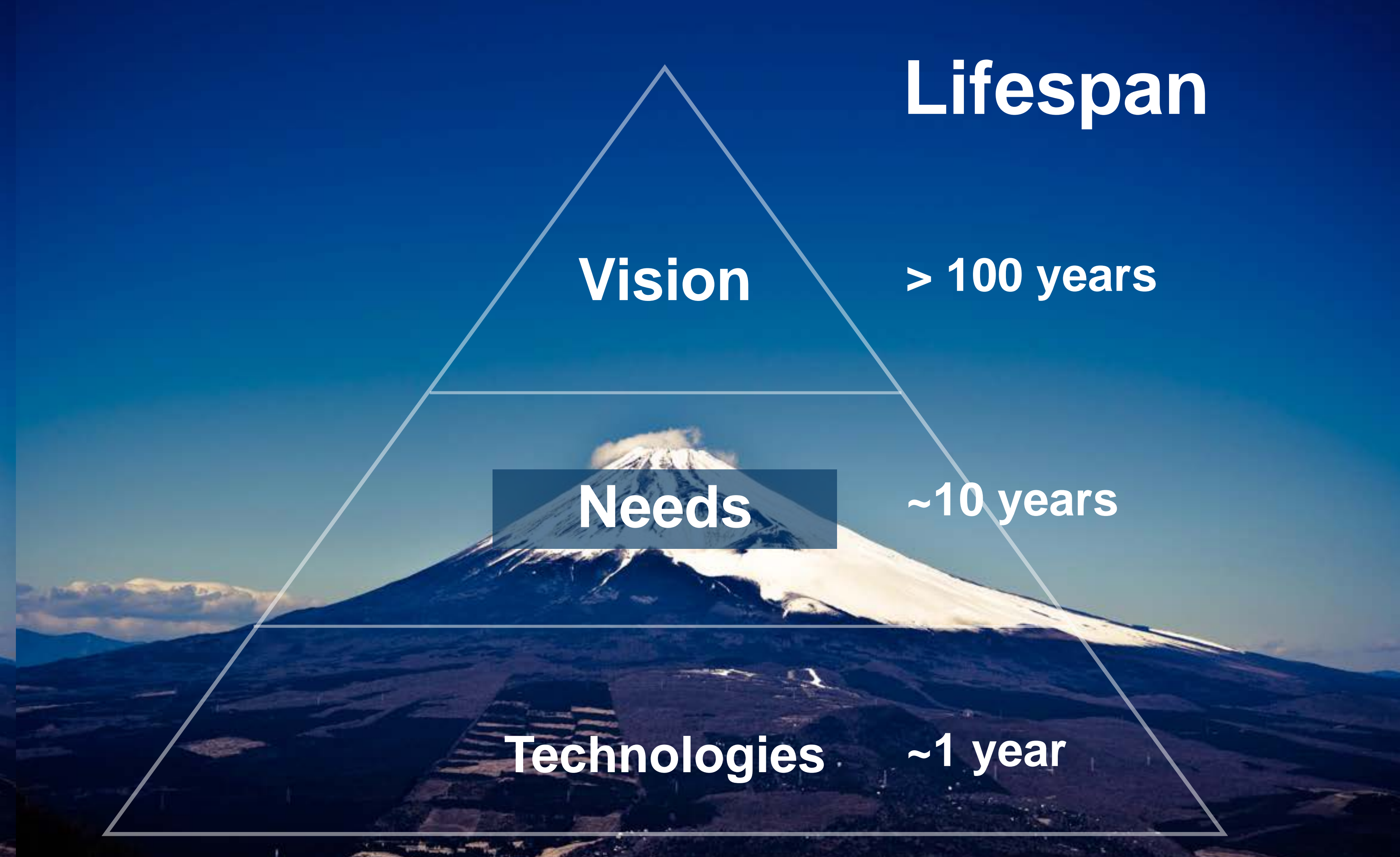
A wide-angle photograph of the Grand Canal in Venice, Italy. The canal is filled with water, and several boats are visible. On the left, there are ornate, multi-story buildings with Gothic architectural details. In the distance, the dome of St. Mark's Basilica is visible against a clear blue sky.

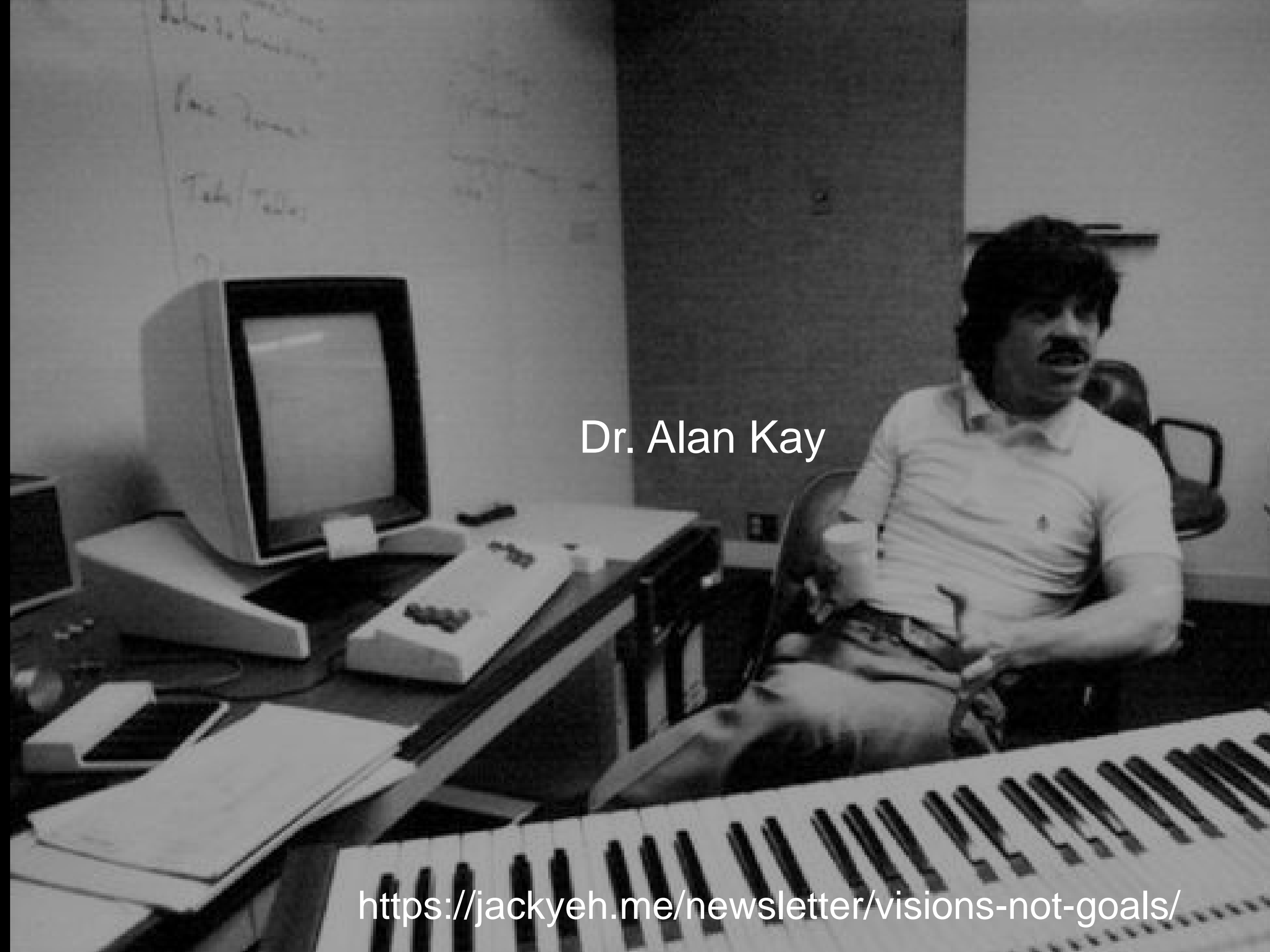
# Firenze

A panoramic view of Florence, Italy, at dusk. The city is illuminated by warm lights, and the sky is a mix of purple and blue. The large, red-tiled dome of the Duomo di Santa Maria del Fiore is the central focus, surrounded by other historic buildings and the city's skyline. The Arno River is visible in the foreground.

# *Timeless*

# vision





Dr. Alan Kay

<https://jackyeh.me/newsletter/visions-not-goals/>

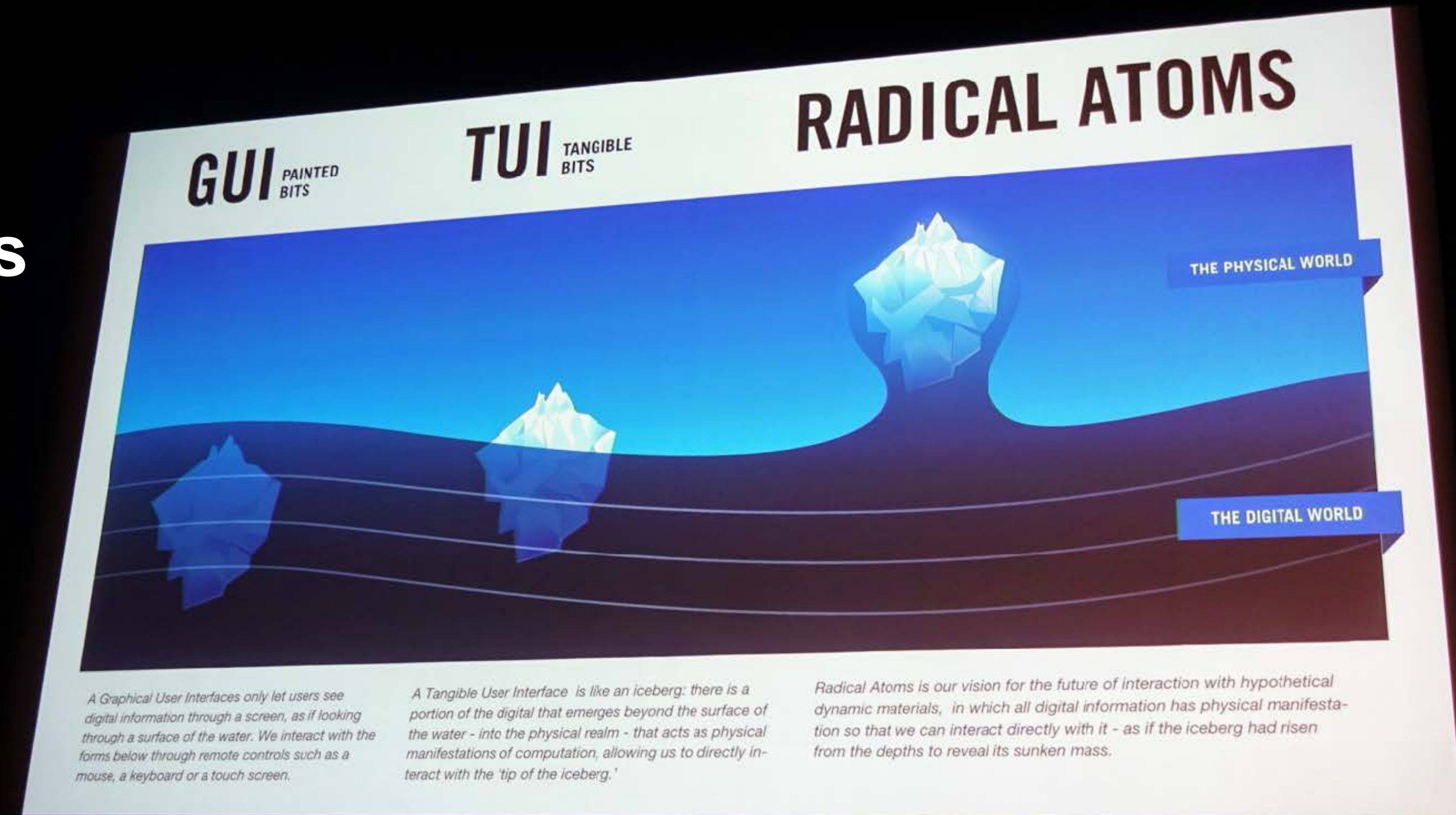
# "Visions, not Goals"

- Alan Kay's "Visions, not goals" principle suggests focusing on a romantic, long-term, and nonspecific future state rather than immediate, short-term objectives, as a key to fostering true innovation. He argues that a powerful, long-term vision acts as a "magnetic field from the future" that inspires and aligns brilliant people to create novel solutions, whereas rigid goals often lead to incremental thinking and short-sighted optimization.
- <https://jackyeh.me/newsletter/visions-not-goals/>

# Vision-Driven

GUI ► Tangible Bits ► Radical Atoms

*“I want to make bits tangible,  
and atoms dance!”*



**Human Augmentation,**  
***Be constructively critical!***  
**or Human Amputation?**

“Every augmentation is also an amputation”



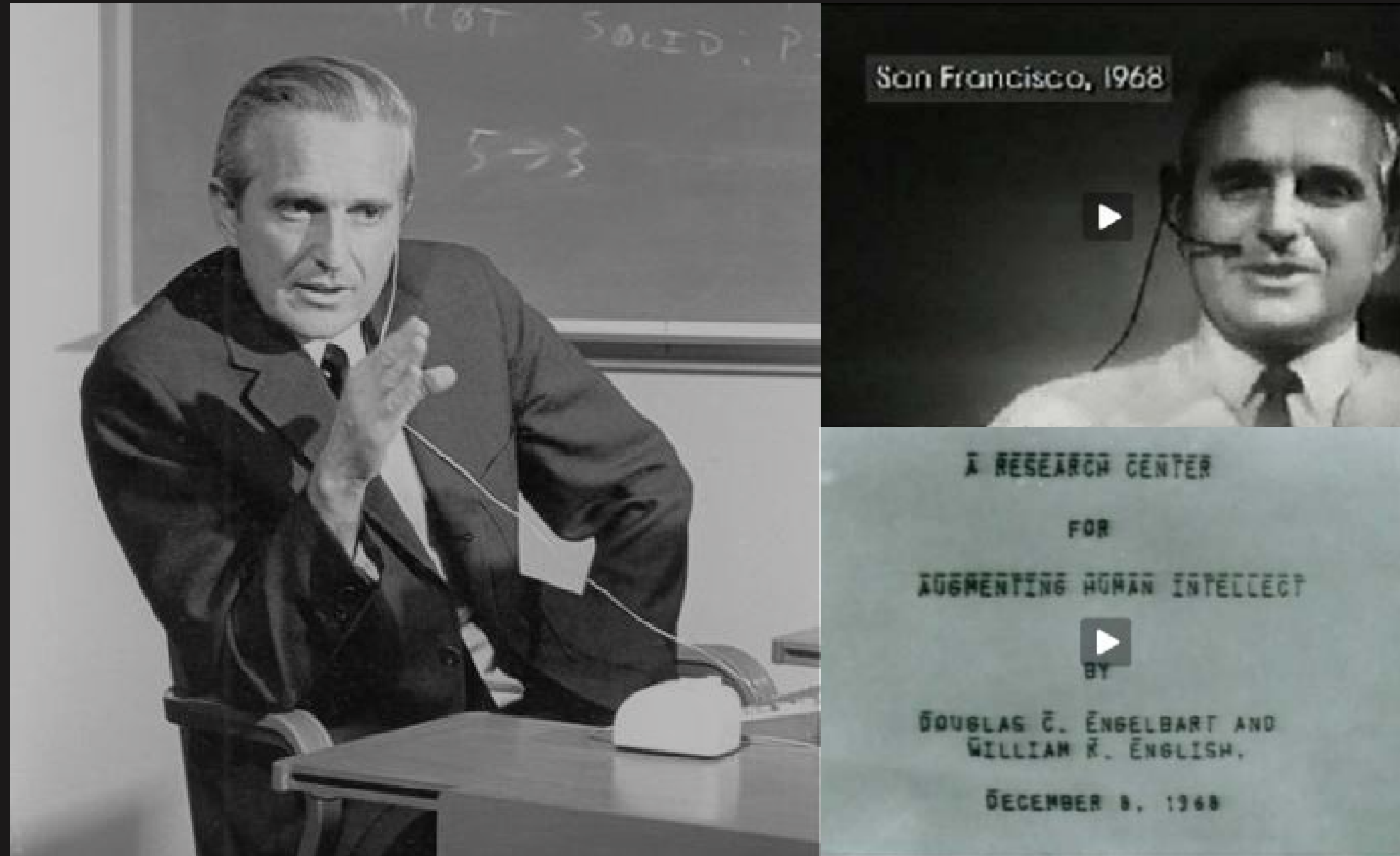
1925 - 2013



Marshall McLuhan  
1911 - 1980

# Douglas Engelbart

## Intelligence Augmentation 1962

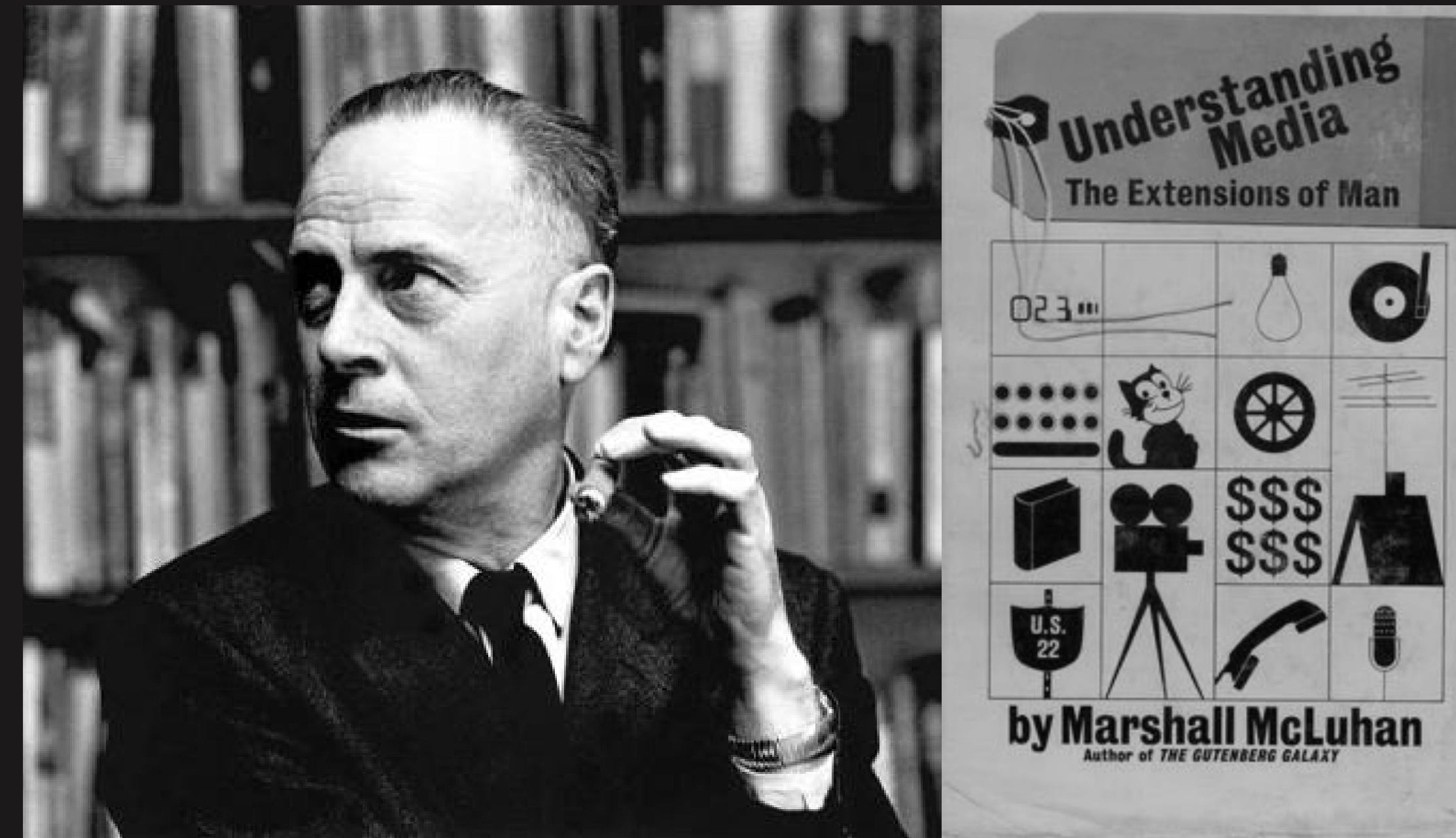


Douglas Engelbart played a crucial role in shaping the foundational ideas of **human augmentation**, especially concerning the amplification of intellect.

He coined the term "**intelligence augmentation**" (**IA**) in his seminal article "**Augmenting Human Intellect: A Conceptual Framework**" (1962). Engelbart's vision emphasized a symbiotic relationship between humans and computers, where technology would expand our intellectual abilities rather than replace them.

# Marshall McLuhan

## The Extensions of Man 1964



**“Every augmentation is also an amputation”**

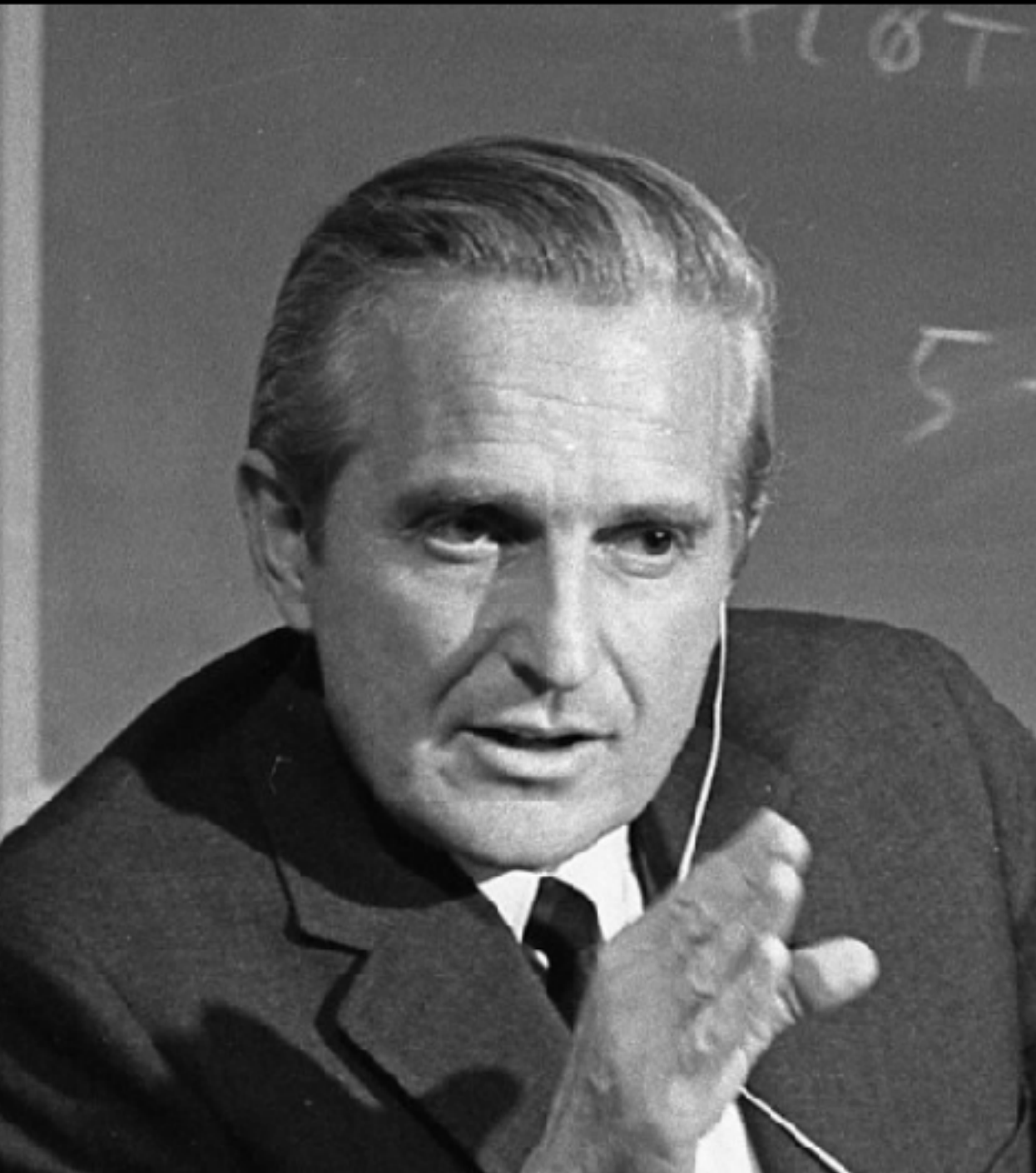
McLuhan frequently described technology as “extensions” that result in the “amputation” of other faculties.

“Every extension of mankind, especially technological extensions, has the effect of amputating or modifying some other extension.”

This reflects McLuhan’s theory that as technologies extend our faculties, they also diminish or displace other human capabilities.

[https://blog.ayjay.org/two-quotations-on-the-brief-dream-of-the-human-intellect/?utm\\_source=chatgpt.com](https://blog.ayjay.org/two-quotations-on-the-brief-dream-of-the-human-intellect/?utm_source=chatgpt.com)

# My Heroes & Mentors



Douglas Engelbart  
1925 - 2013



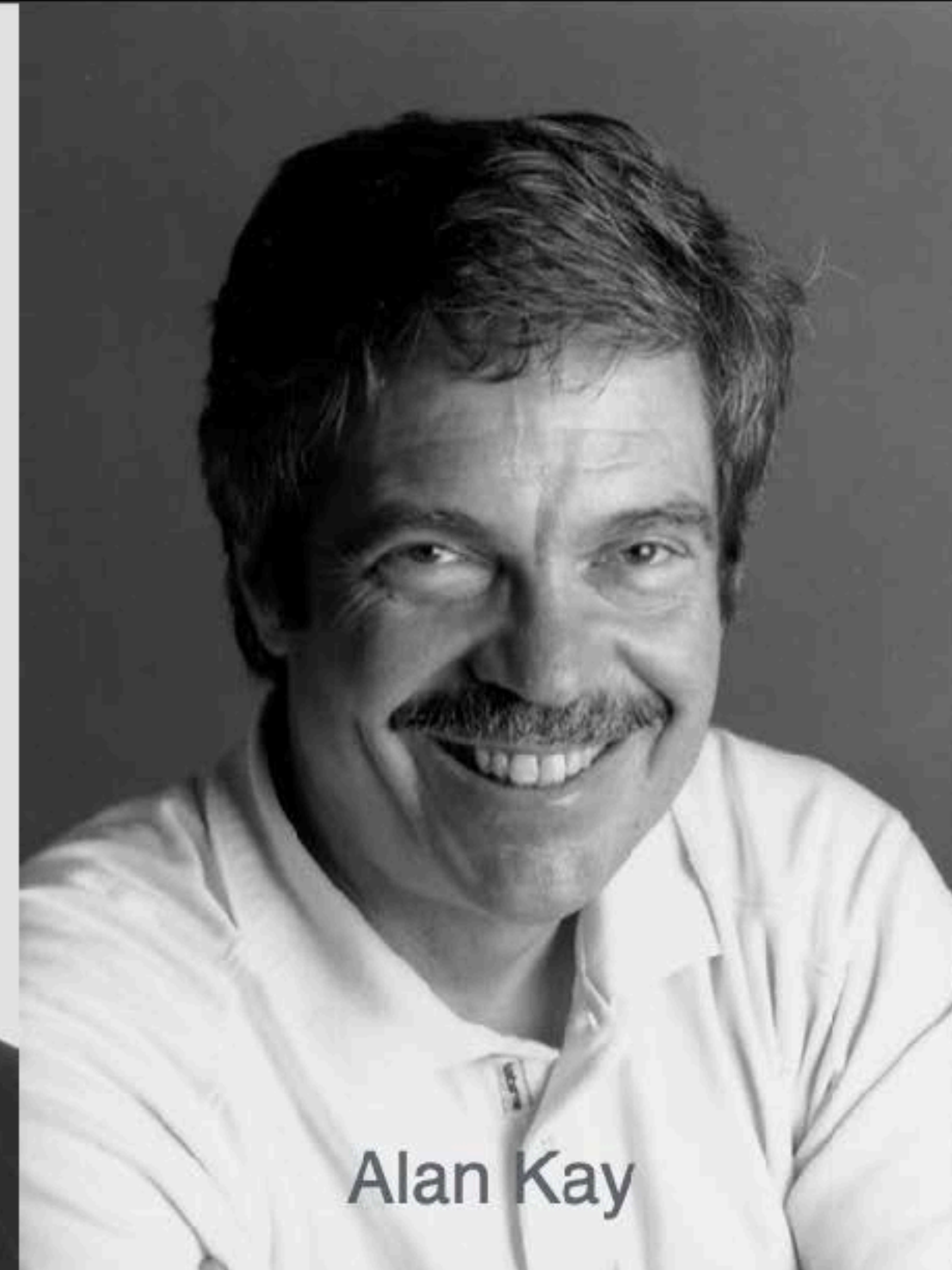
Mark Weiser  
1952 - 1999



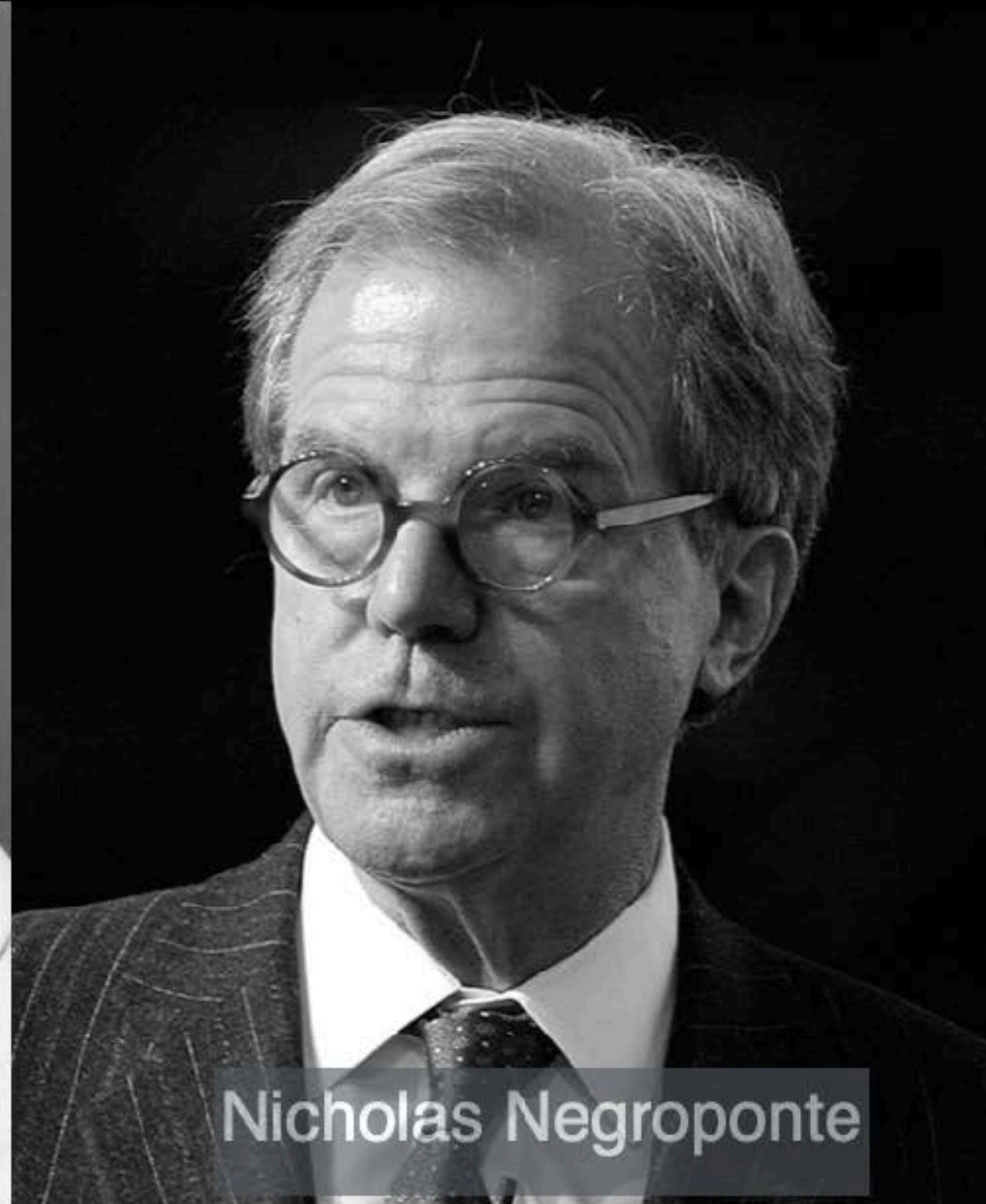
William Mitchell  
1944 - 2010



Mario Tokoro



Alan Kay



Nicholas Negroponte

# Mark Weiser 1952-1999

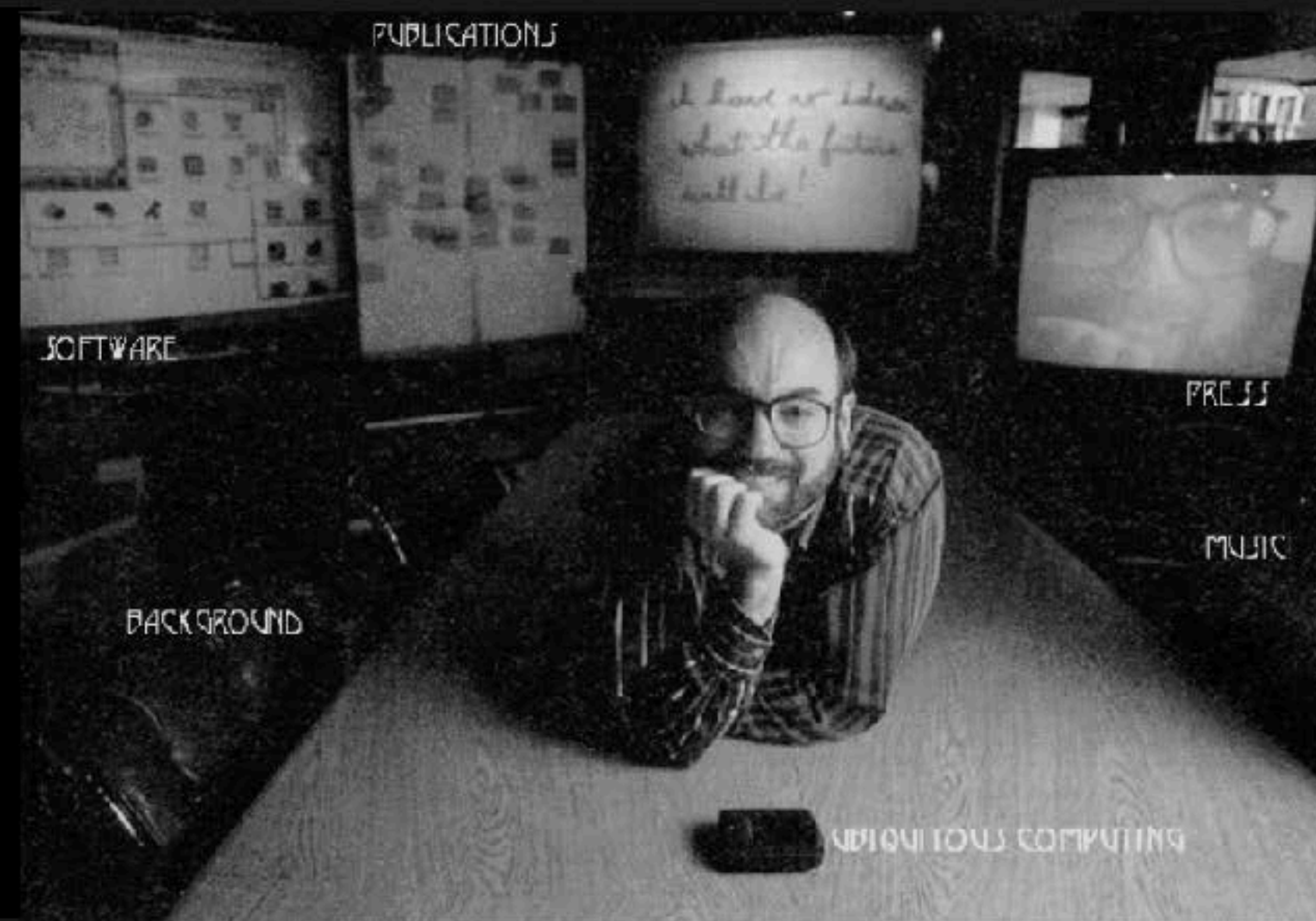
## Ubiquitous Computing

"The Computer for the 21st Century" - Scientific American Special Issue on Communications, Computers, and Networks, September, 1991



"The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it."

Mark Weiser



# Bottles: A Transparent Interface as a Tribute to Mark Weiser

IEICE TRANS. INF. & SYST., VOL.E87-D, NO.6 JUNE 2004



INVITED PAPER Special Section on Human Communication I

## Bottles: A Transparent Interface as a Tribute to Mark Weiser

Hiroshi ISHII<sup>1</sup>, Nonmember

**SUMMARY** This paper first discusses the misinterpretation of the concept of "ubiquitous computing" that Mark Weiser originally proposed in 1991. Weiser's main message was not the ubiquity of computers, but the transparency of interface that detaches users' perception of digital technologies embedded in our physical environment seamlessly. To explore Weiser's philosophy of transparency in interfaces, this paper presents the design of an interface that uses glass bottles as "containers" and "controls" for digital information. The metaphor is a perfume bottle: Instead of scent, the bottles have been filled with music—classical, jazz, and techno music. Opening each bottle releases the sound of a specific instrument accompanied by dynamic colored light. Physical manipulation of the bottles—opening and closing—is the primary mode of interaction for controlling their musical contents. The text illustrates Mark Weiser's vision of the transparent (or invisible) interface that weaves itself into the fabric of everyday life. The bottles also exploits the emotional aspects of glass bottles that are tangible and visual, and evoke the smell of perfume and the taste of exotic beverages. This paper describes the design goals of the bottle interface, the arrangement of musical content, the implementation of the wireless electromagnetic tag technology, and the feedback from users who have played with the system.

**Key words:** Mark Weiser, ubiquitous computing, pervasive computing, invisible computing, transparent interface, tangible interface, tangible bits, bottles, musicBottles, weather bottle

### 1. Introduction

"Ubiquitous" has become a popular buzzword used by virtually every media in Japan today. Unfortunately, however, Mark Weiser's original concept of "ubiquitous computing" [19] was not well understood, and was often misused as a label for the old idea such as "anytime & anyplace computing" or as an acronym of "mobile/wireless broadband services."

This paper first discusses the core message of Weiser's "ubiquitous computing" vision based on my personal communication with him, and then presents "bottles" as a tribute to him. The bottles illustrates Weiser's vision of profound technologies that disappear by weaving themselves into the fabric of everyday life.

### 2. Ubiquitous

#### 2.1 Anytime & Anyplace?

The word *ubiquitous*, meaning "omnipresent," is often interpreted as "anytime & anyplace." However, the concept of "anytime & anyplace" is nothing especially new. This

Manuscript received December 12, 2003.

Manuscript revised February 20, 2004.

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ISHII: BOTTLES: A TRANSPARENT INTERFACE AS A TRIBUTE TO MARK WEISER

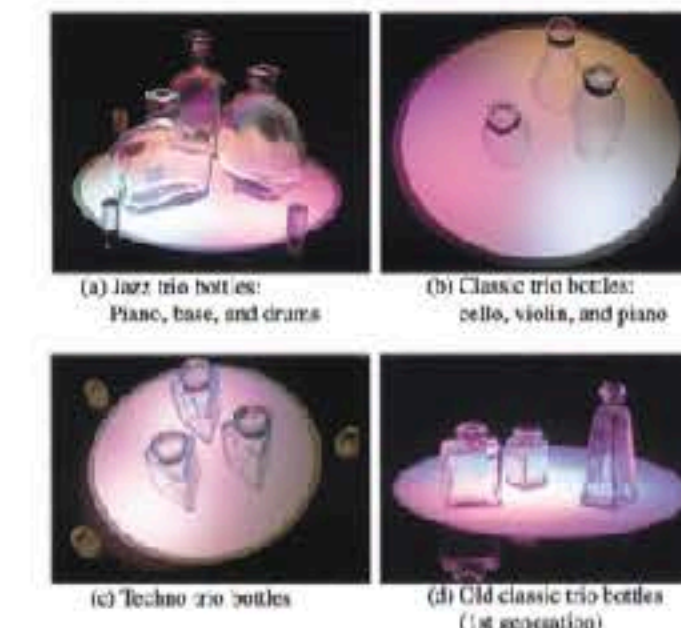


Fig. 4 musicBottles sampler.



Fig. 6 A weather bottle that contains the weather forecast of Sapporo-city.

# Mark Weiser 1952-1999

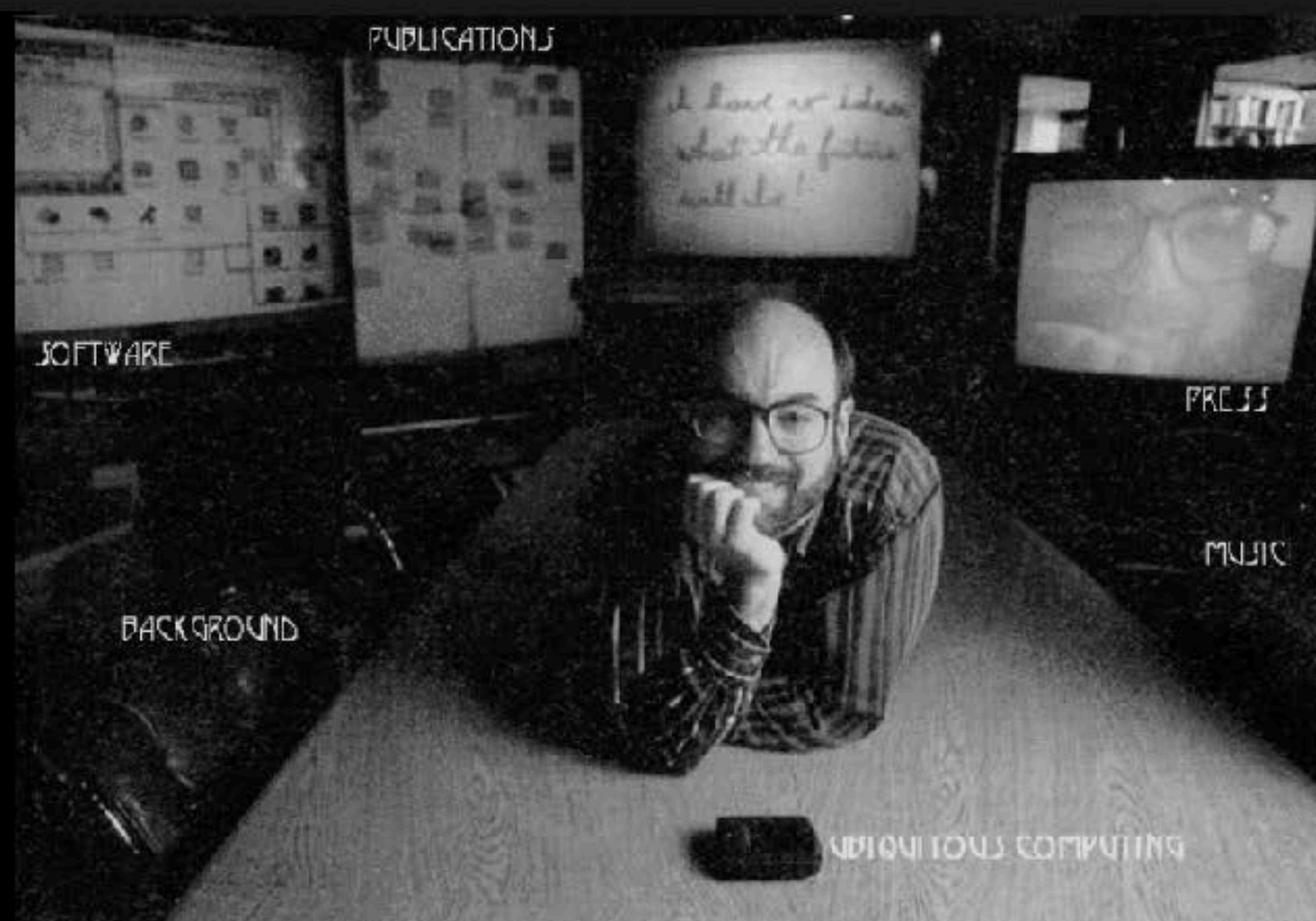
## Ubiquitous Computing

"The Computer for the 21st Century" - Scientific American Special Issue on Communications, Computers, and Networks, September, 1991



"The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it."

Mark Weiser



# Mark Weiser's message Jan. 26, 1997

Date: Sun, 26 Jan 1997 23:34:10 PST

To: ishii@media.mit.edu, ullmer@media.mit.edu

From: Mark Weiser <weiser@xerox.com>

Subject: "Tangible Bits"

Dear Hiroshi and Brygg,

I recently had a chance to read your CHI 97 paper "**Tangible Bits**". Great work! In my opinion this is the kind of work that will characterize the **technological landscape in the twenty-first century...**

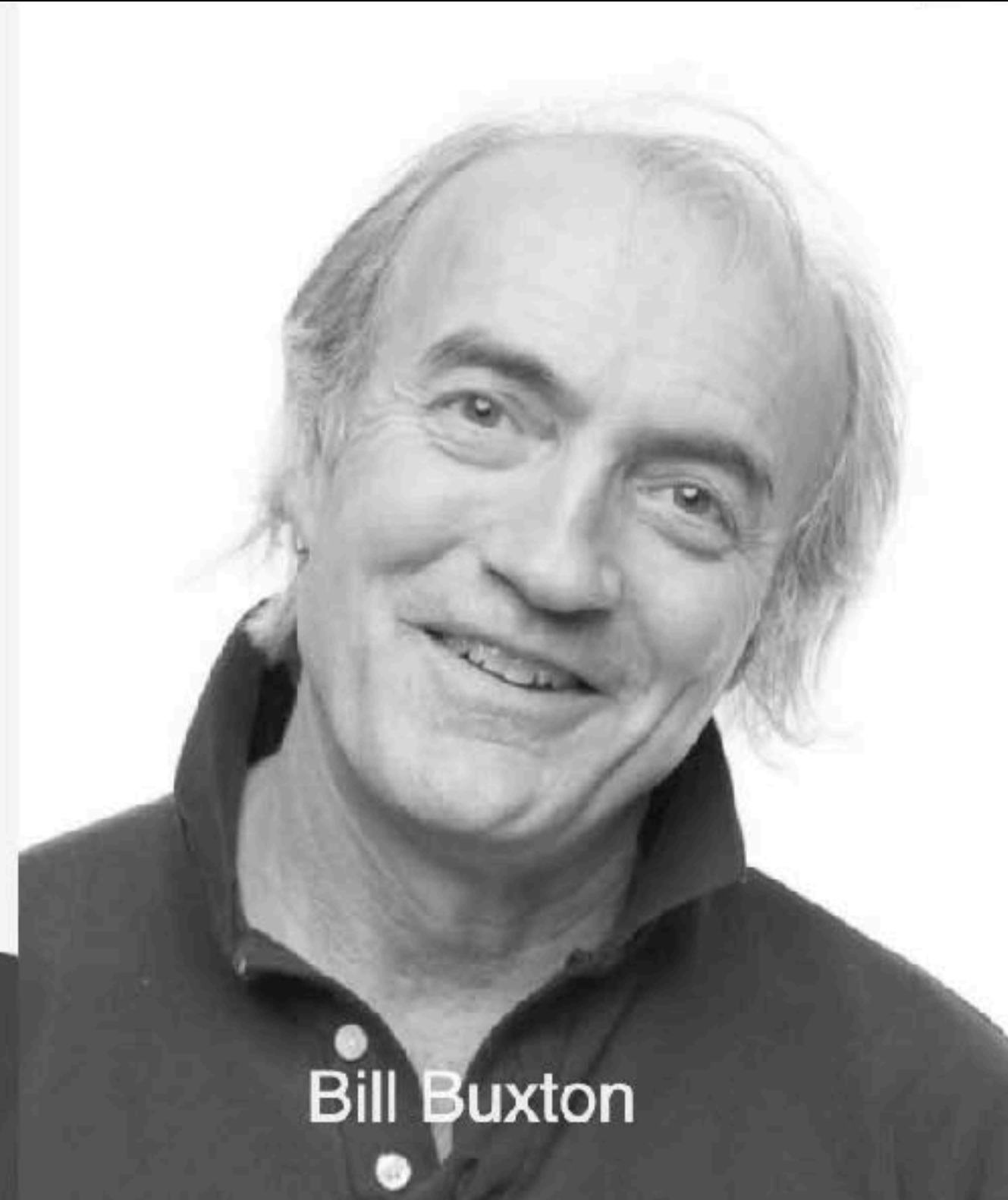
I do have a request. My request is that you help me stop the spread of **misunderstanding of ubiquitous computing** based simply on its name...

**"Tangible Bits"** is very nice, and maybe could serve as an overall **umbrella**, but then you might lose it as the name of your research project! ...

# My Heroes & Friends



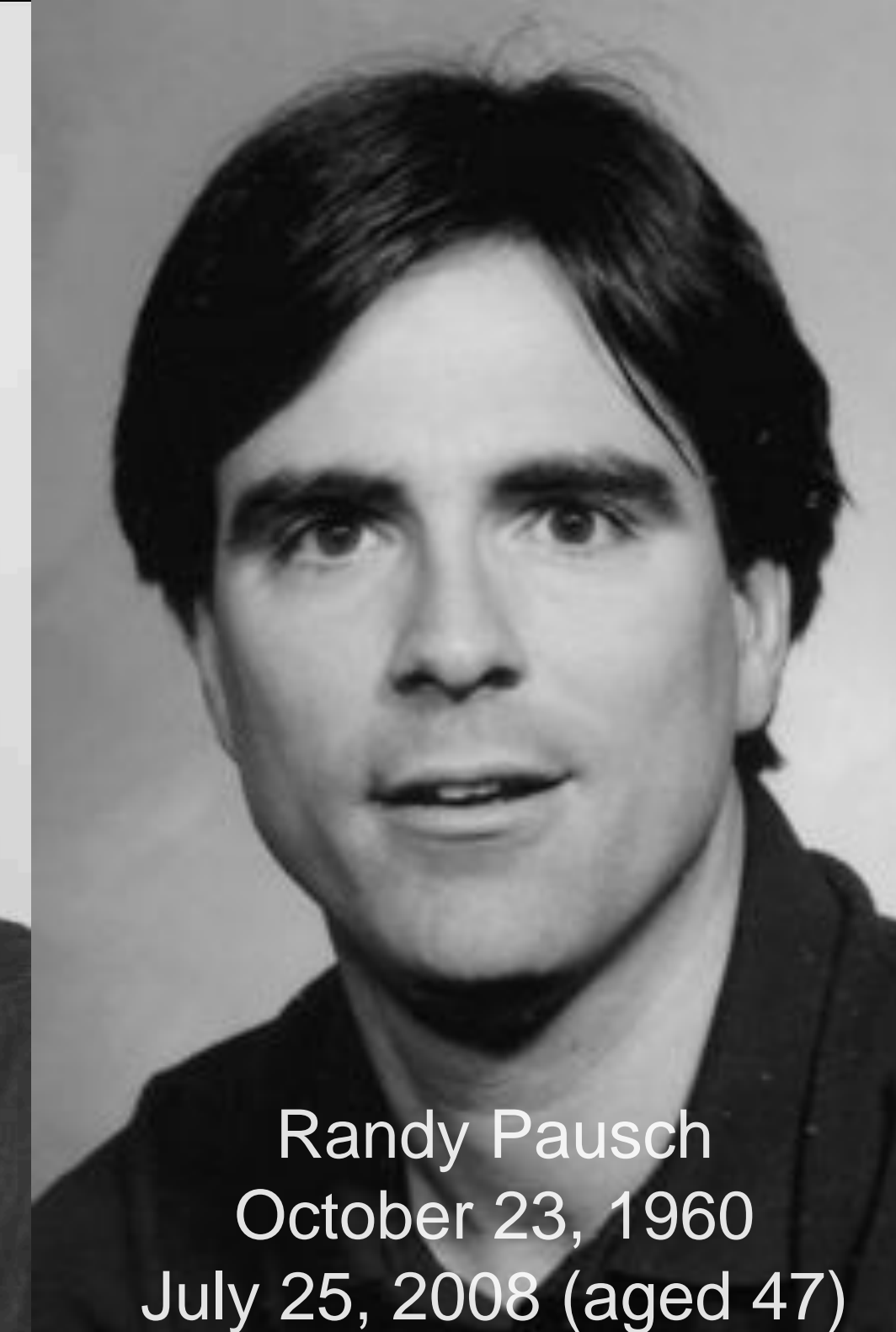
John Maeda



Bill Buxton



Joachim Sauter  
1959 - 2021



Randy Pausch  
October 23, 1960  
July 25, 2008 (aged 47)

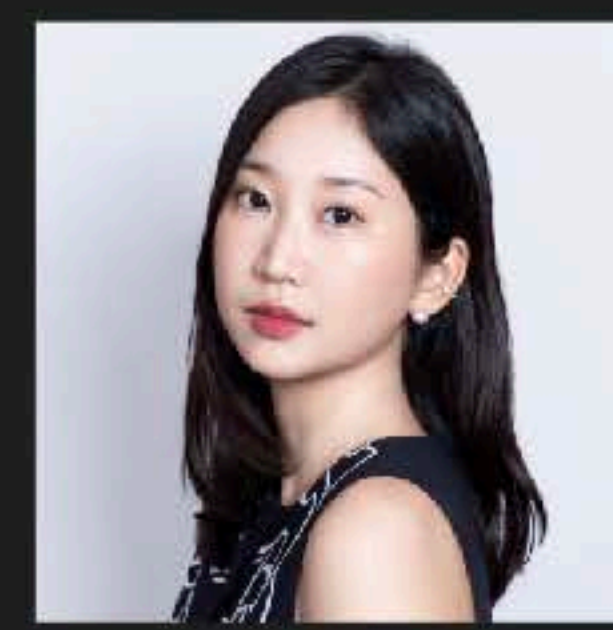


# From Remote Space To Remote Time

Tuesday, April 14, 2026 (14:15 – 15:45 CEST)



Prof. Hiroshi Ishii  
[ishii@mit.edu](mailto:ishii@mit.edu)  
Organizer



Hye Jun Youn  
[hyoun95@mit.edu](mailto:hyou95@mit.edu)  
Organizer & Moderator



Dr. Jie Li  
[jieli8@mit.edu](mailto:jieli8@mit.edu)  
Moderator



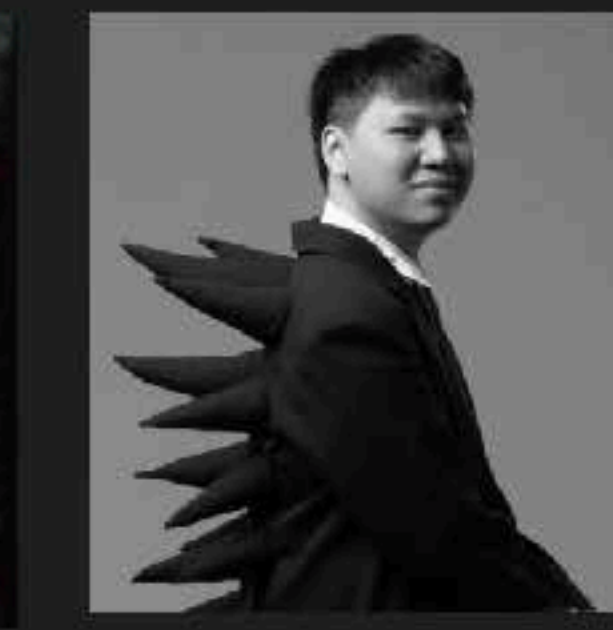
Dr. Xiao Xiao  
Panelist



Prof. Eugene Ch'ng  
Panelist



Prof. Jayne Wallace  
Panelist



Prof. Pat Pataranutaporn  
Panelist

## *TeleAbsence*

► Paper "TeleAbsence: A Vision of Past and Afterlife Telepresence"  
in The MIT Press Journal "PRESENCE"  
MIT Libraries DSpace: <https://hdl.handle.net/1721.1/158451>

<https://www.flickr.com/photos/79203622@N02/9734698717/>



# Thanks to TMG since 1995!



1997



2015



2026

# 1994

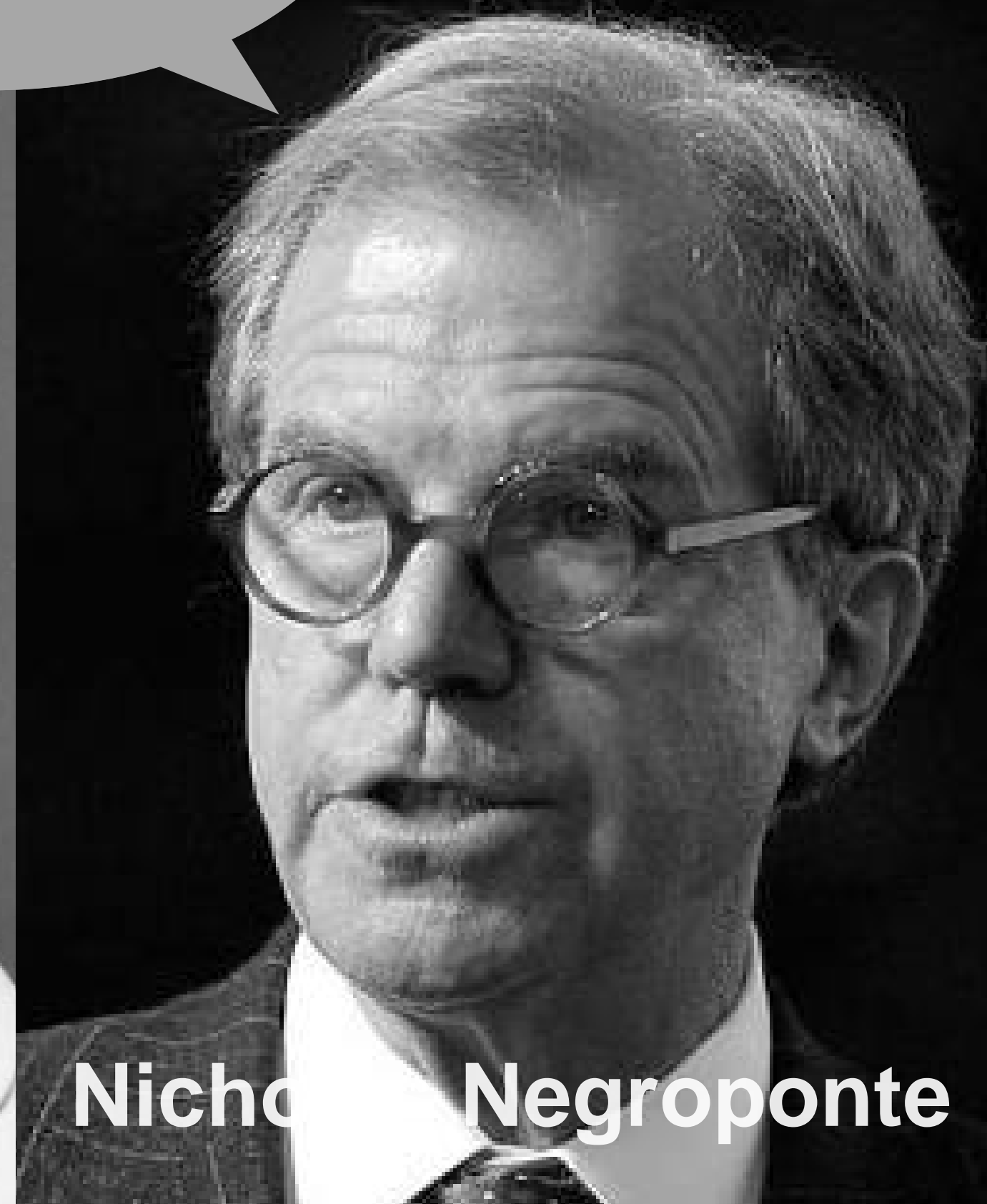
# Atlanta

# Vanguard Conf



Alan Kay

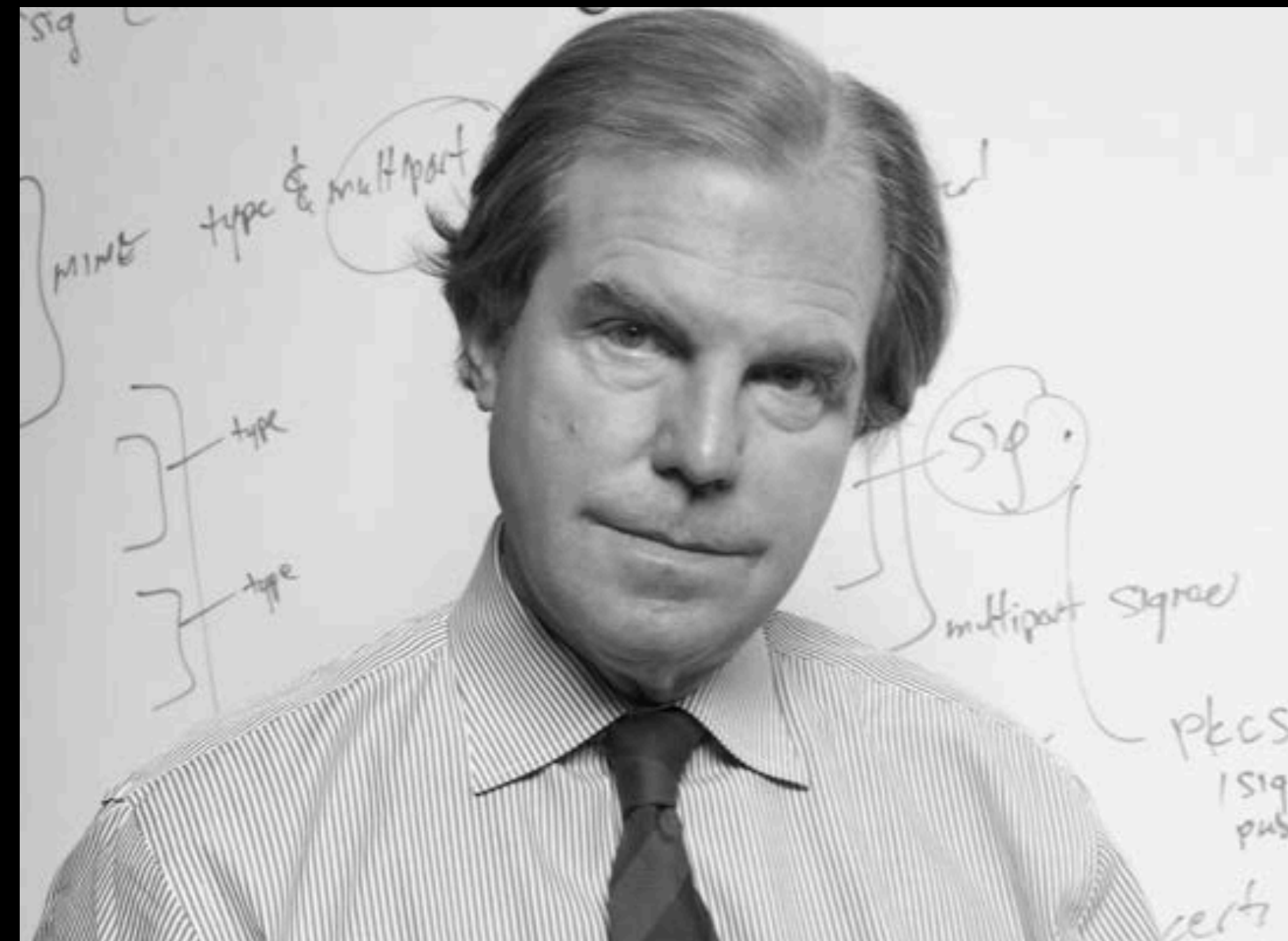
“Come to the  
Media Lab!”



Nicholas Negroponte

**“REBOOT!”**

Feb. 10th, 1995 at MIT Media Lab



Nicholas Negroponte



**1995**

**MIT Media Lab**

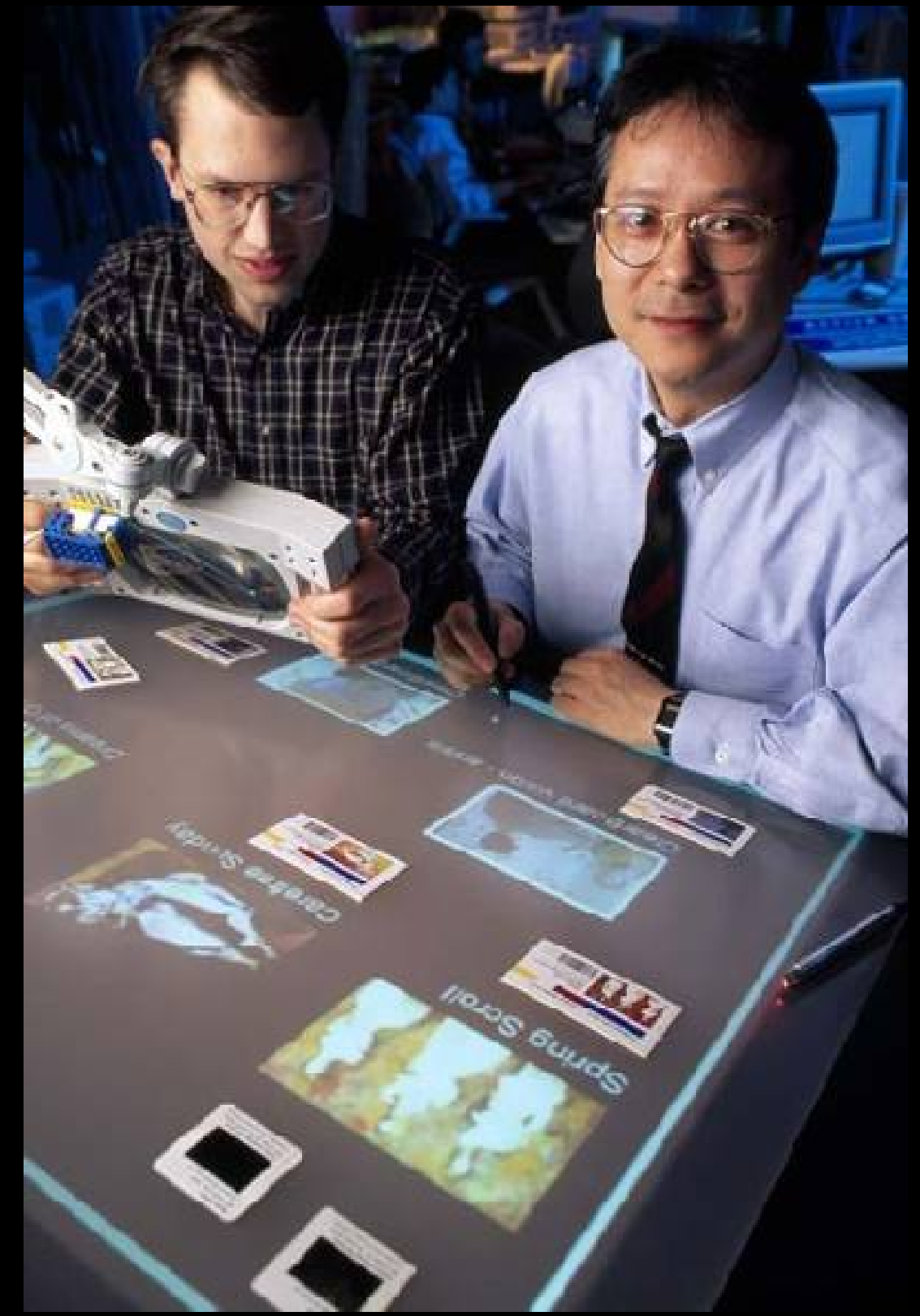
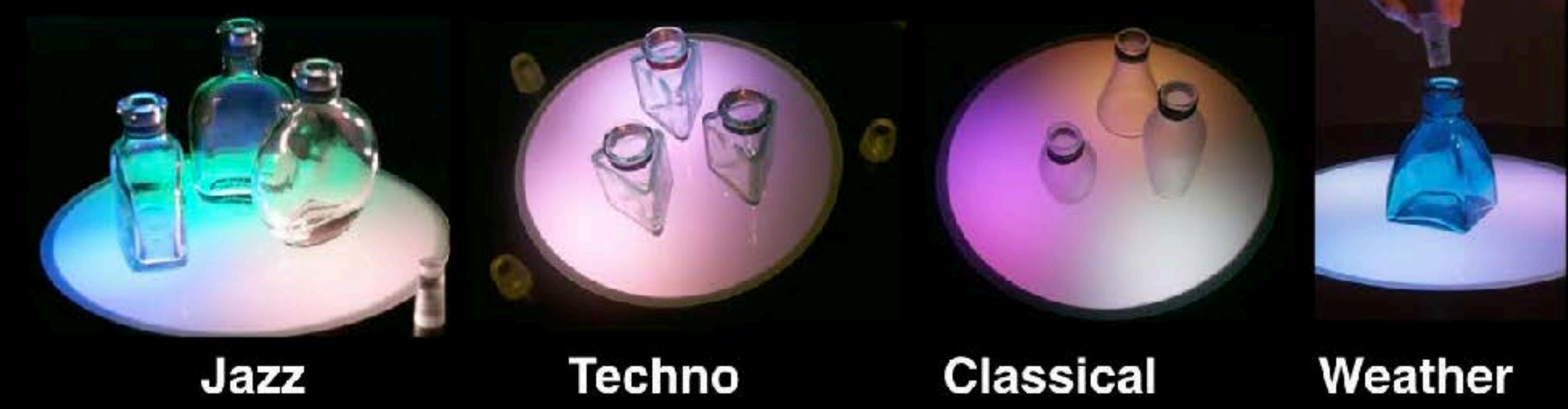


# Tangible Bits 1996-1999

ambientROOM (CHI '97, '98)



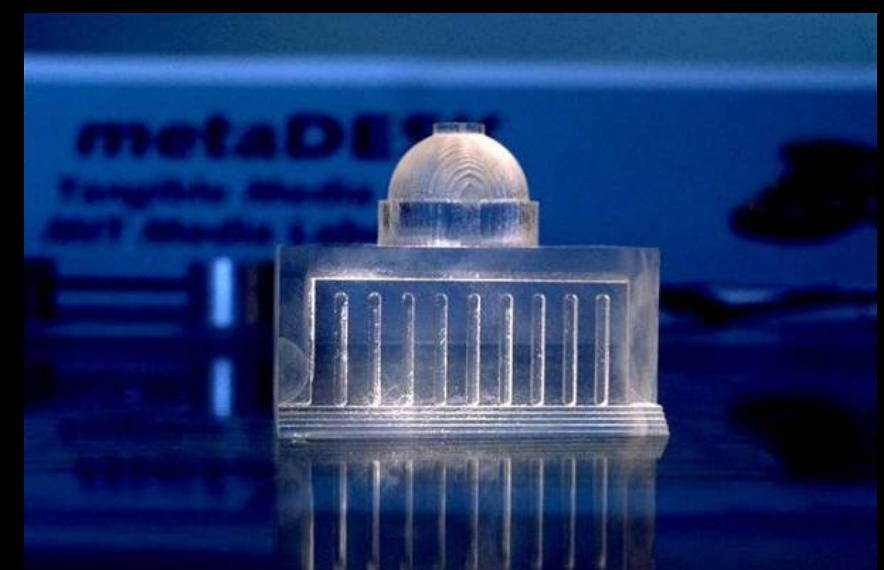
musicBottles. (SIGGRAPH '99, CHI '01)



metaDESK (CHI '97, UIST '97)

# Origin: CHI '97

## Tangible Bits: Towards Seamless Interfaces between People, Bits and Atoms

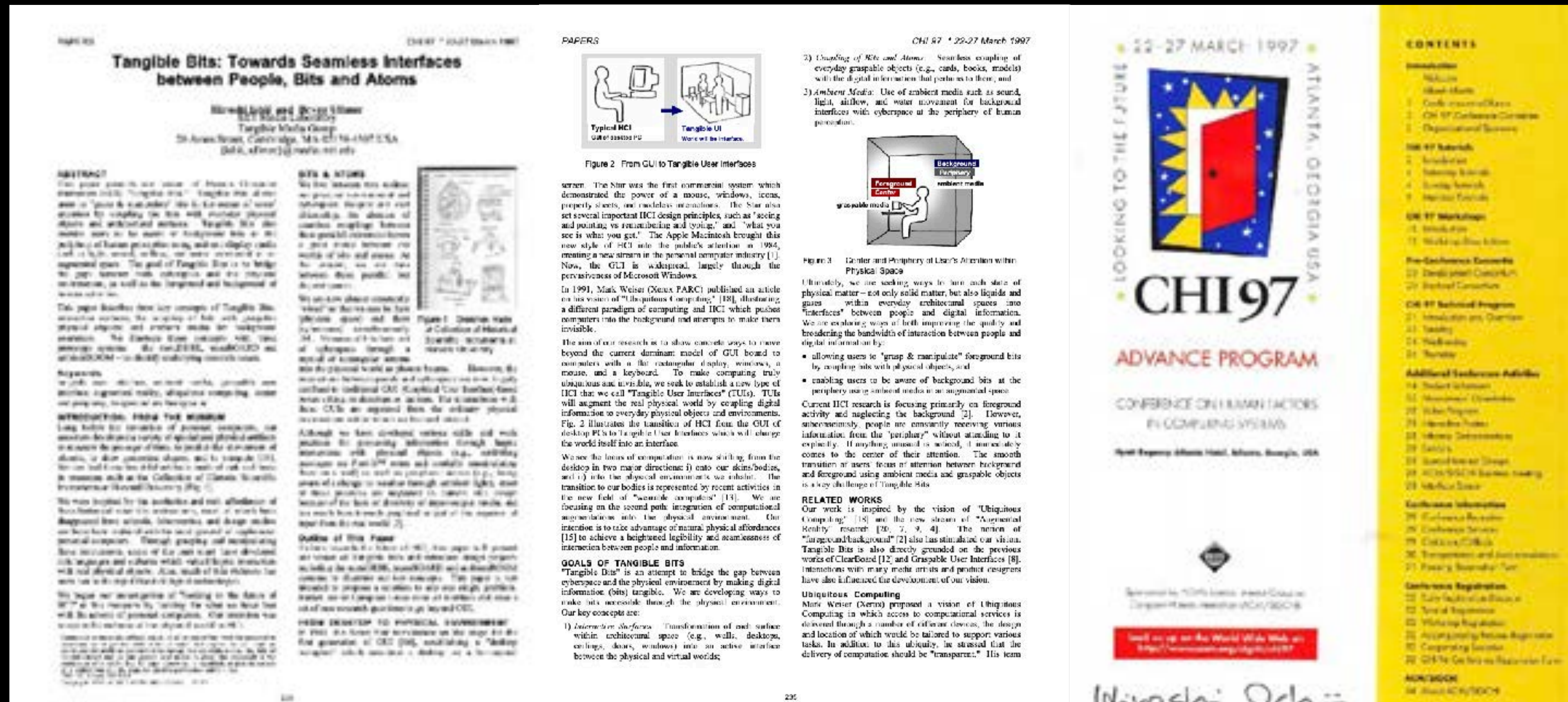


March 1997

Presented at CHI '97 in Atlanta

<http://dl.acm.org/citation.cfm?id=258715>

## The most cited CHI paper



Most Popular

<https://dl.acm.org/conference/chi>

Downloaded

Cited

1

March 1997  
**Tangible bits: towards seamless interfaces between people, bits and atoms**

CHI '97: Proceedings of the ACM SIGCHI Conference on Human Factors in...

[Hiroshi Ishii](#),  
 [Brygg Ullmer](#)

Cited 2,276 times

2

May 1995  
**Social information filtering: algorithms for automating "word of mouth"**

CHI '95: Proceedings of the SIGCHI Conference on Human Factors in...

[Upendra Shardanand](#),  
 [Pattie Maes](#)

Cited 1,775 times

3

March 1990  
**Heuristic evaluation of user interfaces**

CHI '90: Proceedings of the SIGCHI Conference on Human Factors in...

[Jakob Nielsen](#),  
 [Rolf Molich](#)

Cited 1,565 times

4

April 2004  
**Labeling images with a computer game**

CHI '04: Proceedings of the SIGCHI Conference on Human Factors in...

[Luis von Ahn](#), [Laura Dabbish](#)

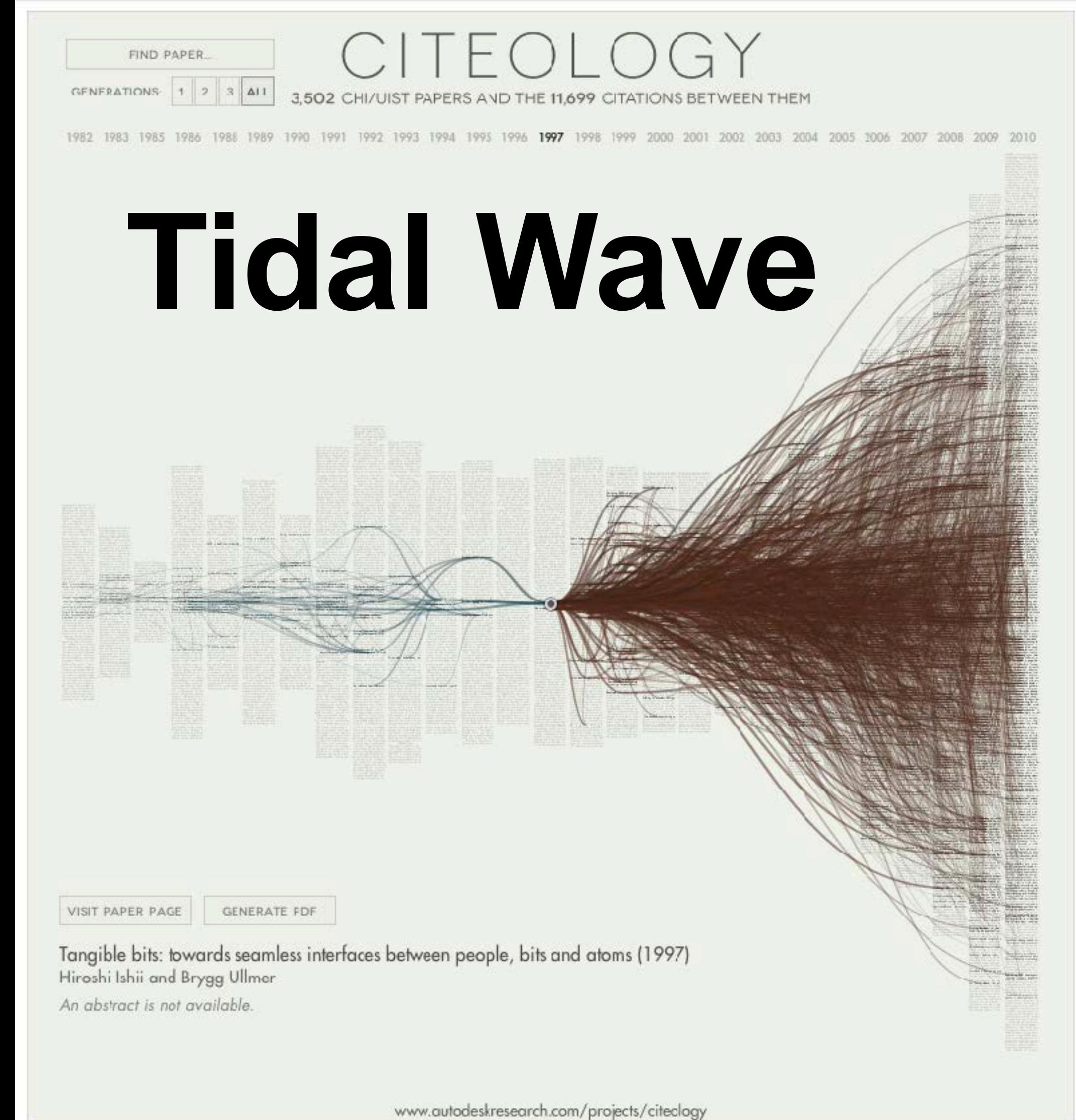
Cited 1,256 times

# Impact of Tangible Bits CHI '97 paper

*A paper is like a stone cast into the sea. Most stones sink quietly, vanishing into the depths, forgotten by time. But a rare few—imbued with purpose—send ripples across the surface, ripples that swell into waves, crossing oceans, reaching distant shores. This is true impact—an unseen force that shapes the tides of thought.*

## Citeology: Visualizing Paper Genealogy (2012)

By Justin Matejka, Tovi Grossman, George Fitzmaurice, Autodesk Research  
CHI '12 Extended Abstracts on Human Factors in Computing Systems, Pages 181–190 <https://doi.org/10.1145/2212776.2212796>



# IMPACT: 20 ACM TEI Conferences since 2007

## Community!

International Conference on Tangible, Embedded, and Embodied Interaction

The 20th TEI '26 will be hosted by the University of Chicago on March 8-11, 2026

<https://tei.acm.org/2026/>

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2020

2021

2022

2023

2024

2025

2026

# ACM SIGCHI Lifetime Research Award 2019 — Honoring the **TEI Community!**



## CHI 2019 in Glasgow, UK

The ACM CHI Conference on Human Factors  
in Computing Systems, May 4-9, Glasgow, UK

<https://vimeo.com/348062352>



Albert-László Barabási

Author of *Bursts: The Hidden Pattern Behind Everything We Do*

+

THE

Formula

=

THE UNIVERSAL  
LAWS OF SUCCESS

< THE SCIENCE BEHIND WHY PEOPLE SUCCEED OR FAIL >

# The Formula

The Universal Laws of Success  
By Albert-László Barabási · 2017

*That is why the CHI, AVI,  
and TEI communities  
are essential!*

*Individual success is not solely based on personal effort or intrinsic merit, but largely depends on **how one's work is perceived and recognized by others**. Success is a collective verdict, not an individual attribute. The book reframes success as less about what you do and more about **how the world responds to it**.*

# Evolving Visions

2020-2022  
COVID-19 Pandemic



NTT Human Interface Labs

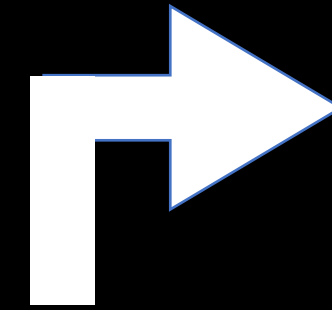
1995

MIT Media Lab

“REBOOT!”



Nicholas Negroponte  
Feb. 10th, 1995



1995-2010

**Tangible Bits**



2005-2030

**Radical Atoms**



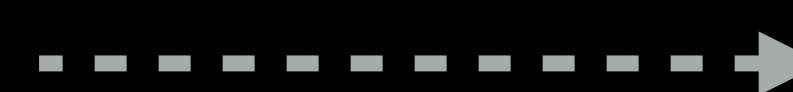
1990-1994

**Seamless  
Telepresence**



1998-2030

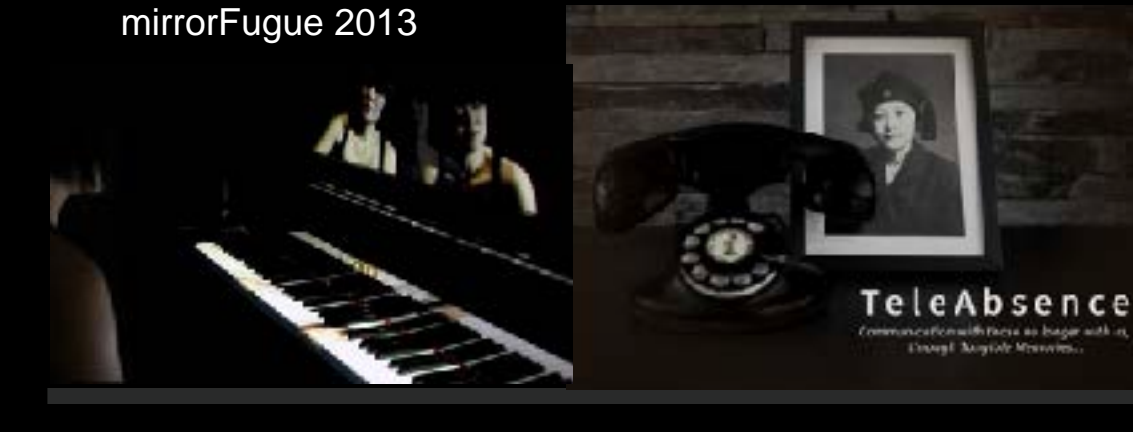
**Tangible  
Telepresence**



2020-2200

**TeleAbsence**

Communicating with those no longer with us  
through Tangible Memories to remember them



# Evolution of Tangible Bits 1

## Foreground - Graspable Media



**metaDESK** (CHI '97, UIST '97)



**inTouch** (CHI '97, CSCW '98)



**curlybot** (SIGGRAPH '99, CHI '00)



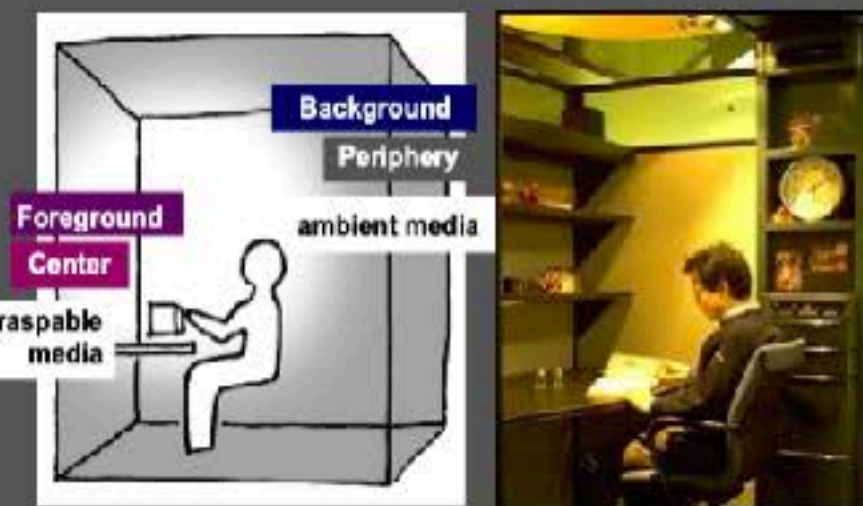
**topobo** (CHI '04, '08) *constructive assembly*



**musicBottles** (SIGGRAPH '99, CHI '01)

*I/O coincident actuated tangibles*

## Background - Ambient Media



**ambientROOM** (CHI '97, '98)



**pinwheels & water lamp** (CoBuild '98, CHI '01)



**mediaBlocks** (SIGGRAPH '98)



**TouchCounters** (CHI '99)



**HandSCAPE** (CHI '00)



**Triangles** (DIS '97, CHI '98)



**LumiTouch** (CHI '01)



**ComTouch** (DIS '02)

# Evolution of Tangible Bits 2

*Tabletop TUIs*

## Sensetable platform



**metaDESK** (CHI '97, UIST '97)



**Illuminating Light** (CHI '98)



**PingPongPlus** (CHI '99, ACE '11)



**Sensetable** (CHI '01)



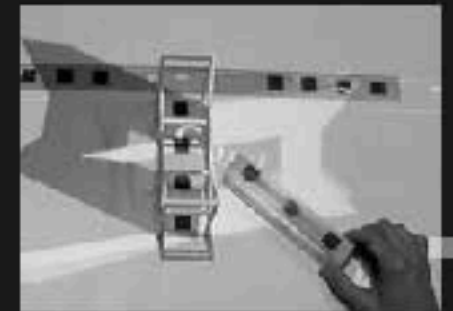
**Audiopad** (NIME '02, ACE '06)



**IP NW WB** (CHI '03)



**Supply Chain Vis** (Sys. Dyn. Rev. '10)



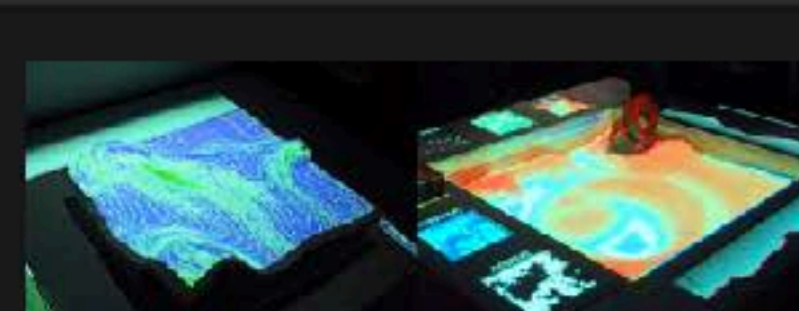
**Urp** (CHI '99, SIGGRAPH '99, ISMAR '02,)



**Urban Sim.** (ISMAR '02)



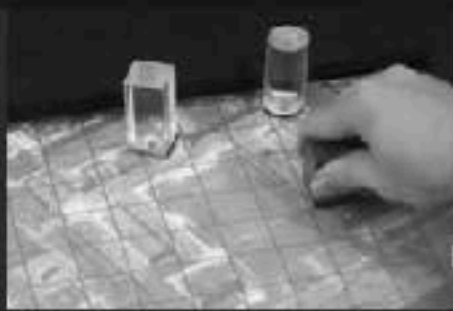
**Senseboard** (CHI '02)



**Illuminating Clay & SandScape** (CHI '02)



**Phoxel Space** (DIS '04)



**PSyBench** (CSCW '98)



**Actuated Workbench** (UIST '02)

*actuated tabletop TUIs*

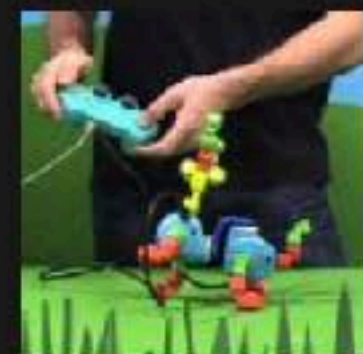


**PICO** (CHI '07)

# Evolution of Tangible Bits 3



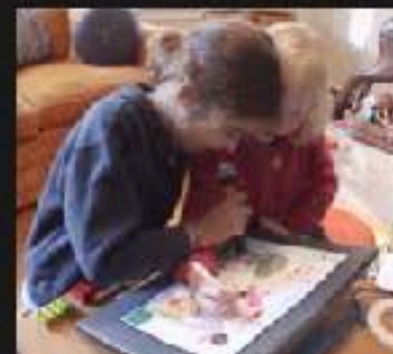
**I/O Brush**  
(CHI '04, '07)



**Remix+Robo Topobo**  
(IDC '07, SIGGRAPH '07)



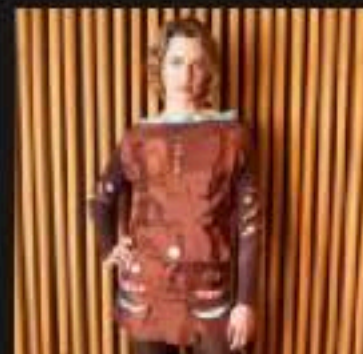
**Picture This!**  
(INTERACT '07, UbiComp '08)



**jabberstamp**  
(IDC '07, SIGGRAPH '07)



**Wetpaint**  
(CHI '09)



**Piezing**  
(TEI '09)



**Psychohaptics**  
(CHI '09)



**OnObject**  
(UIST '10)



**Glume**  
(CHI '06)



**Senspectra**  
(CHI '07)



**Kinected Conf.**  
(CSCW '11)



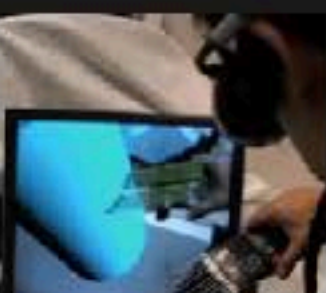
**AnnoScape**  
(SUI '14)



**CopyCAD**  
(UIST '10)



**deFORM & KidCAD**  
(UIST '11, CHI '12)



**AR-Jig**  
(ISMAR '07)



**Beyond**  
(CHI '10)



**g-stalt**  
(TEI '10)



**T(ether)**  
(SUI '14)



**Sourcemap**  
(CHI '10)



**Cord UIs**  
(TEI '15)

# Evolution of Radical Atoms 1

## Actuated Tangibles

*levitating tangibles*



**ZeroN** (UIST '11)



**Perfect Red & Radical Atoms**  
(interactions '12)

*vision*

*I/O coincident actuated tangibles*



**inTouch**  
(CHI '97, CSCW '98)



**curlybot**  
(SIGGRAPH '99, CHI '00)



**topobo**  
(CHI '04, '08)



**Kinetic Sketchup & Bosu**  
(TEI '09, DIS '10)

*Art & Science*



**MirrorFugue** (NIME '13, CHI '16)

*actuated tabletop TUIs*



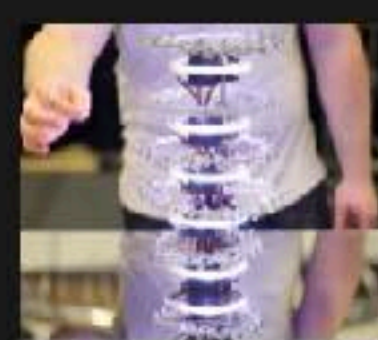
**PSyBench**  
(CSCW '98)



**Actuated WB**  
(UIST '02)



**PICO** (CHI '07)



**Amphorm**  
(CogInfoCom '12)



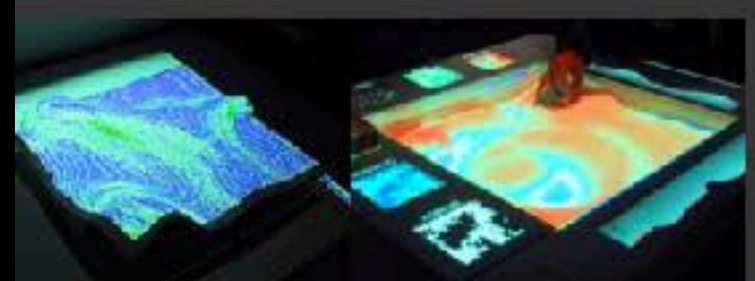
**Weight/Volume Changing UI**  
(TEI '14)

# Evolution of Radical Atoms 2

## Shape Displays

Tangible Bits → Radical Atoms

*Static / Passive  
Tangible Bits*



**Illuminating Clay & SandScape** (CHI '02)

*Active / Kinetic  
Shape Displays*



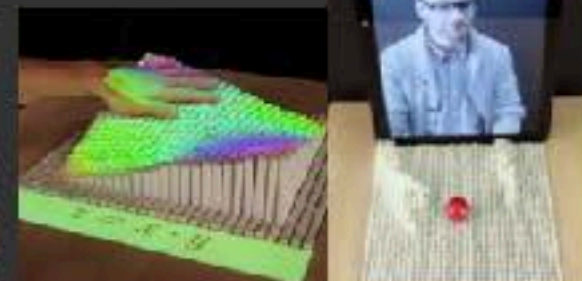
**Relief** (TEI '09, UIST '11)

**Recom pose** (UIST '11)

**SUBLIMATE** (CHI '13)

**Tangible CityScape**

**inFORM** (UIST '13, '14, Fast Comp. Design Award '14)



**Physical Telepresence** (UIST '14)



**Kinetic Blocks** (UIST '15)



**TRANSFORM** (CHI '15, A'Design Award '15)

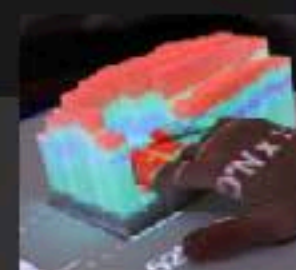


**LineFORM & ChainFORM** (UIST '15, '16 IEEE Perv. Comp. '17)

**Materialie** (CHI '16)



**AnimaStage** (DIS '17)

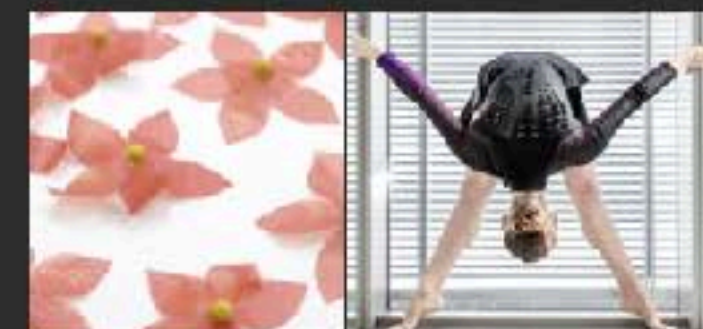


**inFORCE** (TEI '19)

# Evolution of Radical Atoms 3

## Programmable Materials

*Hygromorphic Materials*



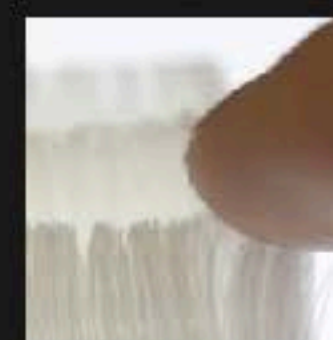
**bioLogic** (CHI '15, A'Design Awards '16, Sci. Adv. '17)



**Transformative Appetite** (CHI '17)



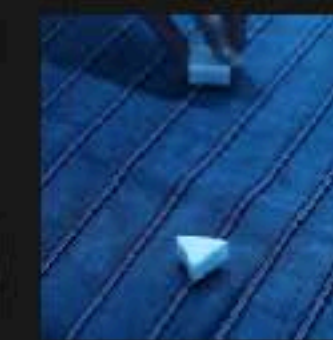
**bioPrint & xPrint** (UIST '14, CHI '16)



**Cillia** (CHI '16)



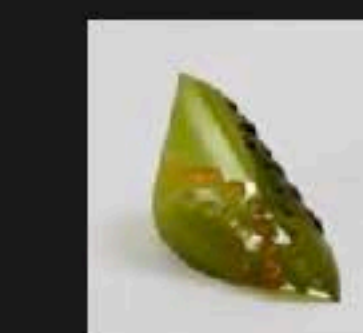
**kinetiX** (Comp. & Graphics '18)



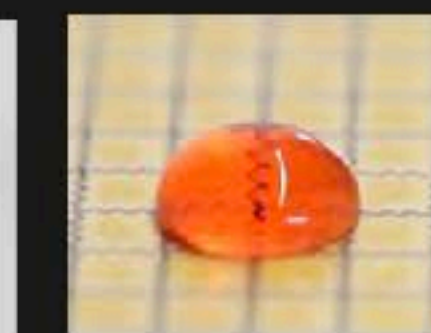
**SensorKnits** (3D Prt. & Add. Manu. '19)



**HydroMorph** (TEI '16)

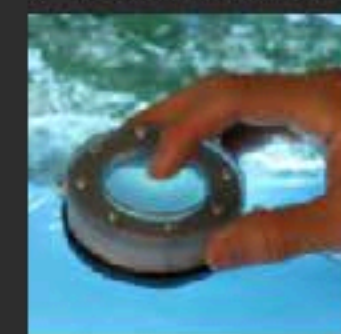


**Organic Primitives** (CHI '17)

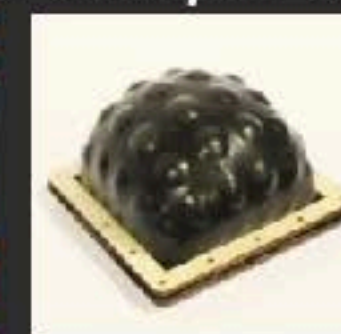


**Programmable Droplets** (CHI '18)

*Pneumatic Shape Changing UIs*



**Jamming UI** (UIST '12)



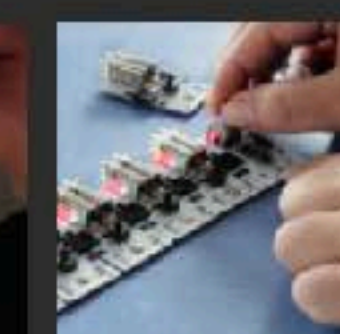
**PneUI** (UIST '13)



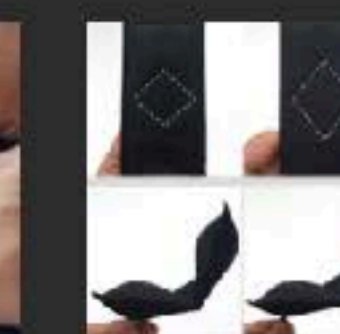
**jamSheets** (TEI '14)



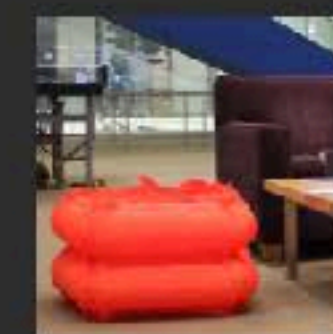
**optiElastic** (UIST '14)



**Pneduino** (TEI '16)



**aeroMorph** (UIST '16)



**Printflatables** (CHI '17)



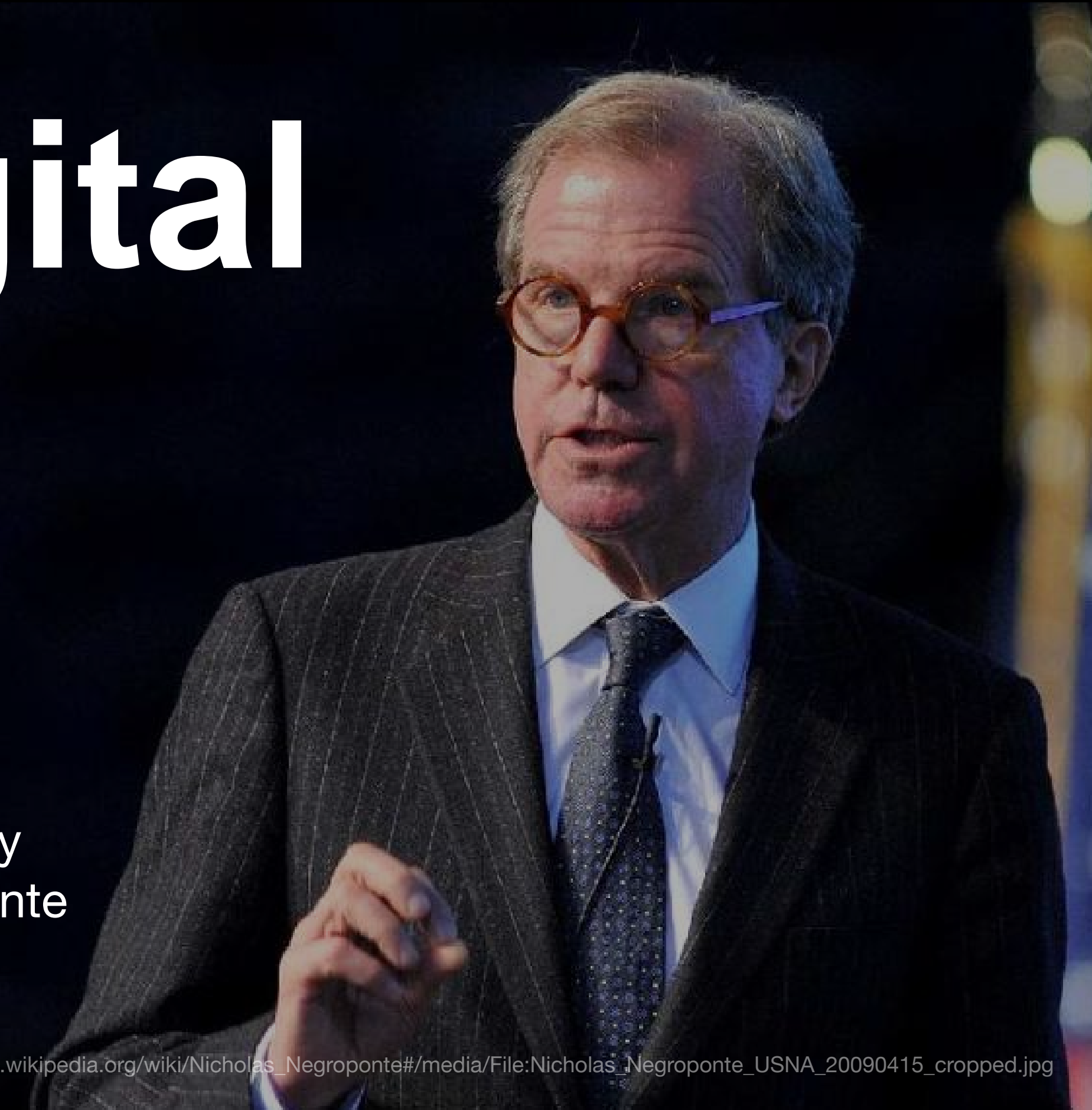
**uniMorph** (UIST '15)

1995

# Being Digital



“Being Digital” (1996) by Prof. Nicholas Negroponte



[https://en.wikipedia.org/wiki/Nicholas\\_Negroponte#/media/File:Nicholas\\_Negroponte\\_USNA\\_20090415\\_cropped.jpg](https://en.wikipedia.org/wiki/Nicholas_Negroponte#/media/File:Nicholas_Negroponte_USNA_20090415_cropped.jpg)

1997

# Being Tangible



Hiroshi Ishii and Brygg Ullmer. 1997. Tangible bits. In Proceedings of the SIGCHI conference on Human factors in computing systems - CHI '97.  
Hiroshi Ishii. 2008. Tangible bits. In Proceedings of the 2nd international conference on Tangible and embedded interaction - TEI '08.

[http://en.wikipedia.org/wiki/File:Grand\\_orrery\\_in\\_Putnam\\_Gallery,\\_2009-11-24.jpg](http://en.wikipedia.org/wiki/File:Grand_orrery_in_Putnam_Gallery,_2009-11-24.jpg)



Photo Credit: Mariko Tagashira

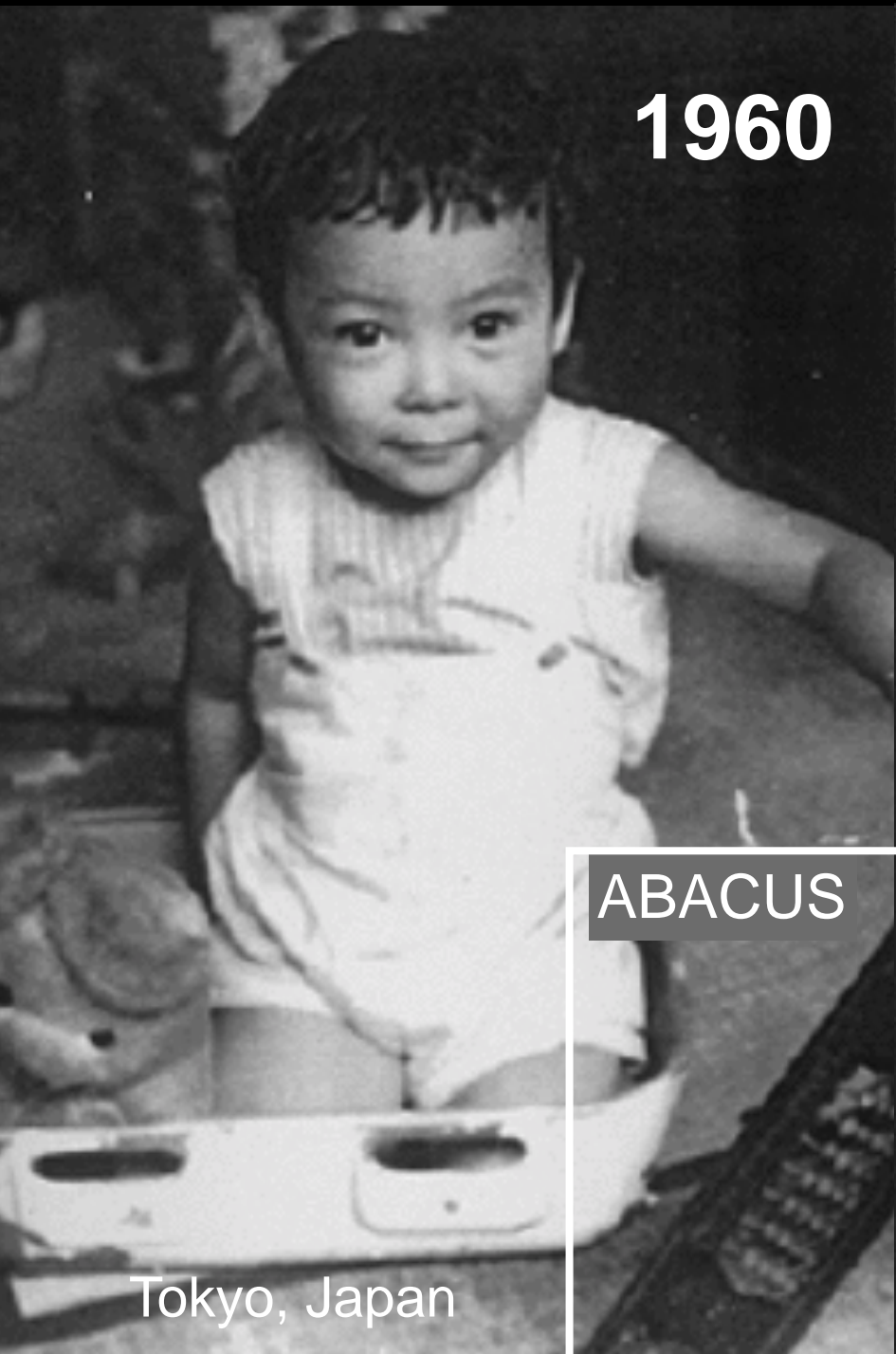


MIT Media Lab FRAMES 1996 "Getting in Touch with the Digital World"

# Tangible Bits

graspable media & ambient media  
 foreground (center) & background (periphery)

# ABACUS: The Origin of Tangible Bits



Tokyo, Japan



PERVASIVE 2004 in Vienna



AXIS magazine Vol. 142

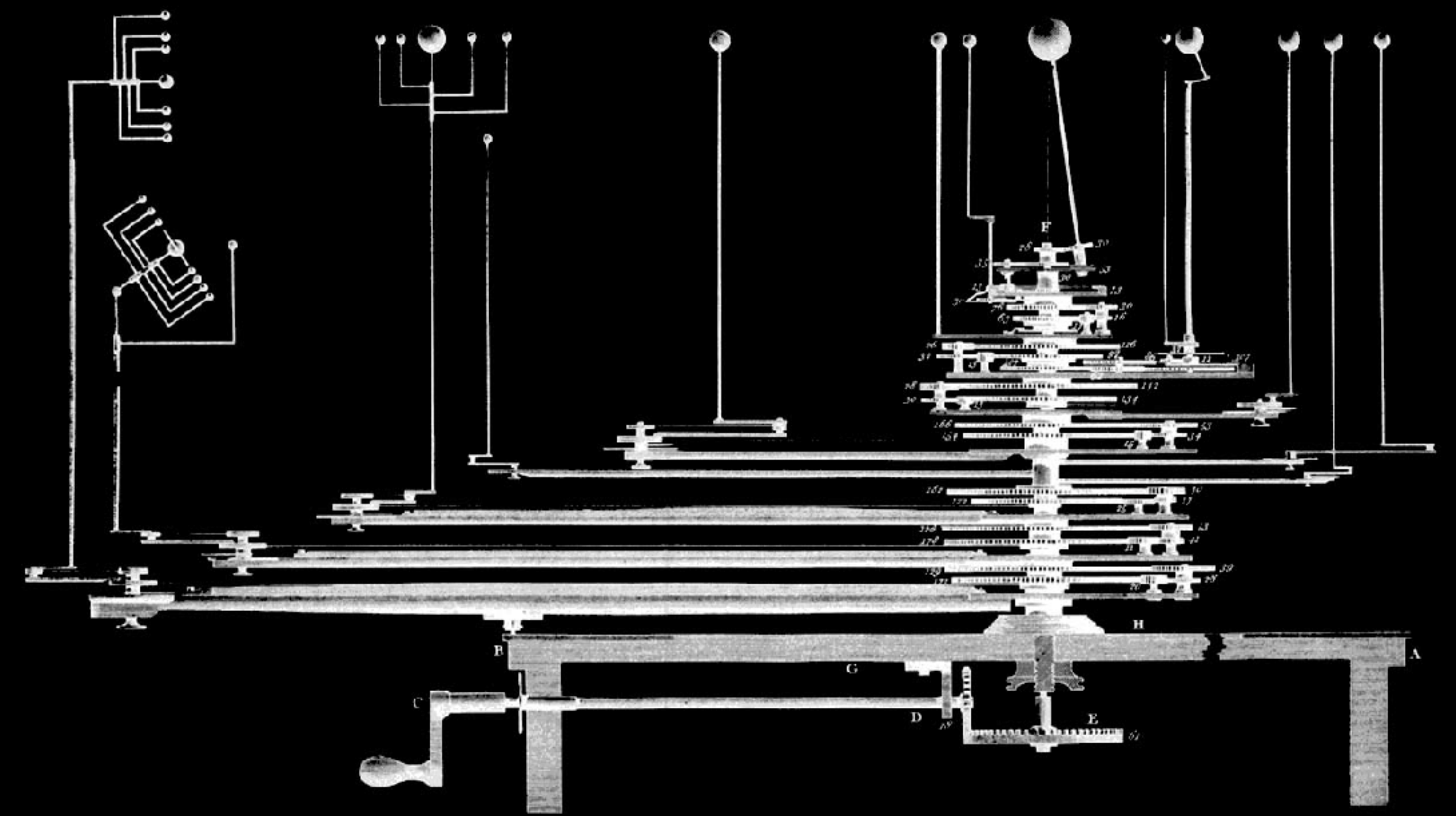
2009



[http://en.wikipedia.org/wiki/File:Grand\\_orrery\\_in\\_Putnam\\_Gallery,\\_2009-11-24.jpg](http://en.wikipedia.org/wiki/File:Grand_orrery_in_Putnam_Gallery,_2009-11-24.jpg)

# Orrery

Tangible Representation of Knowledge

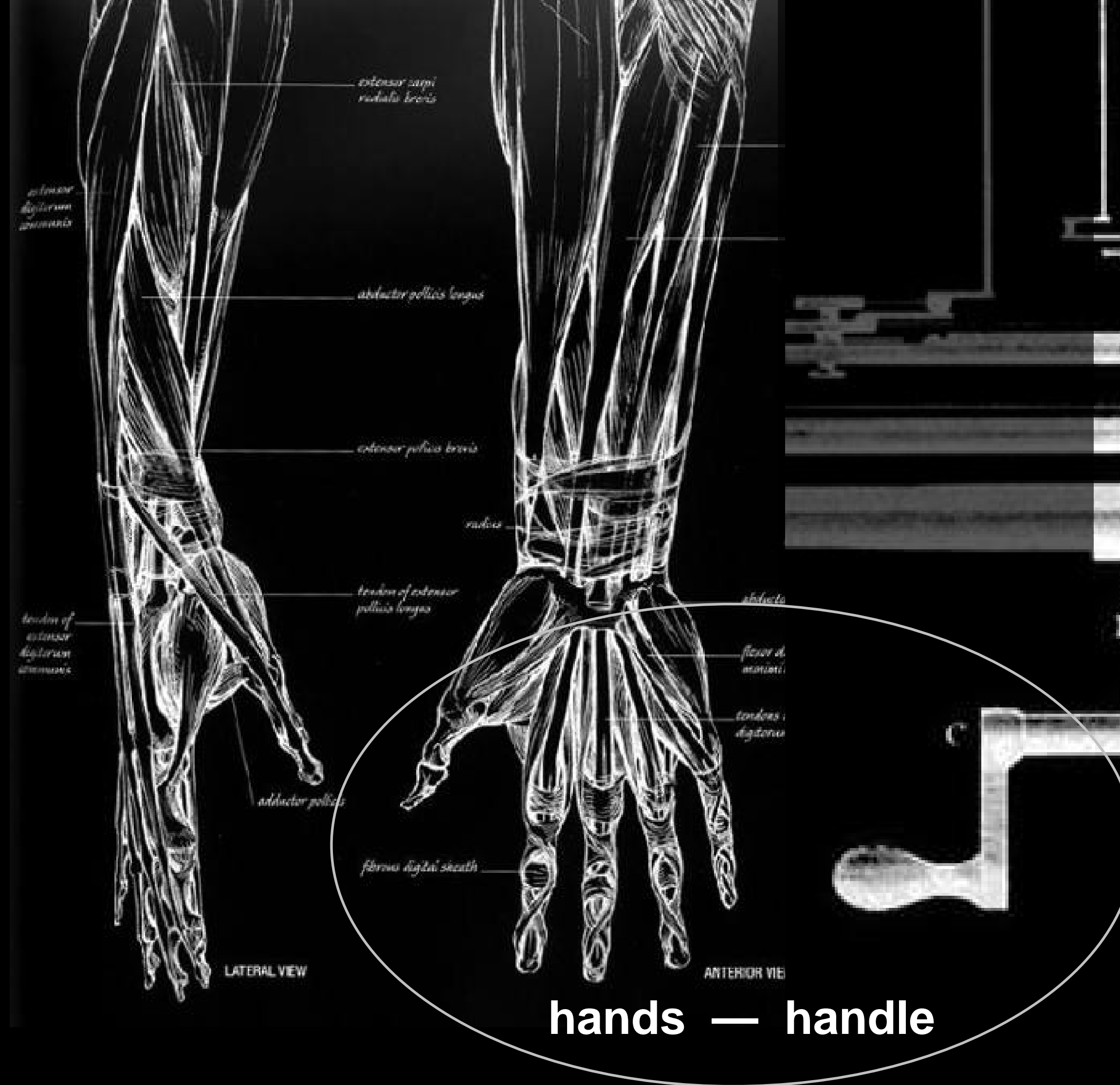




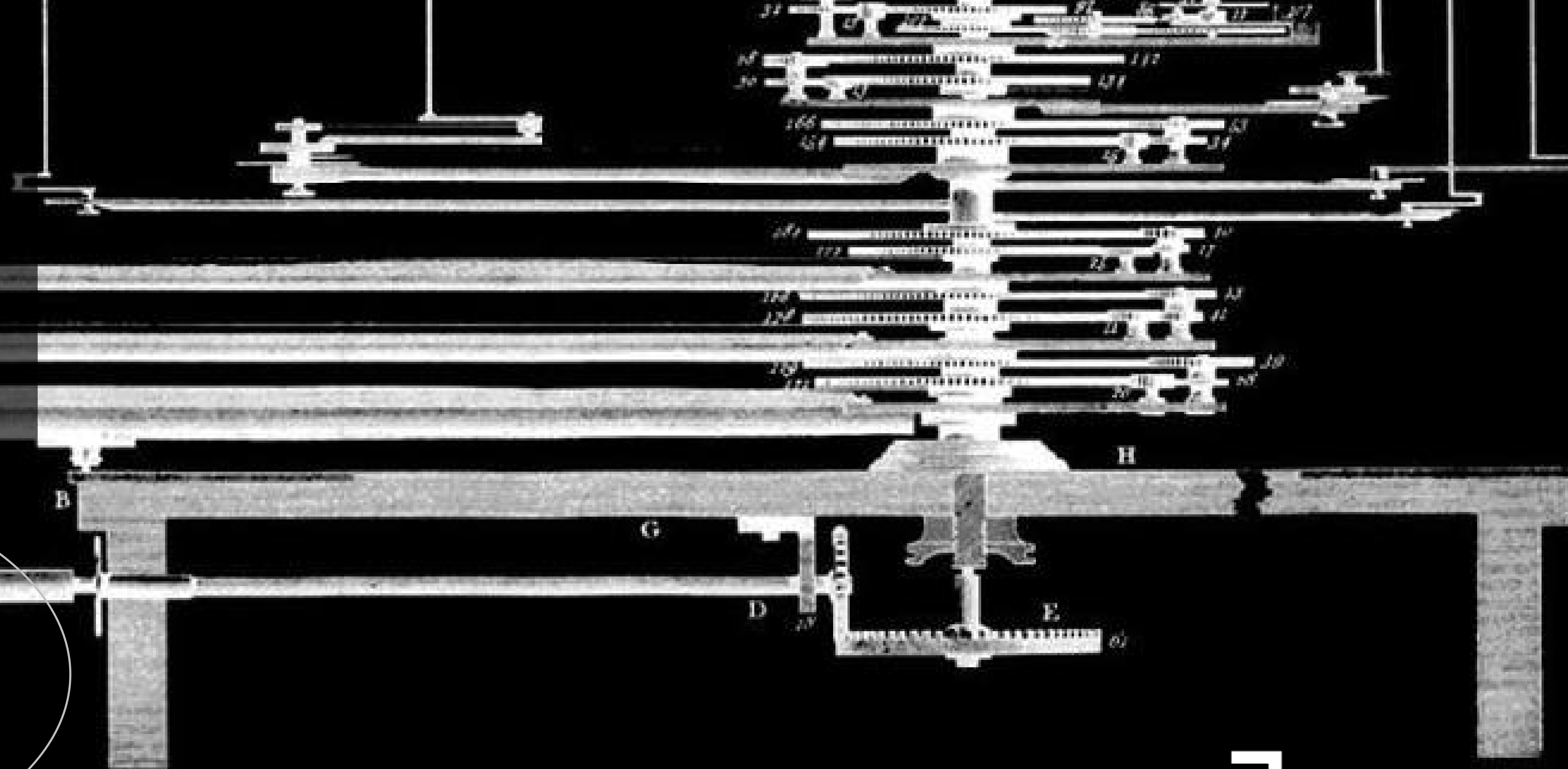
[http://en.wikipedia.org/wiki/File:Grand\\_orrery\\_in\\_Putnam\\_Gallery,\\_2009-11-24.jpg](http://en.wikipedia.org/wiki/File:Grand_orrery_in_Putnam_Gallery,_2009-11-24.jpg)



*A Philosopher Giving a Lecture on the Orrery* (sometimes called simply *The Orrery*) is a painting (oil on canvas, ca. 1766) by Joseph Wright of Derby depicting a public lecture about a model solar system, with a lamp—in place of the sun—illuminating the faces of the audience.



hands — handle



# NTT ICC 2000 Tangible Bits Exhibition

**TANGIBLE BITS EXHIBITION**

*GETTING IN TOUCH WITH THE DIGITAL WORLD*

Tangible Bits give physical form to digital information, making bits directly manipulable and perceptible. The goal is to blur the boundary between physical space and cyberspace, realizing a seamless interface between the people, bits, and atoms.

—Masaru Ishii

From June 23 to July 9, more than 9,000 visitors to the NTT InterCommunication Center (ICC) in Tokyo, Japan saw the first large-scale exhibition mounted by the Media Lab. Tangible Media group, headed by Fukutake Career Development Professor Masaru Ishii. The exhibit was built around a group of tangible media projects designed at the Lab over the past three years.

[ PREVIEW OF THE BACK SPREAD ]

"At the sea shore, between the land of atoms and the sea of bits, we are now facing the challenge of reconciling our dual citizenship in the physical and digital worlds. Our windows to the digital world have been confined to flat rectangular screens and pieces of painted bits." While our visual senses are the part in the sea of digital information, our bodies remain in the physical world. The vision of Tangible Bits is to provide seamless coupling between these two very different worlds of bits and atoms."

—Masaru Ishii

**TANGIBLE INTERFACES**

- HandSCAPE** is a digital age reality that requires not only length, but also depth and breadth. While the information wirelessly is a foot on cyberspace, real time. Combined with a three-dimensional modeling program, it allows the user to interact with digital data they are interested.
- Music Bubbles** provides a transparent, multi-layered interface for digital information. Looking each bubble releases the sound of a specific instrument and controls the colored light projected onto a 1.5m x 0.8m table. Users can hear a piano, saxophone, and other instruments.
- Surlybot**, an autonomous bio-inspired toy, can react and apply physical motion to become more natural and easy-to-use. It is a robot that can react to the user's hand and can separate movements with all the intricacies of the original gesture.
- Triangles** is a construction kit of identical flat, plastic triangles that can be connected in two- and three-dimensional forms. The triangles connect together both physically and digitally with magnetic conducting connections, allowing a simple but powerful means of physically interacting with digital information.
- InTouch** explores new forms of interpersonal communication across distance using the sense of touch. Force-feedback technology is used to create the illusion that people separated by distance are interacting with a shared physical object.

"Until recently, rendering bits into human-readable form has been restricted mostly to displays and keyboards—sensory deprived and physically limited. By contrast, tangible bits allow us to interact with them with our muscles as well as our minds and memory. This work will lead to an entirely new class of computer interface."

—Masaru Ishii

**INTERACTIVE SPACES**

- 1/0 Bulb** was conceived as a "light bulb" that has digital meaning to physical actions, and to the manipulation of objects within its beam. For example, a light bulb can transform a simple table-top into a digital workspace for planning workbench.
- PingPongPlus** uses sensors, sound, and projection technologies to change the traditional game of ping-pong into an interactive experience. For example, images of digital water and a school of fish are projected onto the ping-pong table surface. Each time a ball is struck, ripples emanate purely from the point of impact, and the ball bounces.
- TouchCounter** is a small, electronic bubble that can be attached to a variety of physical objects to record their use. It is a small, flat, and thin device that is used to sense readability, and a light LED display are used to portray the information, allowing people to recognize patterns of use.

**SHARED DRAWING**

**ClearBoard** is a system where people can draw collaboratively while having "face-to-face" communication remotely through use of shared drawing and video-conferencing technologies. It is a system that is used to develop ClearBoard 1 in 1991 at NTT Human Interface Laboratories.

To learn more about the world of the Tangible Media group, visit the ICC website: [www.ntt-icc.com](http://www.ntt-icc.com) or contact us at: [info@ntt-icc.com](mailto:info@ntt-icc.com) or [+81 3 3422 2222](tel:+813342222222).

 ARS ELECTRONICA

**RADICAL ATOMS**

AND THE ALCHEMISTS OF OUR TIME

Linz, Austria, September 8 - 12, 2016

2016

Let's become "the alchemists of our time"  
transforming base metal into gold.

RADICAL ATOMS  
and the alchemists of our time

ARS ELECTRONICA FESTIVAL

POSTCITY Linz, 8. - 12.9.2016  
[www.aec.at/radicalatoms](http://www.aec.at/radicalatoms)

 mit  
media  
lab



**ARS ELECTRONICA**

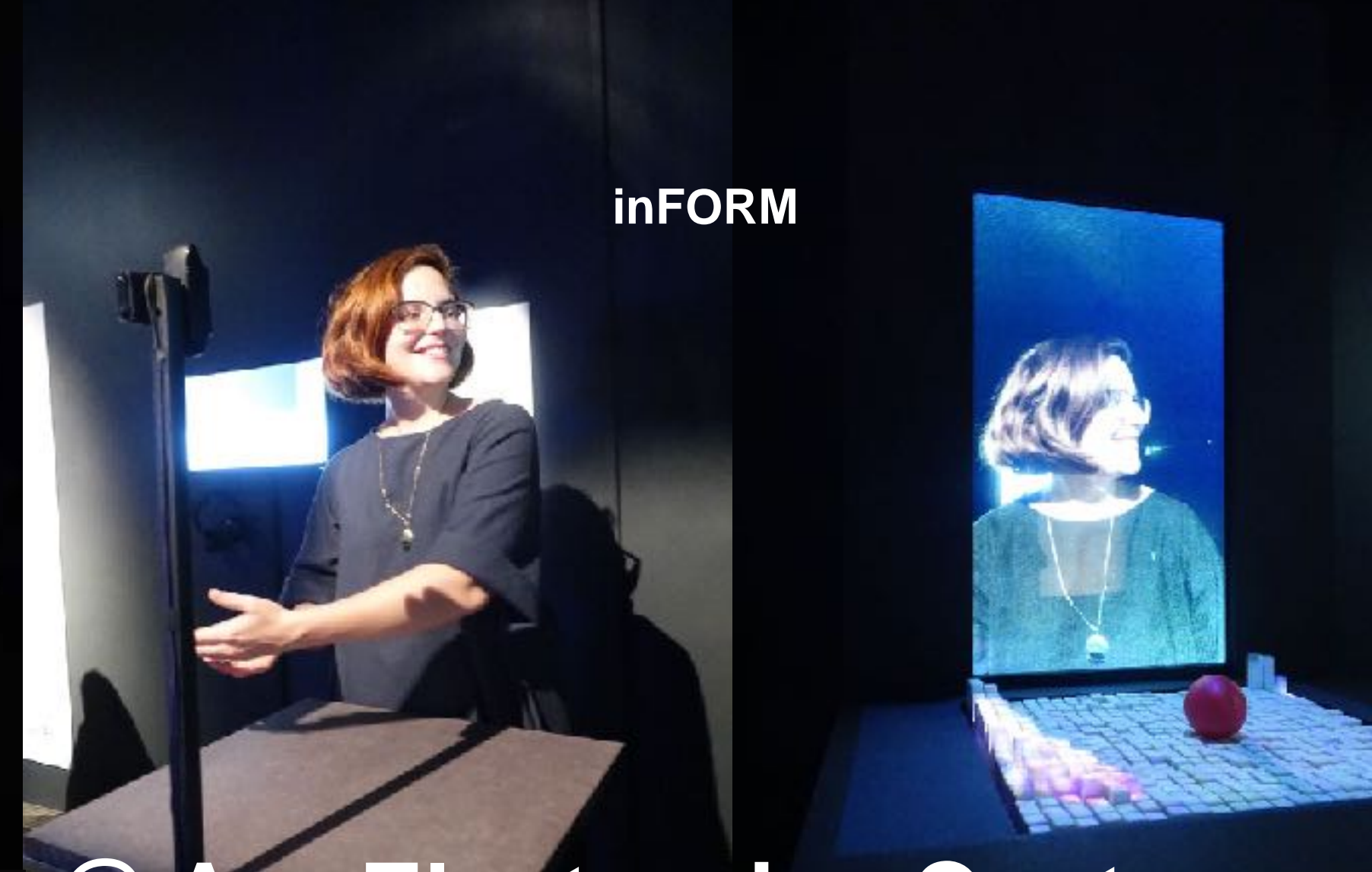
# RADICAL ATOMS

AND THE ALCHEMISTS OF OUR TIME



Prof. Hiroshi Ishii

musicBottles

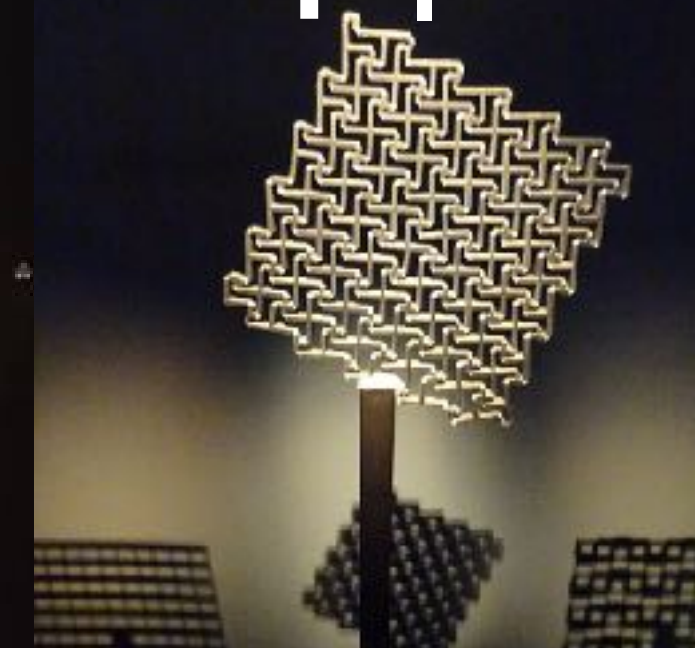


inFORM

## Radical Atoms Exhibition @ Ars Electronica Center Tangible Media Group | MIT Media Lab



bioLogic



KinetiX



Cillia



aeroMorph



# Invent new tangible interactions that inspire and engage people



SandScape 2022 at MIT Museum Opening Exhibit in Fall 2022

# TMG's "Radical Atoms" Exhibition at the MIT Museum since Feb. 2025



Visit  
Plan + Go

On Now  
Look + Do

Collections  
Search + Discover

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Join + Give

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The Exchange  
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MIT

24 > 40

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Home > Exhibitions > Radical Atoms

## Radical Atoms

February 2025 - ongoing

Hiroshi Ishii and the Tangible Media Group at the MIT Media Lab have pioneered new ways for people to interact with computers, with the invention of the "tangible user interface."

It began with a vision of "Tangible Bits," where users can manipulate ordinary physical objects to access digital information. It evolved into a bolder vision of "Radical Atoms," where materials can change form and reconfigure themselves just as pixels can on a screen. This experimental exhibit of three iconic works—SandScape, inFORM, and TRANSFORM—is part of the MIT Museum's ongoing efforts to collect the physical machines as well as preserve the user experience of, in Ishii's words, making atoms dance.

Learn more about the exhibits [here](#), or watch the YouTube video of Hiroshi Ishii's talk at the MIT Museum below.

## Radical Atoms Exhibition at MIT Museum by Tangible Media Group

## Radical Atoms: Making Bits Tangible and Atoms Dance

The MIT Media Lab's Tangible Media Group (TMG) explores the tangible and dynamic relationship between the digital and physical realms. In this exhibition, MIT Media Lab Professor **Hiroshi Ishii** will showcase the evolution of TMG's vision from **Tangible Bits** to **Radical Atoms**, demonstrating how they make bits (digital information) tangible and atoms dance. Through interactive exhibits of **SandScape**, **inFORM**, and **TRANSFORM**, the group aims to inspire future creators by exploring new forms of human expression, communication, and design. The work highlights the value of

< Research

Jan. 25, 2025

People

**Hiroshi Ishii**  
Jerome H. Wiesner Professor of Media Arts and Sciences; Associate Director, MIT Media Lab

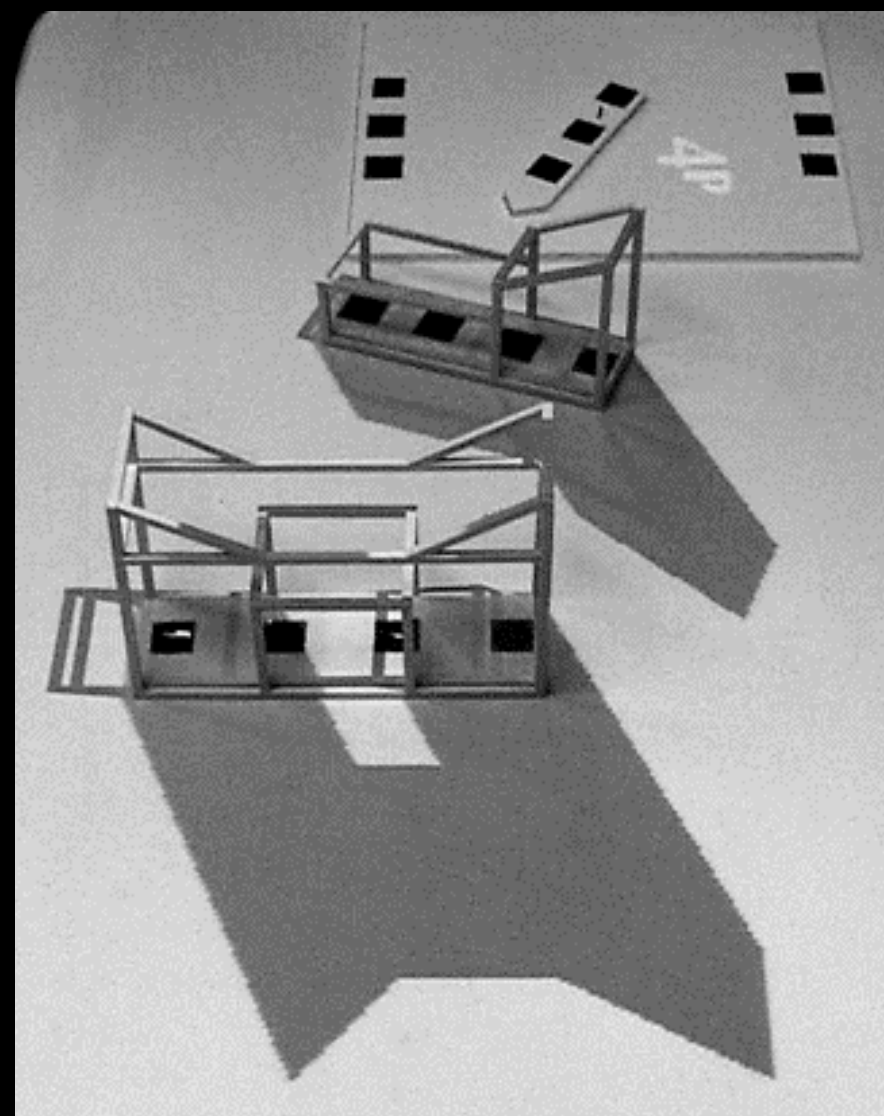
**Paula Aguilera**  
Multimedia Producer

**Daniel Vivan Levine**  
Graduate Student

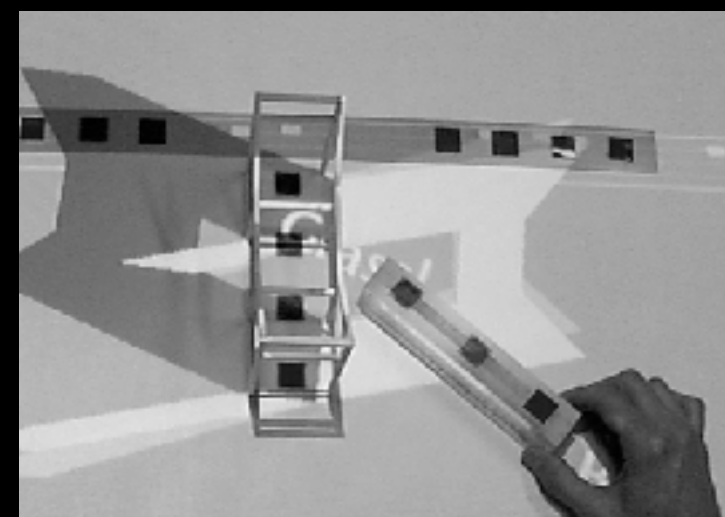
Tangible Media

# Urp: Urban Planning Workbench

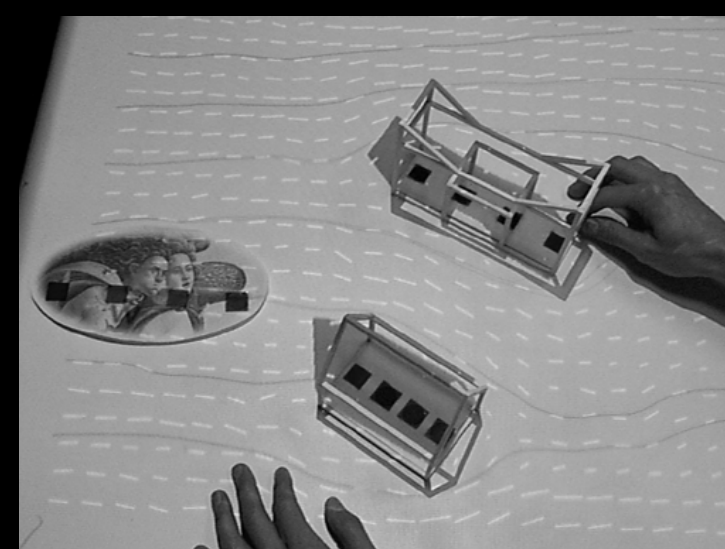
John Underkoffler and Hiroshi Ishii, CHI '98, 99, SIGGRAPH '99



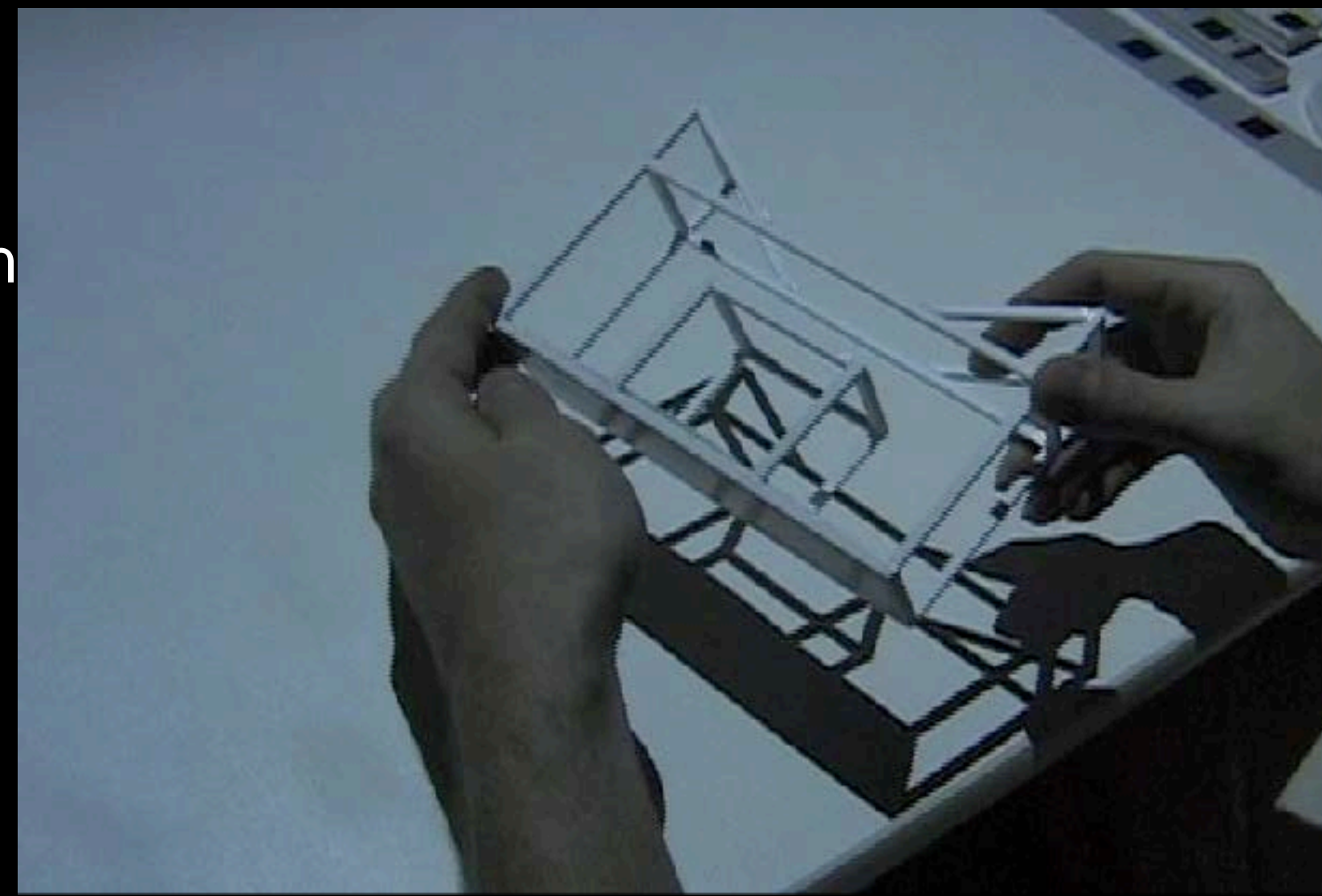
digital shadows



light reflection



wind

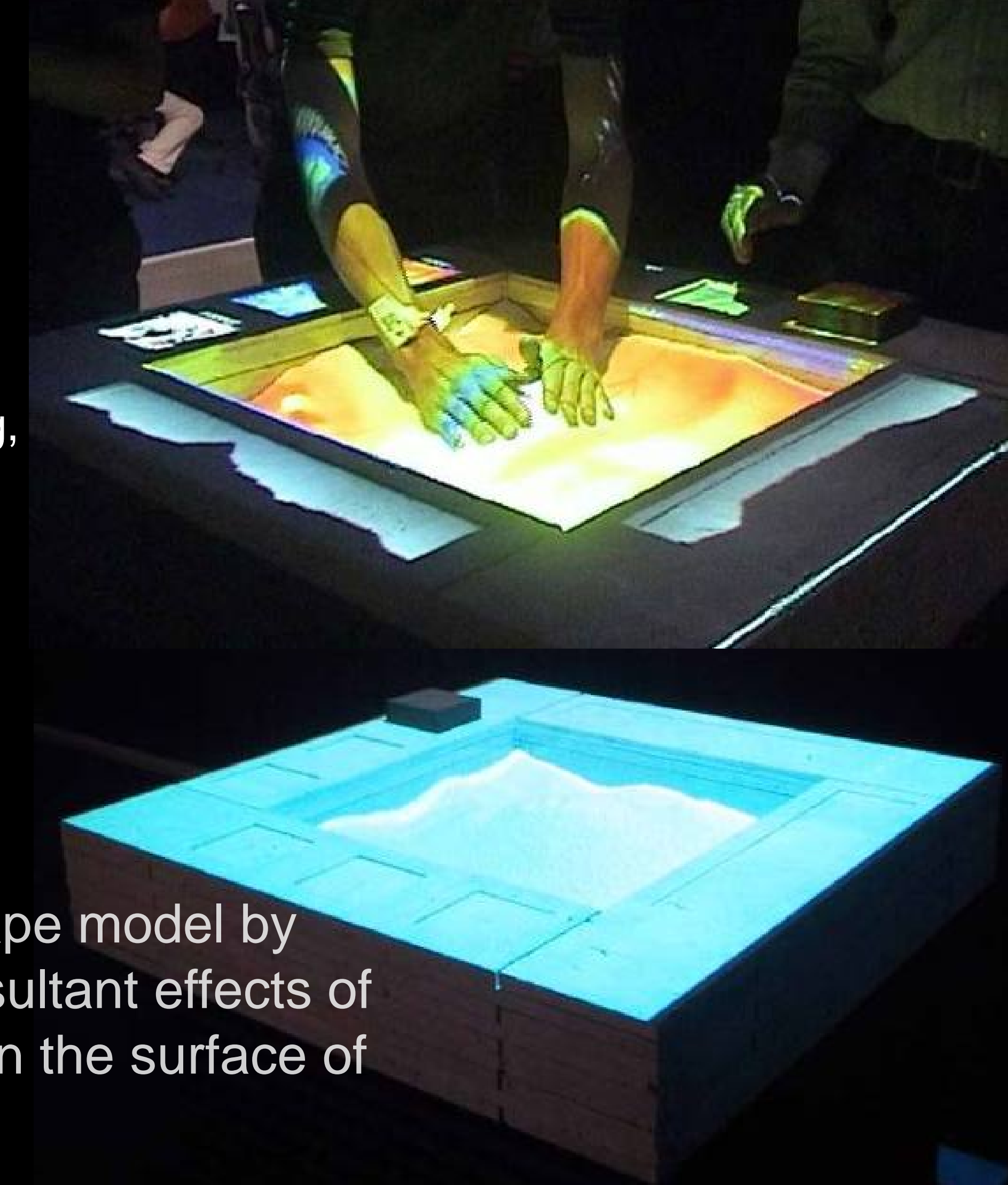


# SandScape

Ars Electronic Center 2003  
CHI '02, TGIS '04, BT Tech. J. '04

Hiroshi Ishii, Carlo Ratti, Ben Piper, Yao Wang,  
and Assaf Biderman

Users can alter the form of the landscape model by manipulating sand while seeing the resultant effects of the computational analysis projected on the surface of

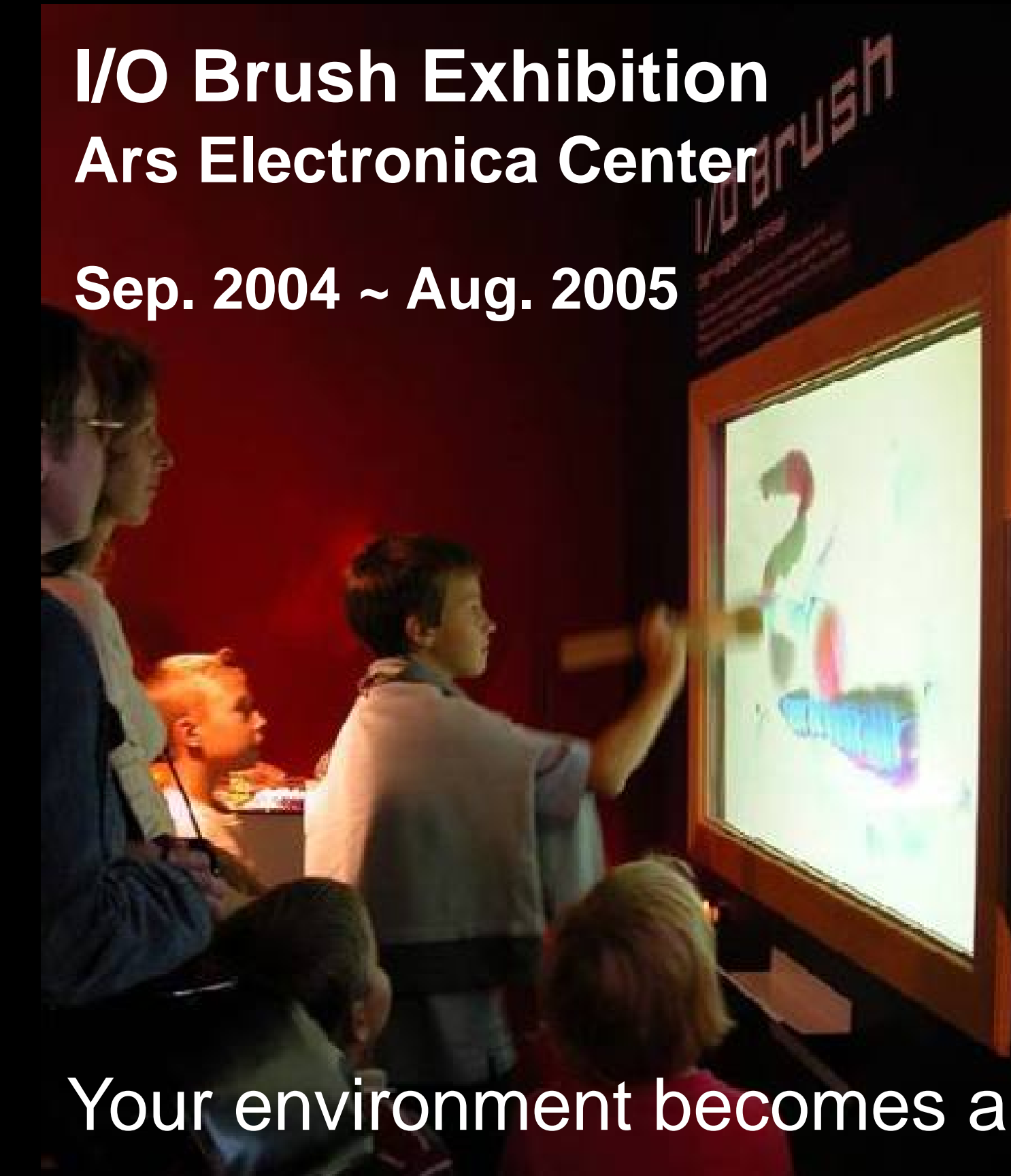


# I/O Brush

Kimiko Ryokai, Stefan Marti & Hiroshi Ishii CHI '04, '07, Ars Electronica '04

I/O Brush Exhibition  
Ars Electronica Center

Sep. 2004 ~ Aug. 2005

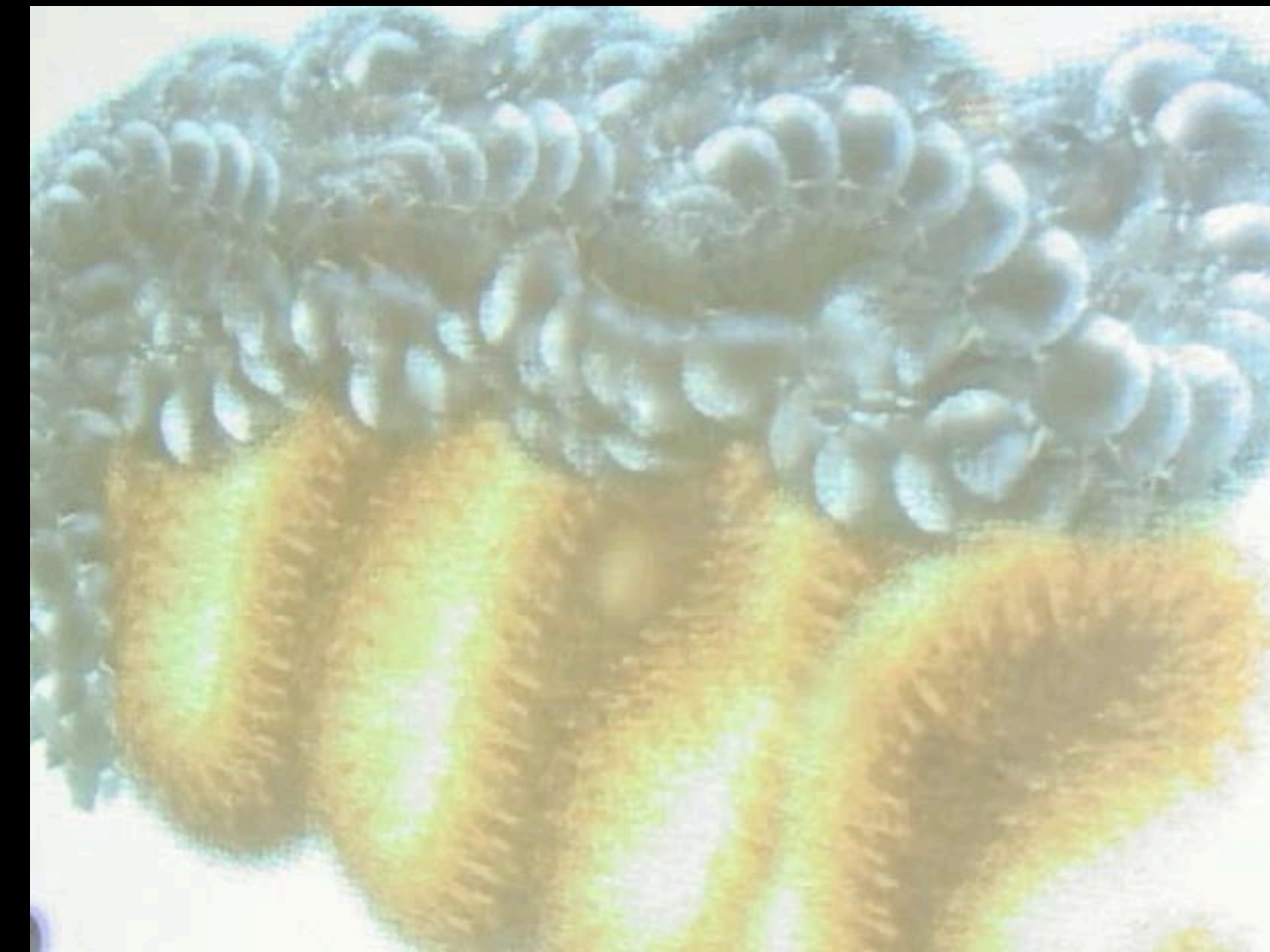


Your environment becomes a color palette to draw with

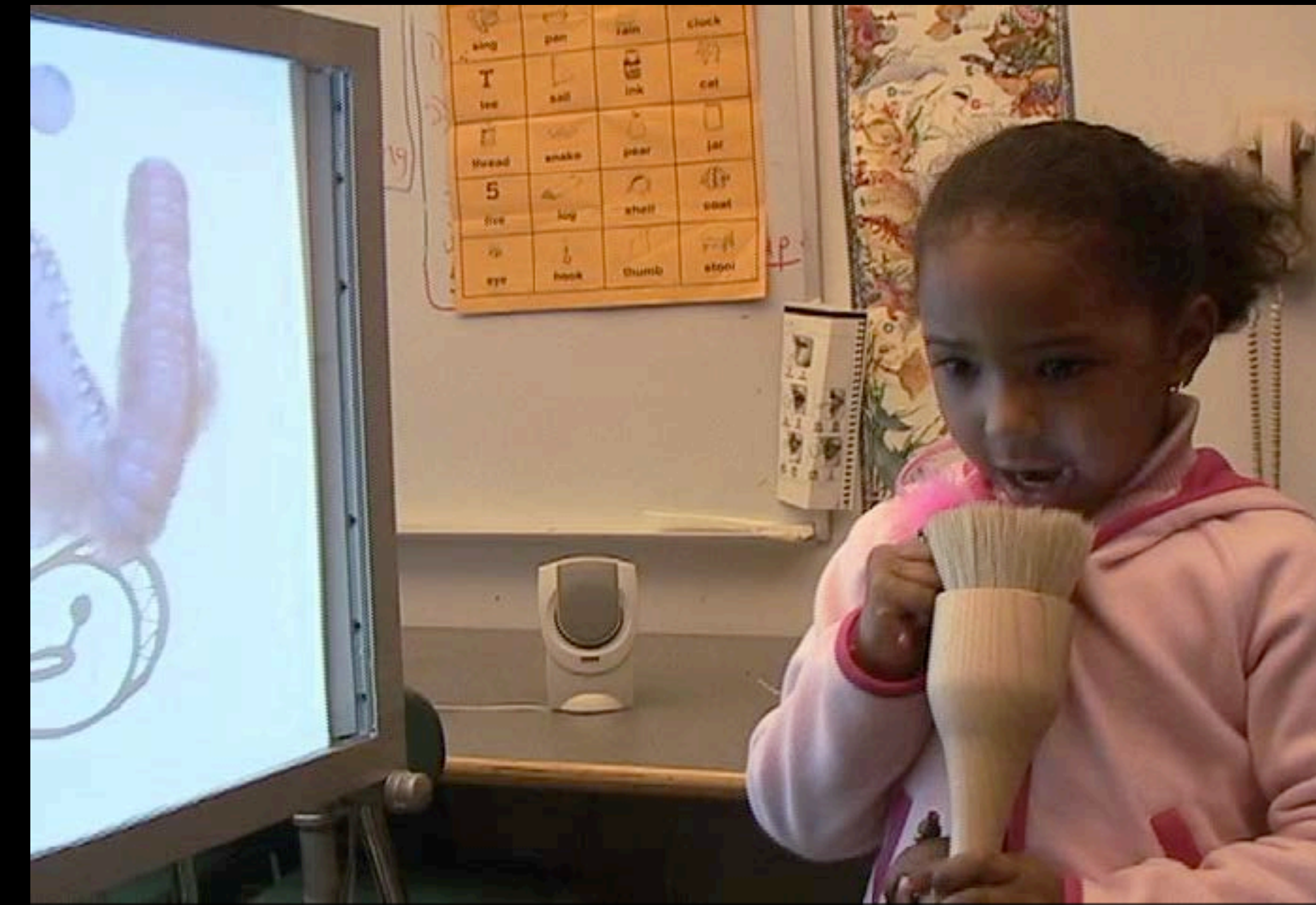


# I/O Brush: History Mode

Kimiko Ryokai, Stefan Marti & Hiroshi Ishii CHI '04, '07



Where does the ink come from?



Capturing and weaving the  
(hi)story for/with every stroke

# Audiopad on the Sensetable Platform

James Patten and Ben Recht, NIME '02, ACE '06



- A new way to perform electronic music.
- Designed based on the Sensetable platform (Tangible UI).

# ReactTable

Sergi Jordà, Martin Kaltenbrunner, Günter Geiger, Ross Bencina  
Proceedings of the ICMC 2005, Barcelona

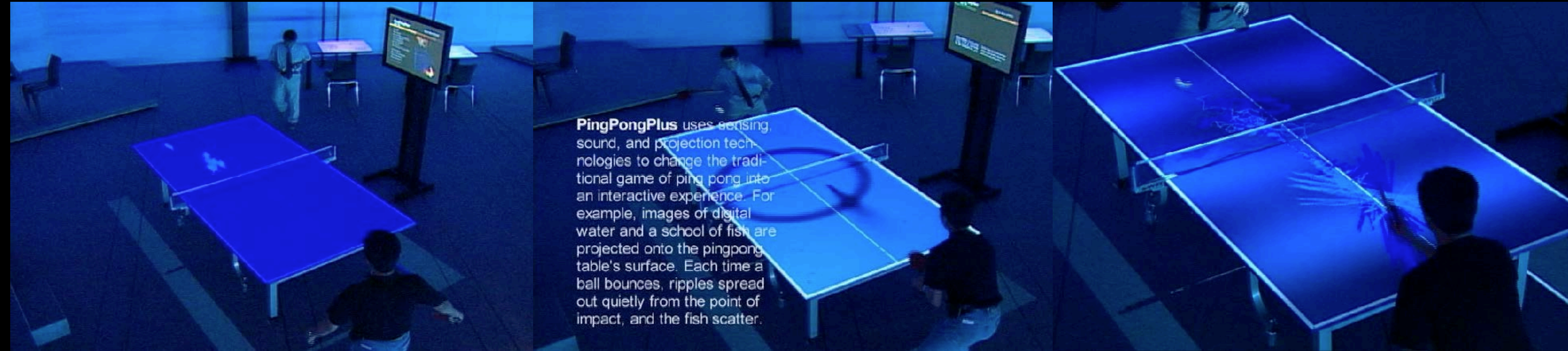


Photo courtesy of Sergi Jordà

# PingPongPlus

Ishii, Lee, Wisneski, Orbanes, Chun, Paradiso  
SIGGRAPH '98, CHI '99, NTT ICC '00, Ars  
Electronica '01,  
Centre Pompidou '03, ACE '11

- **Interactive Surface**
- Digital augmentation of ping pong play using a "reactive table"
- From competition to collaboration



radical atoms  
2012



# Radical Atoms

Dynamic, Physical & Computational  
Materials that Change Shapes & Properties



Frozen Atoms



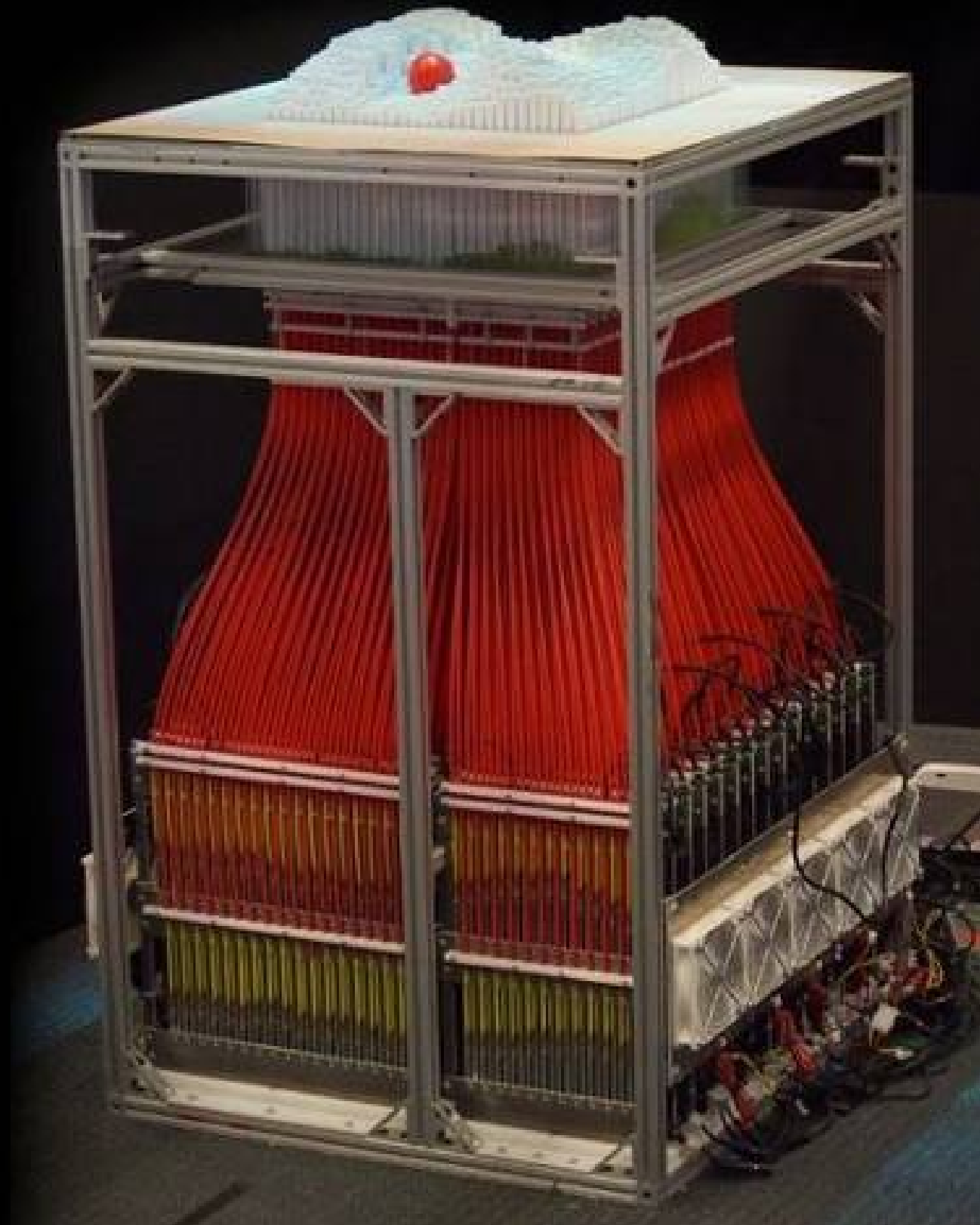
Intangible Pixels



Radical Atoms

# inFORM

Sean Follmer, Daniel Leithinger, Alex Olwal, Akimitsu Hogge, Hiroshi Ishii. UIST '13, '14



Fast Company Innovation by Design Awards: Winner - Experimental  
Red Dot Award: Best of the Best - Design Concept  
Laval Virtual 2014 Award - INDUSTRIAL DESIGN & SIMULATION  
Core 77 Award - Interaction Student Winner  
IDSA IDEA Award Bronze

# TRANSFORM

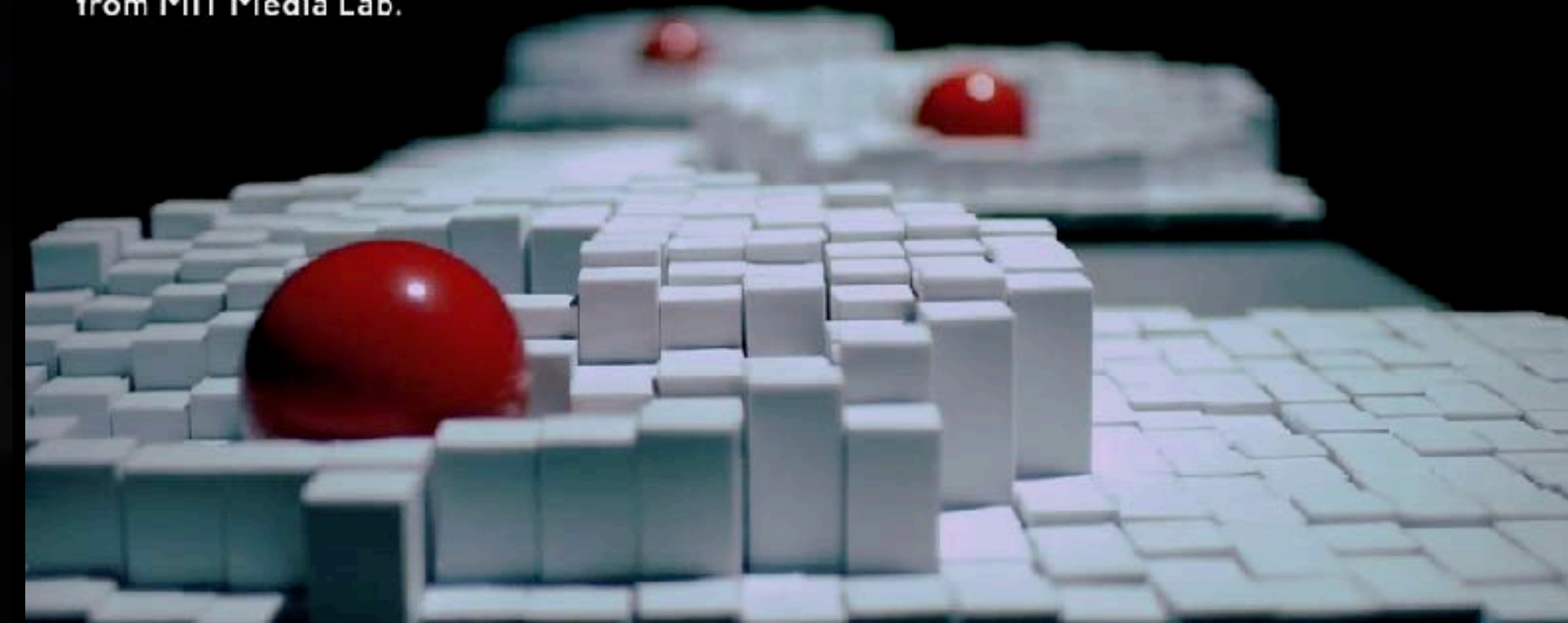
Hiroshi Ishii, Daniel Leithinger, Sean Follmer, Amit Zoran, Philipp Schoessler, Jared Counts  
CHI '15, Milan Design Week '14, LEXUS DESIGN AMAZING 2014 MILAN

Platinum A'DESIGN AWARD 2015



## TRANSFORM

Tangible Media Group led by Prof. Hiroshi Ishii  
from MIT Media Lab.



LEXUS DESIGN AMAZING 2014 MILAN

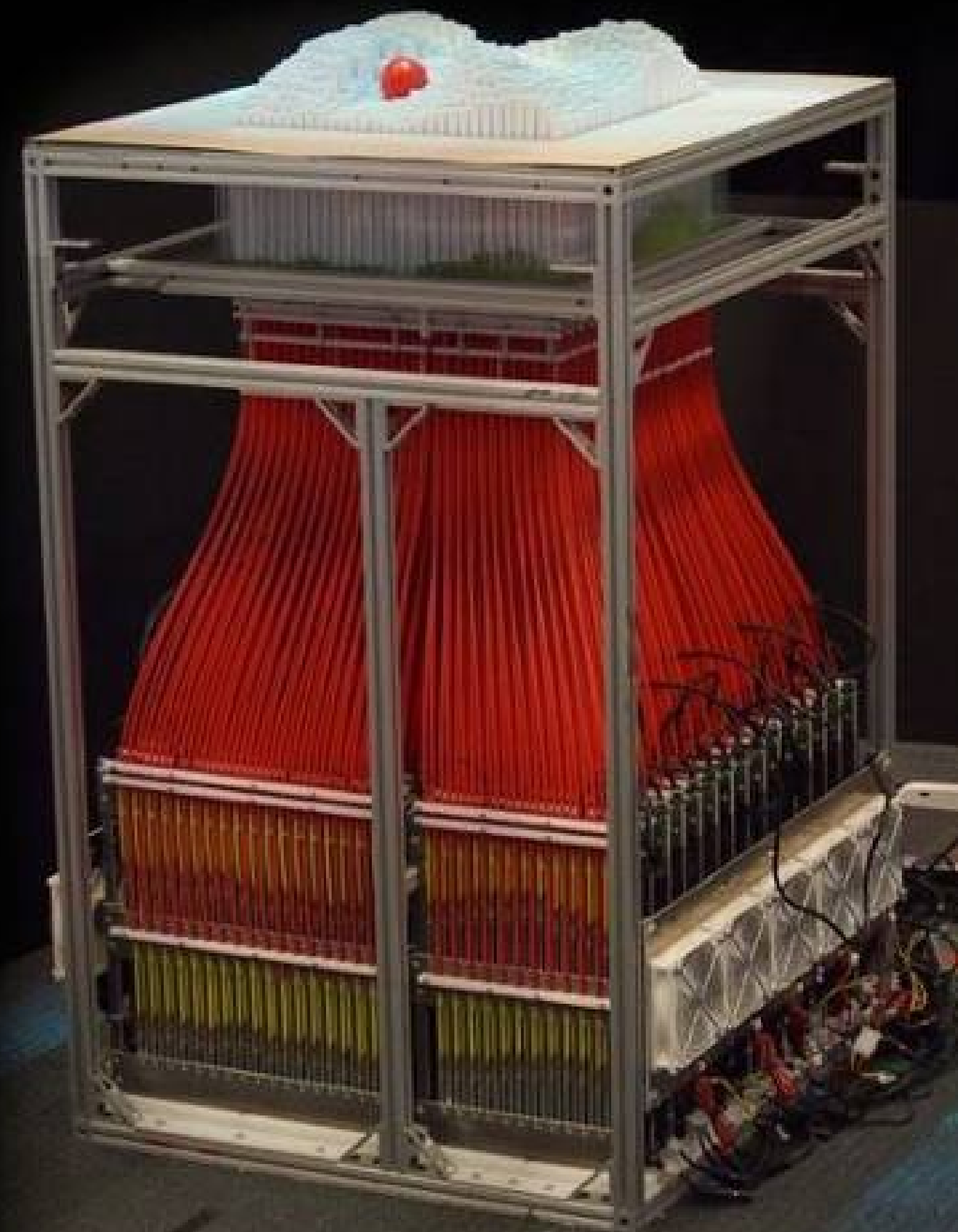
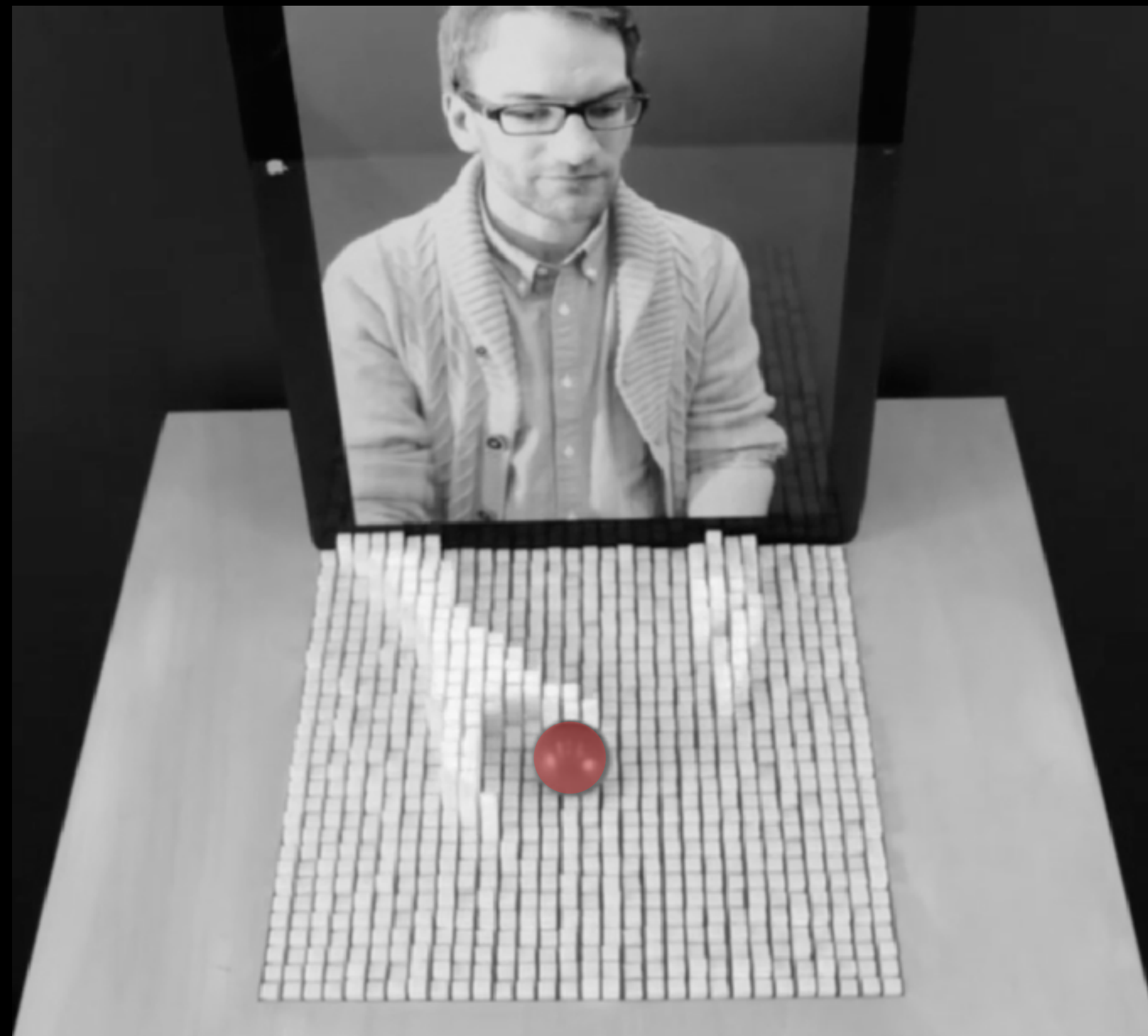
*“Beyond Tangible Bits, Toward Radical Atoms”*



# inFORM

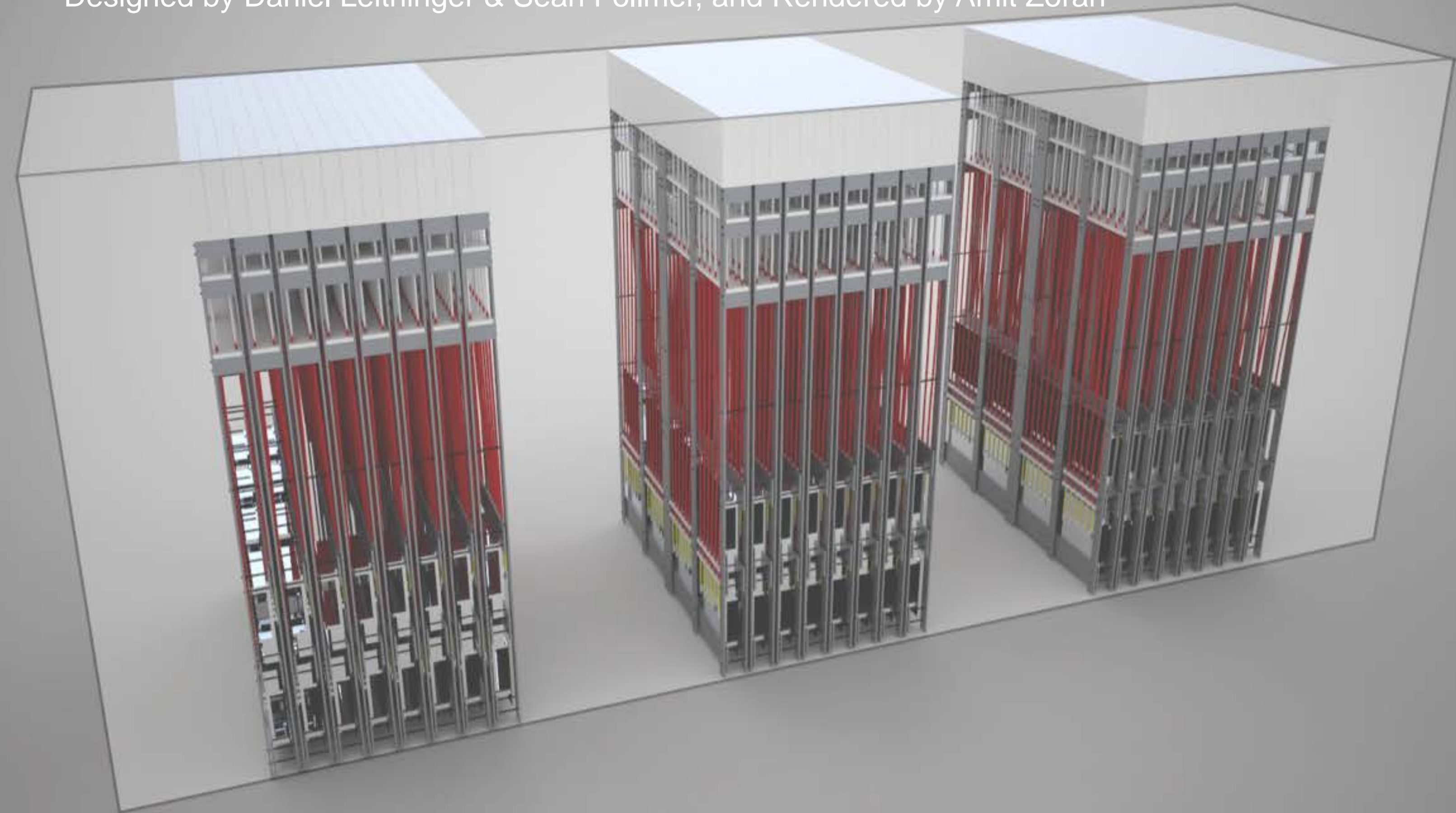
Sean Follmer, Daniel Leithinger, Alex Olwal, Akimitsu Hogge,  
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Core 77 Award - Interaction Student Winner  
IDSA IDEA Award Bronze



# inFORM ENGINES

Designed by Daniel Leithinger & Sean Follmer, and Rendered by Amit Zoran



## Triptych



Francis Bacon

The three panels of the triptych were sold separately in the mid-1970s.[9] Bacon was unhappy that the panels had been split up, writing on a photograph of the left-hand panel that it was "meaningless unless it is united with the other two panels."

# TRANSFORM

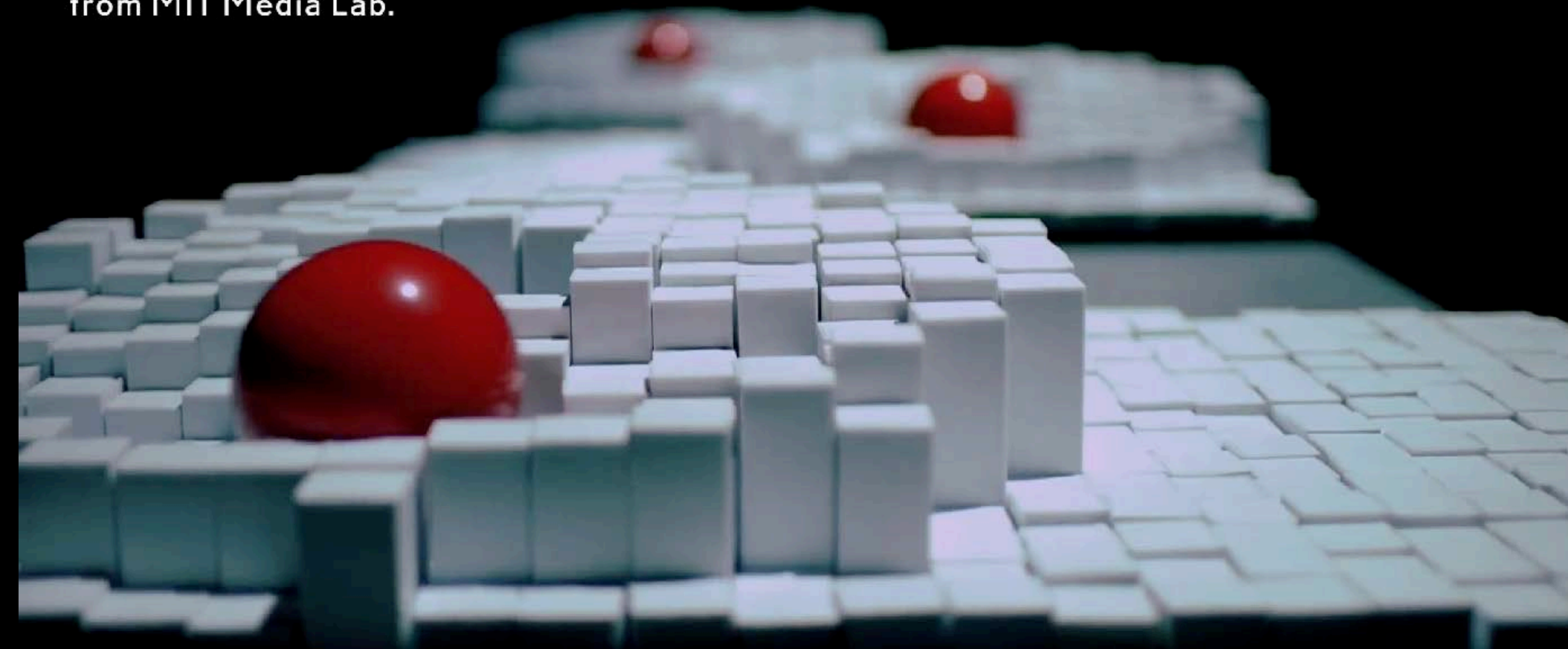
## Radical Atoms

(C) LEXUS DESIGN AMAZING 2014 MILAN



# TRANSFORM

Tangible Media Group led by Prof. Hiroshi Ishii  
from MIT Media Lab.



LEXUS DESIGN AMAZING 2014 MILAN

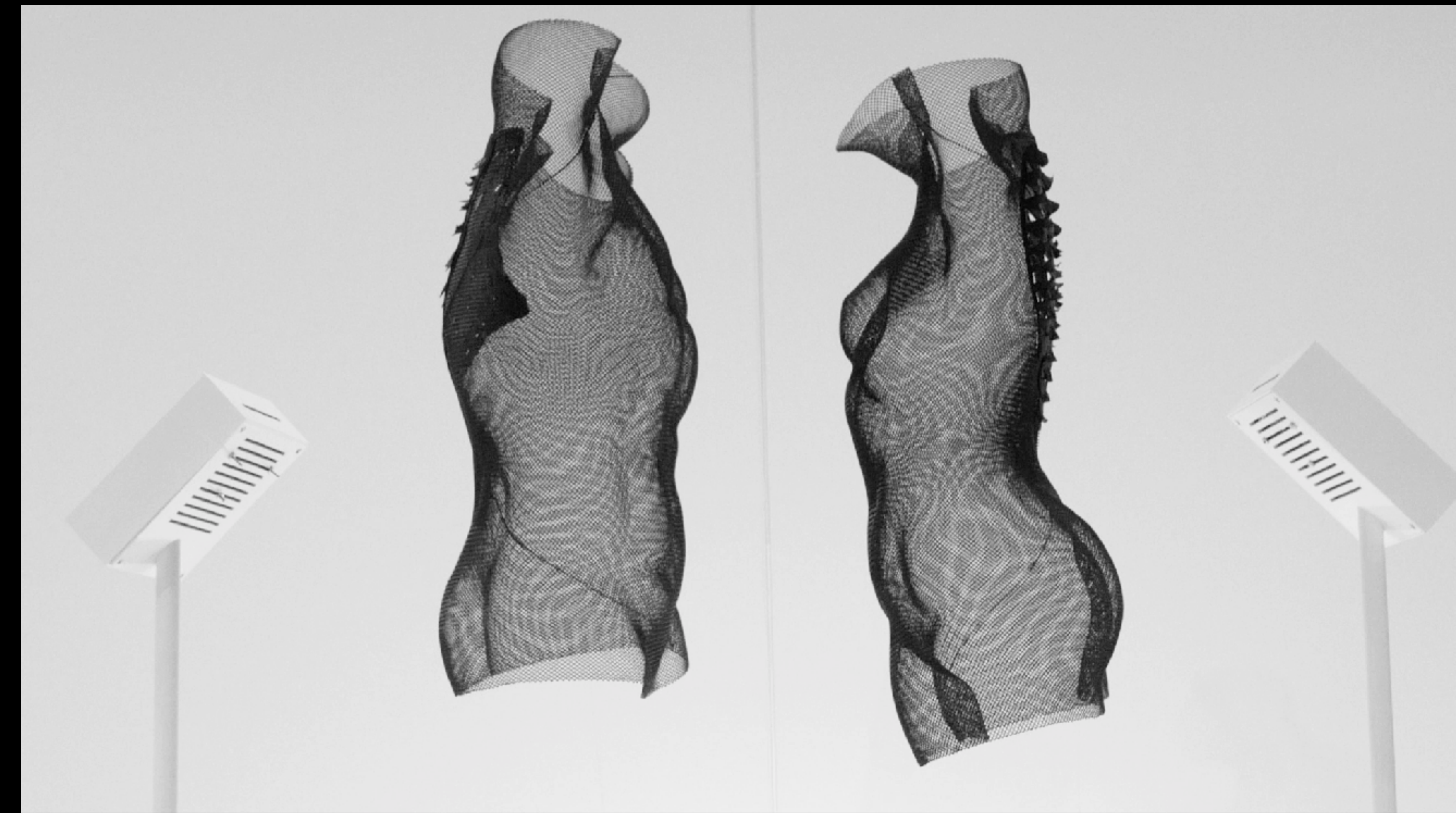
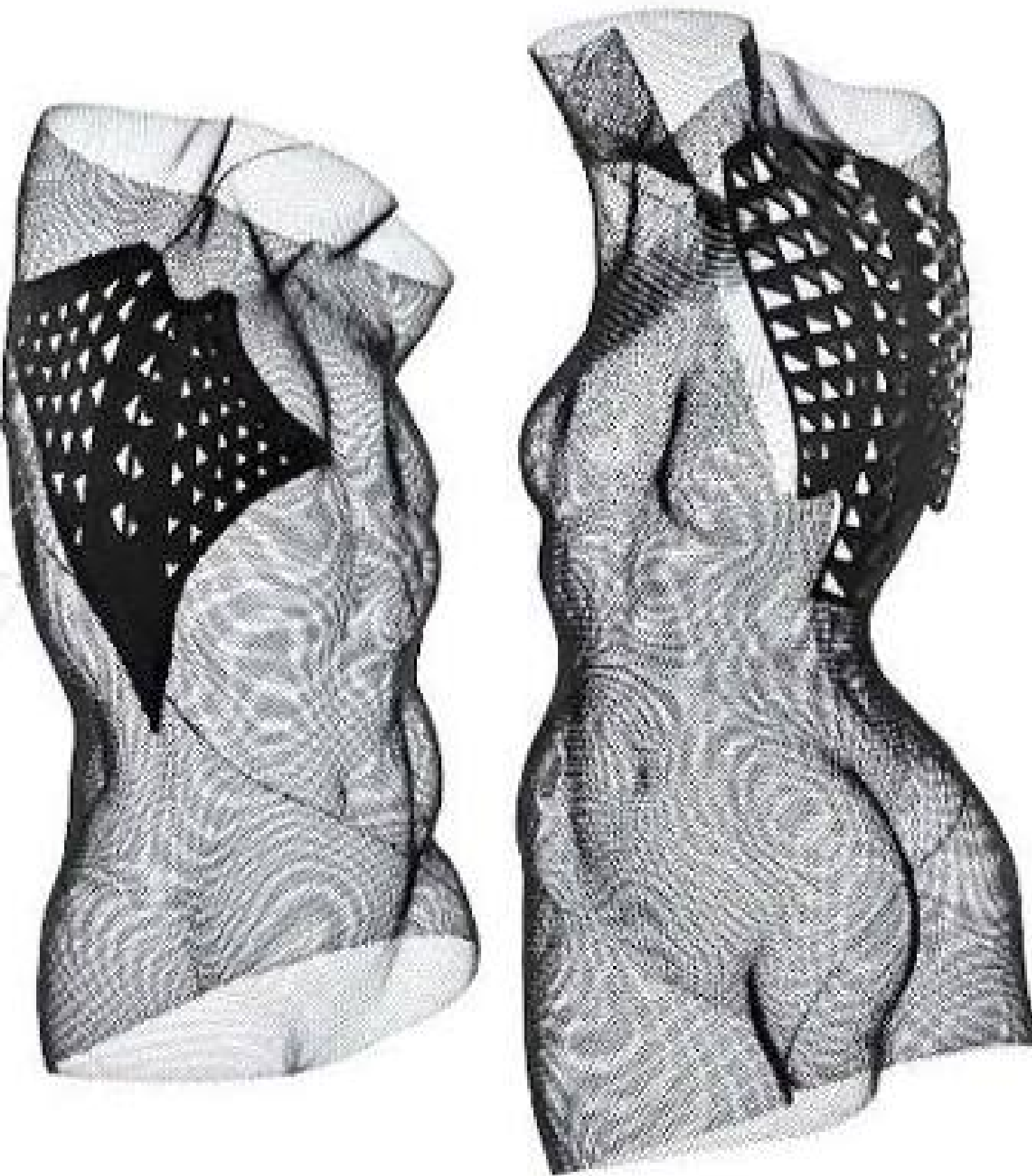
# bioLogic 2015

*“Bio is the new Interface”*

**Beyond Human-Machine Interfaces  
Towards Human-Living Machine Interfaces**

bioLogic Exhibit at MIT Media Lab  
E14 lobby in October 2015

Lining Yao, Wen Wang, Guanyun Wang, Helene Steiner, Chin-Yi Cheng, Jifei Ou, Oksana Anilionyte, Hiroshi Ishii. 3D Print. & Additive Manuf. '15, CHI '15, Science Advances '17, 3 A'Design Awards '16, Fast Co.Design 2016 Innovation By Design Award, DIA Excellence Award '16



Many thanks to Prof. Sean Follmer (Stanford) and Prof. Lining Yao (UC Berkeley) for their leadership of the UIST 2023 and 2024 conferences!

Milano Design Week 2014  
**TRANSFORM Exhibit**  
 04/08-13/14, Milano, Italia



CHI 2015

Tangible Media Group | MIT Media Lab @ LEXUS DESIGN AMAZING 2014 MILAN



Prof. Hiroshi Ishii  
*Concept Design*



Daniel Leithinger  
*Engine Design*



Sean Follmer  
*Engine Design*



Amit Zoran  
*Product Design*



Philipp Schoessler  
*Motion Design*

Prof. Hiroshi Ishii  
 Prof. Daniel Leithinger  
 Prof. Sean Follmer  
 Prof. Amit Zoran  
 Philipp Schoessler  
 Jared Counts

for more information about the project and the process, go to  
[tangible.media.mit.edu/project/transform](https://tangible.media.mit.edu/project/transform)

Platinum A'DESIGN  
 AWARD 2015



# bioLogic

CHI 2015, Science Advances 2017

<https://tangible.media.mit.edu/project/biologic/>

3 A'DESIGN AWARDS 2016

UIST 2024 Co-Chair



Prof. Lining Yao, concept creation, interaction design and fabrication, MIT Media Lab ...now CMU professor



Dr. Wen Wang, biotechnology and material science, MIT Dept. of Chemical Engineering



Guanyun Wang, industrial design and fabrication, MIT Media Lab/Zhejiang University



Helene Steiner, interaction design, MIT Media Lab/Royal College of Art



Chin-Yi Cheng, computational design and simulation, MIT Architecture



Jifei Ou, concept design and fabrication, MIT Media Lab



Oksana Anilionyte, fashion design, MIT Media Lab/Royal College of Art



Prof. Hiroshi Ishii, advising and directing, Tangible Media Group, MIT Media Lab



Textile  
 Platinum



Wearable  
 Gold



Fashion  
 Silver





**Defy Gravity  
Radical Atoms**



**ZeroN**

Jinha Lee, Rehmi Post, Hiroshi Ishii, MIT Media Lab · UIST '11

**ART**  
questions the world around us

**DESIGN**  
articulates the solution

**SCIENCE**  
explains the world around us

**TECHNOLOGY**  
enables the solution



**BUILDING SPIRAL TOWER OF THE BABEL**  
TRANS-DISCIPLINARY STUDY THAT TRANSCENDS  
ART, DESIGN, SCIENCE, and TECHNOLOGY

**ART**  
questions the world around us

**SCIENCE**  
explains the world around us

**DESIGN**  
articulates the solution

**TECHNOLOGY**  
enables the solution

# Sagrada Família Antoni Gaudí

CHI 2026, Barcelona



View of the Sagrada Família basilica, which became the world's tallest church on Thursday after a section of its central tower was lifted into place, in Barcelona, Spain, Oct. 30, 2025. (AP Photo/Emilio Morenatti)  
<https://thehill.com/homenews/ap/ap-international/ap-barcelonas-sagrada-familia-becomes-the-worlds-tallest-church/>



<https://velvetescape.com/sagrada-familia-highlights/>

# TeleAbsence

Connecting to Remote Time

*"People die twice.  
First, when they die.  
Then when they are forgotten."*

*Rokusuke Ei (1933-2016)*

*"I want to always remember you."*

*"I want to always be remembered by you."*

*Hiroshi ISHII (1956-2200)*



# Telepresence

Connecting to  
Remote Space

*"Being There and  
Being Together"*

ClearBoard

NTT Human Interface Labs

Hiroshi ISHII & Minoru Kobayashi

CHI 92, CSCW 92, CACM 94, TOIS 93



# Telepresence

Connecting to Remote Space

*“Being There,  
Being Together”*



ClearBoard

NTT Human Interface Labs

Hiroshi ISHII & Minoru Kobayashi

CHI 92, CSCW 92, CACM 94, TOIS 93



ClearBoard at NTT ICC 2000

# Tangible Telepresence

## inTouch 1998

Scott Brave, Andrew Dahley, and Hiroshi Ishii  
CHI '97, CSCW '98

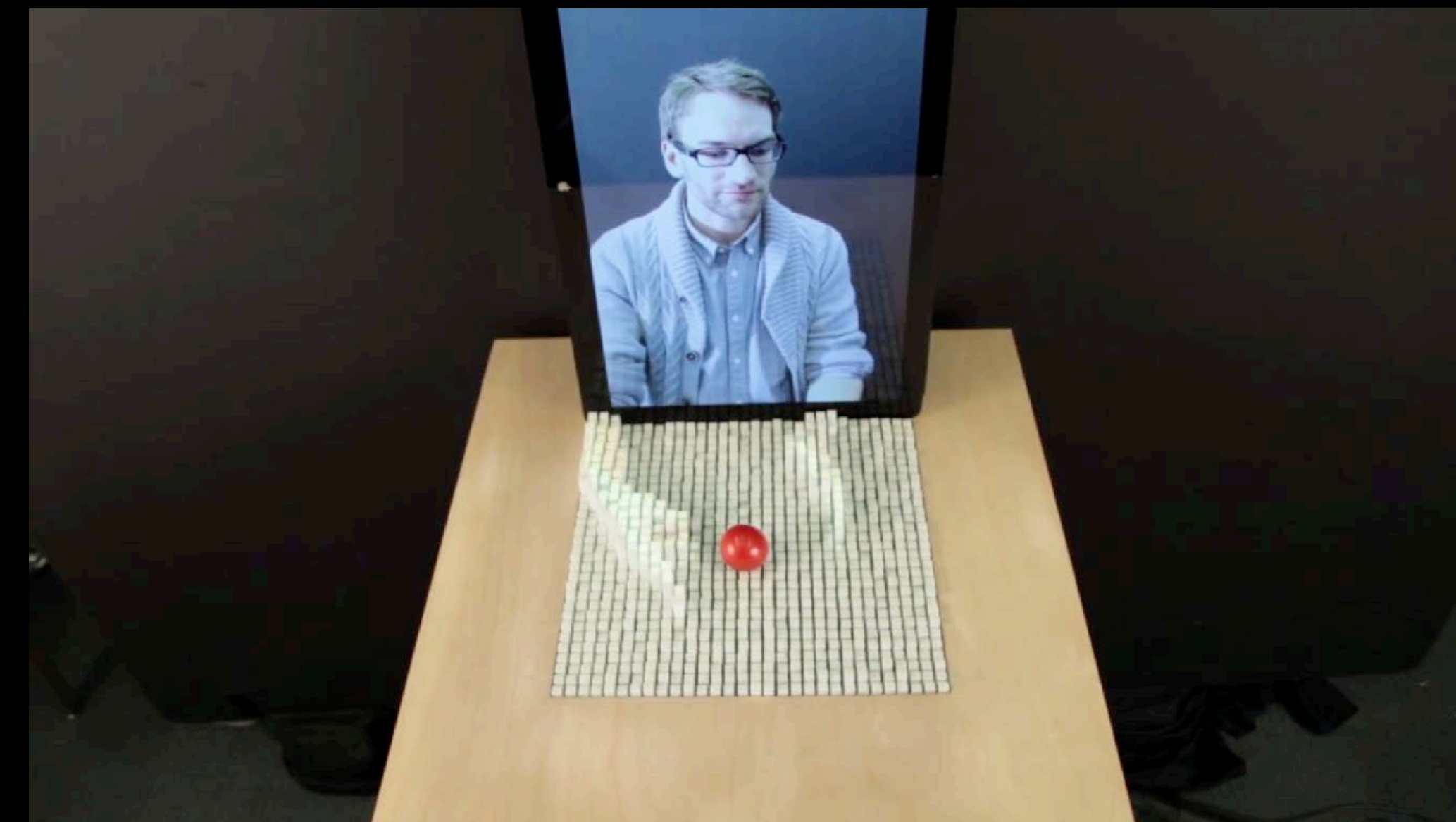
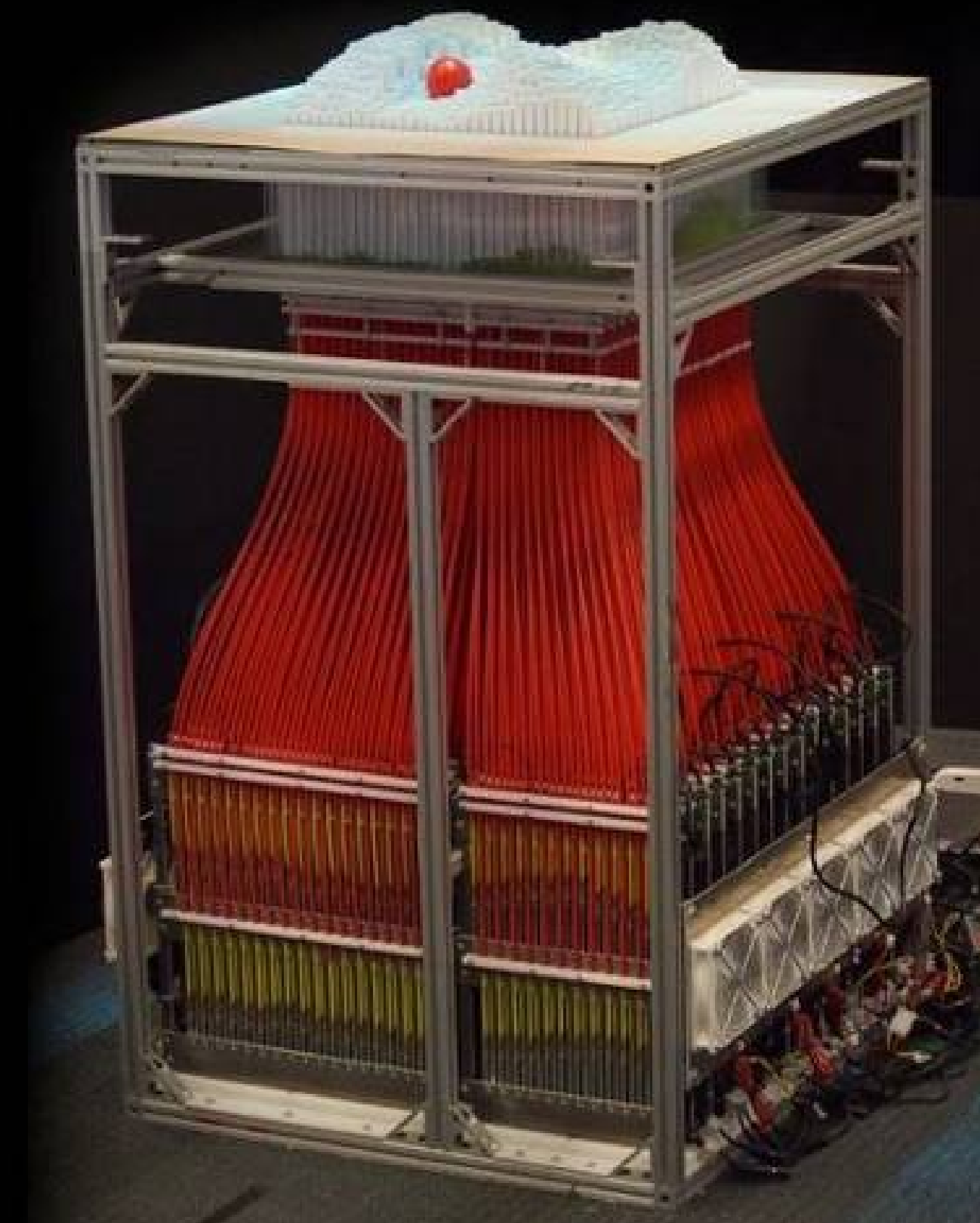


Tangible Bits  
Exhibition 2000  
@NTT ICC Tokyo

tangible interpersonal communication

## inFORM 2013

Sean Follmer, Daniel Leithinger, Alex Olwal, Akimitsu Hogge,  
Hiroshi Ishii. UIST '13, '14



Fast Company Innovation by Design Awards: Winner - Experimental  
Red Dot Award: Best of the Best - Design Concept  
Laval Virtual 2014 Award - INDUSTRIAL DESIGN & SIMULATION  
Core 77 Award - Interaction Student Winner  
IDSA IDEA Award Bronze

# TeleAbsence

Presence of Absence  
Connecting to Remote Time

*"Absence, the highest form of presence"*

James Joyce (1882-1941)



*"People die twice.*

*First, when they die.*

*Then when they are forgotten."*

*Rokusuke Ei (1933-2016)*

*"I want to always remember you."*

*"I want to always be remembered by you."*

*Hiroshi Ishii (1956 - 2200)*

# 花鳥

Art inspired by the beauty of nature

# 風月



Photo Credit: Mohamed Elsayed  
<https://unsplash.com/photos/oMnP8RbVy-s>

白鳥は哀しからずや空の青 海のをにも染まずただよふ  
若山牧水

【孤高】  
solitude

White bird,  
are you not sad?  
You drift, never dyed  
by the navy blue of the  
sea or the sky's blue.

“Umi no Koe” by Bokusui Wakayama (1885–1928)  
English translation by Janine Beichman



Photo Credit: Mohamed Elsayed  
<https://unsplash.com/photos/oMnP8RbVy-s>



Photo Credit: Ali Abdul Rahman  
<https://unsplash.com/photos/jil2vW8lf18>

# Lonely Planet

*“Loneliness is a pandemic.”*



***“I want to remember and reconnect with those I have lost.”***



(c) [noell oszvald](https://www.facebook.com/noellosvald)

<https://www.facebook.com/noellosvald/posts/pfbid032WY1k56wH4hMCpcb9Fb4G83M8vbQxPvCtVahdq1GsMJavQwD4xzPAfNtoNzGak6UI>

## **Loneliness**

*“TeleAbsence addresses the vast emotional and temporal distance caused by the memory of loved ones who drifted apart and faded away.”*

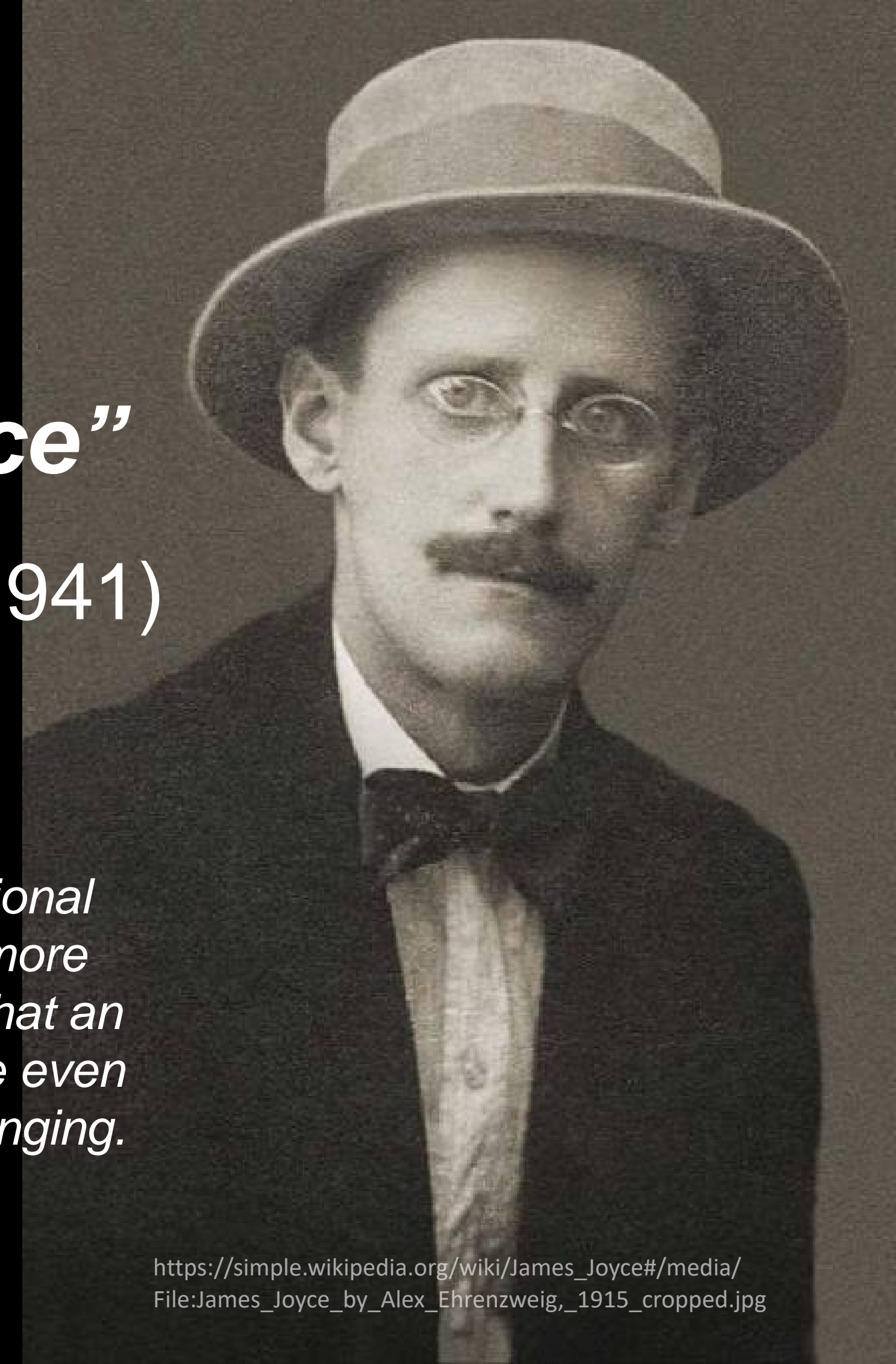
***“Absence,  
the highest form of presence”***

James Joyce (1882-1941)

*When someone or something is gone, the memory, emotional impact, or what is implied by their absence can become more potent and felt than their physical presence. The idea is that an empty space can make the person or thing that was there even more real and vivid through contemplation, memory, or longing.*

*Prompt to Google: “absence is the highest form of presence”*

[https://simple.wikipedia.org/wiki/James\\_Joyce#/media/File:James\\_Joyce\\_by\\_Alex\\_Ehrenzweig,\\_1915\\_cropped.jpg](https://simple.wikipedia.org/wiki/James_Joyce#/media/File:James_Joyce_by_Alex_Ehrenzweig,_1915_cropped.jpg)



***“People die twice.  
First, when they die.  
Then when they are forgotten.”***

Rokusuke Ei (1933-2016)

*The nature of memory and legacy, suggesting that physical death is only the first end. The final, true death occurs when all memory of a person fades away. This idea has resonated with many and has been explored in works of art and culture, such as the MIT Media Lab project "TeleAbsence," which uses the quote to frame its mission of creating communication channels with those who have passed.*

*Prompt to Google: “People die twice. First, when they die. Then when they are forgotten.”*



<https://www.bbc.com/news/world-asia-36761497>

[https://commons.wikimedia.org/wiki/File:Ei\\_Rokusuke.jpg](https://commons.wikimedia.org/wiki/File:Ei_Rokusuke.jpg)

# Presence of Absence

*The 1st principle of TeleAbsence*

## Hiroshima Shadow 1945



Shadow of a human being captured on the steps of Sumitomo Bank in Hiroshima-city right after an atomic bomb explosion in 1945 (Serena, 2023)

# “Saudade”

Presence of Absence - Portuguese word

**‘The desire for the beloved thing,  
made painful by its absence’**

Teixeira de Pascoaes 1912

**“Saudade** is a deep emotional state of nostalgic or profound melancholic longing for a beloved yet absent something or someone.”

Wikipedia: <https://en.wikipedia.org/wiki/Saudade>

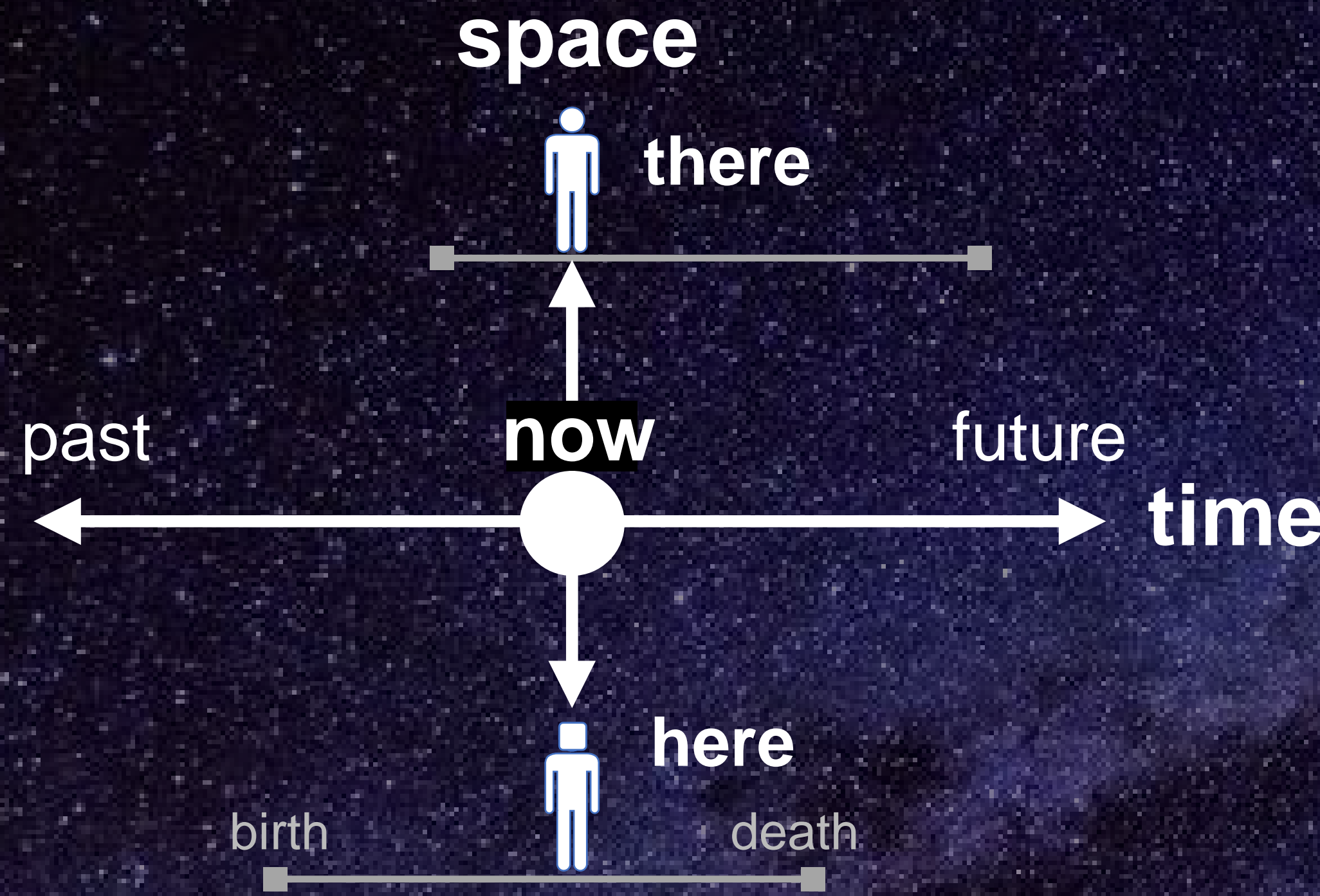
(c) [noell oszvald](#)

<https://www.flickr.com/photos/noellosvald/15761678743>



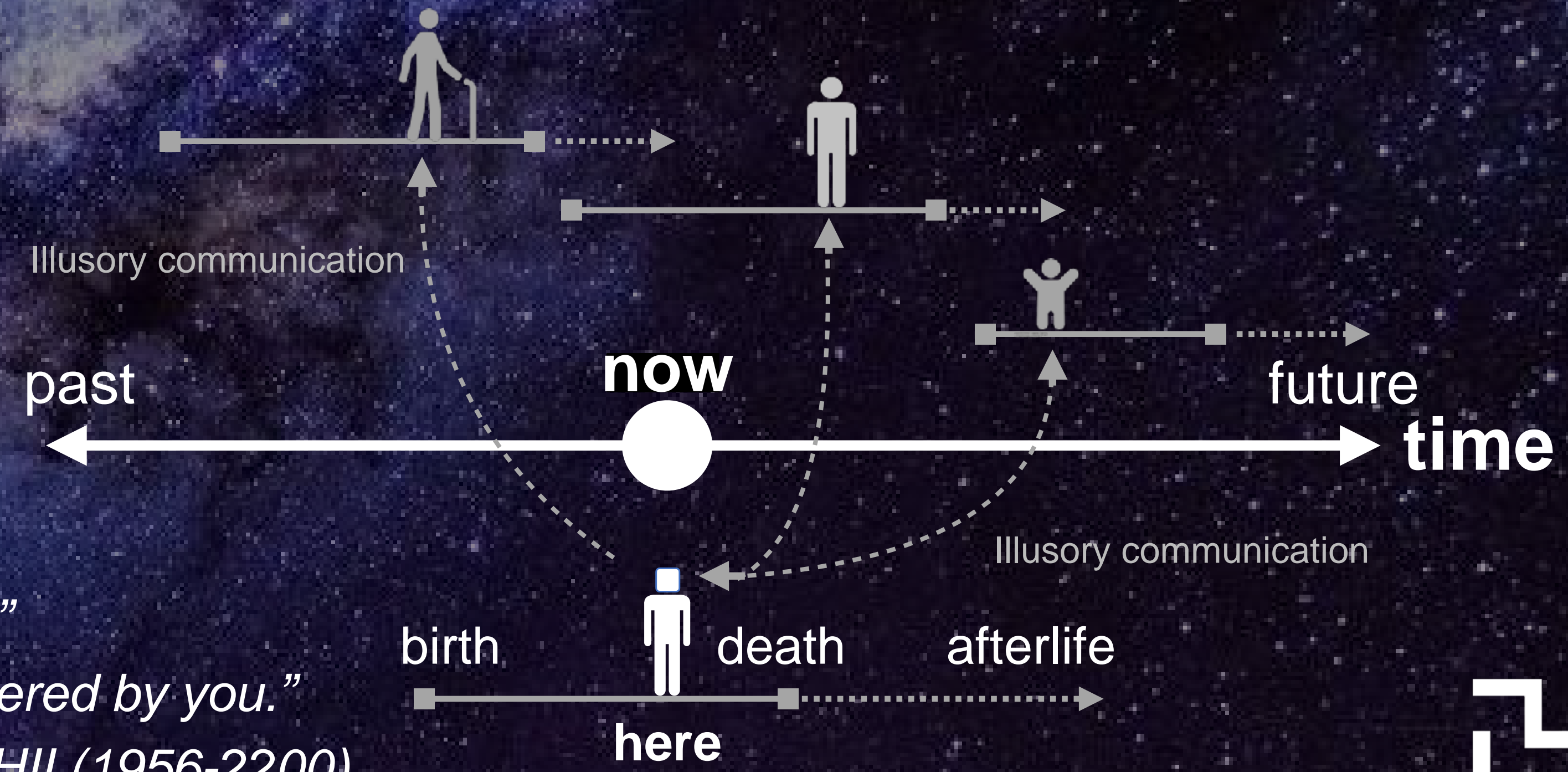
# Telepresence

Remote Space/Real-Time



# TeleAbsence

Remote Time/Nowhere



*"I want to always remember you."*  
*"I want to always be remembered by you."*  
Hiroshi ISHII (1956-2200)

一期

A once-in-a-lifetime  
encounter

一会

<https://www.flickr.com/photos/79203622@N02/9734698717/>

会者

All who meet must part

定離

nanamori : <https://web.archive.org/web/20161023221611/http://www.panoramio.com/photo/69476479>

# Buddhism Principles

## Emptiness (Śūnyatā) 色即是空

In Buddhism, emptiness does not mean nothingness but rather the absence of inherent existence in all things. Everything is dependent on other conditions for its existence: we exist in this context in relationship to others or in relationship to emptiness.

諸法空相 真空妙有  
一期一会 会者定離

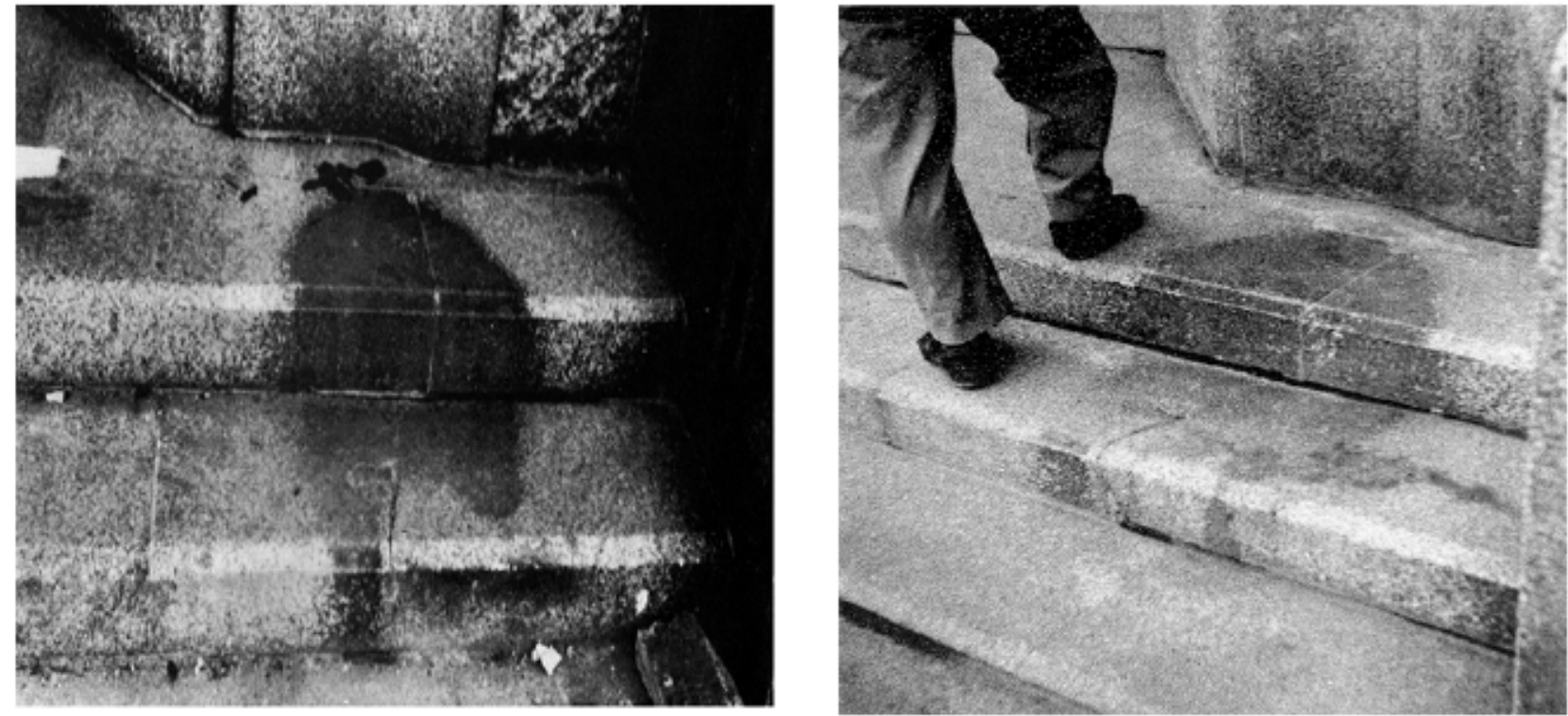
## Impermanence (Anicca) 諸行無常

In Buddhism, impermanence reflects on how nothing remains the same; everything is subject to birth, growth, decay, death, dissolution and recomposition. Impermanence refers to the understanding that all phenomena are in a constant state of flux and change.

生者必滅 無常迅速  
泡沫夢幻 有為轉變

# TeleAbsence Design Principles

## 1. Presence of Absence



Shadow of a human being captured on the steps of Sumitomo Bank in Hiroshima-city right after an atomic bomb explosion in 1945 (Serena, 2023)

## 2. Illusory Communication



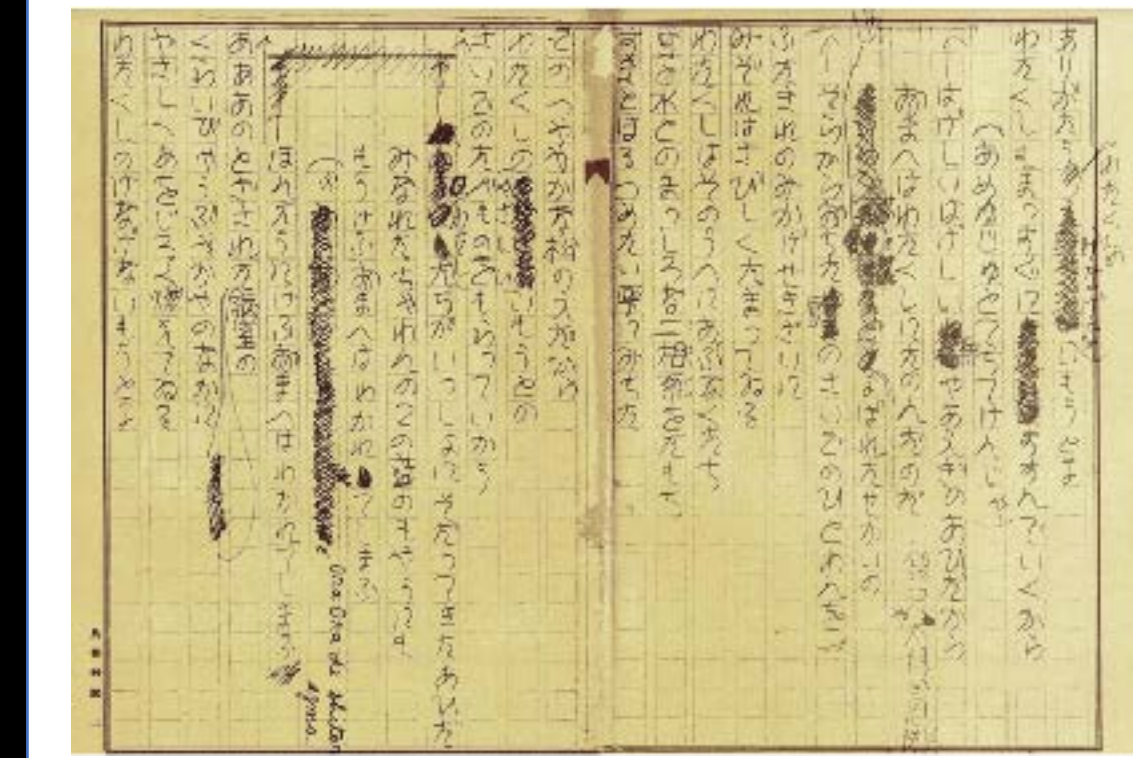
The Wind Phone was originally built by Itaru Sasaki in Otsuchi in Tohoku region, as a place where he could have one-sided “conversations” with his lost cousin (Komatsu, 2018) (Huntley, 2018)

## 3. Materiality of Memory



"Impact Steel," the beams that were ripped apart when the hijacked United Flight 175 tore into the South Tower of the World Trade Center (Segar, 2013)

## 4. Traces of Reflection



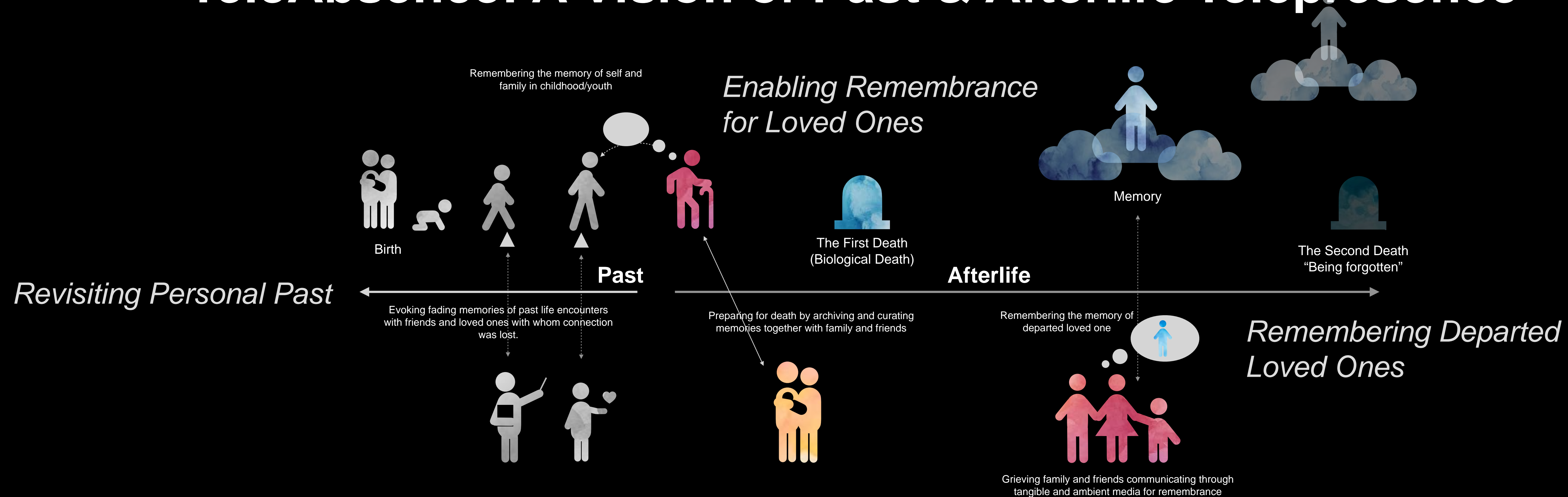
The Last Farewell, Courtesy of Kenji Miyazawa Museum in Hanamaki, Japan (Miyazawa Kenki Museum, 1994)

## 5. Remote Time



A photo from the inside of Notre-Dame merely hours before the 2019 fire

# TeleAbsence: A Vision of Past & Afterlife Telepresence



**Hiroshi Ishii\***  
**Daniel Pillis**  
**Pat Pataranutaporn**  
Media Lab  
Massachusetts Institute of  
Technology

**Xiao Xiao**  
De Vinci Higher Education  
De Vinci Research Center  
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Media Lab  
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Technology

**Hayoun Noh**  
University of Oxford  
Department of Computer  
Science  
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Media Lab  
Massachusetts Institute of  
Technology

**Lucy Li**  
Media Lab  
Massachusetts Institute of  
Technology

**Alaa Algargoosh**  
Media Lab  
Massachusetts Institute of  
Technology  
and  
Virginia Polytechnic Institute  
and State University  
School of Architecture

**Jean-Baptiste Labrune**  
Media Lab  
Massachusetts Institute of  
Technology

Presence, Vol. 34, Winter 2025, 65–75  
10.1162/pres\_a\_00441  
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## TeleAbsence: A Vision of Past and Afterlife Telepresence

### Abstract

This paper presents our vision of TeleAbsence, extending the concept of telepresence to the past and the afterlife to address the vast emotional and temporal distance caused by the memory of loved ones who drifted apart and faded away. Instead of explicit and literal representations of loved ones, TeleAbsence describes poetic encounters with digital and physical traces left by the absence of others. TeleAbsence fosters *illusory communications* to conjure the feeling of being there with those no longer with us without using synthetic or generative representations and utterances. Our vision is deeply inspired by the Portuguese concept “Saudade”—the “desire for the beloved thing, people, place, and moment, made painful by its absence.” We present our vision through five design principles: *presence of absence*, *illusory communication*, the *materiality of memory*, *traces of reflection*, and *remote time*, grounded in historical and cultural contexts. We present exploratory narratives to illustrate these principles and the concept of ambient co-presence using poetry, phone, piano, and pen as mediums. We discuss challenges and opportunities for future work, including representational strategies to depict lost loved ones, ethical issues, and the possible extension of TeleAbsence to historical public figures.

“In loving memory of Elise O’Hara (1986–2024) and Kazaku Ishii (1926–1998), whose presence is deeply felt every day.”

### 1 Introduction

“Absence is the highest form of presence.”  
—James Joyce (1882–1941)<sup>1</sup>

Presence and absence are fundamental states of being for mortal humans: being present, proximate, or close; or being absent, far away, or lost. Our vision, TeleAbsence, expands the current scope of telepresence technologies by focusing on these profound states of being. Unlike traditional telepresence models that concentrate on real-time connections between the living and present, our vision extends to the memories of those who have faded away and the lingering echoes of past relationships. This paper introduces a design philosophy aimed at preserving these memories against the passing of time and the fear of being forgotten, responding to the universal longing encapsulated in phrases like

\* Correspondence to: [ishi@mit.edu](mailto:ishi@mit.edu).

<sup>1</sup>“Absence is the highest form of presence” is a quote commonly attributed to James Joyce, though its exact source is unverified.

# TeleAbsence: A Vision of Past and Afterlife Telepresence (MIT Library)

<https://dspace.mit.edu/handle/1721.1/158451>



Hiroshi Ishii, Daniel Pillis, Pat Pataranutaporn, Xiao Xiao, Hayoun Noh, Lucy Li, Alaa Algargoosh, Jean-Baptiste Labrune; TeleAbsence: A Vision of Past and Afterlife Telepresence. PRESENCE: Virtual and Augmented Reality 2025; doi: [https://doi.org/10.1162/PRES\\_a\\_00441](https://doi.org/10.1162/PRES_a_00441)



# musicBottles



# bottles



classical



# Weather Bottle



weather



石井 和子  
Kazuko ISHII  
1926 - 1998

present for my mother  
model: soy sauce bottle in her kitchen



I miss you.  
I want to talk to you.  
I want to hear from you.



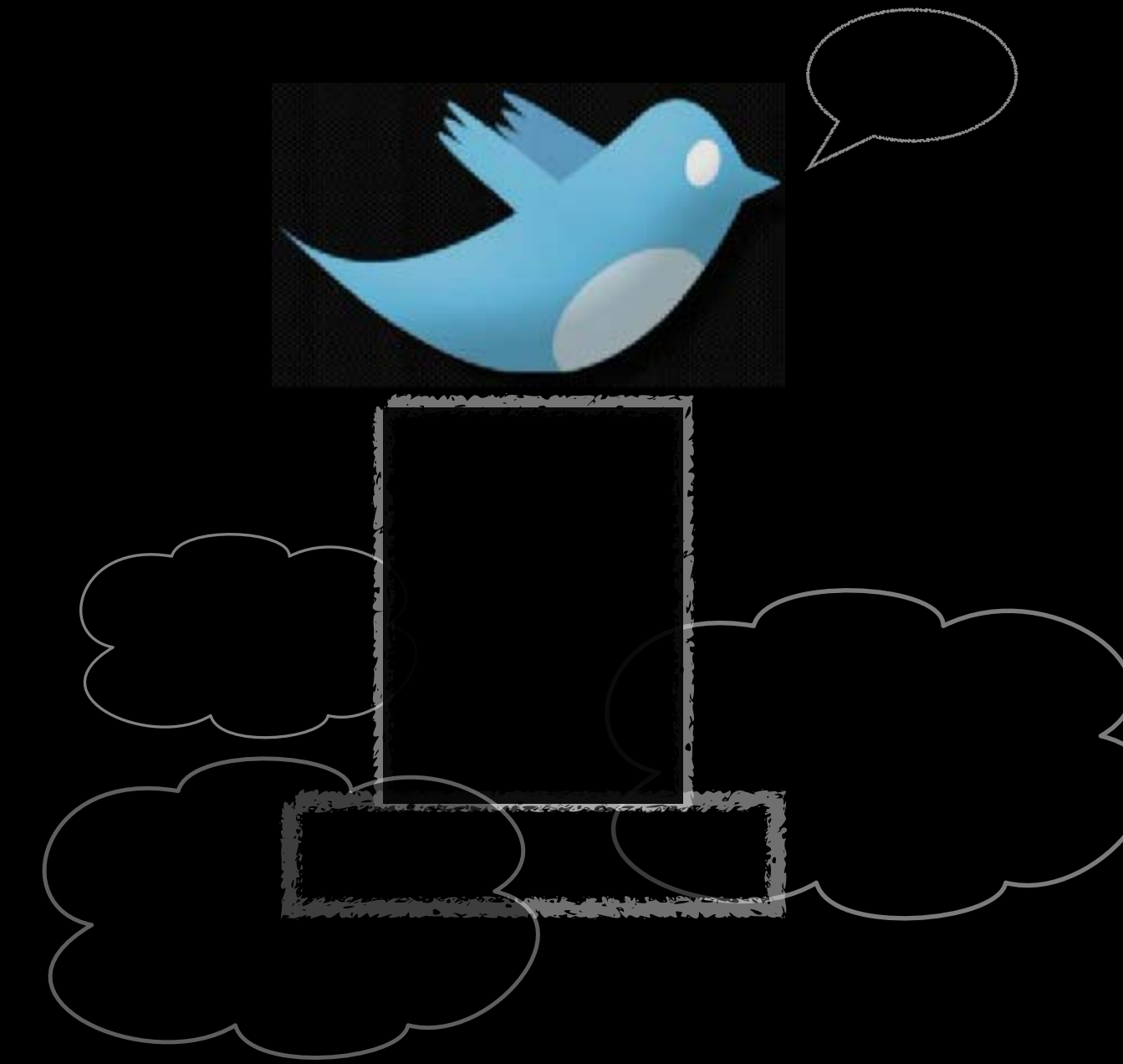
my parents' grave in Nishioka  
Mausoleum, Sapporo-City, Japan

# TwitterPoet

A bluebird that sings my  
mom's poems on her  
tombstone in the clouds



松蒼柏翠 (しょうそうはくすい)



石井 和子  
Kazuko ISHII  
1926 - 1998

# 藍鳥

a bluebird on her tombstone in the clouds

# 墓標



石井 和子

@Kazuko\_Ishii 天国 (heaven)

born: February 10, 1926 died: August 30, 1998 I loved 文学, but WW2 made it impossible for me to study 文学. I went to 東京薬科大学 instead. 石井裕 @ishii\_mit is my son.

Edit your profile →

Timeline Favorites Following Followers Lists

**Kazuko\_Ishii** 石井 和子  
美しいお花を有難うございます。RT @nekotanu: @Kazuko\_Ishii 今日のご生誕84年ですね。拙い花の写真をお贈りします。大分は異常なくらい暖かく、越冬した「PEACE」が今にも開きそうです。私は息子さんとは同い年。父は石井さんの二つ下.. @ishii\_mit  
10 Feb

**Kazuko\_Ishii** 石井 和子  
もはや見ぬ あしたの空のたたずまい 雪ふかくあらむか 西岡の里  
辞世 (3) 石井和子 1998  
6 Feb

**Kazuko\_Ishii** 石井 和子  
ひとせわれ 恋せしくにの青垣の かなたはるけく 消えもゆかまし  
辞世 (2) 石井和子 1998  
6 Feb

**Kazuko\_Ishii** 石井 和子  
かすみたつ 大和の空を魂 (たま) ひとつ かけりのぼらな 白とりのこと  
辞世 (1) 石井和子 1998  
6 Feb

**Kazuko\_Ishii** 石井 和子  
時の流れ超えゆく力ありもせば弟在りし世にかへりたし 弟の  
靈に捧ぐるうた 遠き星に 石井和子 11/9/1973  
31 Jan

**Kazuko\_Ishii** 石井 和子  
弟の旅路はとほく昏からむ星よまたたけ道しるべせよ 弟の靈  
に捧ぐるうた 遠き星に 石井和子 10/2/1973  
31 Jan


**Kazuko\_Ishii** 石井 和子  
逝きしいのちただあはれなり名も富も愛もむなしきうつし世と知  
れど 弟の靈に捧ぐるうた 遠き星に 石井和子 11/7/1973  
31 Jan

**Kazuko\_Ishii** 石井 和子  
遠き星に常世のいのち得むとてや逝きしか弟よ秋雨の夜を 弟  
の靈に捧ぐるうた 遠き星に 石井和子 9/23/1973  
31 Jan

**Kazuko\_Ishii** 石井 和子  
@ishii\_mit @AkikoSugaya Thanks for following me.  
24 Jan


**Kazuko\_Ishii** 石井 和子  
I passed away in the end of summer 1998 in 札幌. My son, 石井裕 (Hiroshi Ishii) created this account to share my 短歌 I composed in my life. 合掌.  
24 Jan



 **@nekotanu**  
Tomoko Nakamura-S


@Kazuko\_Ishii 今日はご生誕84年ですね。拙い花の写真をお贈りします。大分は異常なくらい暖かく、越冬した「PEACE」が今にも開きそうです。http://bit.ly/9MHRUK 私は息子さんとは同い年。父は石井さんの二つ下で川柳を捻る日々を送っています。

9 Feb via TweetDeck Favorite Retweet Reply


 **大弓羊子 (Yoko Oyumi)** @OfficeAmigo 260d  
@Kazuko\_Ishii 【雲海暮標永遠】 @ishii\_mit 石井先生と青い鳥のお導きにより、ご生誕の記念日にお参り申し上げます。寒波の中でも、春に咲く準備をしている花々の香しさをお届けできれば幸いです☆  
pic.twitter.com/S8G8XaPE

Details

石井 和子 retweeted

 **Tomoko Nakamura-S** @nekotanu 626d  
@Kazuko\_Ishii ポストン時間でお参りします。母子草と、和子さんと同い年の父が昨日詠んだ川柳「鮮やかな手つきで老母うどん打ち」も添えて...  
pic.twitter.com/mPrH3aYW

Details

 **Tomoko Nakamura-S** @nekotanu 260d  
@Kazuko\_Ishii 今年もポストン時間でお参りさせていただきます。老父母の住む実家に咲く水仙を供えます。日本の2/9は寒波で全国的に寒い日でした。でもそこかしこに「早春賦」の歌が聞こえてきそうな春の芽生えも...(合掌) pic.twitter.com/ucX7YINk

Details





*"I want to hear the message you left in the bottle."*

musicBottles  
Photo: NTT ICC



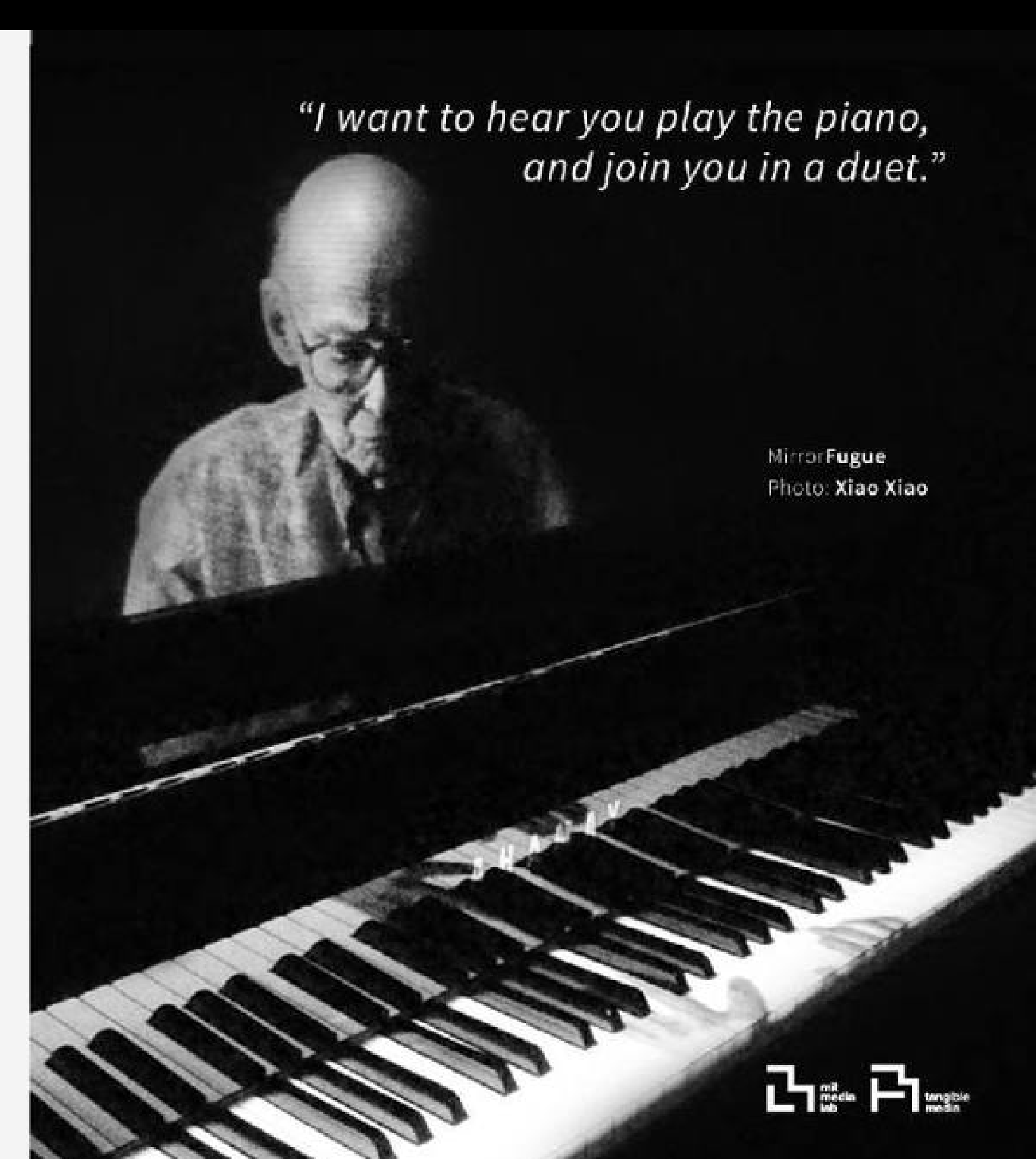
*"I want to talk to you and hear the sounds that bring back the vivid memories of when you were with me."*

ambientPhone  
Photo: Hiroshi Ishii



*"I want to hear you type your favorite poems at midnight."*

GhostTypeWriter  
Photo: Kyung Yun Choi



*"I want to hear you play the piano, and join you in a duet."*

MirrorFugue  
Photo: Xiao Xiao





*"I want to hear the message you left in the bottle."*

musicBottles  
Photo: NTT ICC

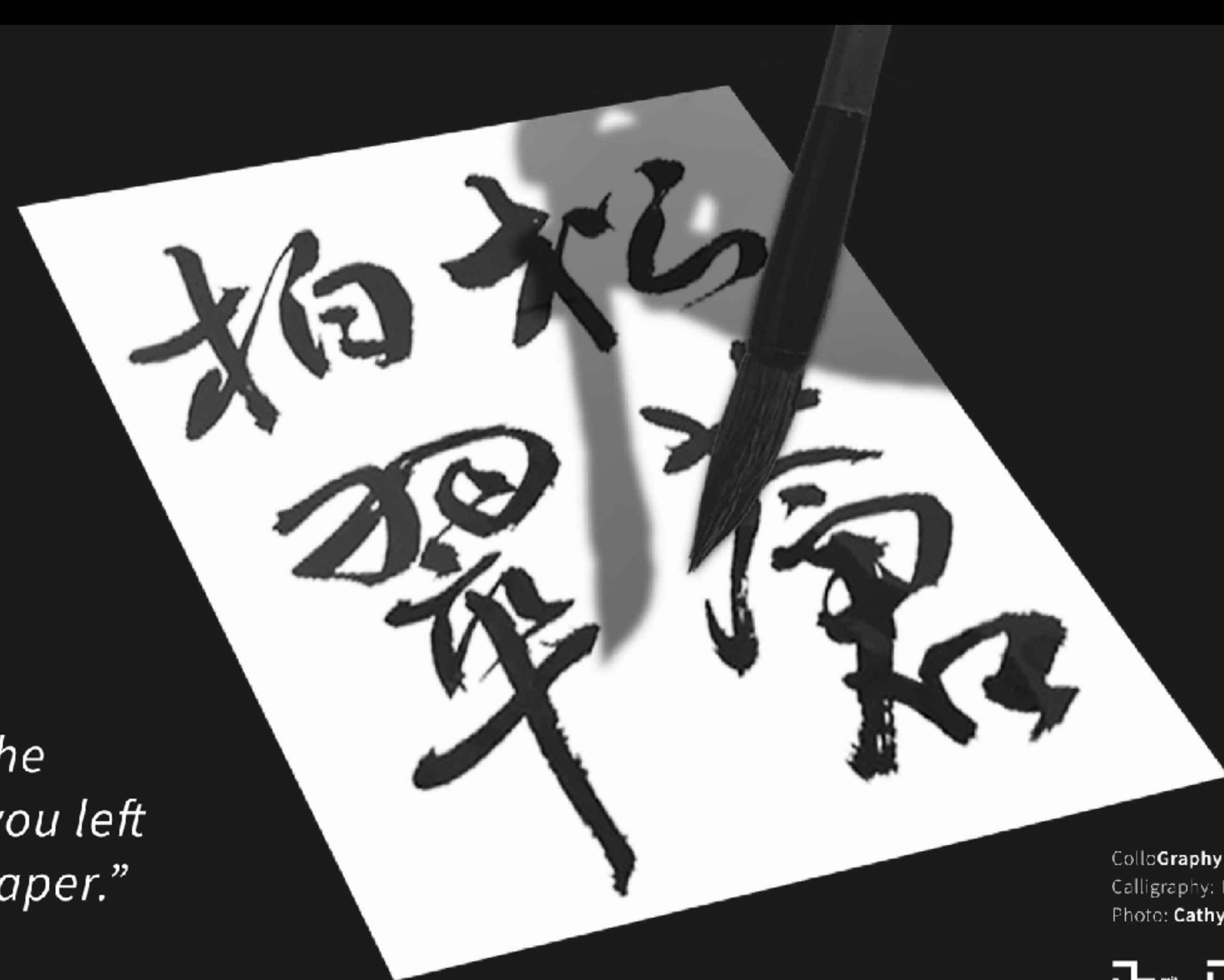


*"I want to talk to you and hear the sounds that bring back the vivid memories of when you were with me."*

ambientPhone  
Photo: Hiroshi Ishii

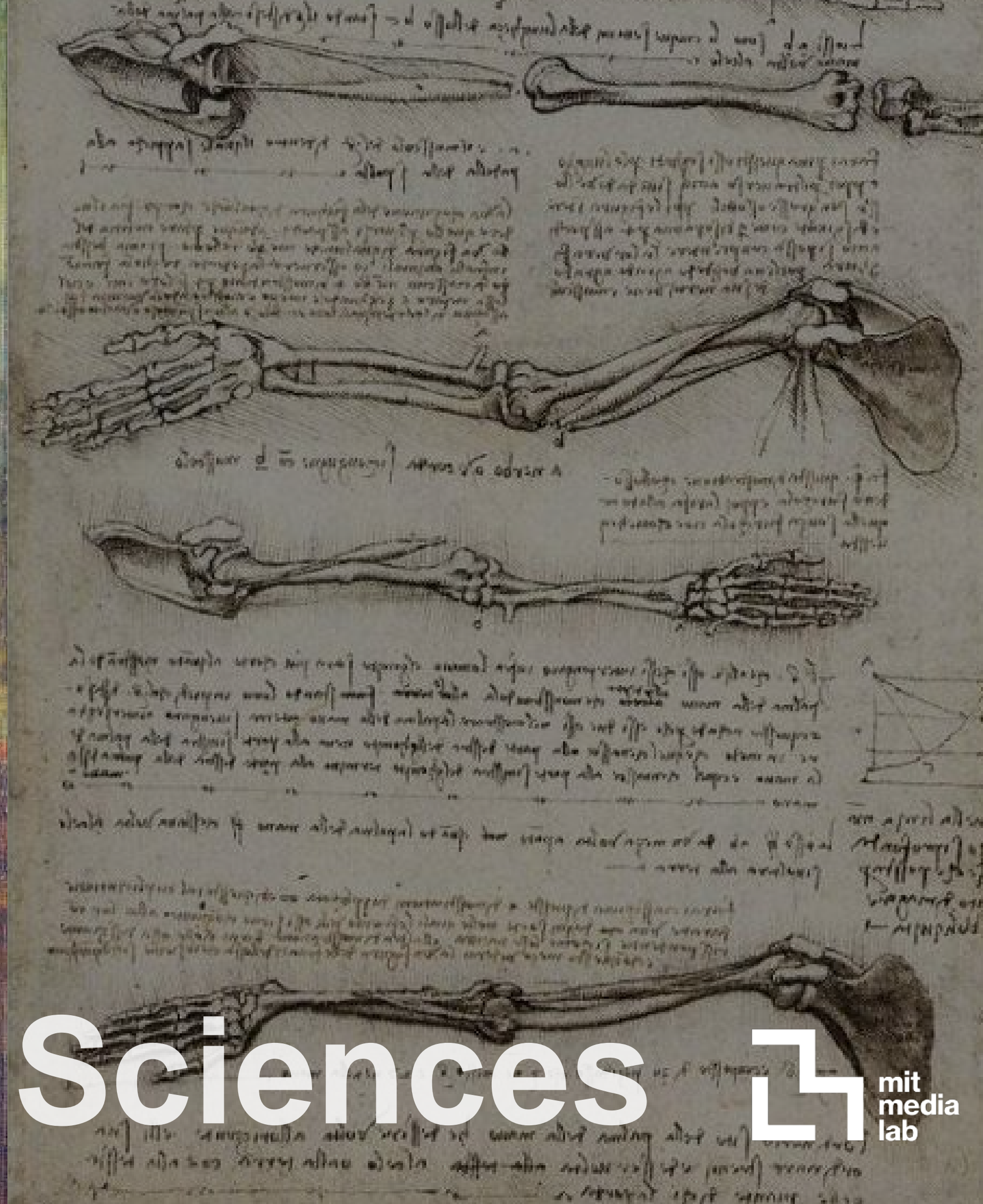
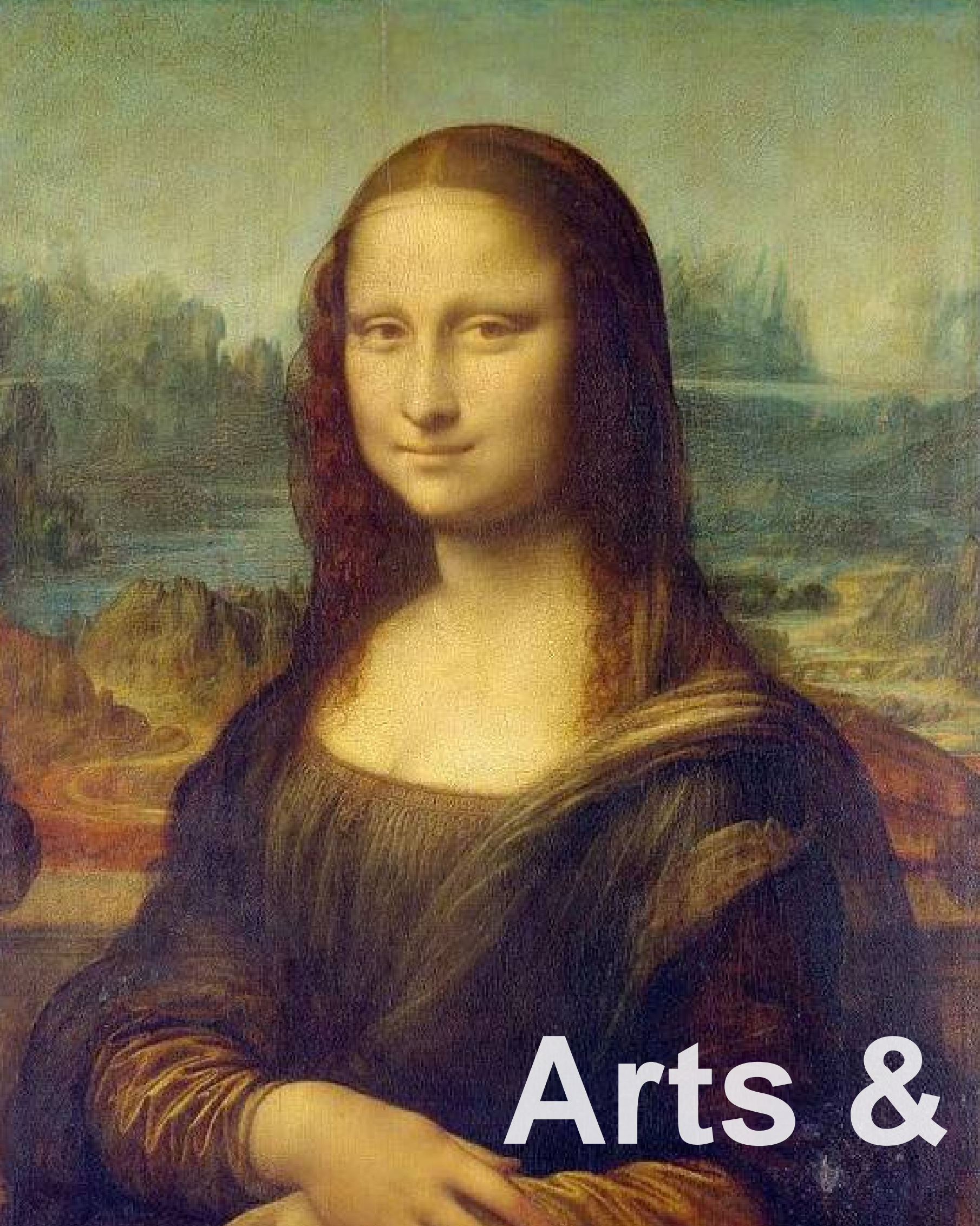


*"I want to sense the energy of the brush strokes you left on a sheet of paper."*



ColloGraphy  
Calligraphy: Kazuko Ishii  
Photo: Cathy Fang





Arts & Sciences  mit media lab

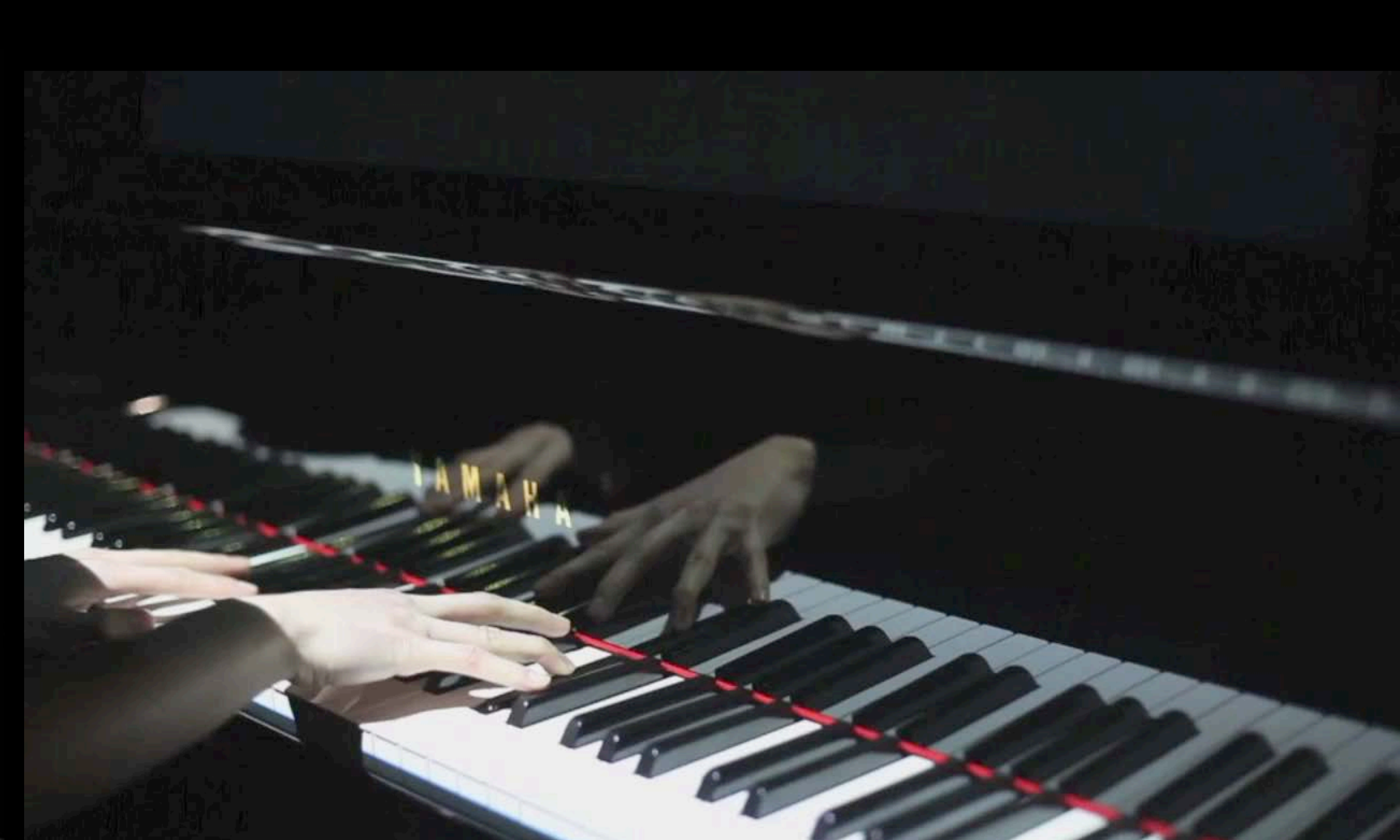
# MirrorFugue III (2013)

## Xiao Xiao



# MirrorFugue III (2012)

Xiao Xiao



**MirrorFugue III (2012) Xiao Xiao & Alisa**



2024-06-08 Alisa Ishii (19) & [ Alisa Ishii (7) in MirrorFugue ]



2013-06-26 Ryuichi Sakamoto and Xiao Xiao



2013-06-26 Ryuichi Sakamoto and Xiao Xiao



2013-06-26 Ryuichi Sakamoto and [ Xiao Xiao in MirrorFugue ]



Ryuichi Sakamoto. 1952-2023



RYUICHI SAKAMOTO | OPUS - Official US Trailer

[https://www.youtube.com/watch?v=OyhTmH92Ljc&ab\\_channel=JanusFilms](https://www.youtube.com/watch?v=OyhTmH92Ljc&ab_channel=JanusFilms)



Recorded in 2022

Courtesy of Ryuichi Sakamoto Office

Ryuichi Sakamoto. 1952-2023



RYUICHI SAKAMOTO | OPUS - Official US Trailer

[https://www.youtube.com/watch?v=OyhTmH92Ljc&ab\\_channel=JanusFilms](https://www.youtube.com/watch?v=OyhTmH92Ljc&ab_channel=JanusFilms)



2024-06-08 Ryuichi Sakamoto in reMirrorFugue



*“I want to always remember you.”*  
*“I want to always be remembered by you.”*

*Hiroshi Ishii (1956 - 2200)*

# TeleAbsence

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1924



# Human Arc - TeleAbsence

*“Memory makes us—and connects us.”*

*Reflecting on Remote Time, I have come to believe that we can deepen our bonds across time itself—with lost loved ones, our former selves, our ancestors, and even descendants we may never meet.*

*Across time, absence becomes a new form of presence.  
What once felt impossibly distant begins to feel closer than before—almost within reach.*

*TeleAbsence expands our capacity to care, to remember, and to see ourselves as part of a longer human arc. It becomes a living medium, stretching across generations and weaving fragments of identity into continuity.*

*In this way, memory becomes more than remembrance.  
It becomes a human bond.*

**Hiroshi Ishii**  
April 14, 2026  
CHI 2026 in Barcelona

[https://stock.adobe.com/search?k=%2522electrical%2Barc%2522&asset\\_id=1744060687](https://stock.adobe.com/search?k=%2522electrical%2Barc%2522&asset_id=1744060687)

TeleAbsence

FEBRUARY 22, 2024  
Hiroshi Ishii, MIT Media Lab, Director of the MIT Media Lab, is a pioneer in the field of interactive design and user experience. He is the author of the book "The Invisible City: A Life in Design" and the co-author of "The Invisible City: A Life in Design". He is also the co-founder of the MIT Media Lab and the co-director of the MIT Media Lab's Center for Intelligent Media.

MARCH 14, 2024  
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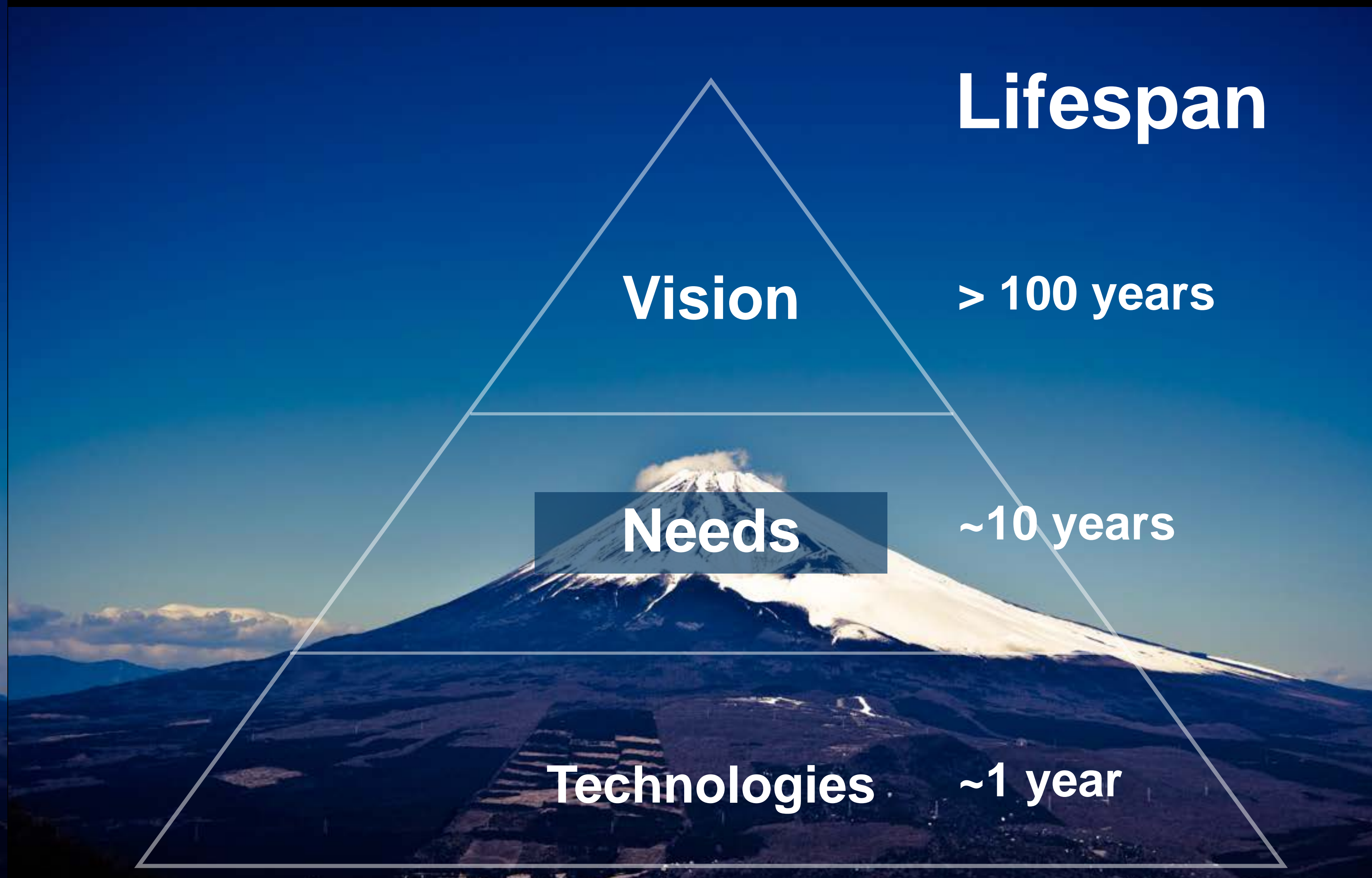
# TeleAbsence breathes between Amber and Ember



*“What fades is not lost.  
An **\*amber\*** remembers the light it once held.  
An **\*ember\*** remembers the warmth it once gave.  
Between them breathes **\*TeleAbsence\*** —  
the quiet glow of what remains,  
and the gentle lingering echo of what is gone.”*

*Hiroshi Ishii*

# vision



# The Future

is not to predict,  
but to invent

Alan Kay 1971

This is the century in which you can be proactive about the future; you don't have to be reactive. The whole idea of having scientists and technology is that those things you can envision and describe can actually be built.

Photo courtesy of Nobukazu Kuriki

# Envision

# Embody

# Engage

# Inspire

Photo courtesy of Nobukazu Kuriki

**Conceptual Intelli\***  
art & philosophy

**Technical Intelli\***  
design, engineering &  
science

**Social Intelli\***  
empathy, respect &  
collaboration

**Artistic Intelli\***  
art & narrative



**INVENT & INSPIRE**

<https://www.flickr.com/photos/79203622@N02/9734698717/>

**Be Artistic & Analytic**

**Be Poetic & Pragmatic**

**Be Romantic & Realistic**

<https://www.flickr.com/photos/79203622@N02/9734698717/>



22000

future



Photo courtesy of Nobukazu Kuriki <http://kurikiyama.jp>



**Life has a set end point**

**But the future is never-ending**

Photo courtesy of Nobukazu Kuriki <http://kurikiyama.jp>



**Technology soon  
becomes obsolete**

**But true vision is ever-lasting**

"Cradle of Stars" by Scott Cresswell



# Timely

Photo courtesy of Nobukazu Kuriki <http://kurikiyama.jp>



# Timeless

"Cradle of Stars" by Scott Cresswell

# Venezia



# Firenze



# *Timeless*

22000

"Cradle of Stars" by Scott Cresswell



**What legacy do you wish to leave for  
those living in 2200?**

**How do you want to be remembered?**

Life has an endpoint, but the future is never-ending.  
Technology becomes obsolete, but Vision is ever-lasting.  
What legacy do you wish to leave for those living in 2200?

Hiroshi Ishii

22000

"Cradle of Stars" by Scott Cresswell

砂

sand

"Why do I run?" People ask me.

"Because life is too short," I answer.

Time flies into the past like sand between my fingers.

That's why I love this moment. That's why I run.

How many more seconds?

When all the sand is gone, the real future begins. **I am not there.**

**But 'I' will be there.**

Life has an endpoint, but the future is never-ending.  
Technology becomes obsolete, but Vision is ever-lasting.  
What legacy do you wish to leave for those living in 2200?

Hiroshi Ishii

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"Cradle of Stars" by Scott Cresswell



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# Thanks!

*"I want to always remember you."*

*"I want to always be remembered by you."*

*Hiroshi Ishii (1956-2200)*

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# Please Support Our Research



<https://giving.mit.edu/search/node/2741502>



A screenshot of the MIT Giving website. The page shows search results for the query "2741502". At the top, there are navigation links for "EXPLORE", "WAYS OF GIVING +", and "WHY SUPPORT MIT +", along with a search icon and a "Give now" button. The main content area displays "1 results for '2741502'" and "1 FUNDS". The fund listed is "Media Lab: Tangible Media Research Fund - Hiroshi Ishii" with ID "2741502". Below the fund name is a description: "Creating tangible interactions with the digital world to inspire and engage people." There are "LESS -" and "Give" buttons next to the fund name, and a "- Show less" button at the bottom of the fund entry. The footer contains "Giving to MIT" with a "Give now" button, a navigation menu with "Explore", "Ways of Giving", and "Why Support MIT", and "INFORMATION FOR" with "Foundations" and "Corporations". It also includes "CONTACT" with a phone number "617.253.0129" and a "Contact us" link, and an "FAQ" link. A search bar is present above the footer. The footer also includes the MIT logo, the MIT Alumni Association logo, and social media icons for Facebook, LinkedIn, Twitter, and Google+. At the bottom, there are links for "TERMS OF USE", "PRIVACY STATEMENT", and "ACCESSIBILITY".