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MASTER INTERACTION

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## TACTILE INTERACTION GESTURAL INTERACTION INSTRUMENTAL INTERACTION

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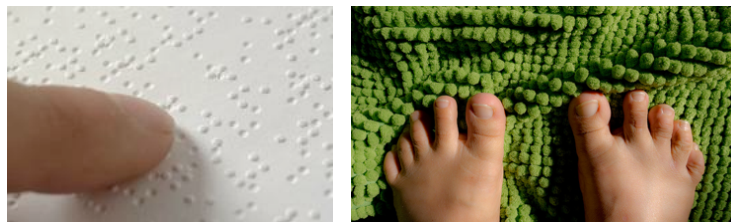
# TACTILE AND GESTURAL INTERACTION

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## TACTILE INTERACTION

- ▶ Involves the sense of touch



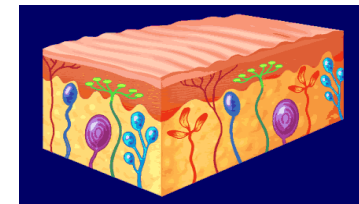
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TACTILE INTERACTION

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## THE SENSE OF TOUCH

- ▶ Tactile :  
6 types of sensors  
(Hot, Cold,  
Pressure, Pain,  
Fine touch, Coarse touch)



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## SENS OF TOUCH

- ▶ Tactile
- ▶ Proprioception : configuration of the body in space



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## SENSE OF TOUCH

- ▶ Tactile
- ▶ Proprioception
- ▶ Kinesthesia : tension of the muscles



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## THIS IS NOT A TACTILE INTERFACE



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## GESTURAL INTERACTION

- ▶ Gesture :  
movement that  
illustrates or replaces  
a word or sentence



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## FUNCTIONS OF THE GESTURAL CHANNEL

Claude Cadoz

- ▶ Epistemic function :  
acquire information

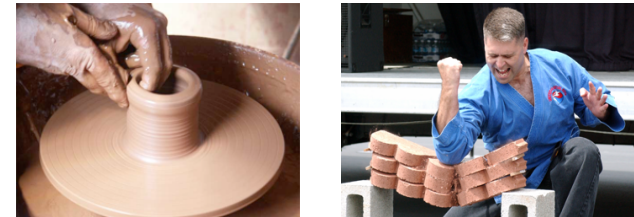


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## FUNCTIONS OF THE GESTURAL CHANNEL

Claude Cadoz

- ▶ Ergodic function :  
transform through physical action

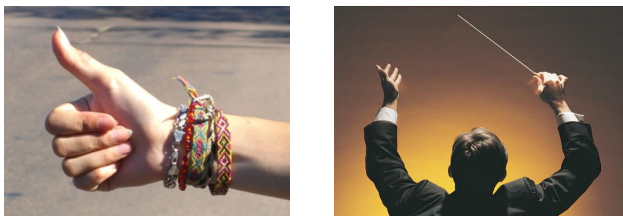


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## FUNCTIONS OF THE GESTURAL CHANNEL

Claude Cadoz

- ▶ Semiotic function :  
Emit information



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## FUNCTIONS OF THE GESTURAL CHANNEL

Claude Cadoz

- ▶ Epistemic function :  
acquire information
- ▶ Ergodic function :  
transform through  
physical action
- ▶ Semiotic function :  
emit information



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## EXAMPLE

- ▶ Epistemic : touch the strings to place the fingers
- ▶ Ergodic : move the bow
- ▶ Semiotic : communicate an emotion to the audience



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## LIMITS OF CURRENT GESTURAL INTERFACES



Pseudo-ergodic gestures

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## LIMITS OF CURRENT GESTURAL INTERFACES



Navigation gestures



Imitation gestures

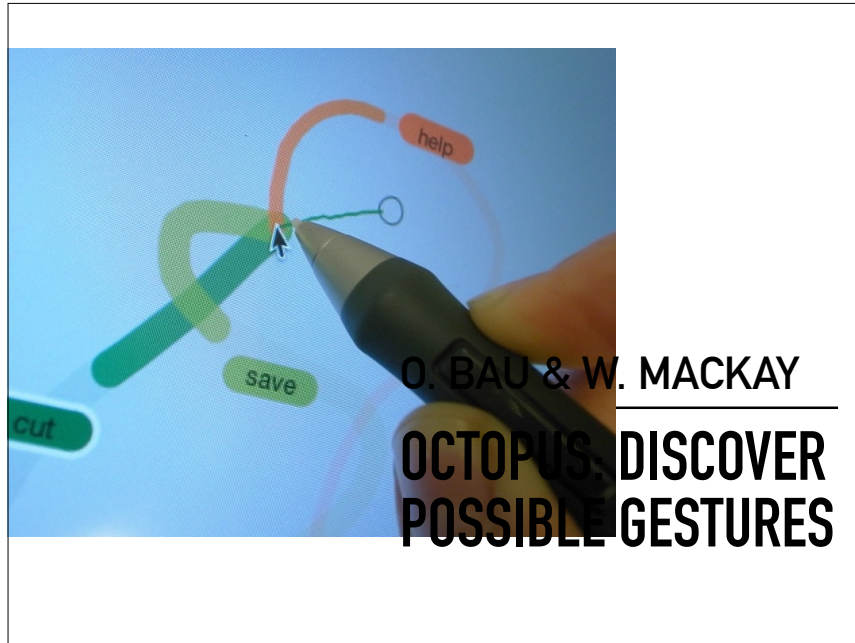
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## LIMITS OF GESTURAL INTERFACES

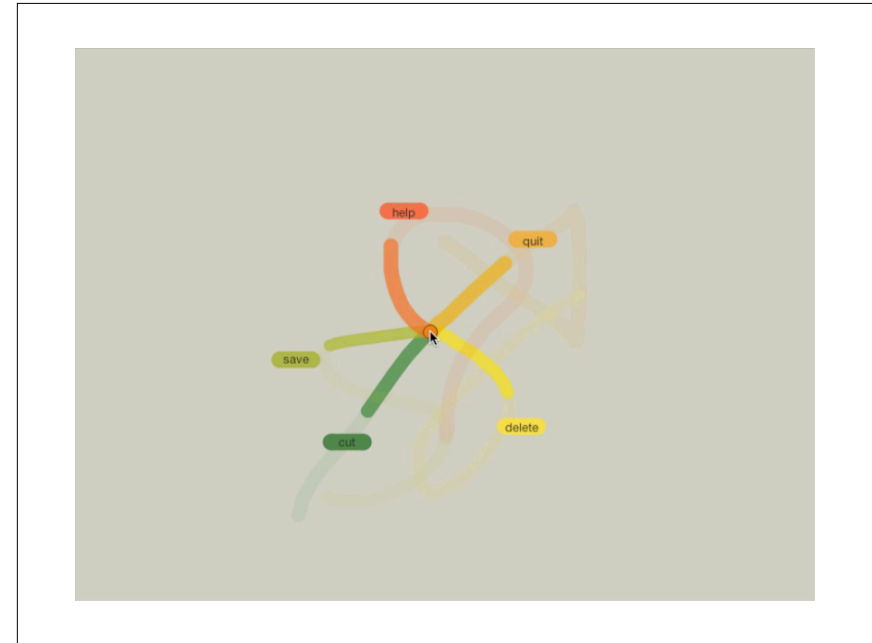


Fatigue, precision, discovering the vocabulary

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**INSTRUMENTAL  
INTERACTION**

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INSTRUMENTAL INTERACTION

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**MOST OF OUR INTERACTIONS ARE  
MEDIATED BY TOOLS / INSTRUMENTS**

L'encyclopédie - Diderot & d'Alembert, 1751-1772

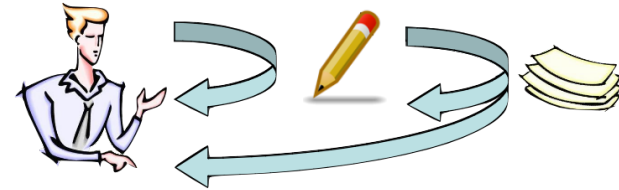
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## TOOLS TO ADAPT OUR ENVIRONMENT



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## INTERACTION IS MEDIATED BY TOOLS



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## THE POWER OF TOOLS

- ▶ The user internalizes the tool as an extension of their own body



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## THE POWER OF TOOLS

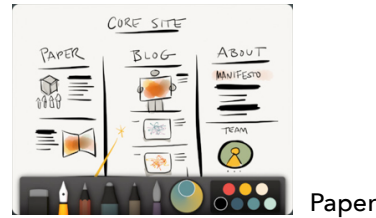
- ▶ Holding a tool in the hand redefines the affordances of the environment



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## INSTRUMENTAL INTERACTION

- ▶ For content creation and editing
- ▶ For gaming



Paper



Wii mote



iPhoto

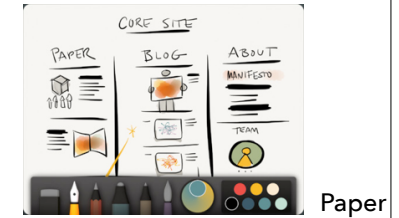
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# FUTURES THAT ARE ALREADY HERE

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## INSTRUMENTAL INTERFACES

- ▶ But these interfaces are limited
- ▶ How to use the pencil from "Paper" to write on a photo in "iPhoto"?



Paper



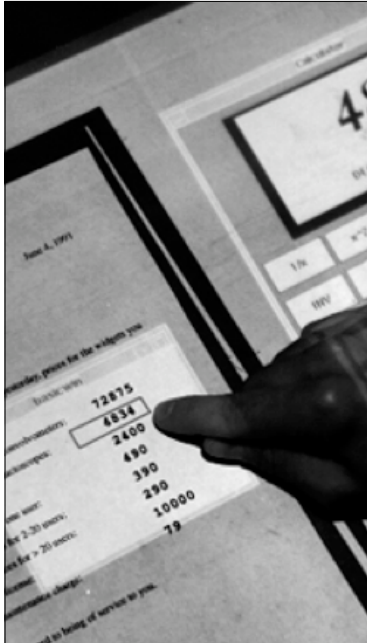
iPhoto

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# THE FUTURE IS ALREADY HERE IT'S JUST NOT VERY EVENLY DISTRIBUTED

William Gibson

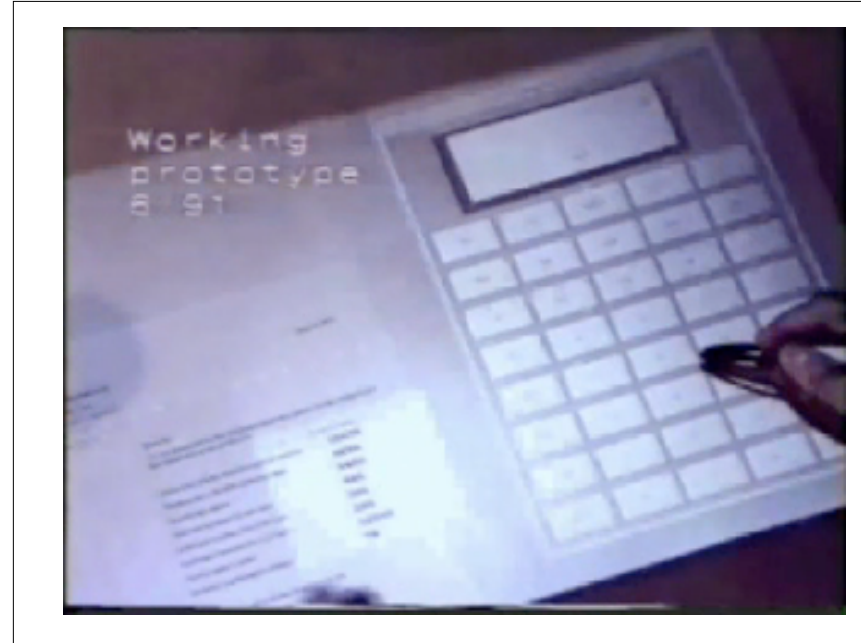
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DIGITAL DESK  
PIERRE WELLNER, 1991

## AUGMENTED ENVIRONMENTS

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Working  
prototype  
align

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SKINPUT  
CHRIS HARRISON, 2010

## INTERACTION ON YOUR OWN BODY

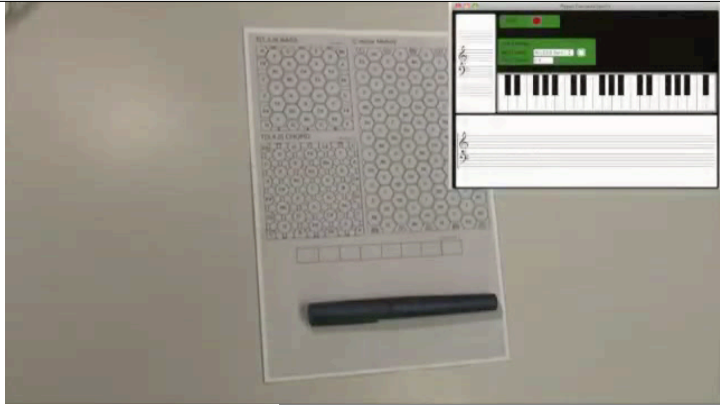
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XEROX E-PAPER, 1970'S  
ANOTO TECHNOLOGY, 2000  
LIVESCRIBE PULSE PEN, 2008

## INTERACTIVE PAPER

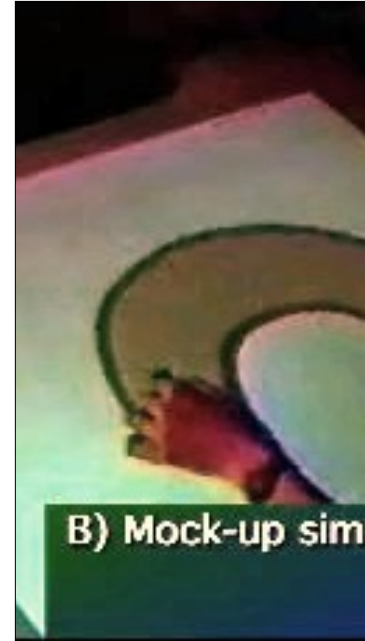
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# PAPER TONNETZ

IN-SITU & IRCAM, 2012

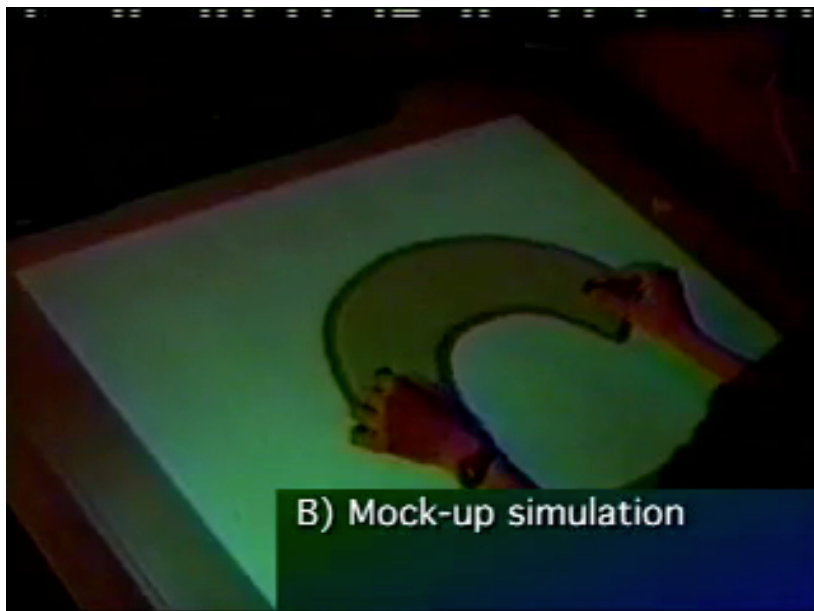
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GRASPABLE INTERFACES  
GEORGE FITZMAURICE, 1995

# TANGIBLE INTERACTION

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UNIV POMPEU FABRA, 2005

# REACTABLE

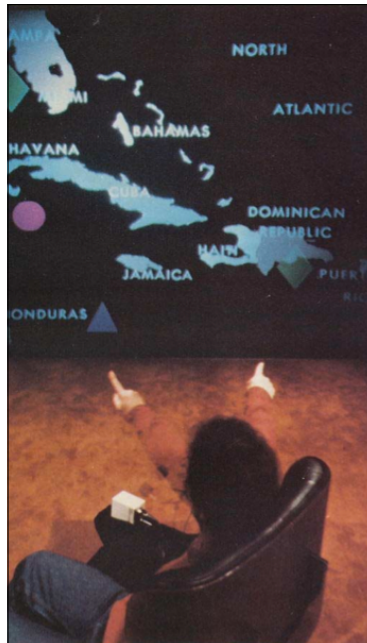
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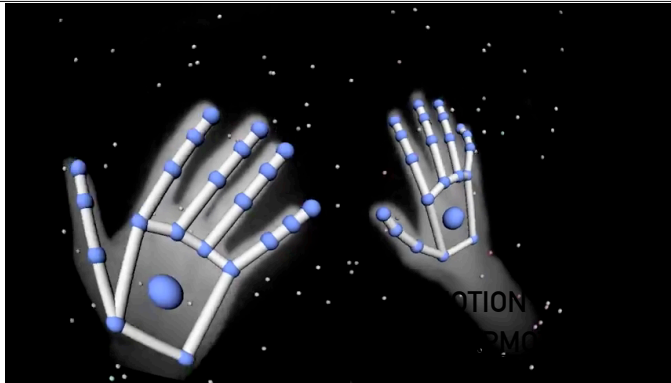
PUT-THAT-THERE  
RICHARD BOLT, 1980

**MULTIMODAL  
INTERACTION**

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## SENSING HAND POSITIONS

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## SENSING MUSCLES

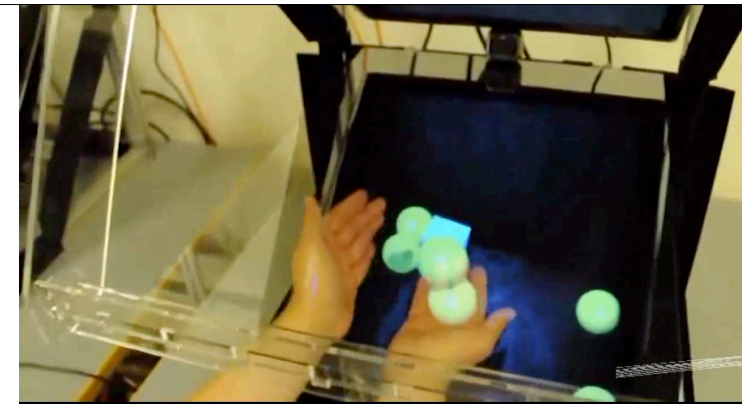
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WILD  
IN-SITU, 2012

## INTERACTION WITH WALL DISPLAYS

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## INTERACTION 3D HOLODESK HILLIGES ET AL., 2012

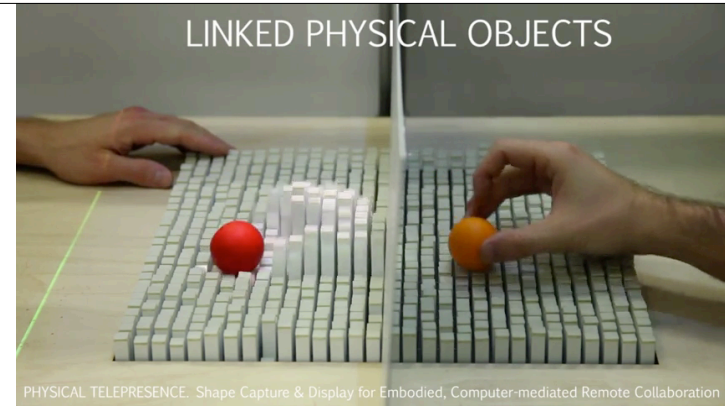
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ROOMALIVE  
MICROSOFT RESEARCH, 2014

## AUGMENTING THE ENVIRONMENT

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INFORM  
MIT MEDIA LAB, 2014

## A 3D "SCREEN"

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