



Gilles Bailly

C'est quoi un

Chercheur en
Interaction Homme-Machine?

Crédits

- Nicolas Roussel

Pourquoi s'intéresser

à l'interaction homme-machine?



Cool KINECT **SPORTS**



MICRO MULTIDIRECTIONNEL :

capable de capter les voix des joueurs,
et d'isoler les bruits ambiants

CAPTEUR DE PROFONDEUR :

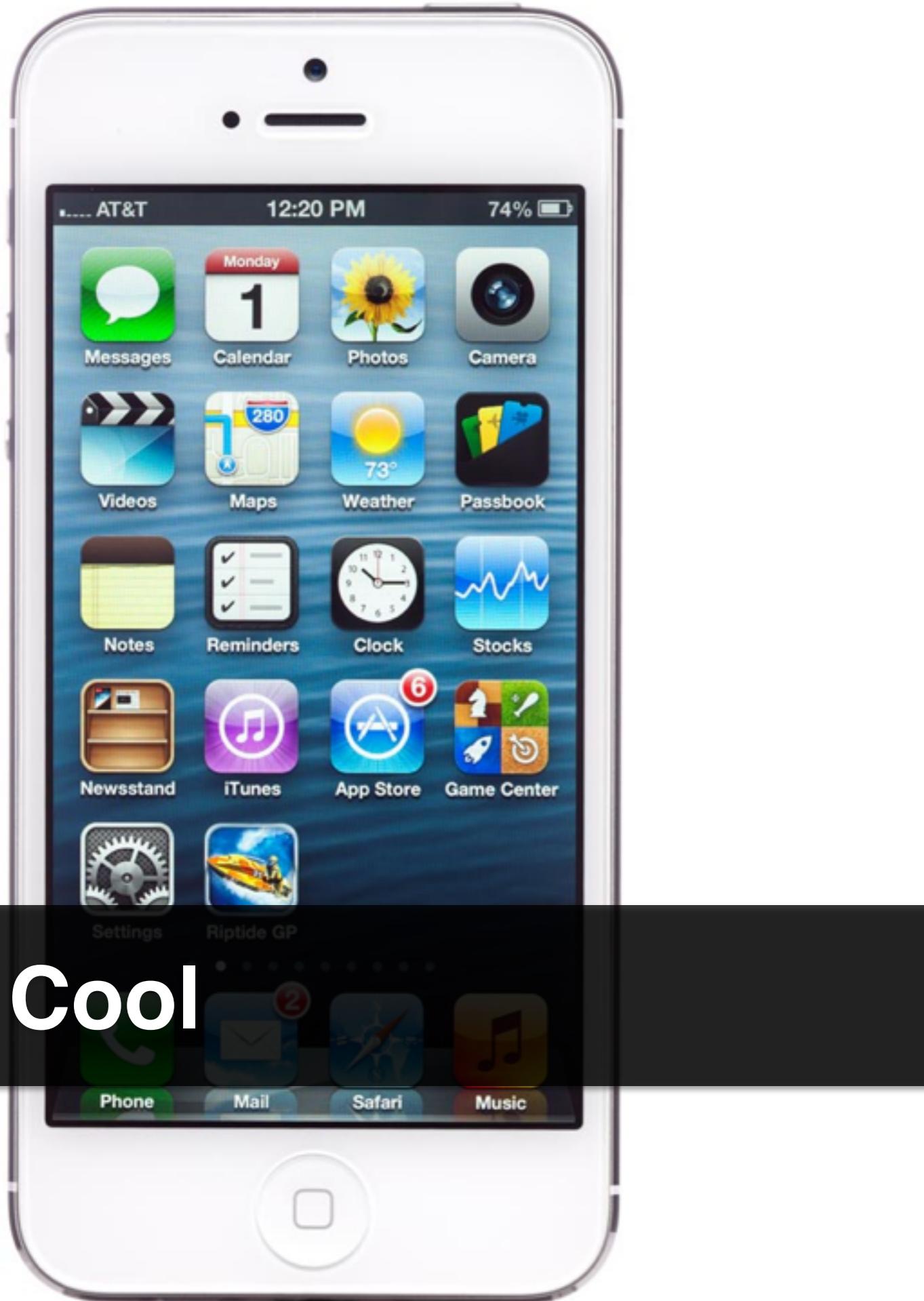
un projecteur infrarouge et un capteur
CMOS, pour visualiser la pièce en 3D

LOGICIEL MICROSOFT :

qui coordonne les différents éléments,
et rend possible la magie de Kinect !



Microsoft Kinect



Habit-forming mobile apps

Mari

Dashboard

Ad

29%

Comple

0

Judgments Per Hour

Trusted Judgments

Untrusted Judgments

Judgments Per Hour

Estimated Con

Frustrant

0.5

0

13:55 14:00 14:05 14:10 14:15 14:20 14:25 14:30 14:35 14:40 14:45 14:50 14:55 15:00 15:05

Contributor Funnel

Test Questions

Contrib

Confirm



Are you sure you want to cancel job 396628? Your account will be refunded for the amount not yet completed.

[Cancel](#)[Cancel](#)

Habit-forming mobile apps

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Contributor Funnel

Test Questions

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Confirm

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Cancel

gta3.exe - Erreur d'application



L'instruction à "0x036d2131" emploie l'adresse mémoire
"0x036d2131", La mémoire ne peut pas être "read".

Cliquez sur OK pour terminer le programme.

Cliquez sur Annuler pour déboguer le programme

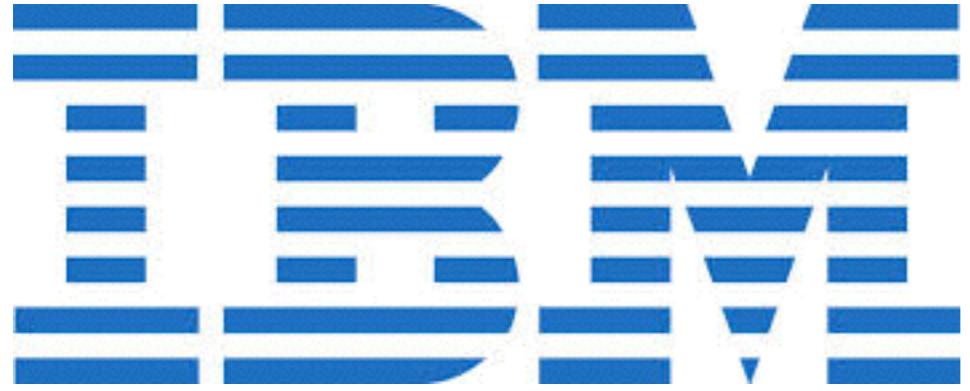
OK

Annuler

Frustrant

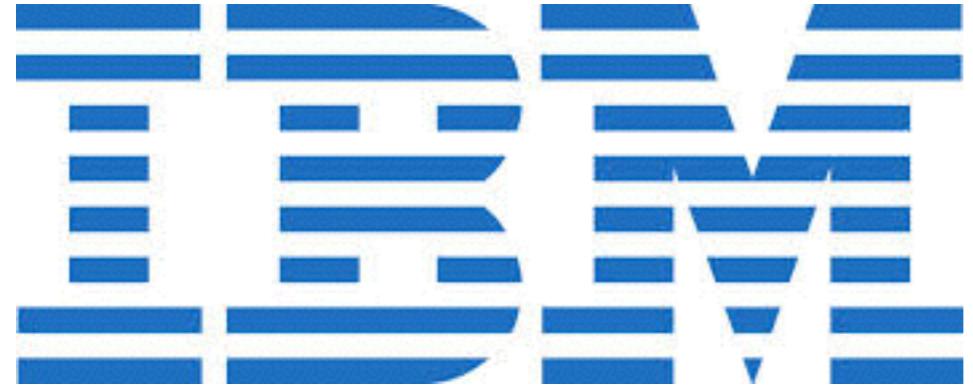


Frustrant



Avant (1999)

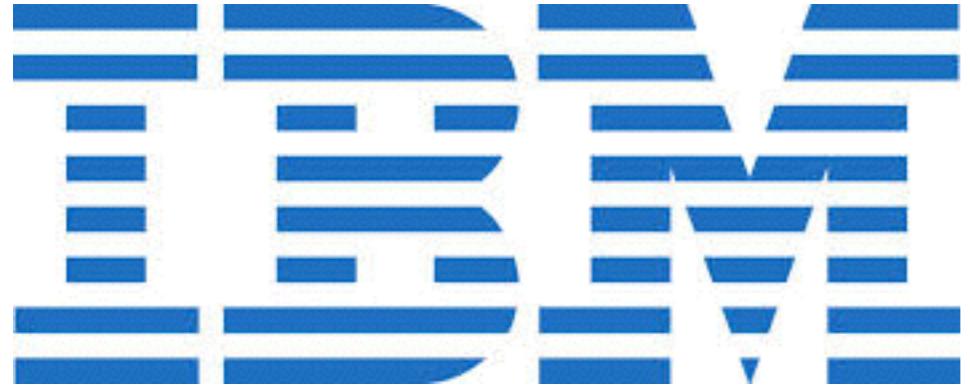
La fonctionnalité **la plus utilisée** était ...



Avant (1999)

La fonctionnalité **la plus utilisée** était ... **Recherche**.

“Les utilisateurs n’arrivaient pas à naviguer sur le site.”



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La seconde fonctionnalité **la plus utilisée** était ...

Le bouton ‘HELP’.

“car le moteur de recherche était inefficace.”



Avant (1999)

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La seconde fonctionnalité **la plus utilisée** était ...

Le bouton ‘HELP’.

“car le moteur de recherche était inefficace.”

Après

L’utilisation du bouton ‘Help’ a **baissé de 40%**

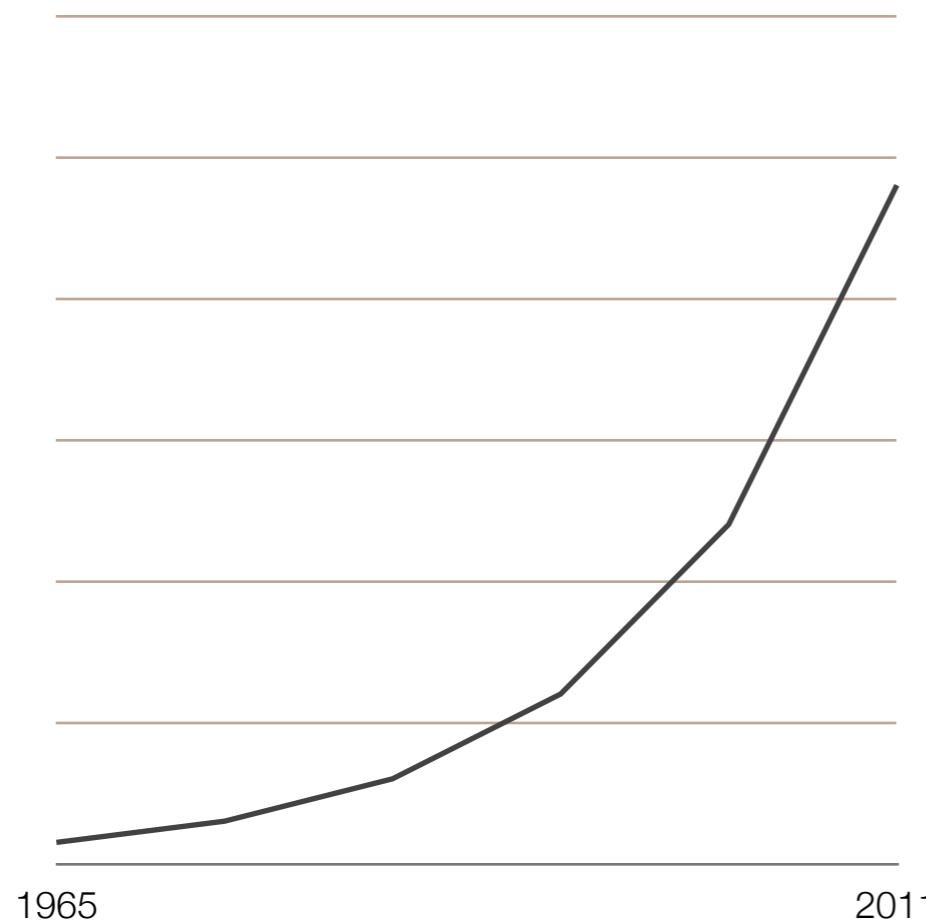
Les ventes ont **augmenté de 400%**



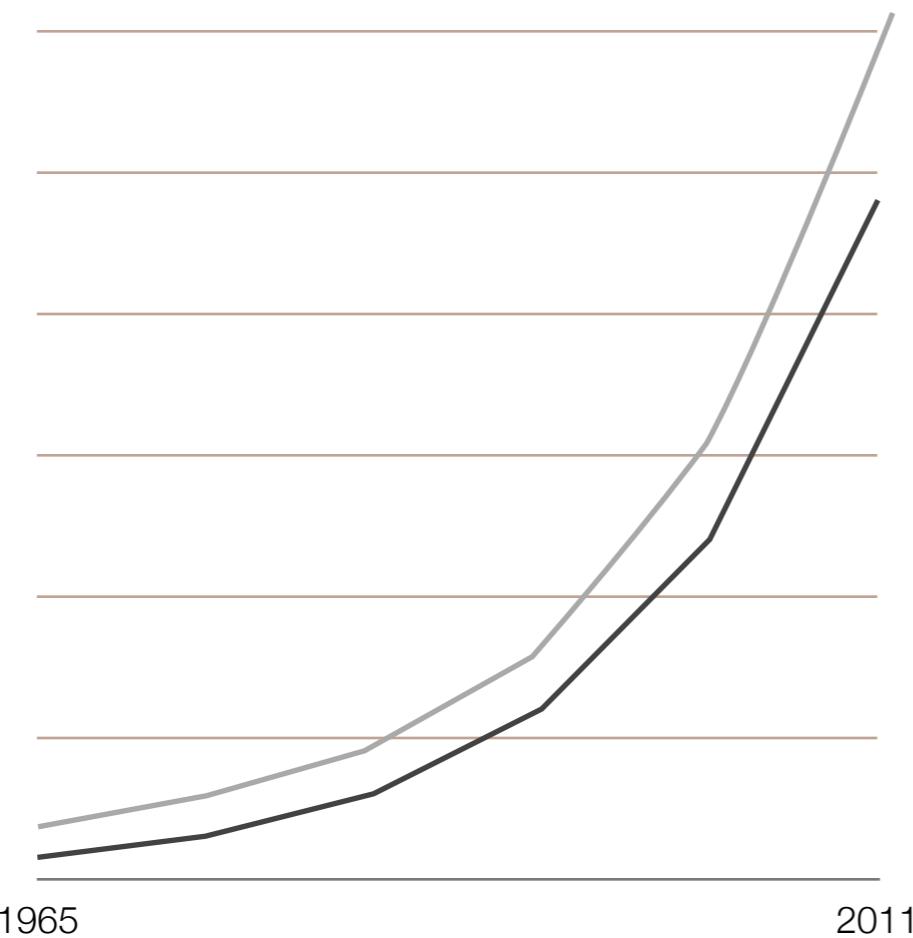
Partout



Important



Loi de Moore : les possibilités techniques augmentent régulièrement au cours du temps

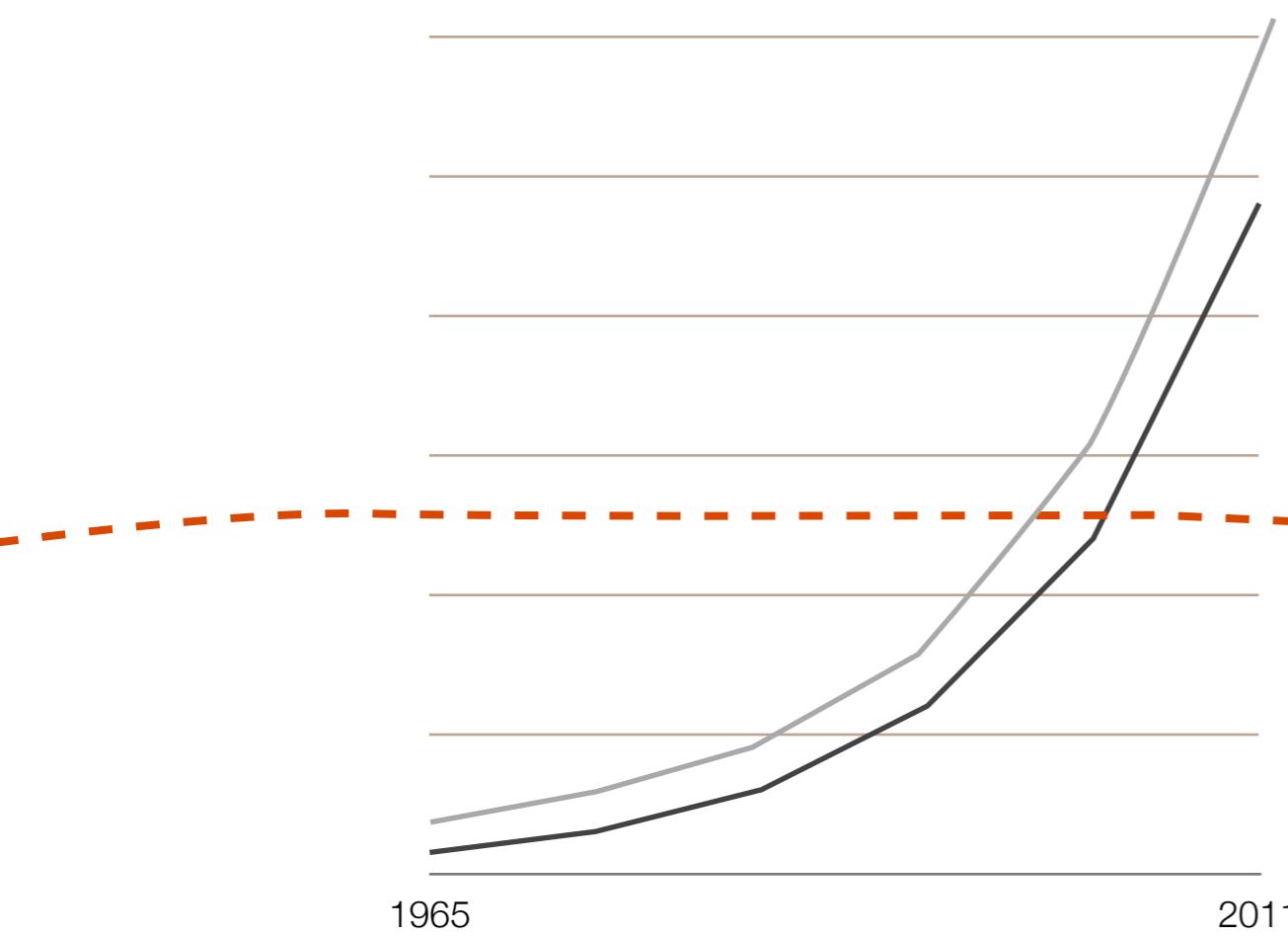


Loi de Buxton : les fonctionnalités promises suivent la loi de Moore

<http://billbuxton.com/LessIsMore.html>



Loi de Moore : les possibilités techniques augmentent régulièrement au cours du temps



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Loi de Moore : les possibilités techniques augmentent régulièrement au cours du temps

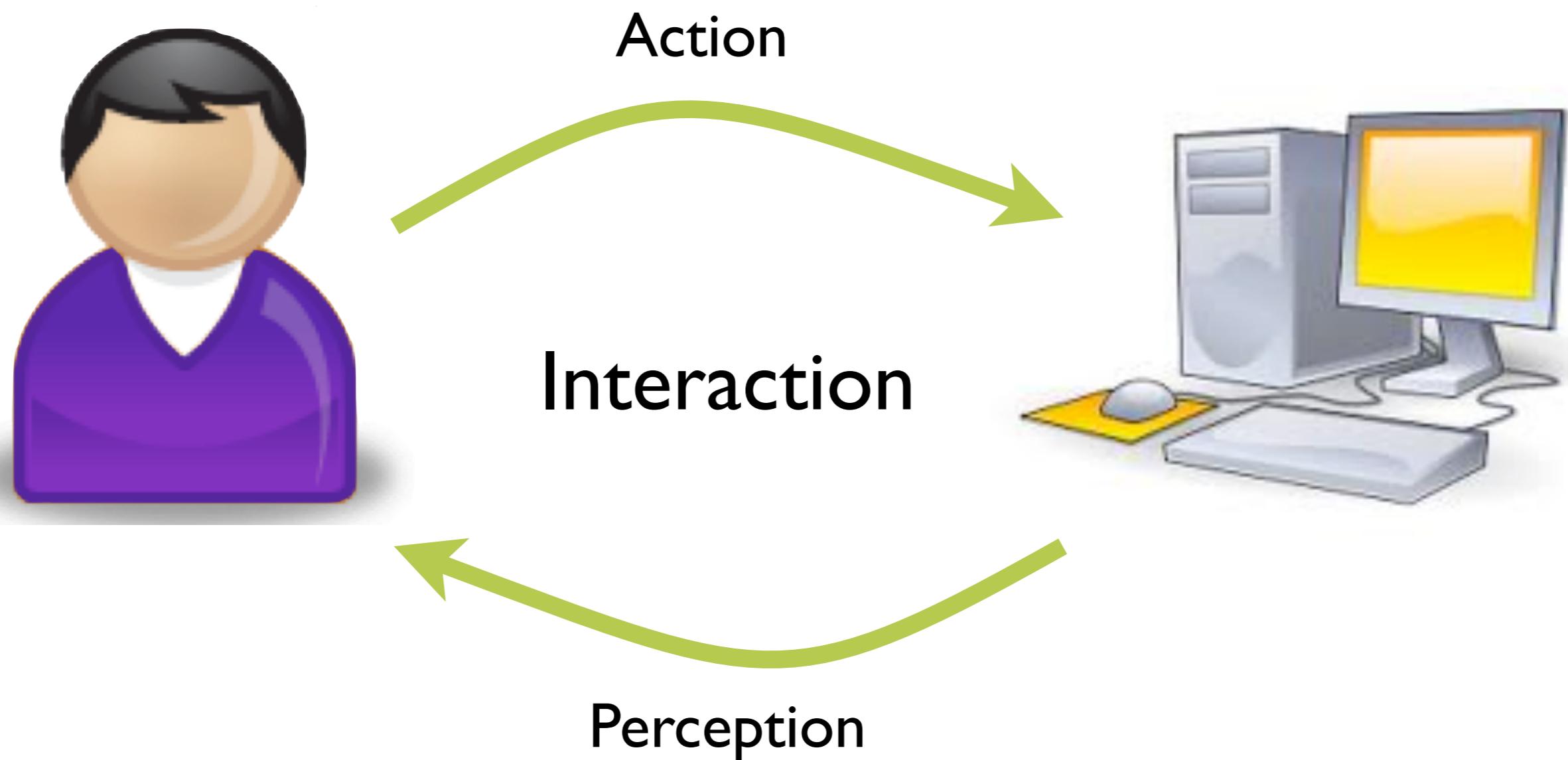
Les capacités humaines stagnent et les contextes d'usages se diversifient



Ok, l'**IHM** c'est **important**

mais c'est quoi?

L'IHM : **Science** de l'**interaction** entre un utilisateur et un système interactif

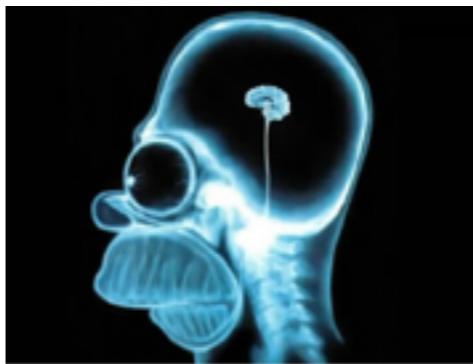


Objectifs généraux

► **comprendre** :



Décrire



Expliquer



Prédire

► **innover** :



Nouvelles
formes d'interaction

► **guider** :



Outils

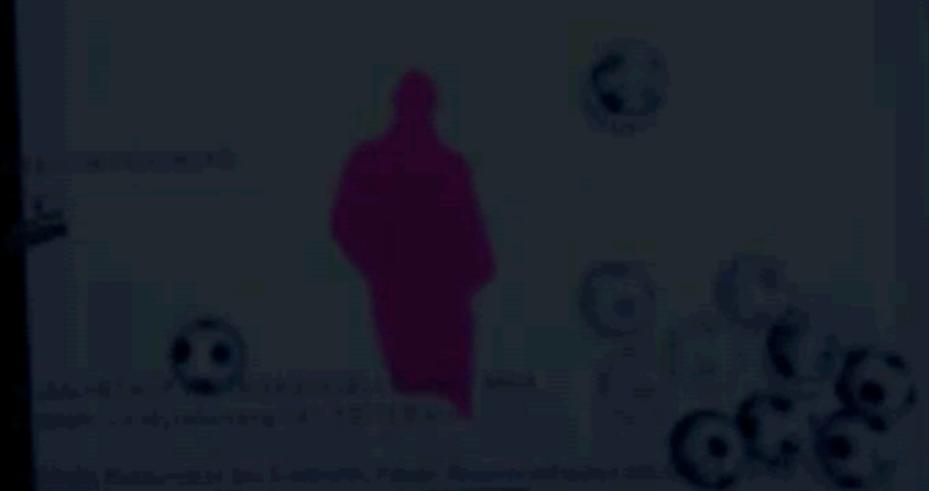
Looking Glass

Noticing Interactivity of a Shop Window

Jörg Müller Robert Walter Gilles Bailly Michael Nischt
Quality and Usability Lab, Telekom Innovation Laboratories, TU Berlin

Florian Alt

University of Stuttgart, Germany



Comprendre le phénomène

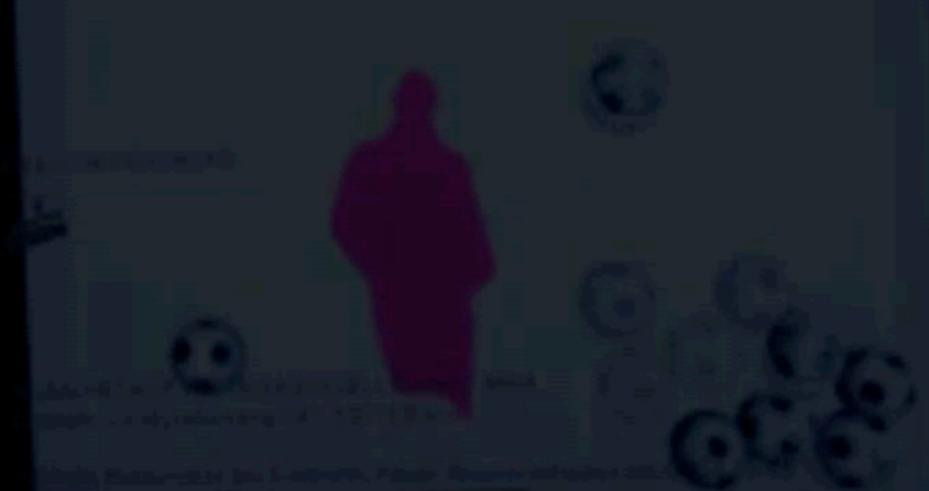
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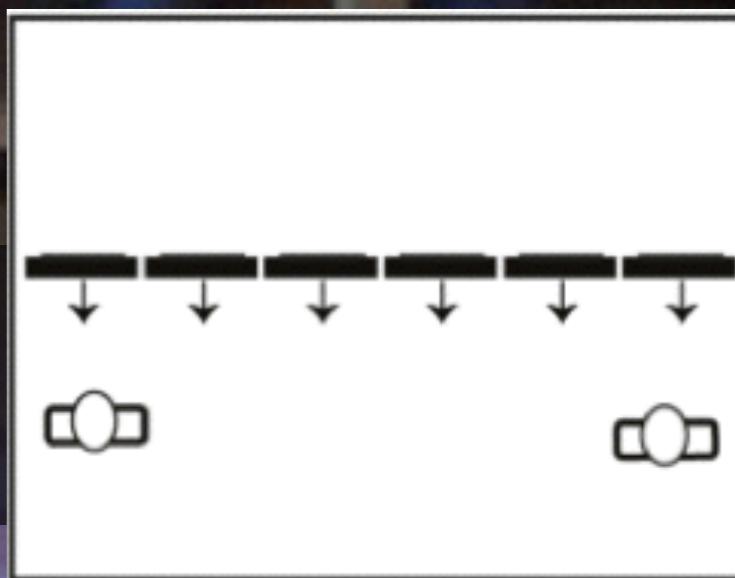
Comprendre le phénomène

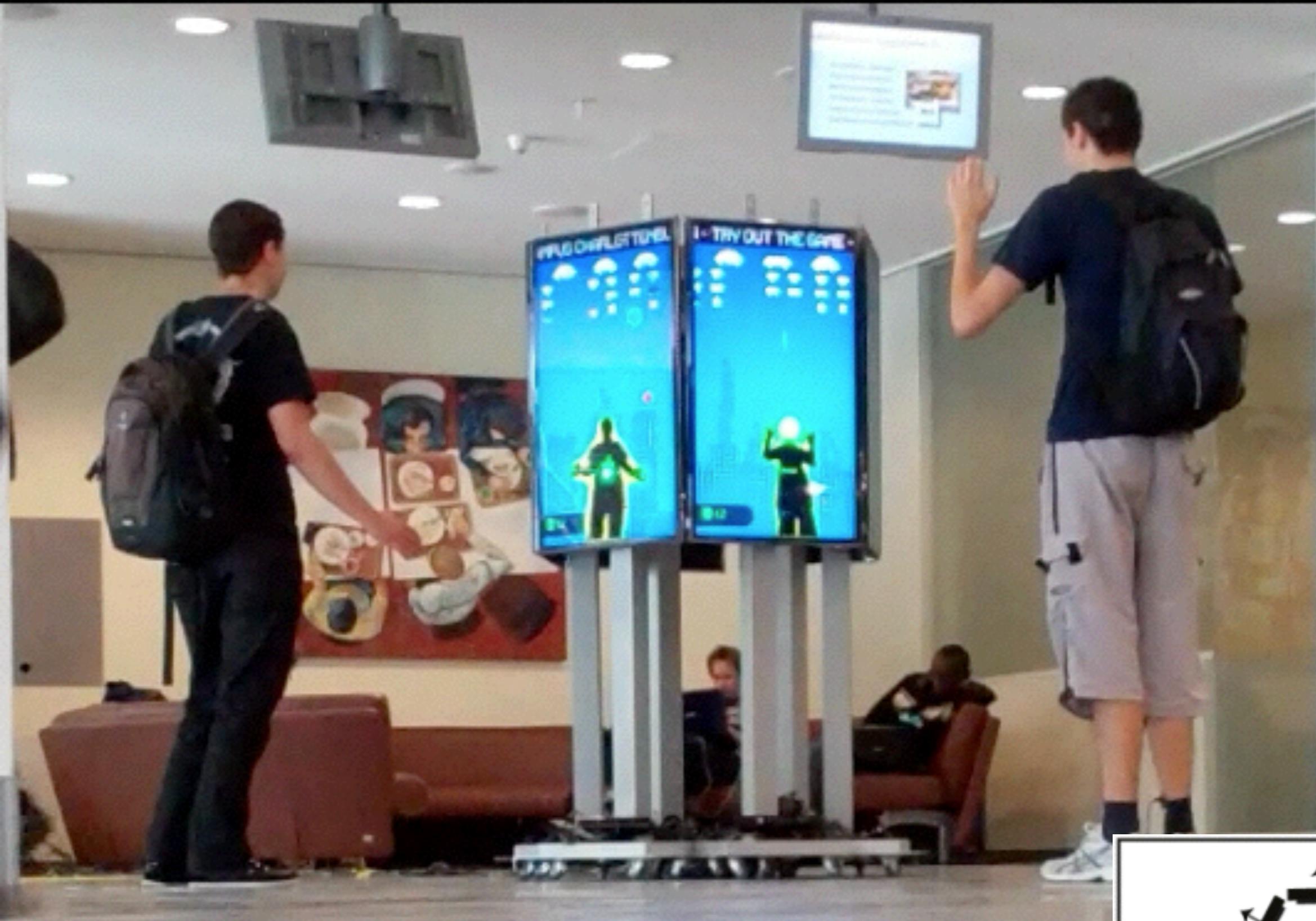
Concave



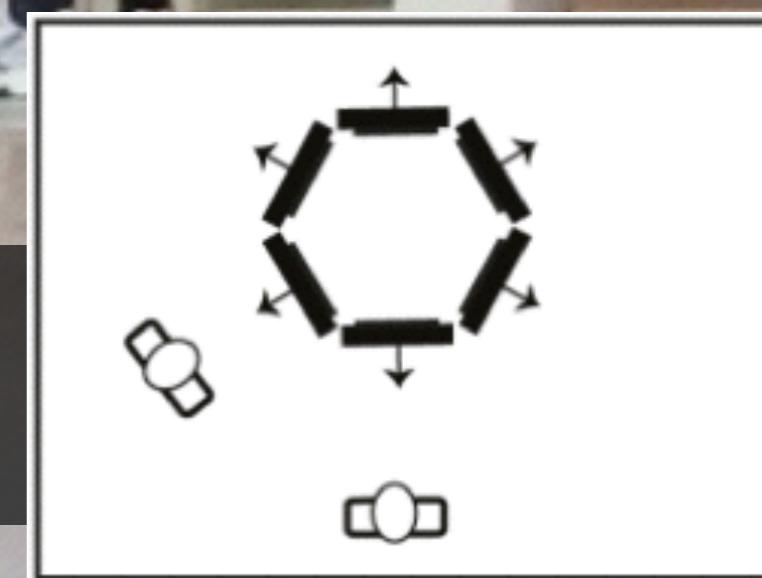


Flat



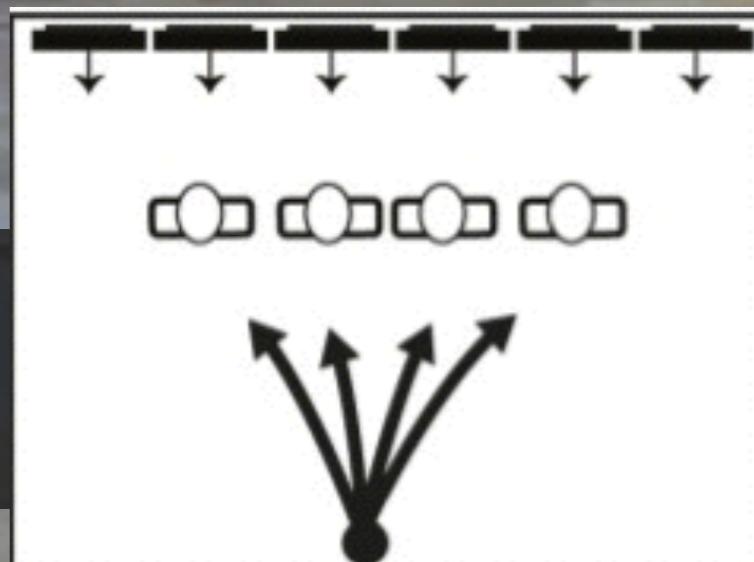


Convex (Hexagonal)



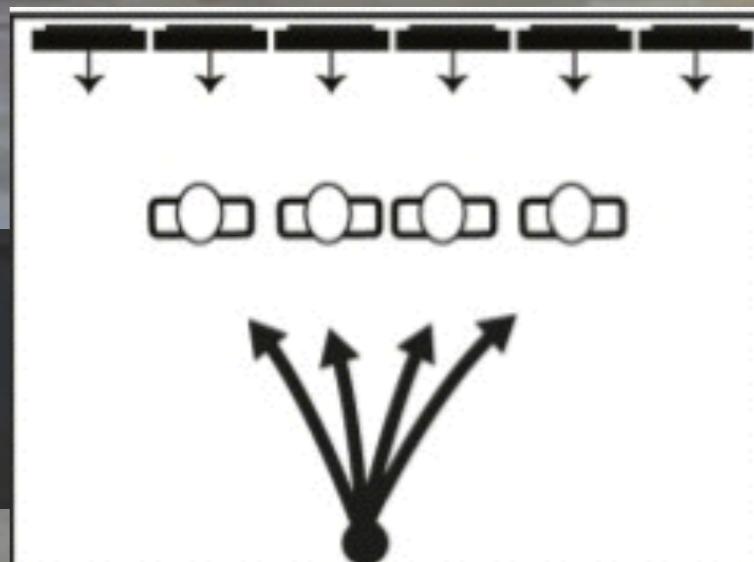


Group Approaching

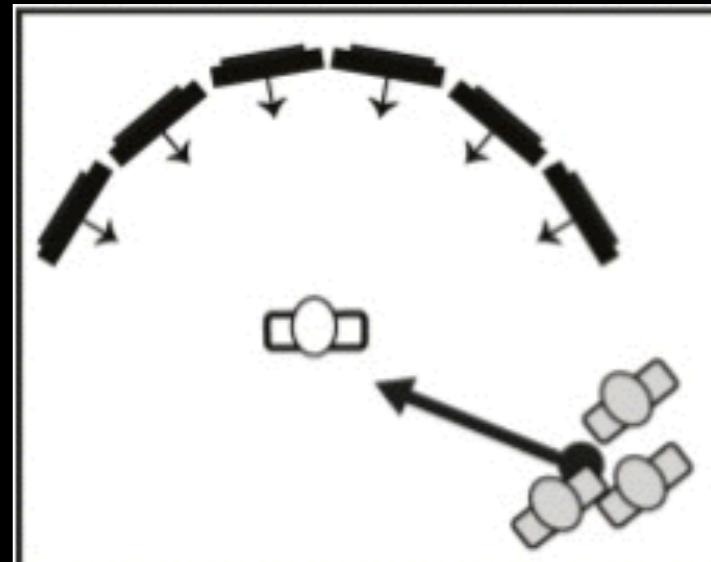




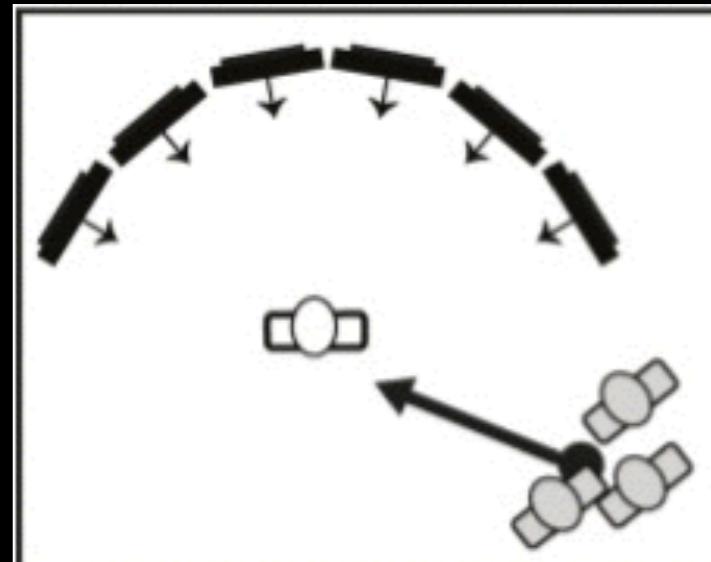
Group Approaching



Group Approaching

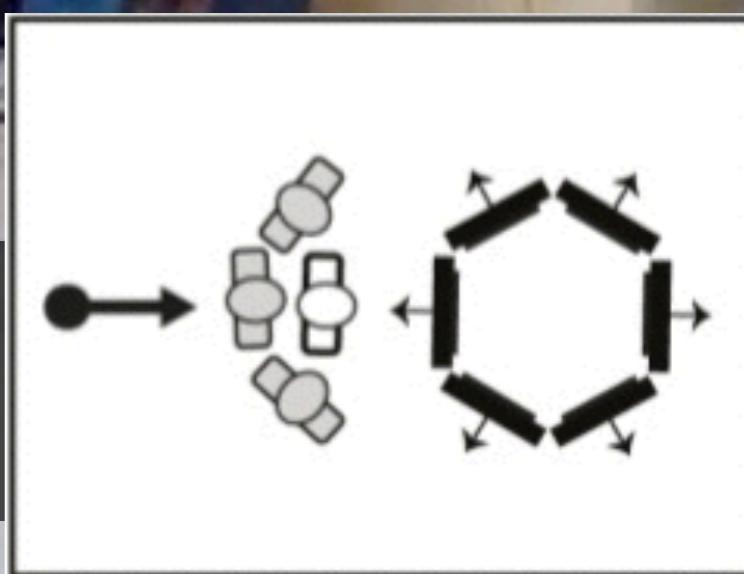


Group Approaching



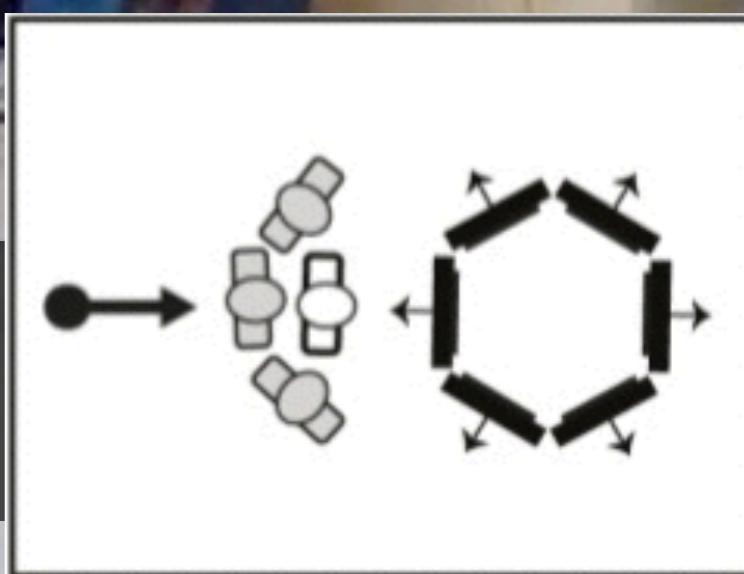


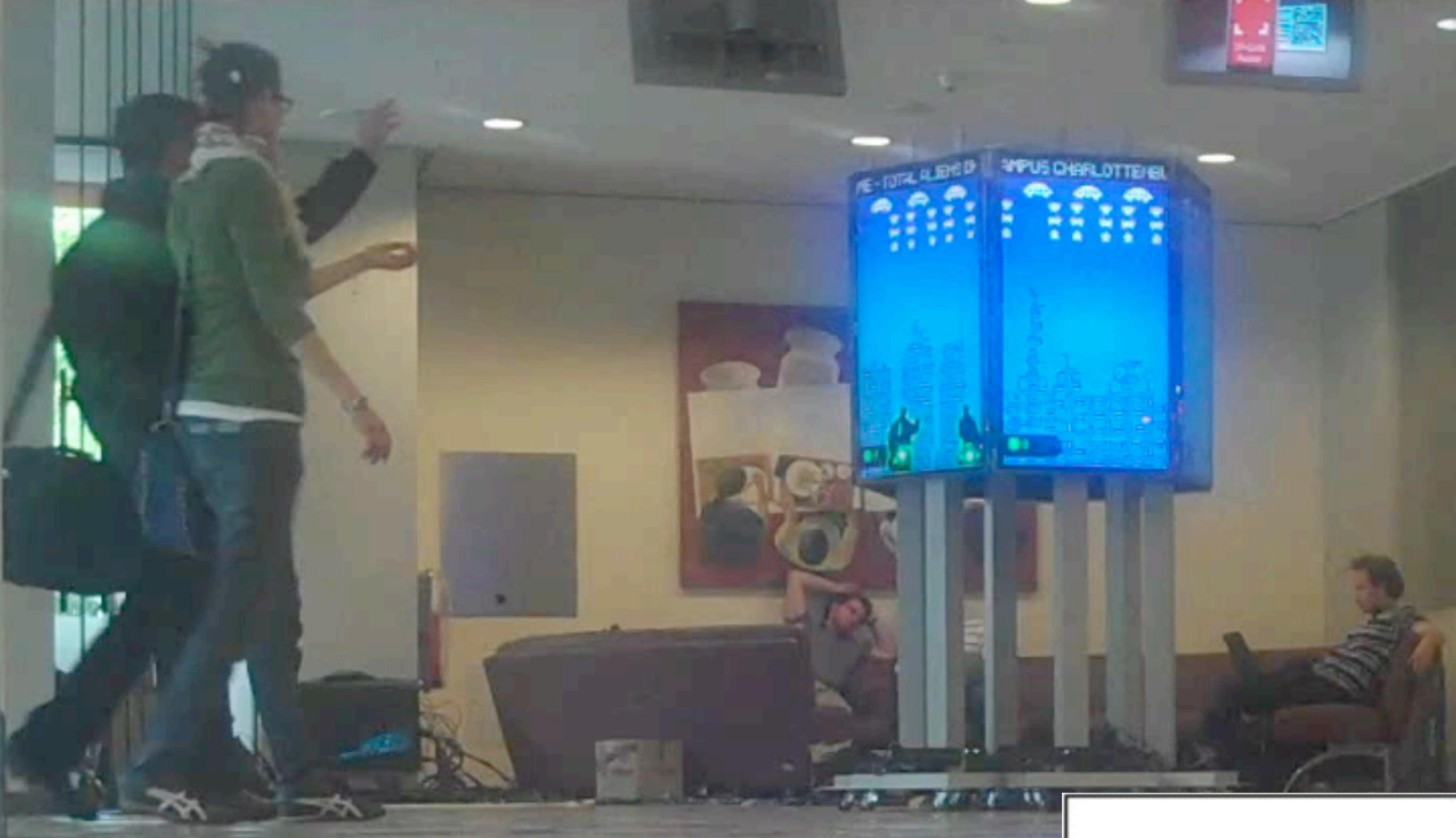
Group Approaching



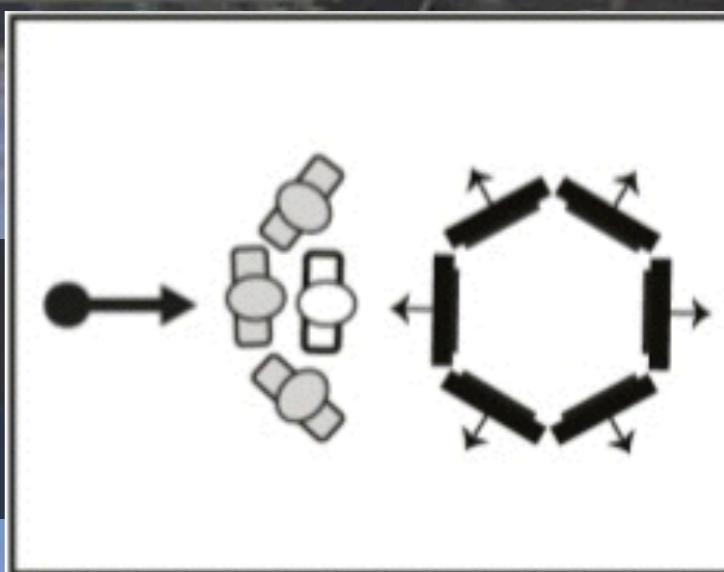


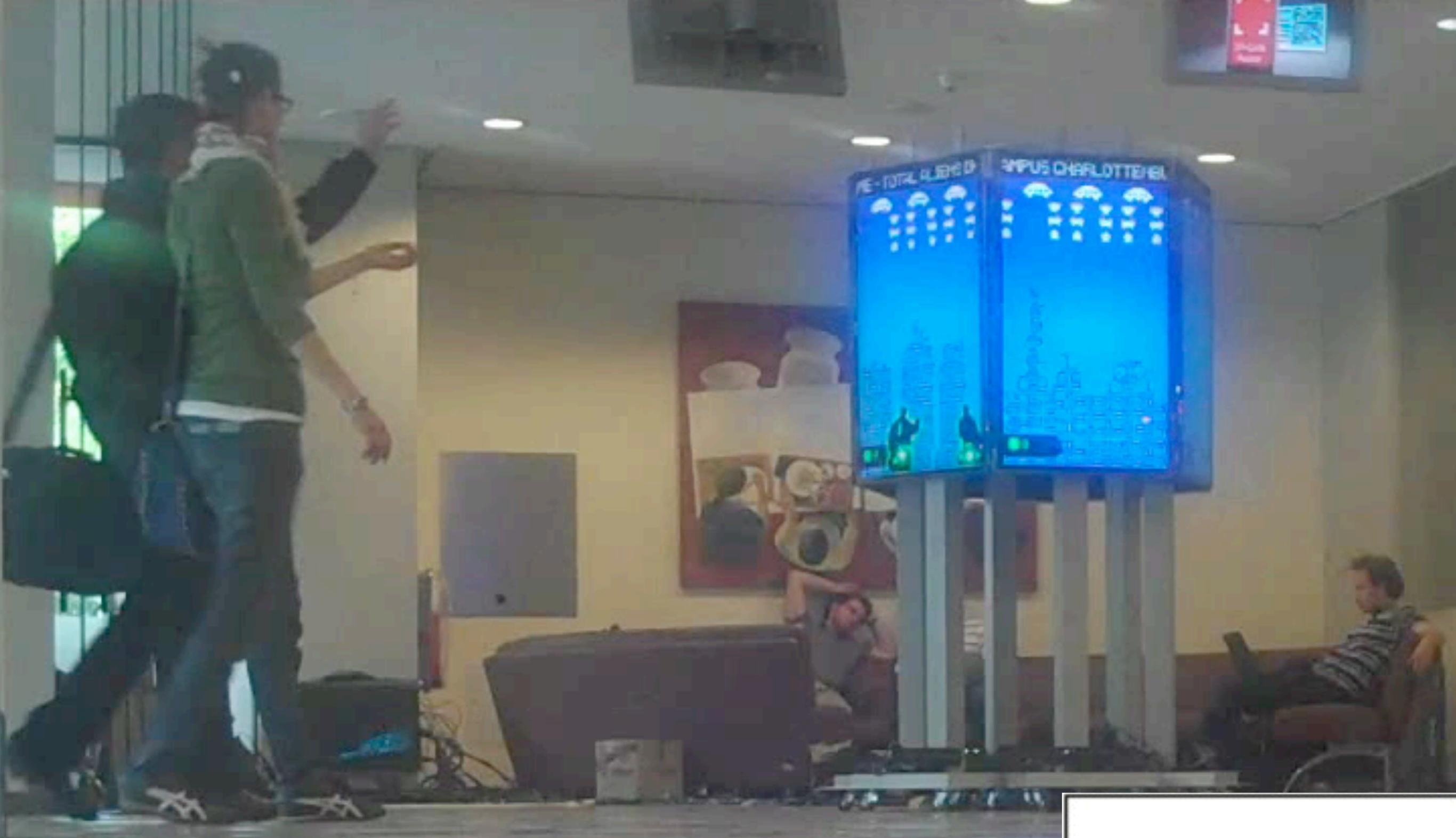
Group Approaching



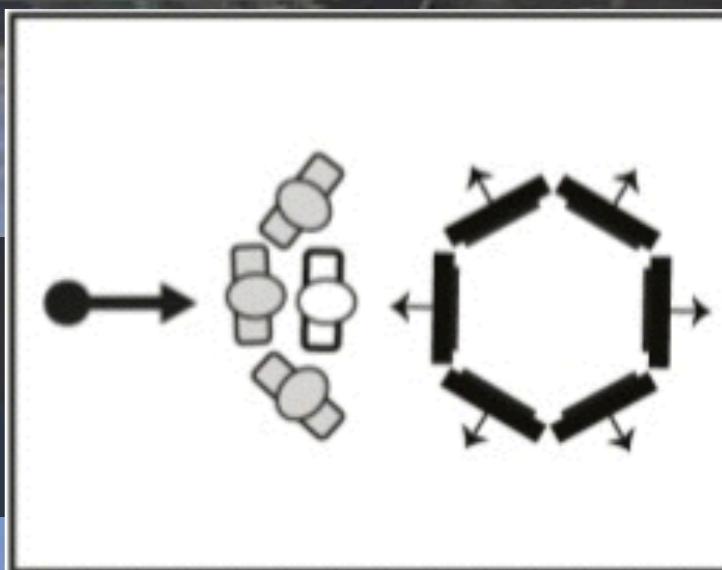


Group Approaching





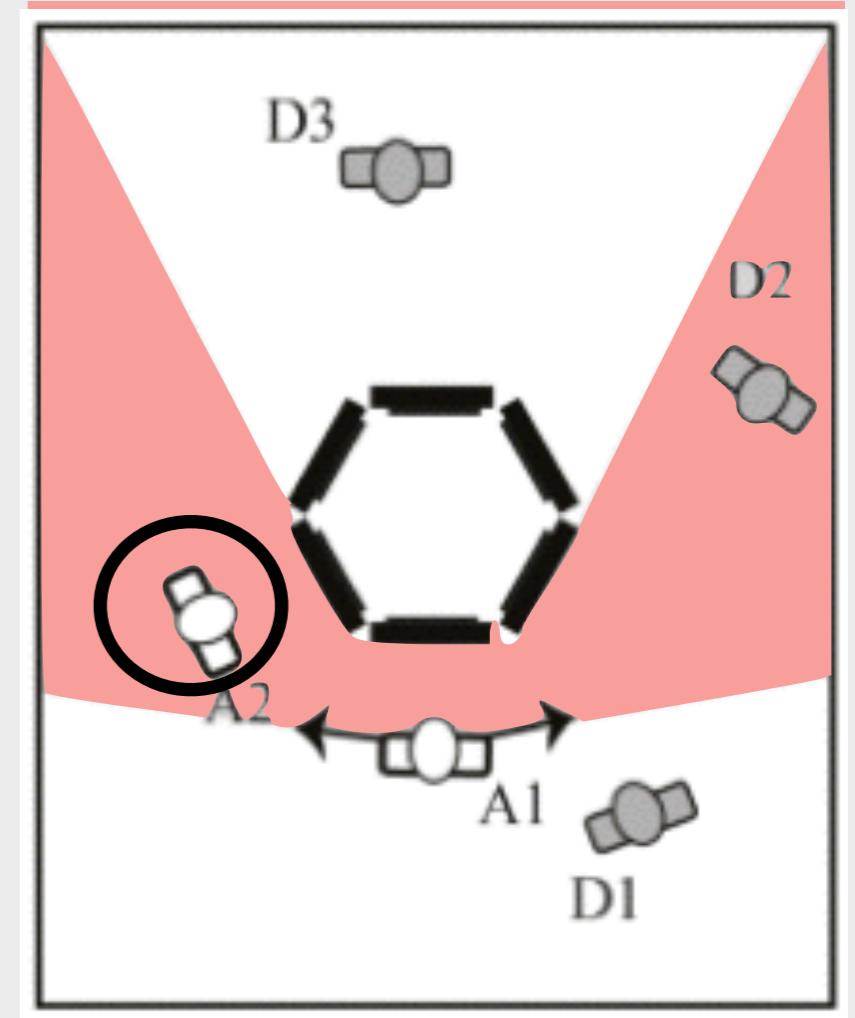
Group Approaching



Actor



Focus

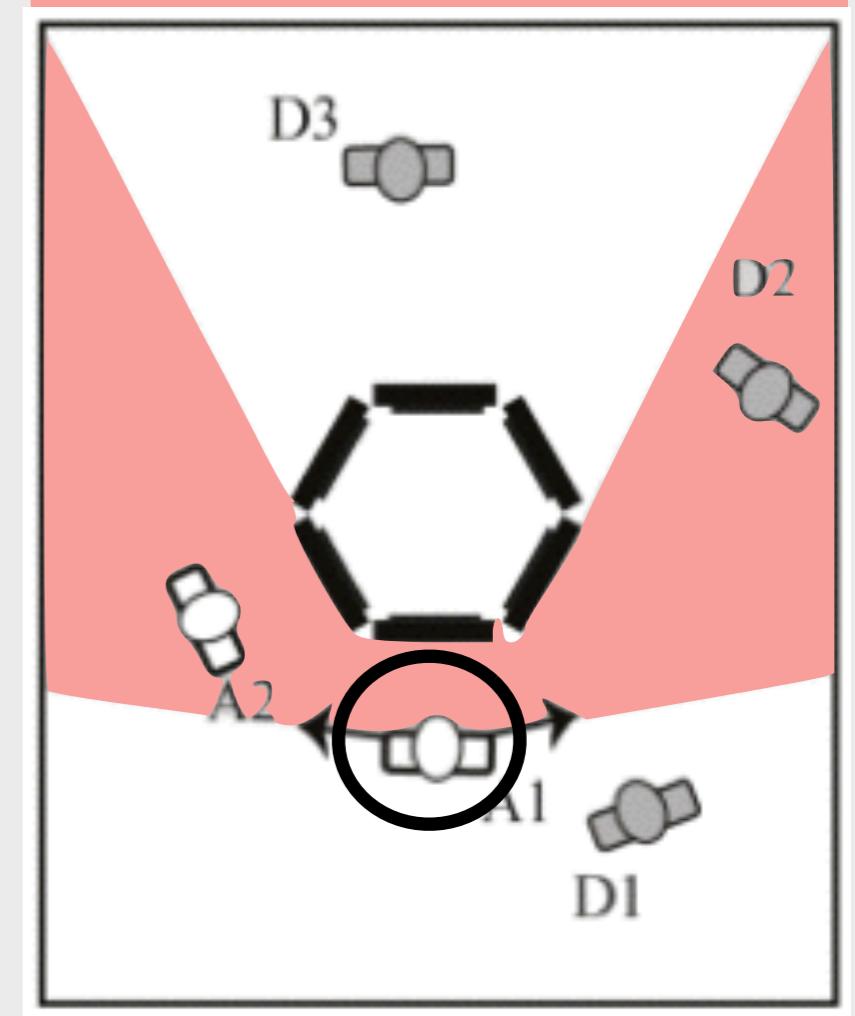


What can I observe?

Actor



Focus

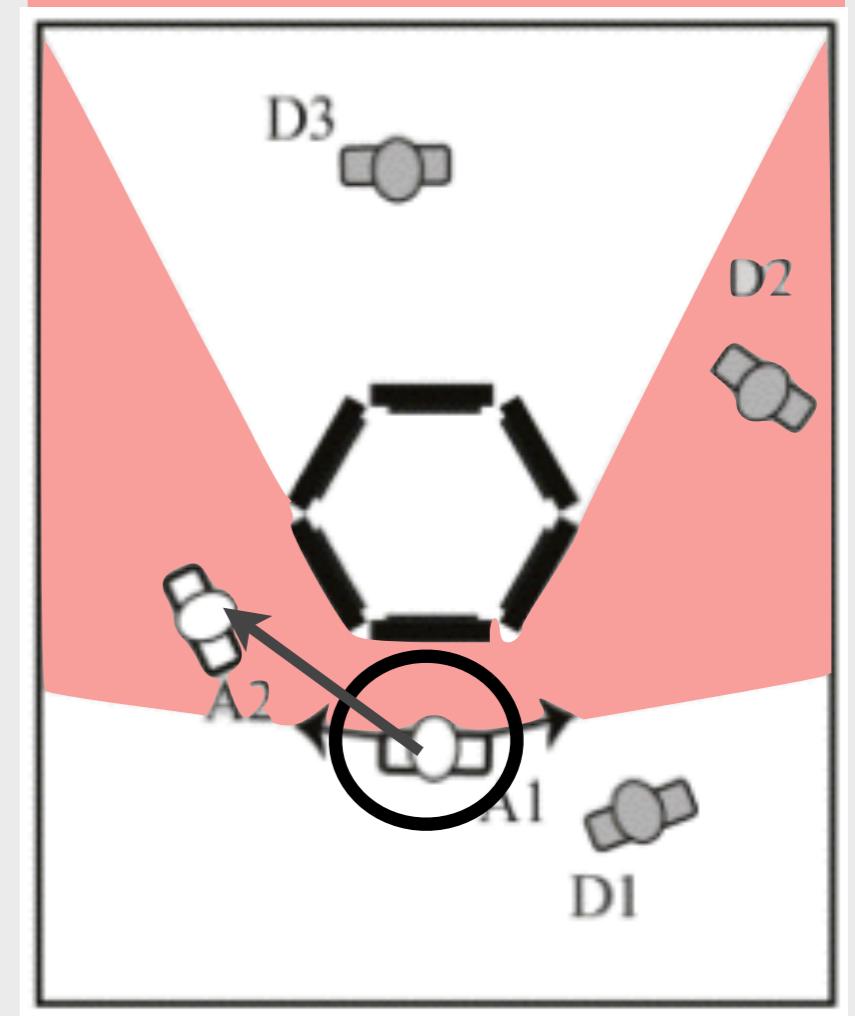


What can I observe?

Actor



Focus

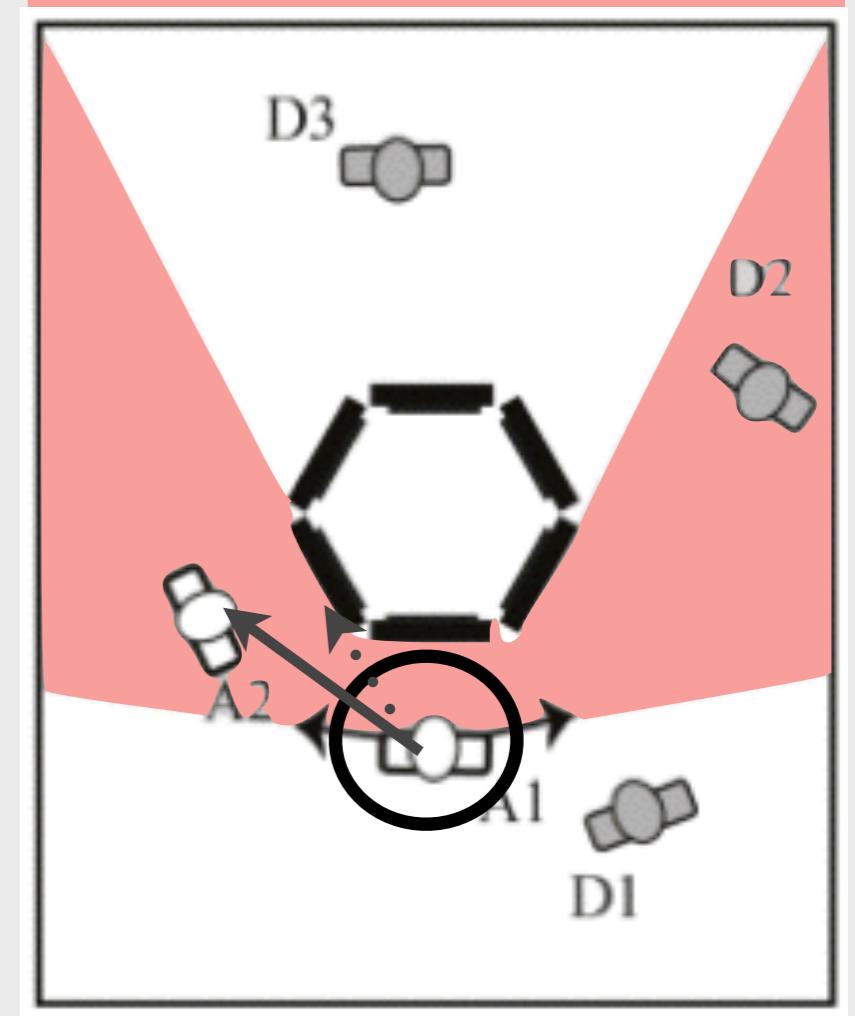


What can I observe?

Actor



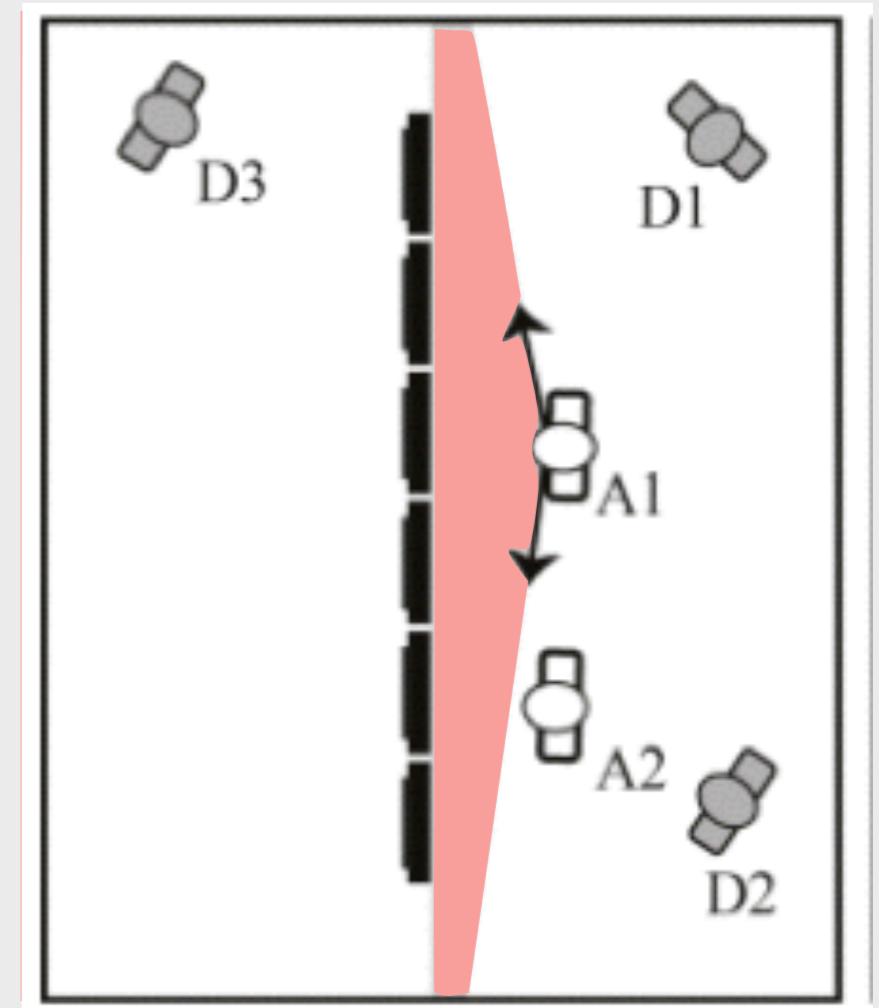
Focus



What can I observe?

Actor

Focus



What can I observe?

Social Embarrassment

infomax

DE

THE GAME - T



HOME: 156 - CAMPUS D



infomax

DE

THE GAME - T



HOME: 156 - CAMPUS D







Performance



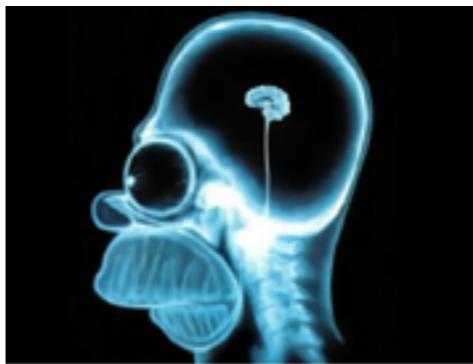


Objectifs généraux

► **comprendre** :



Décrire



Expliquer



Prédire

► **innover** :

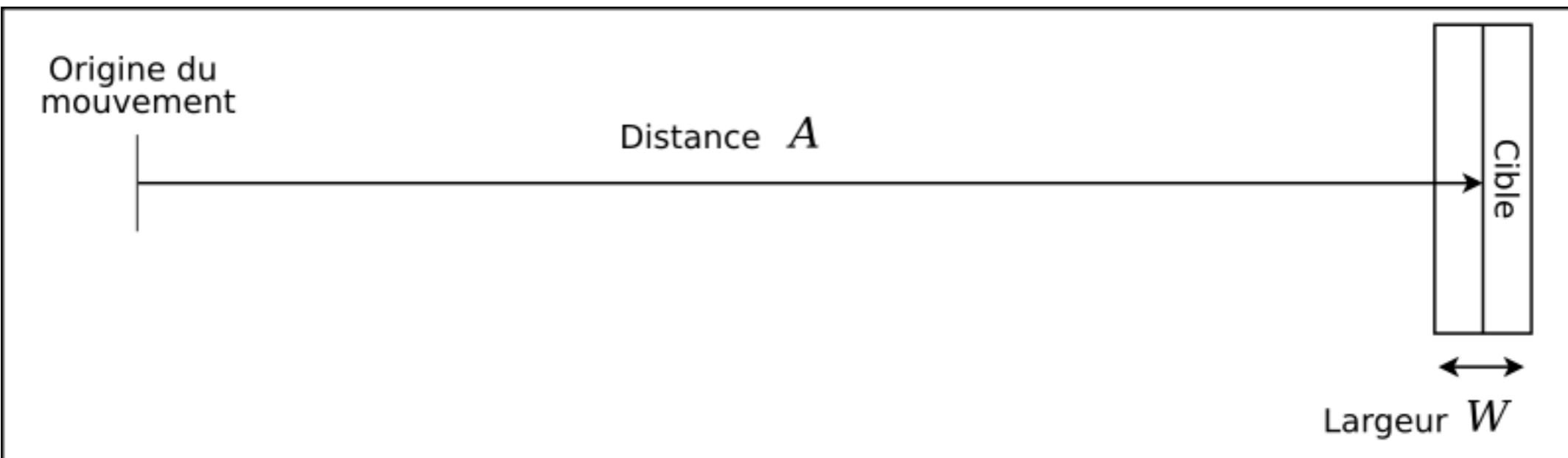


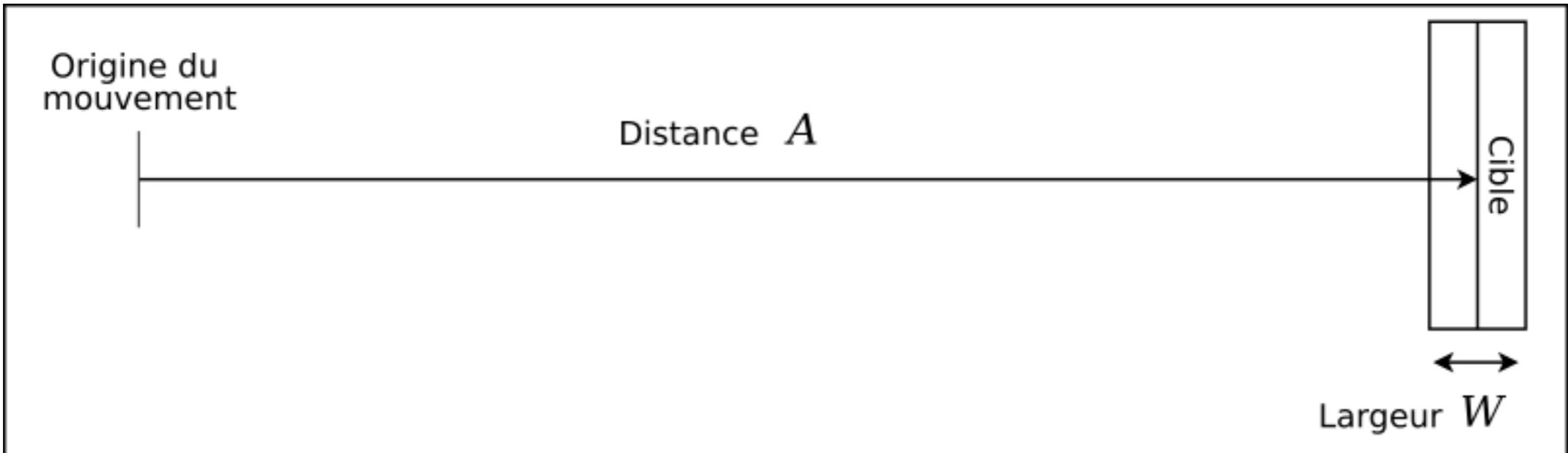
Nouvelles
formes d'interaction

► **guider** :



Outils

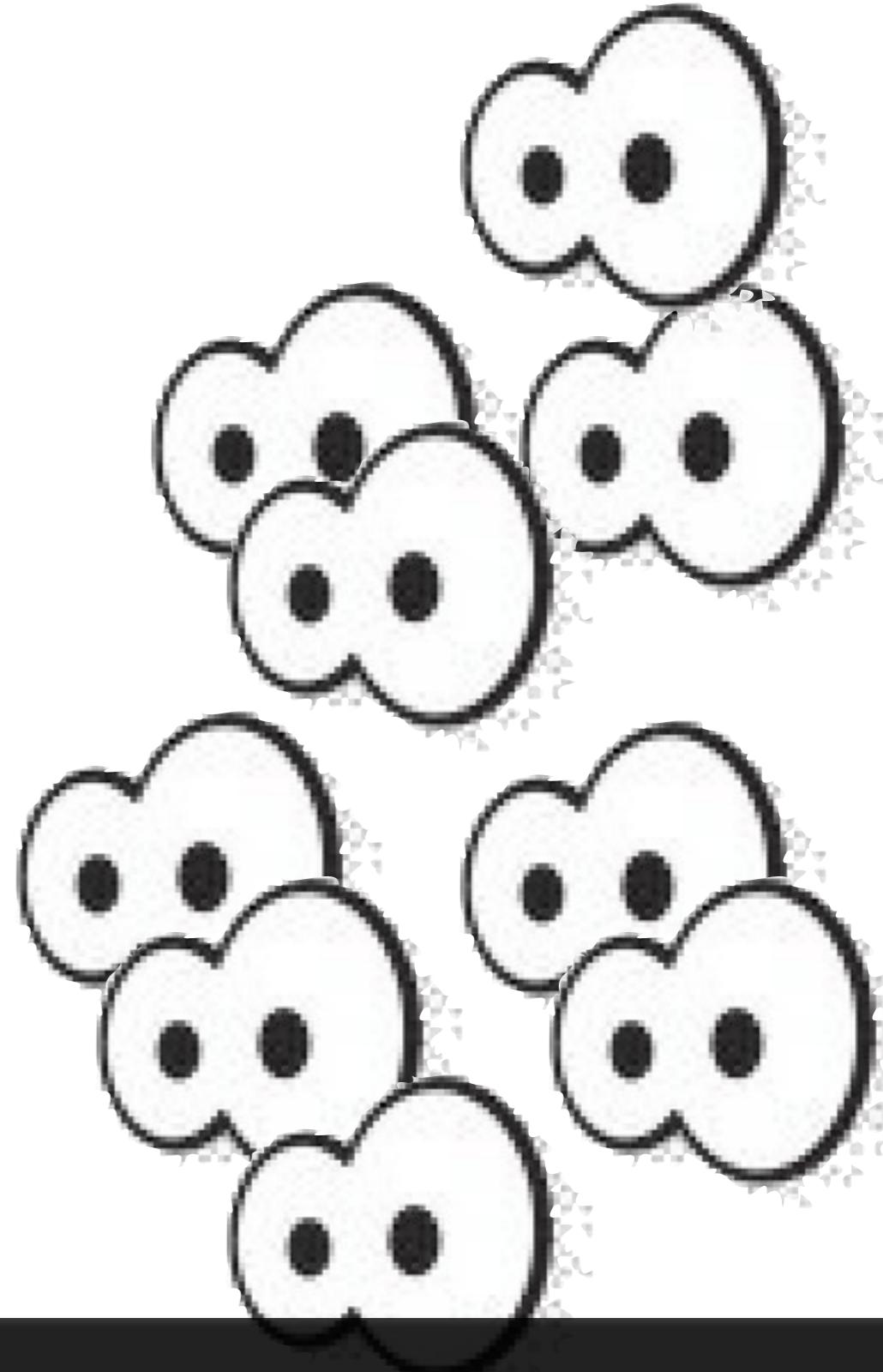




$$T = a + b \log_2 \left(2 \frac{D}{W} \right)$$

Annotations for the equation:

- "Constantes empiriques" (Empirical constants) points to the coefficients a and b .
- "Temps pour accomplir l'action" (Time to perform the action) points to the term a .
- "Distance de l'objet" (Object distance) points to the term D .
- "Taille de l'objet" (Object size) points to the term W .



Comprendre le phénomène

Objectifs généraux

► **comprendre** :



Décrire

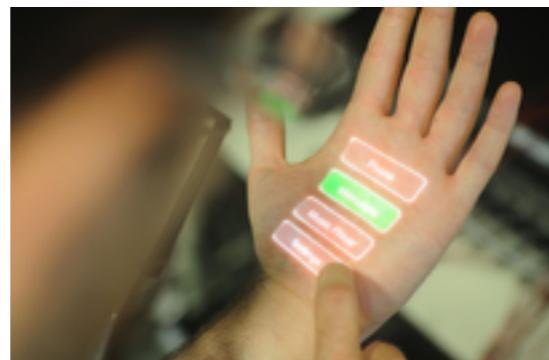


Expliquer



Prédire

► **innover** :



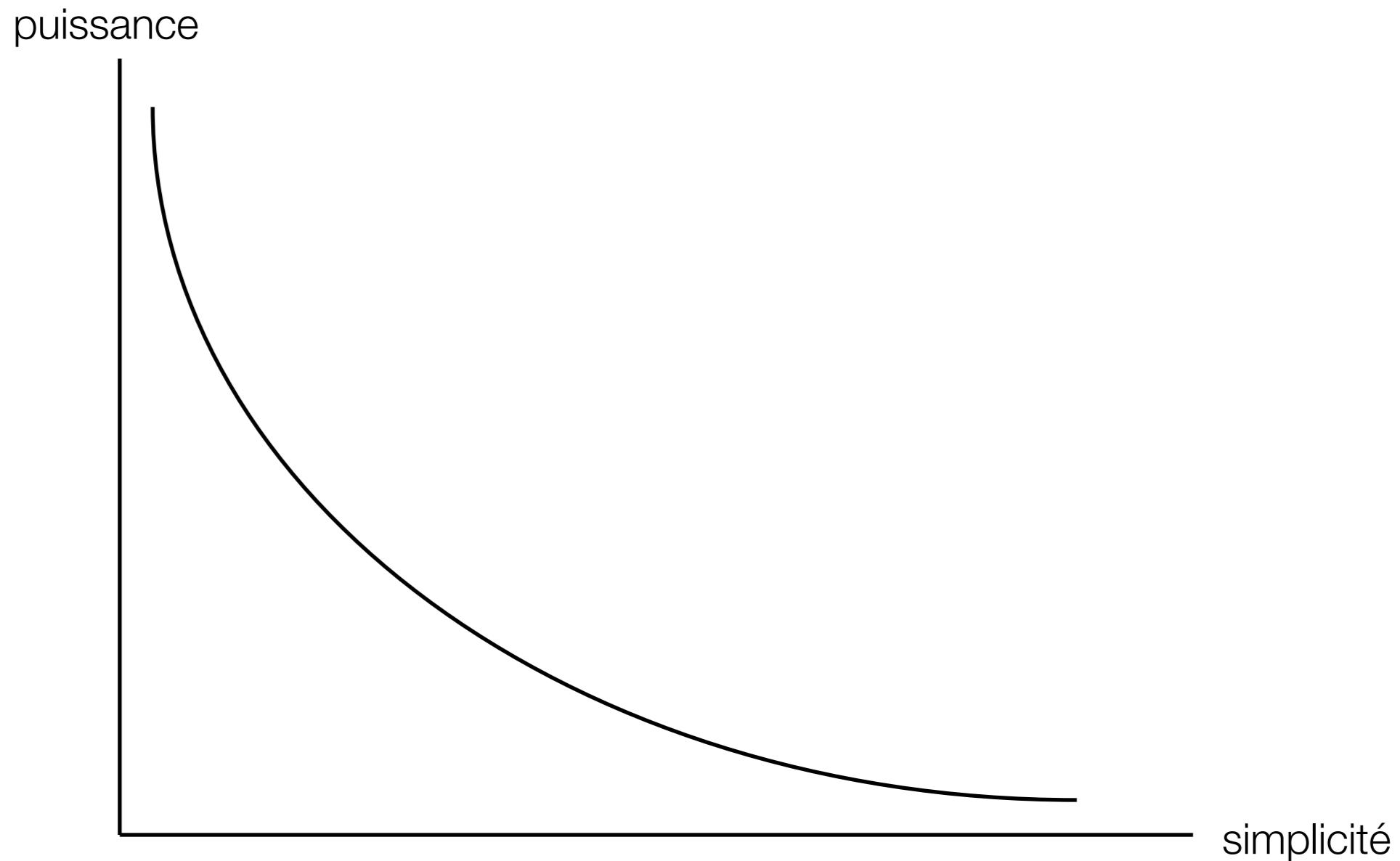
Nouvelles
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► **guider** :

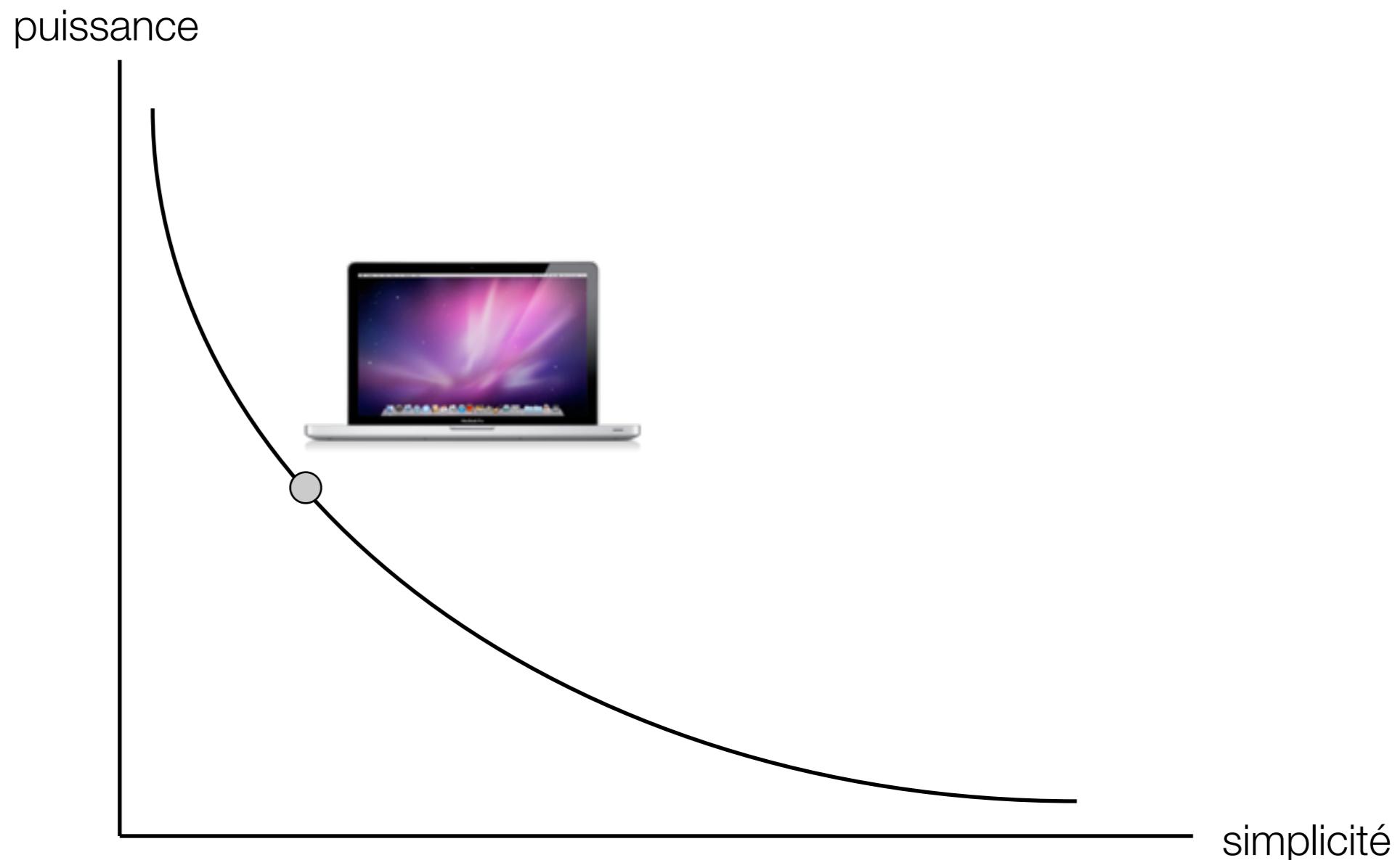


Outils

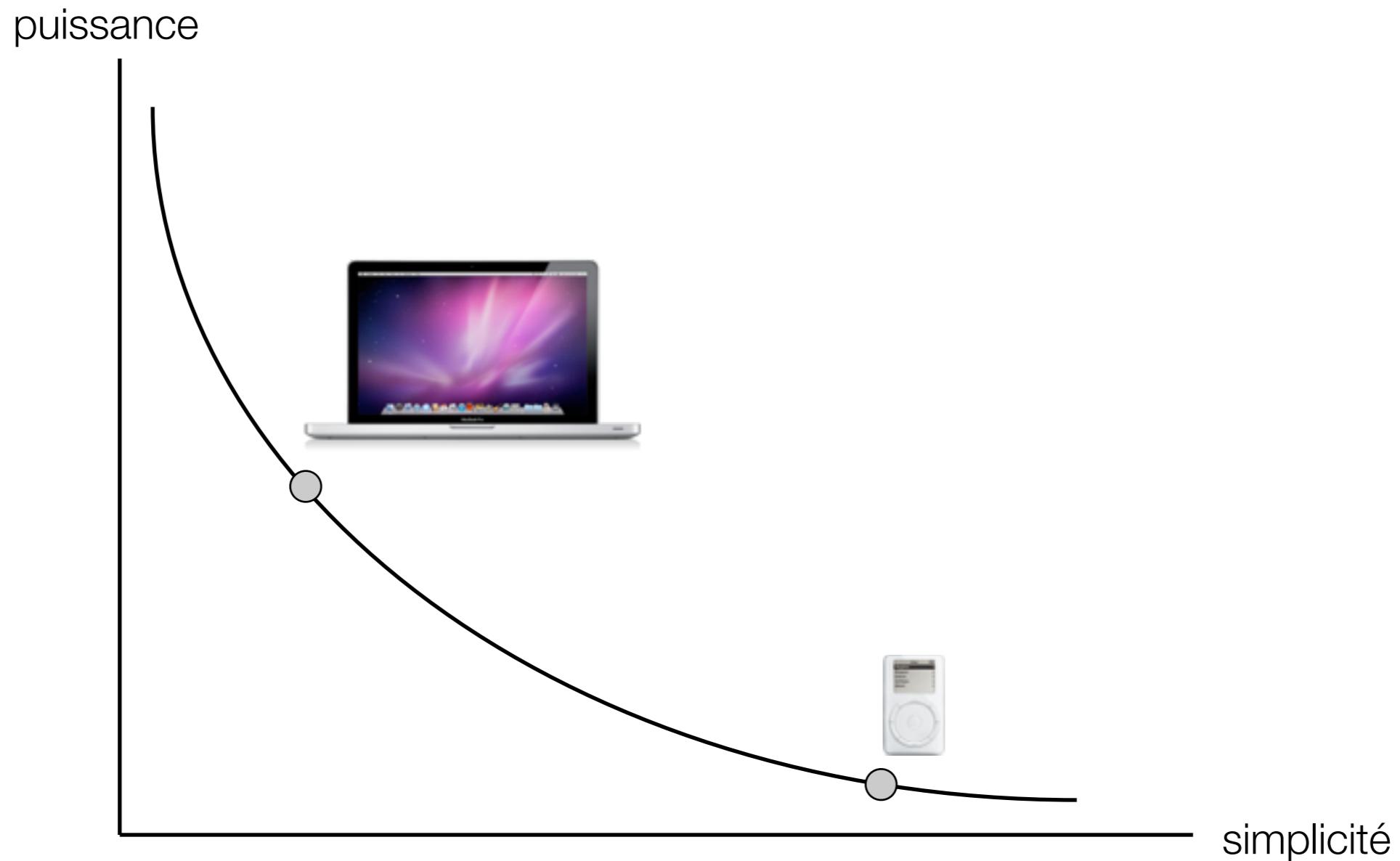
Puissance vs. simplicité



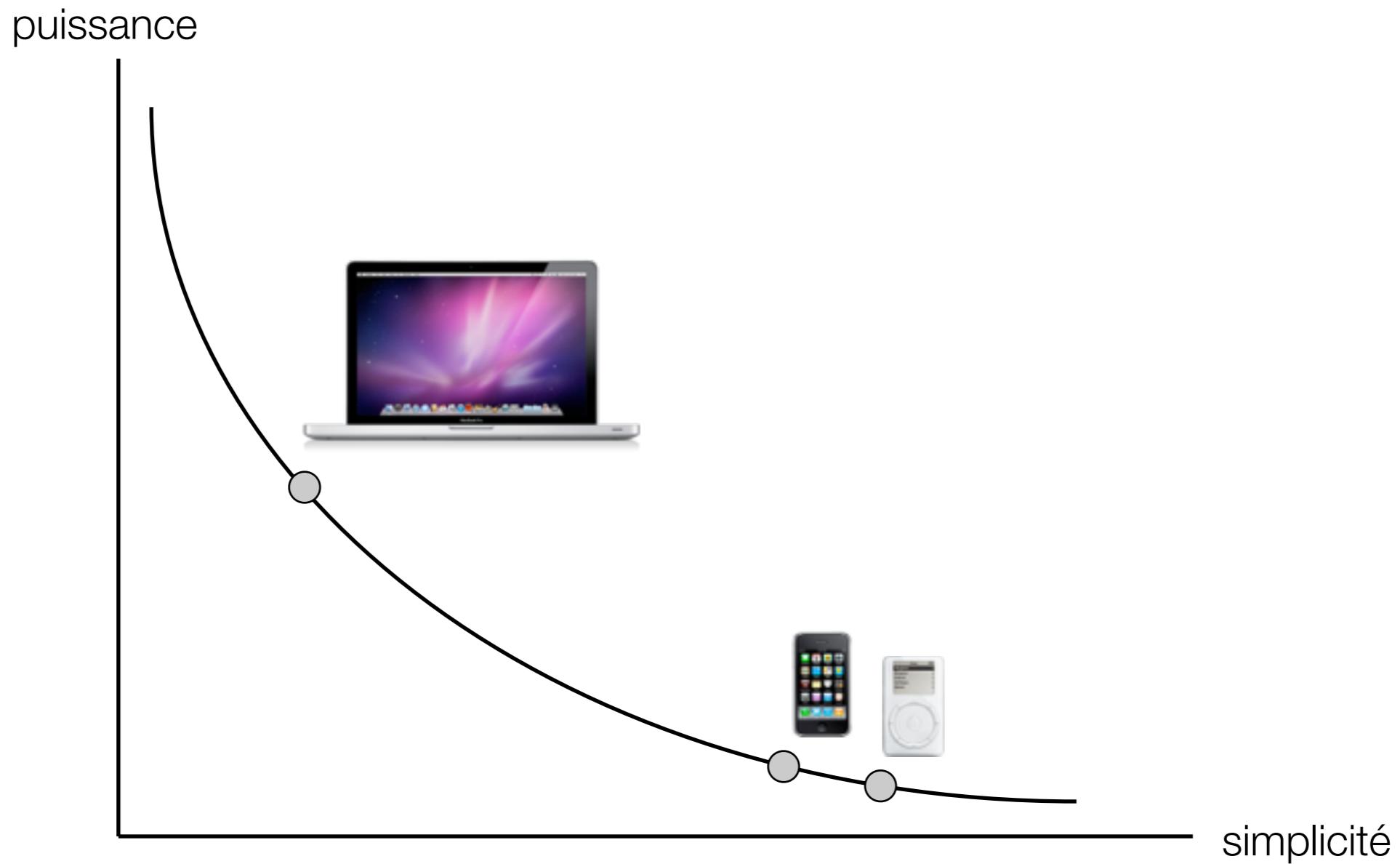
Puissance vs. simplicité



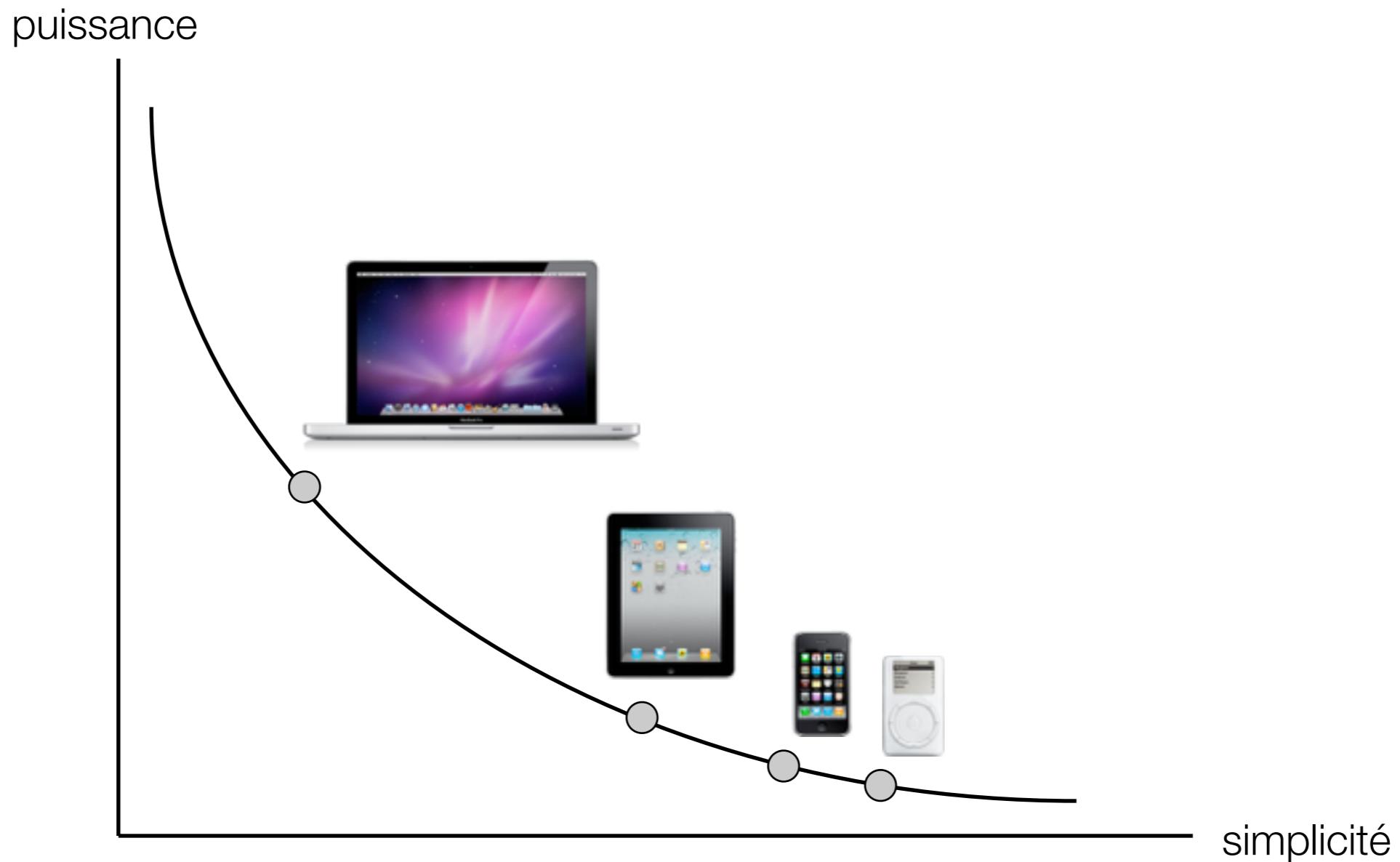
Puissance vs. simplicité



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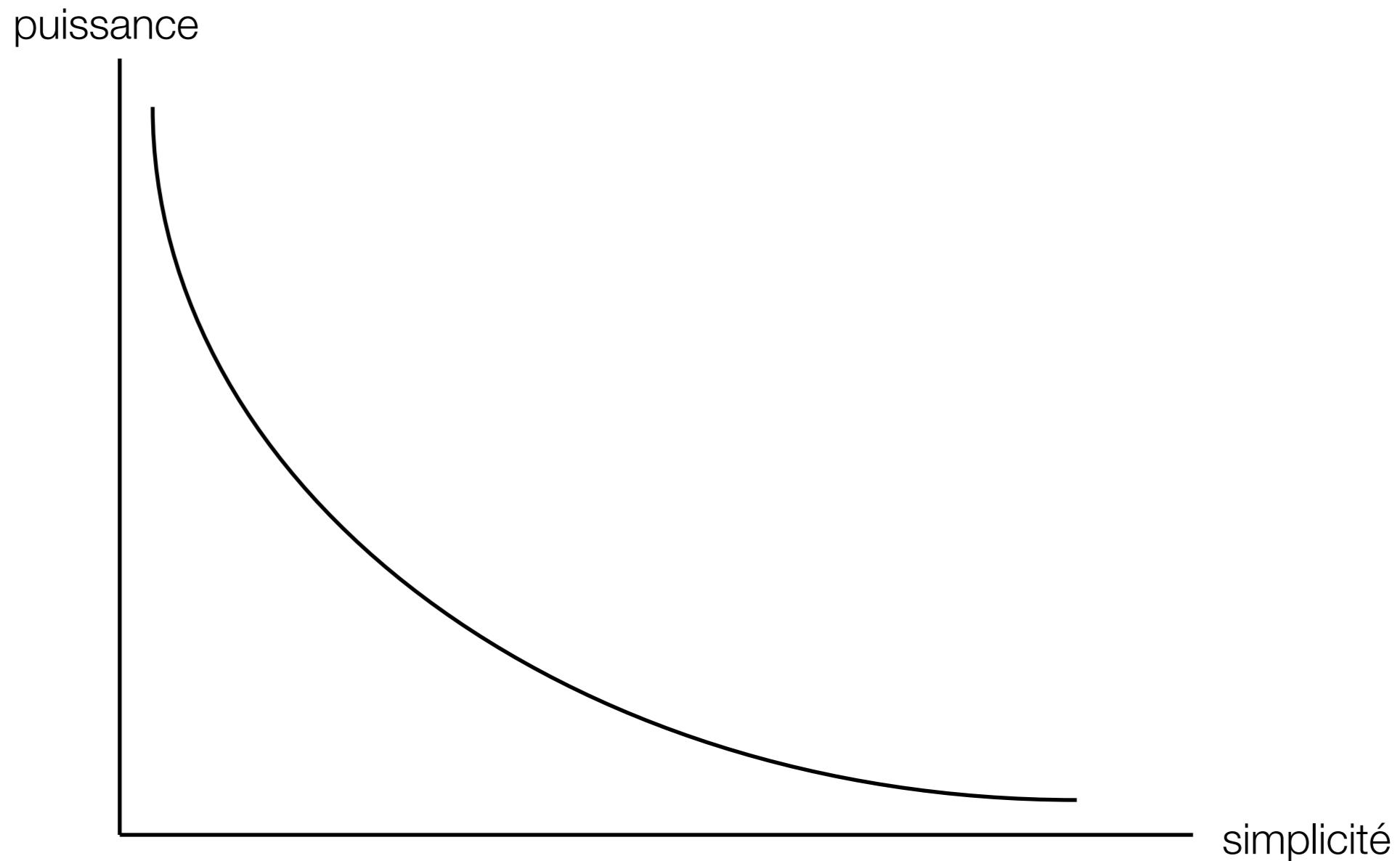


Puissance vs. simplicité

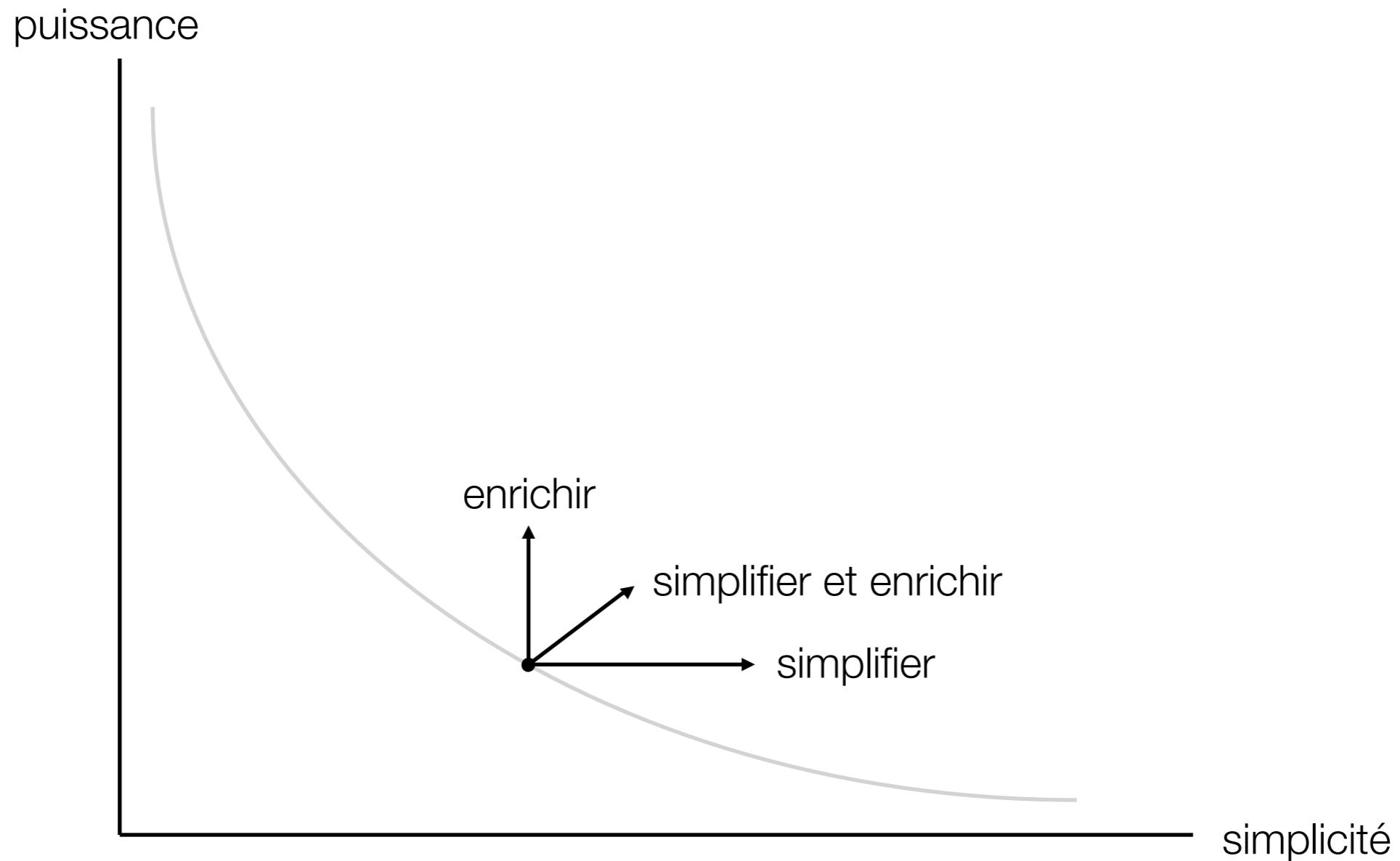


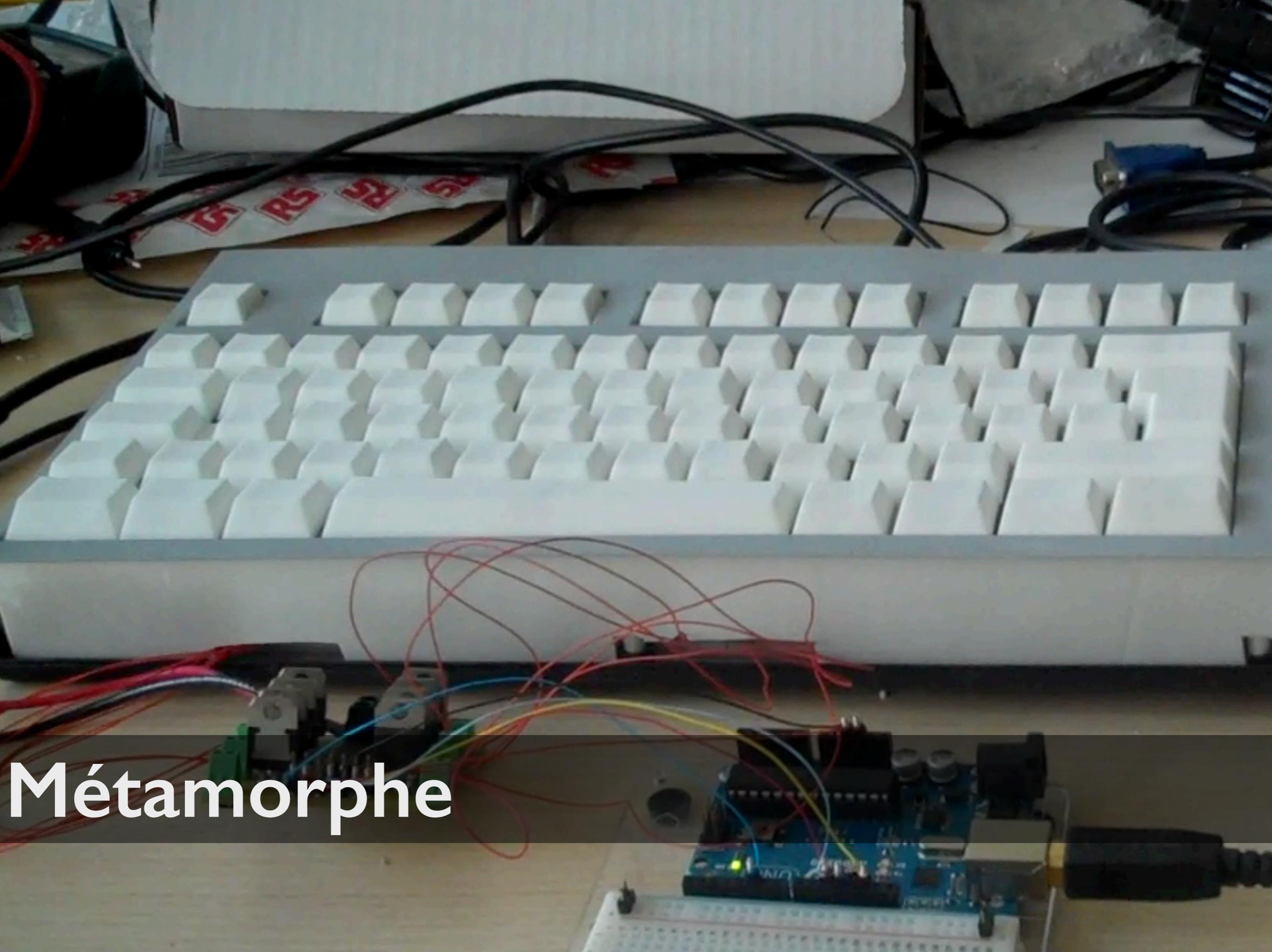


Puissance et simplicité

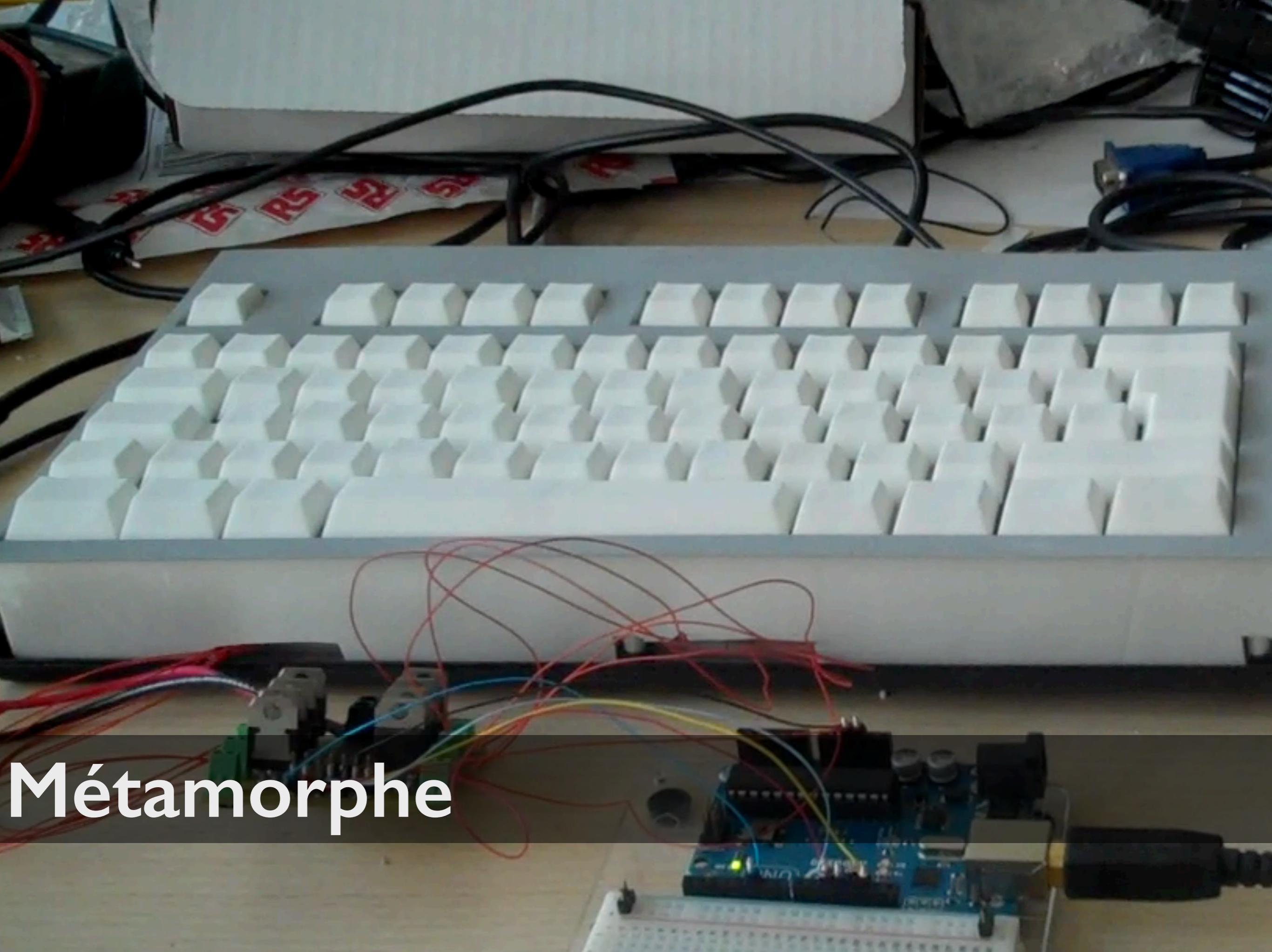


Puissance et simplicité

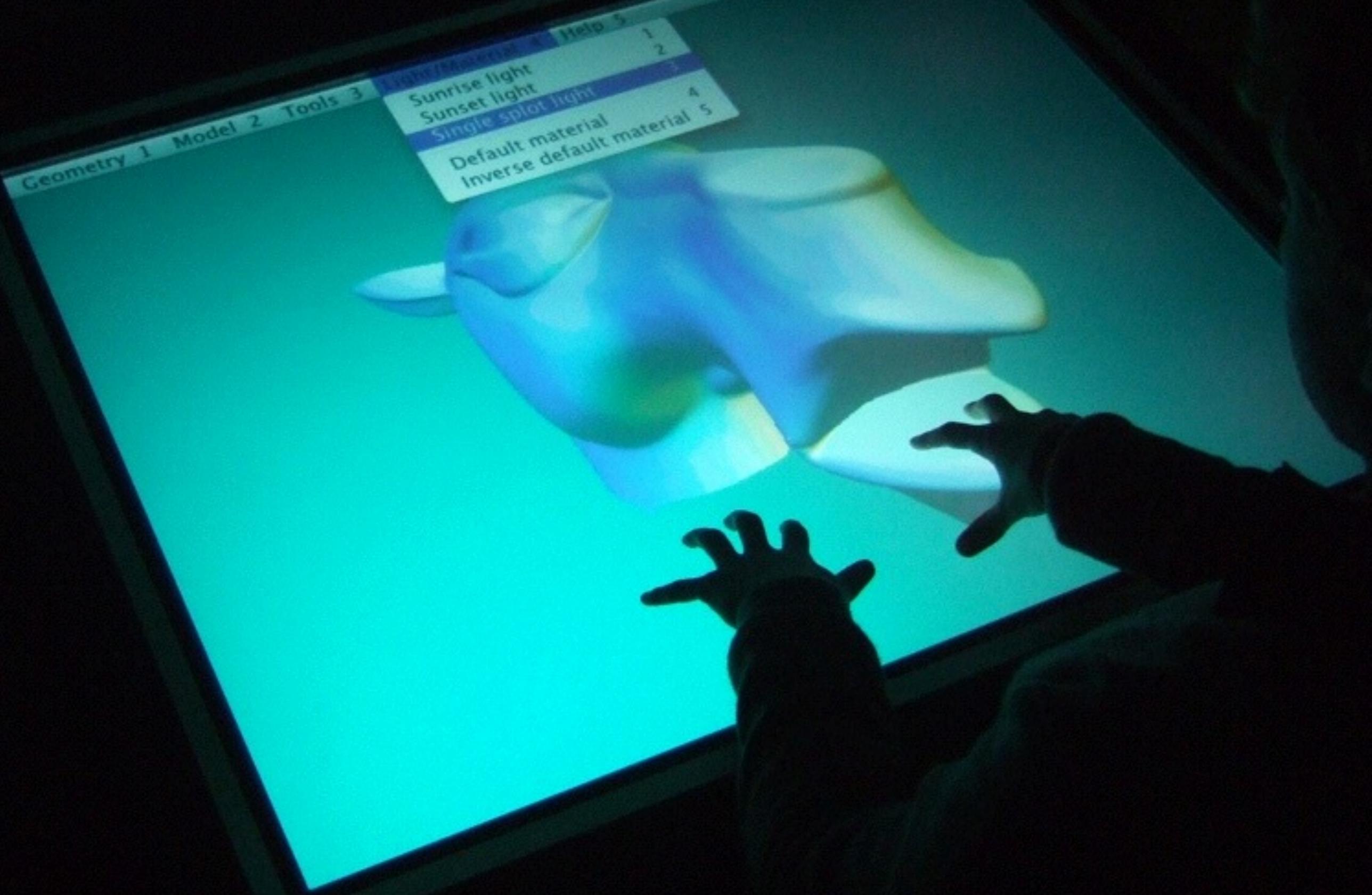




Métamorphe

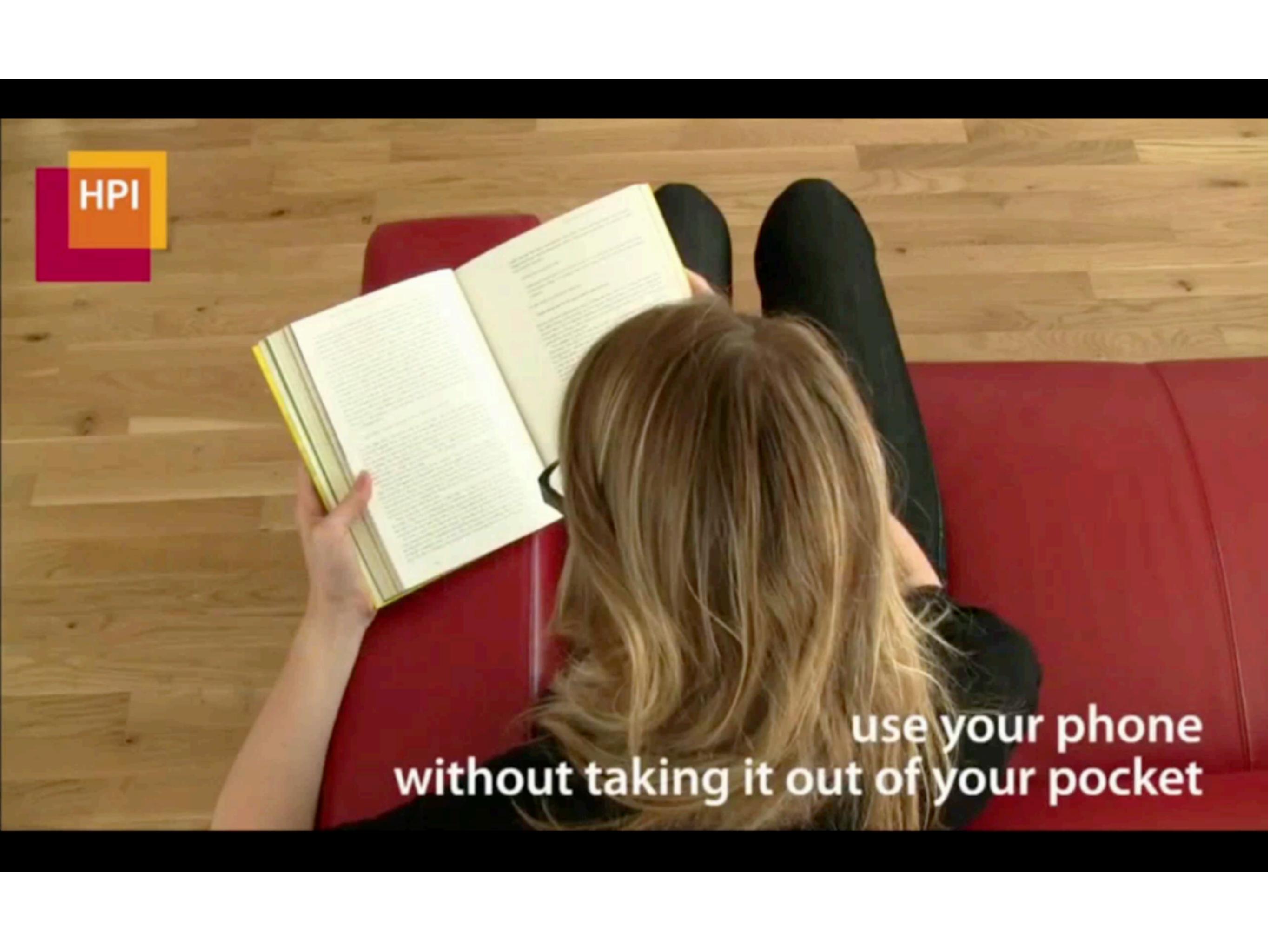


Métamorphe



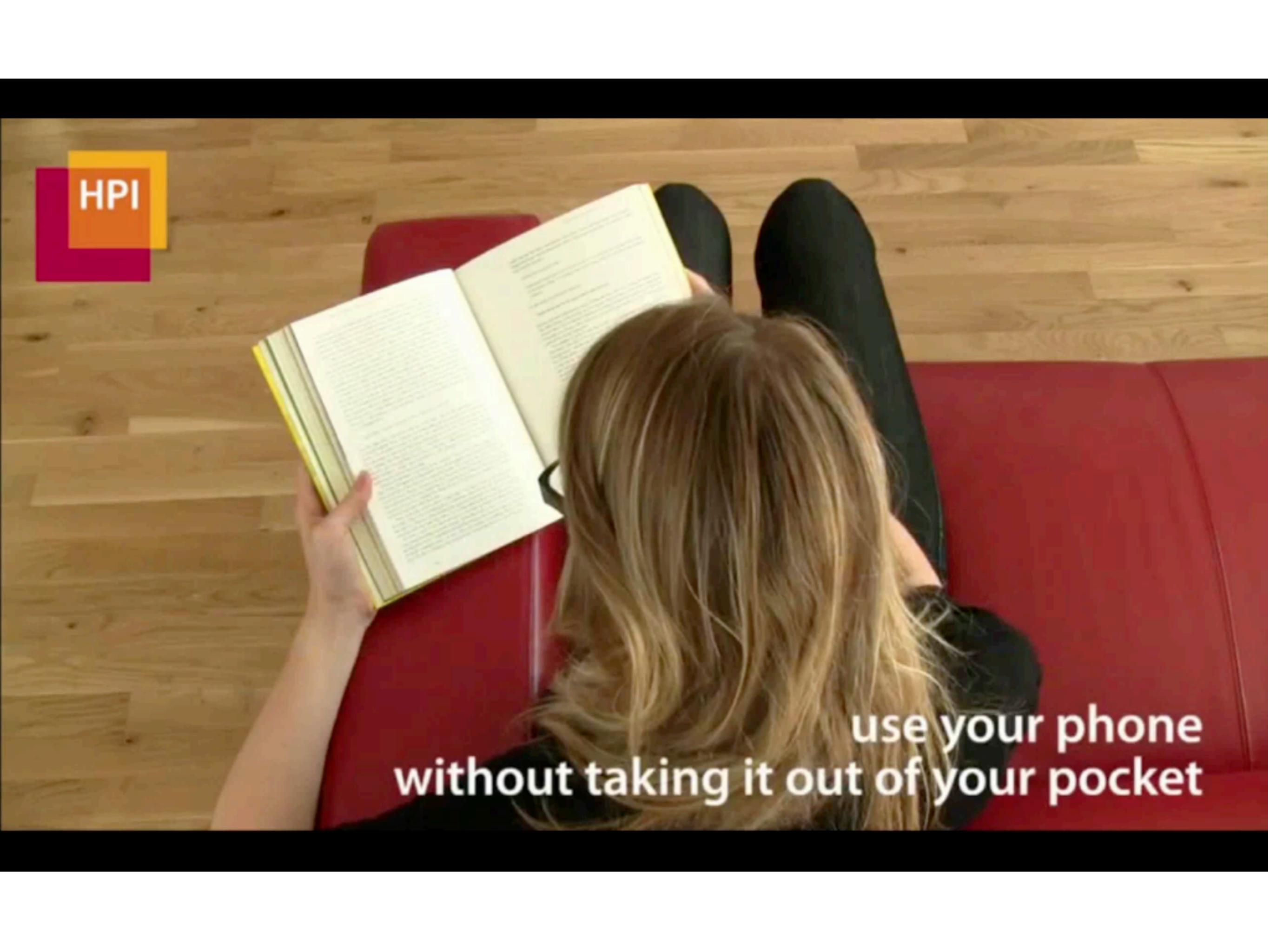




A woman with long blonde hair is sitting on a red couch, viewed from behind. She is holding an open book and appears to be reading. Her feet, wearing black socks and dark shoes, are propped up against a light-colored wooden floor. The background shows a red wall.

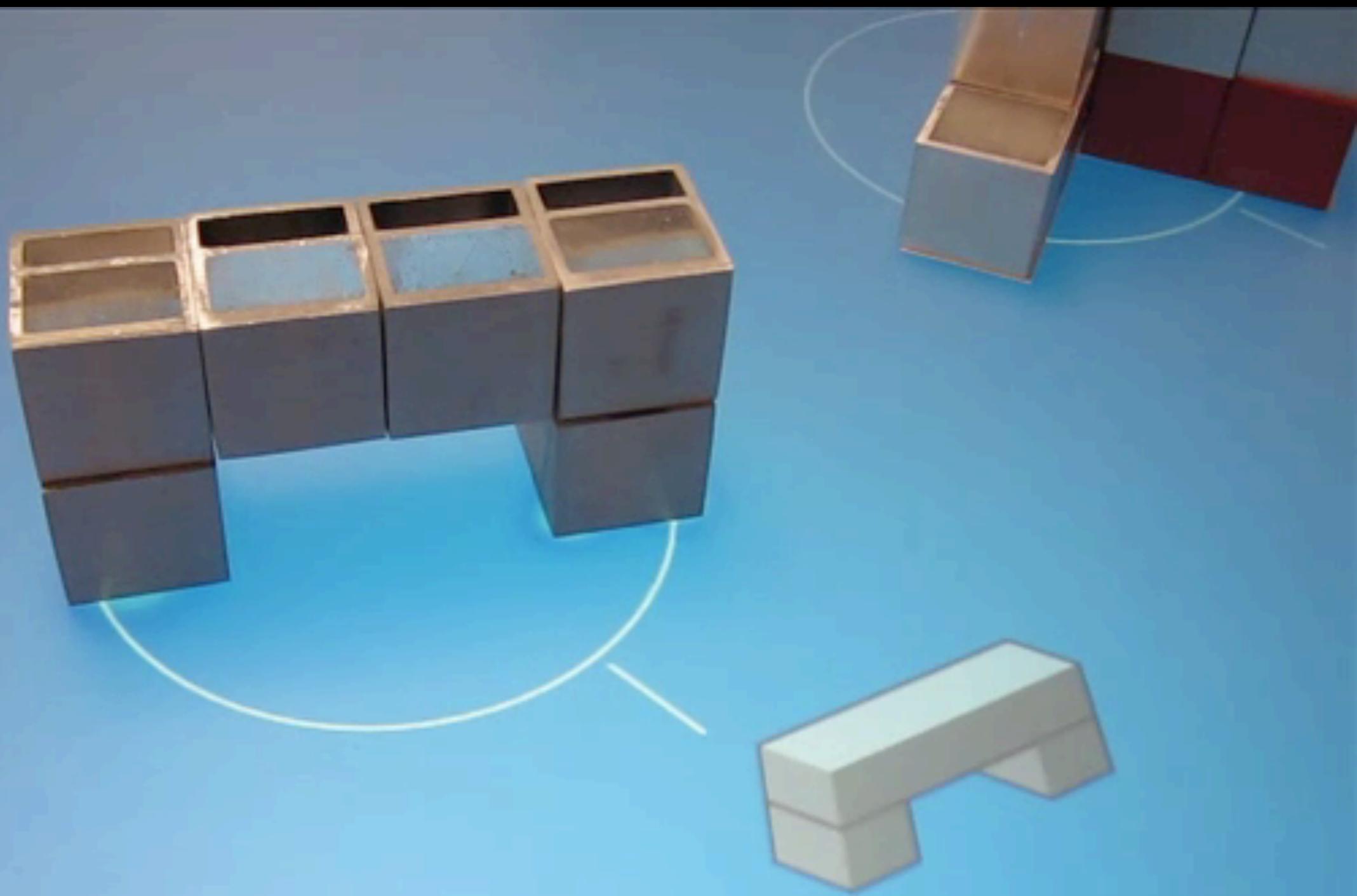
HPI

use your phone
without taking it out of your pocket

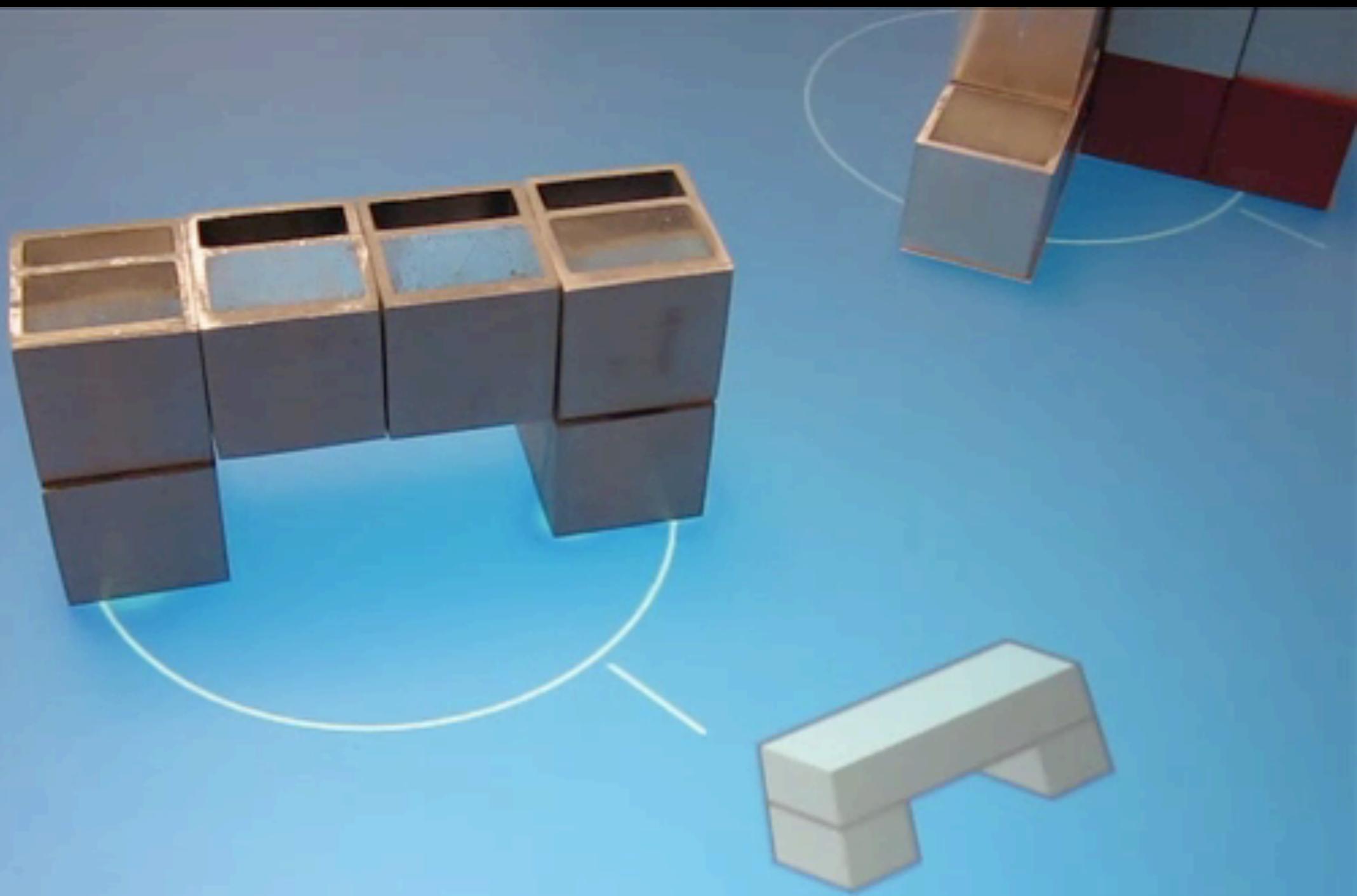
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HPI

use your phone
without taking it out of your pocket



Lumino (CHI'10)



Lumino (CHI'10)

What is Sand Animation?

What is Sand Animation?



Interactive Floor

WHO ARE YOU
Tom
Caro
René
Dan



Interactive Floor



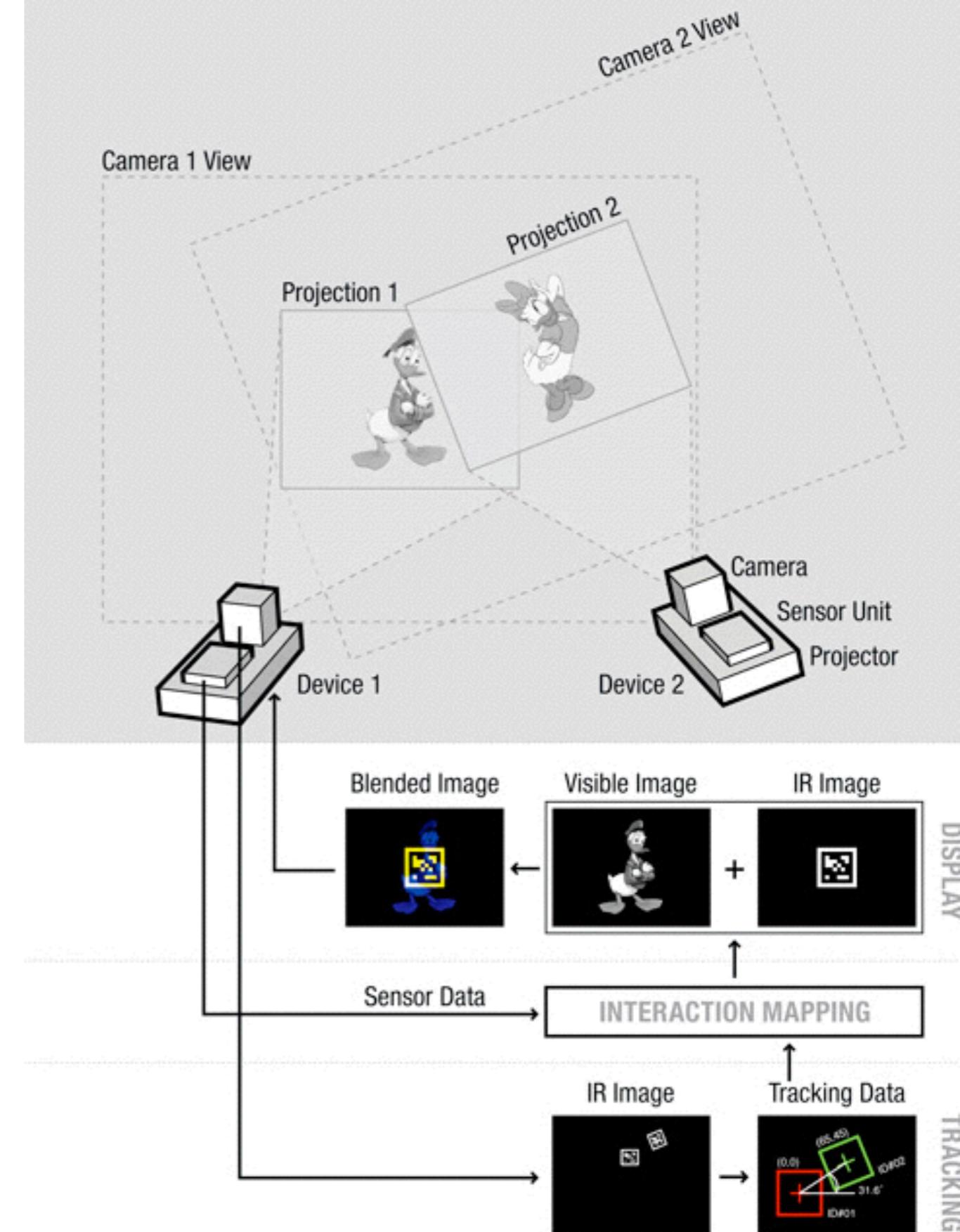
Interactive Floor



PhotoElastic Touch



PhotoElastic Touch



SideBySide:

Ad-hoc Multi-user Interaction
with Handheld Projectors



SideBySide:

Ad-hoc Multi-user Interaction
with Handheld Projectors



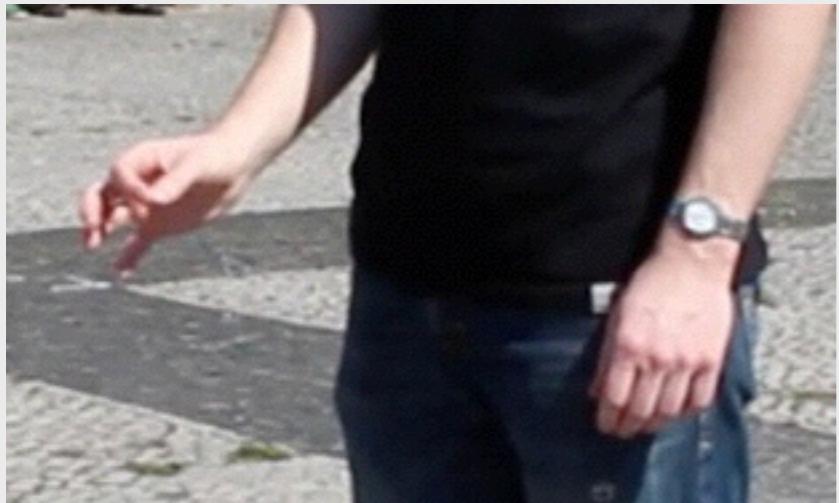
5s Video

5s Video

5s Video (with sound)

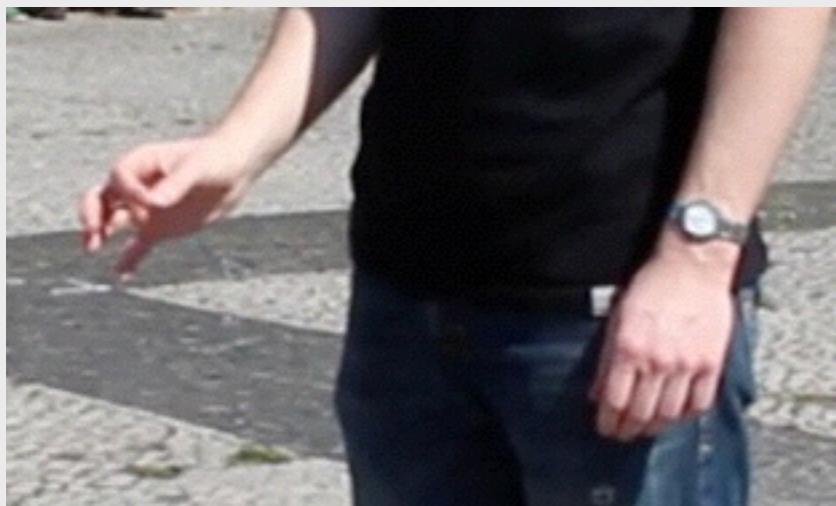
5s Video (with sound)

3 Gesture Sets

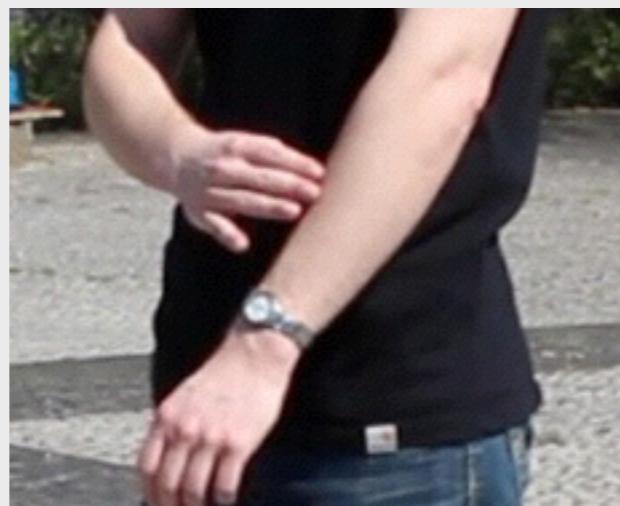


Next Song

3 Gesture Sets

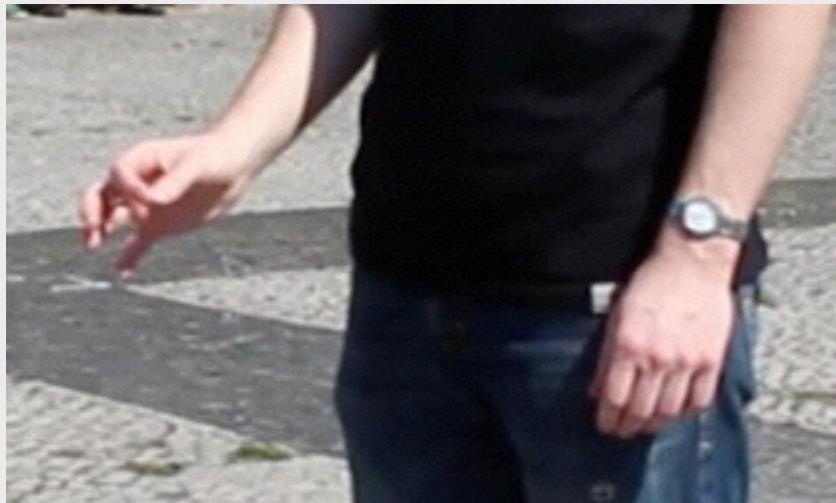


Next Song

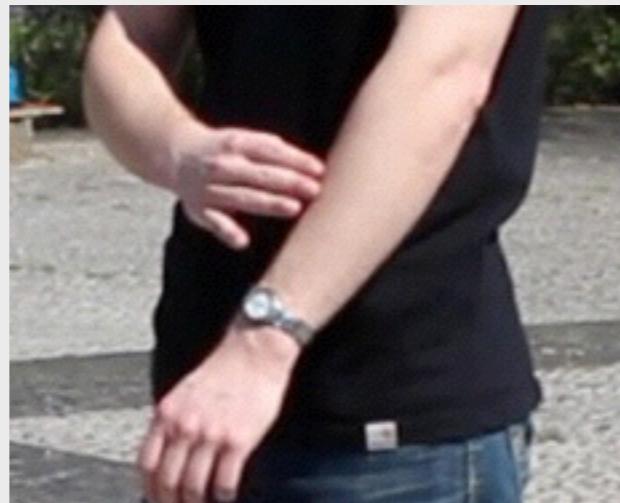


Volume +

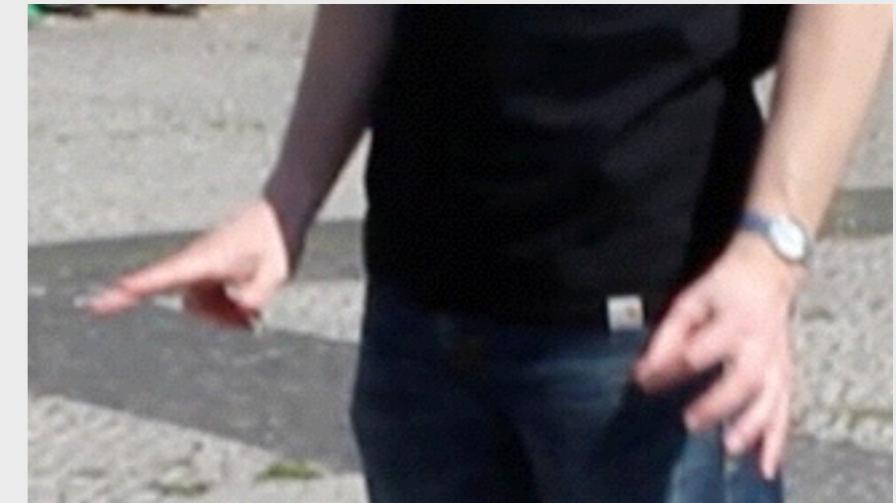
3 Gesture Sets



Next Song

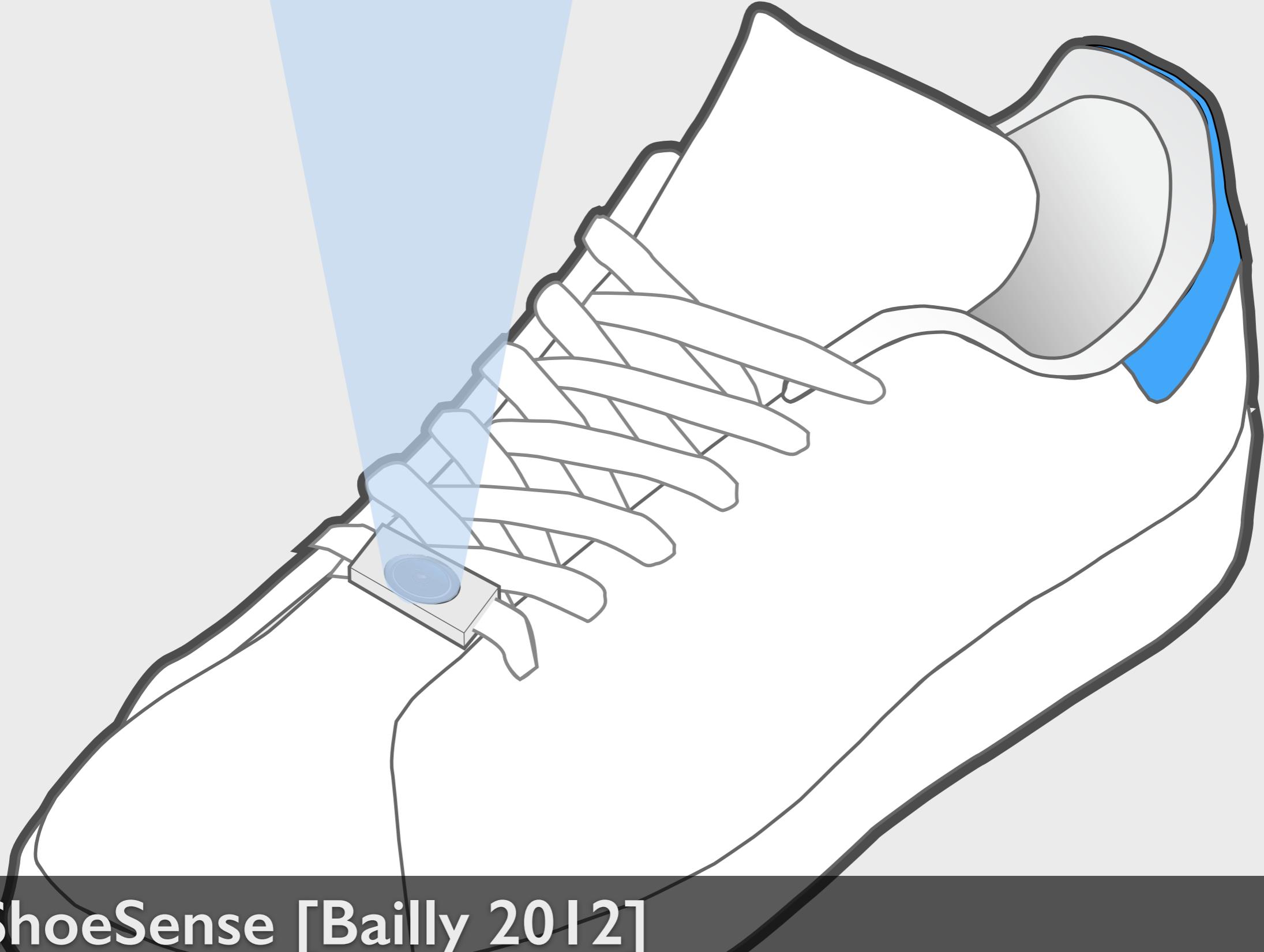


Volume +



Send message

3 Gesture Sets



ShoeSense [Bailly 2012]
Platform for Hand Gesture

- Shoes as a platform for interaction

Shoes as a platform for Hand
Gesture interaction

- Shoes as a platform for interaction

Shoes as a platform for **Hand
Gesture** interaction

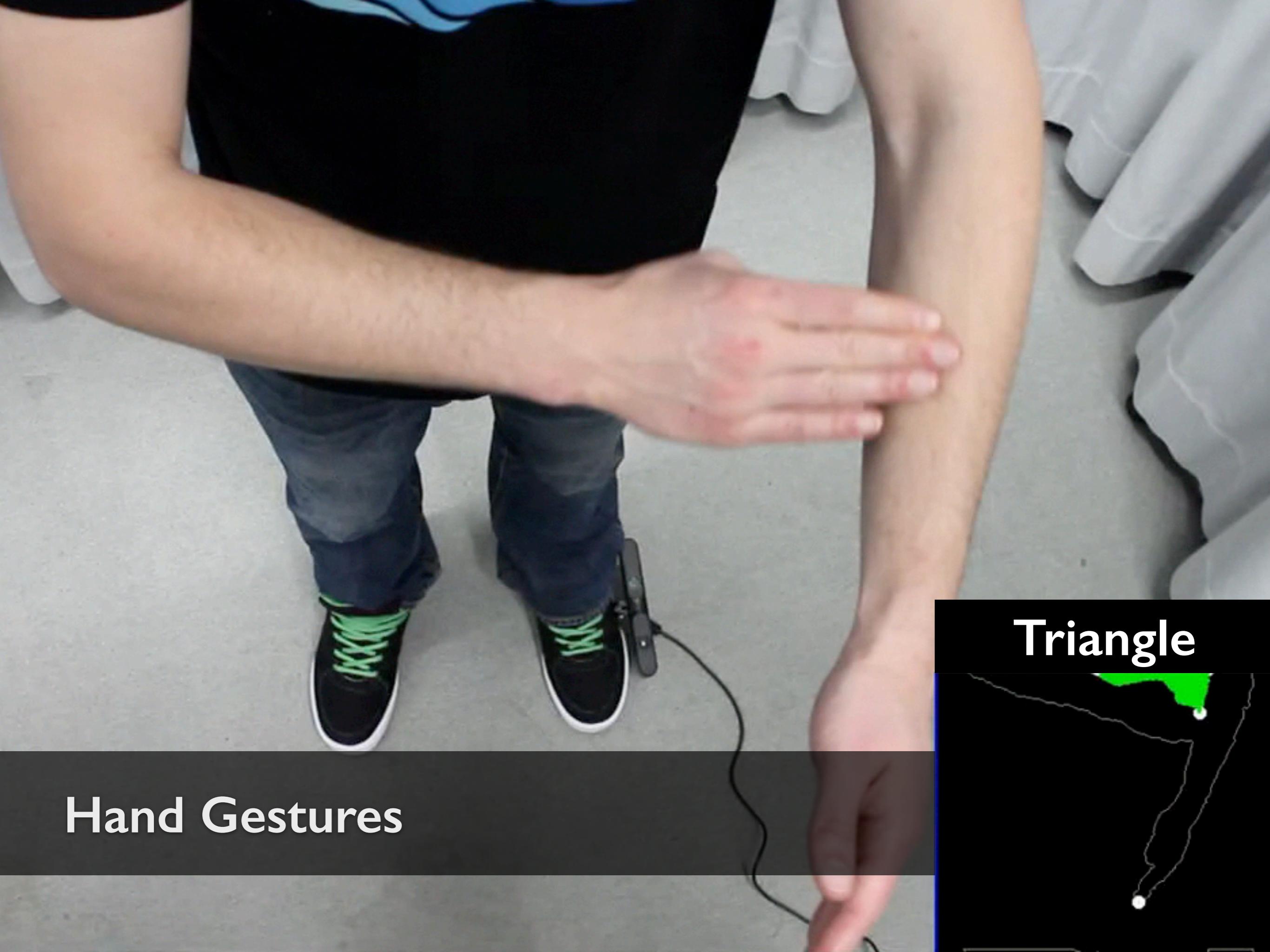
Radial



Radial



Hand Gestures

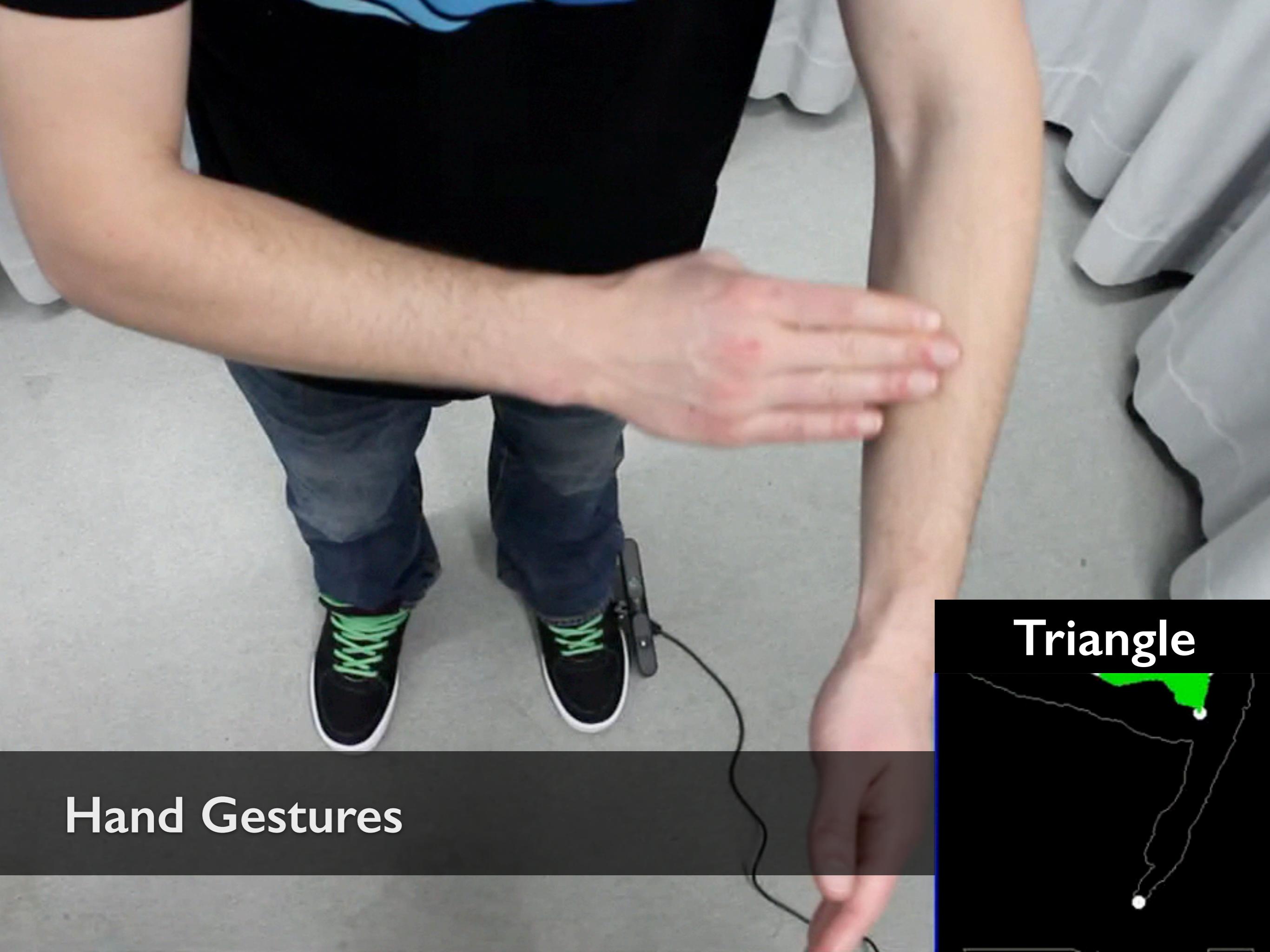


Triangle



Hand Gestures

Triangle

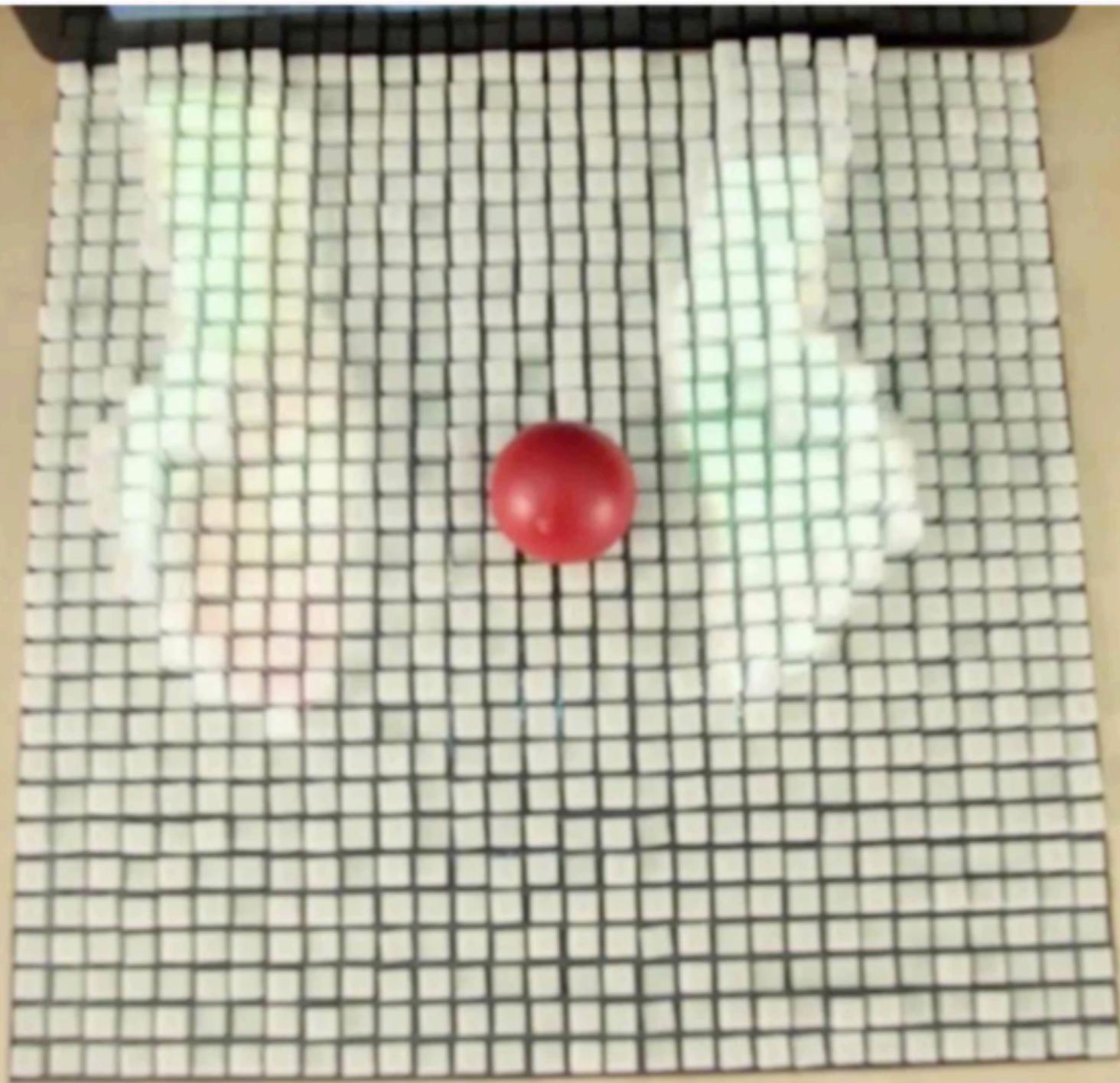


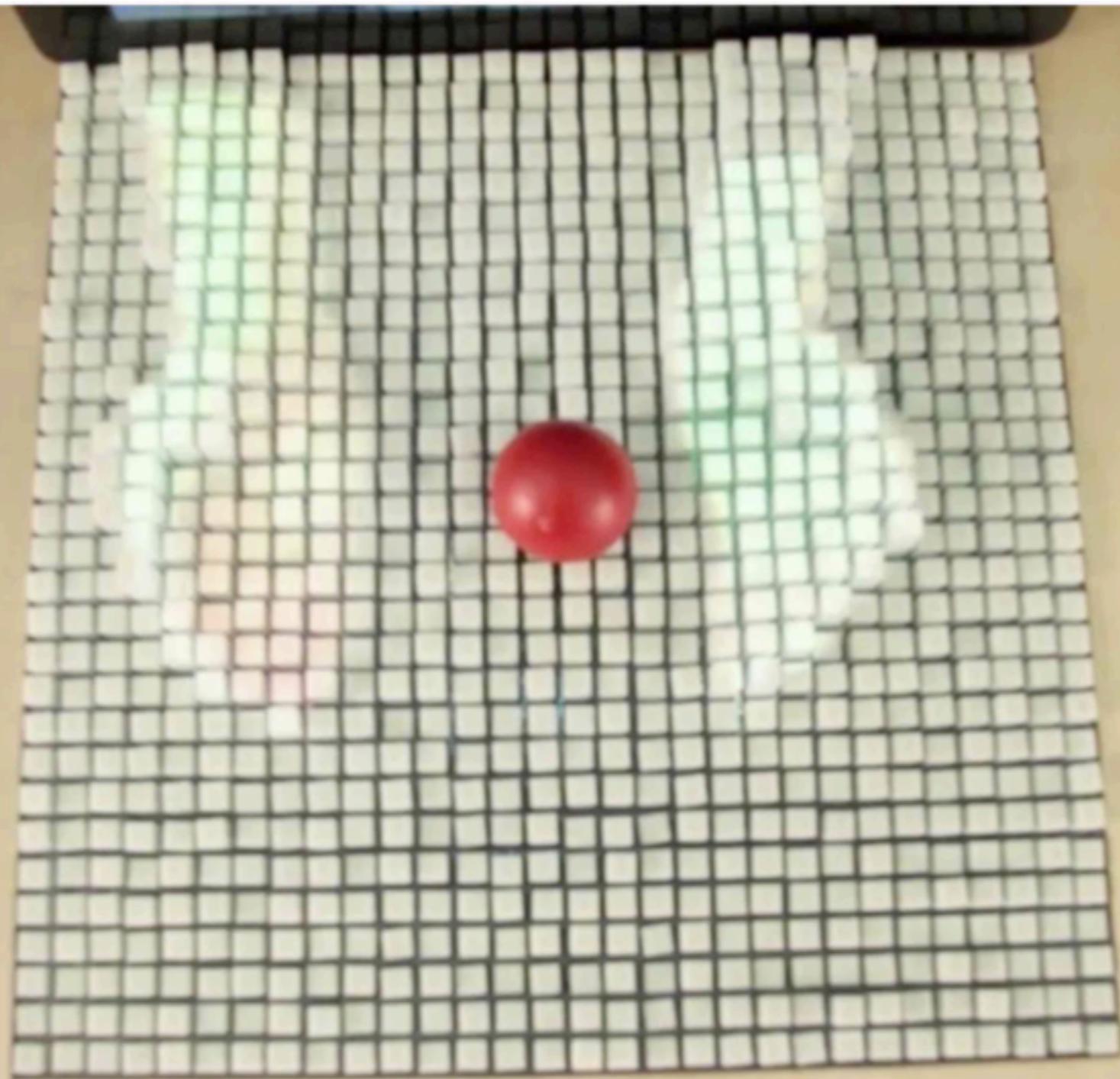


Mobile Device Interaction



Mobile Device Interaction





Objectifs généraux

► **comprendre** :



Décrire

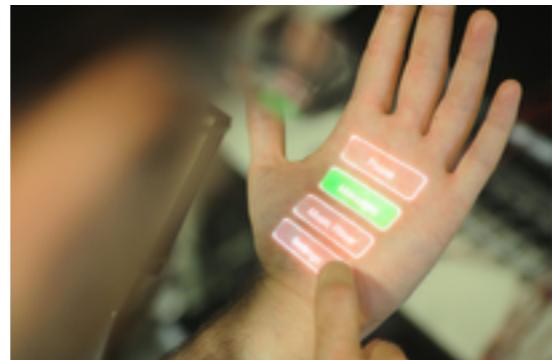


Expliquer



Prédire

► **innover** :



Nouvelles
formes d'interaction

► **guider** :



Outils

Welcome to GECKO, the GEsture Clustering toolKit. [about GECKO](#)

single user analysis multiple users analysis



1. Load gestures

2. Auto cluster
(all gestures) less
clustersmore
clusters

3. Save results

gesture set gesture clusters

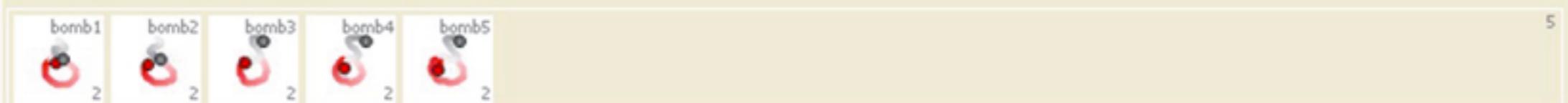
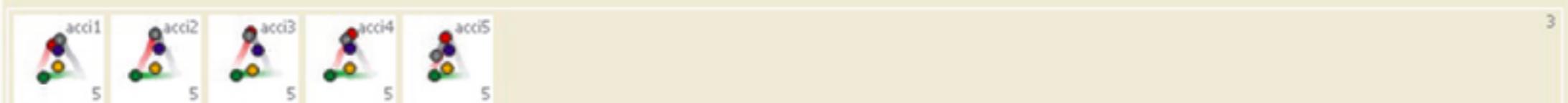
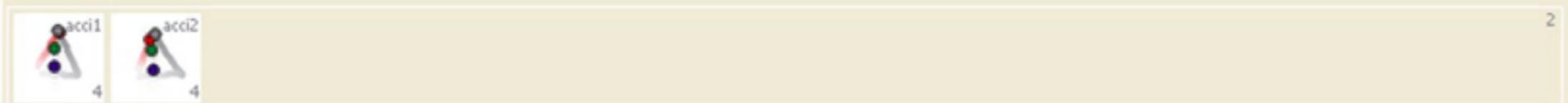
Clusters: 34 | Total samples: 420 | Average cluster size: 12.4

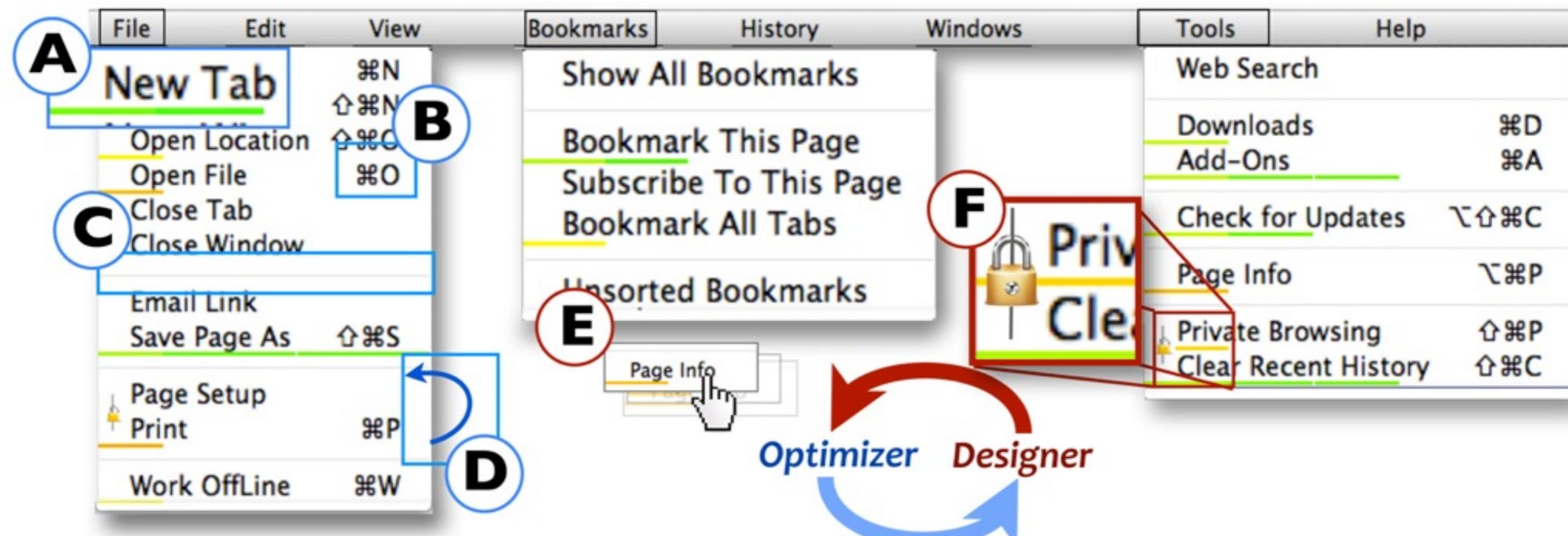
Left click on gesture to select/unselect. Right click to play.
Outside click selects cluster.Remove selected
samples

Split at selection

Merge selected
clusters

Sort clusters





Pourquoi étudier l'IHM?

C'est quoi l'IHM?

Comprendre / Innover / Guider

Comment Évaluer l'IHM

- Projet
- Système



April 18 - 23, 2015

[About Crossings »](#)

134
days until CHI 2015

Welcome

For over 30 years, the CHI conference (pronounced 'kai') has attracted the world's leading researchers and practitioners in the field of Human Computer Interaction (HCI) from businesses and universities to share ground-breaking research and innovations related to how humans interact with digital technologies. The Association for Computing Machinery's (ACM) CHI conference is the world's premiere conference on Human Factors in Computing Systems, presenting a highly selective showcase of the very best advances across the disciplines of computer science, cognitive psychology, design, social science, human factors, artificial intelligence, graphics, visualization, multi-media design and other disciplines.

The theme for CHI 2015 is "Crossings": crossing borders, crossing boundaries, crossing disciplines, crossing people and technology, crossing past and future, crossing physical and digital, crossing art and science, ... crossing you and me.

Cross into new territory by joining us in Seoul, Korea, one of the world's most dynamic cities and the center of emerging trends in culture, technology and design. For those who create and evaluate new

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NAVER

- User Experience and Usability
- Specific Application Areas
- Interaction Beyond the Individual
- Design
- Interaction Using Specific Capabilities or Modalities
- Understanding People: Theory, Concepts, Methods
- Interaction Techniques and Devices
- Technology, Systems and Engineering

User Experience & Usability

Approaches, practices, methods and tools that make technology more useful, usable and desirable. The focus is on usability of widely used technologies.

- **Measuring** the user experience on a large scale: user-centered **metrics** for web applications
 - Average task times in **usability tests**: what to report?
 - Undo and erase events as **indicators of usability problems**

Specific Application Areas

User groups: older adults, children, families, people in developing countries, and people with impairments.

Application areas: education, health, home, sustainability, ict4d, security, privacy and creativity.

- PointAssist for **Older Adults**: Analyzing Sub-Movement Characteristics to Aid in Pointing Task
- Mobile-izing Health Workers in **Rural India**
- Family Story Play: Reading With **Young Children** (and Elmo) Over a Distance
- Why is my Internet Slow? Making Network Speeds Visible

Interaction Beyond the Individual

Human communication, collaboration, conflict, play, and other activities supported or mediated by technologies.

- Enhancing Directed Content **Sharing on the Web**.
- **Social Network** Activity and Social Well-Being
- Using information scent to model the dynamic foraging behavior of programmers in maintenance tasks
- Think different: Increasing **online community** participation using uniqueness and group dissimilarity

Design

Contribution to the design of interactive products, services, or systems; or that advance knowledge of the human activity of design as it relates to HCI.

Design approaches: participatory, user-centered, experience, and service.

Design practices: interaction, industrial, experience, information, architecture, visual communication, and sensorial.

Design research issues: aesthetics, values, effects (such as emotion), methods, practices, critique, and theory.

Design of computer games.

- Interactivity attributes: a new way of thinking and describing interactivity
- Empathy and experience in HCI
- G-name surfer: a tabletop interface for collaborative exploration of genomic data
- Feminist HCI: taking stock and outlining an agenda for design

Interaction using specific Capabilities or Modalities

Capabilities, **modalities**, or technologies that have not yet been fully exploited in standard interactions.

Novelty and their ability to extend user capabilities in powerful new ways or to new contexts.

Multimodal, tangible, speech, auditory, physiological computing, brain-computer interfaces, perception and vision-based systems, AR and visualisation.

- A role for **haptics** in mobile interaction: initial design using a handheld tactile display prototype
- Sizing the horizon: the effects of chart size and layering on the graphical perception of time series **visualizations**
- Musink: composing music through augmented drawing
- Skinput: appropriating the body as an **input** surface

Understanding People: Theory, Concepts, Methods

Improved understanding of people and interactional contexts for HCI problems.

Qualitative/quantitative research.

Theories, concepts or methods.

- Blogging in a region of conflict: supporting transition to recovery
- **The effects of diversity on** group productivity and member withdrawal in online volunteer groups
- The Case of the Disappearing Ox: Seeing Through Digital Images to an Analysis of Ancient Texts
- Why it's quick to be square: **modelling** new and existing hierarchical menu designs
- How does search behavior change as search becomes more difficult?

Interaction Techniques and Device

New input or interaction techniques, or devices.

will be judged in part based on their **novelty** or on a **demonstrated improvement** in an existing interaction type of interest to the HCI community.

Sensors & actuators, mobile devices, 3D interaction, (multi-)touch, tangible UI, large display interaction.

Technology / Systems and Engineering

Software and hardware technologies and systems that enable and demonstrate novel interactive capabilities,

Languages, methods and tools for construction and engineering of interactive systems.

scalability, reliability, interoperability, testing, and performance.

technical innovation and/or ability to connect, simplify or enrich interactions, for example in intelligent interfaces and **mobile/ubiquitous computing**.

- Prefab: implementing advanced behaviors using pixel-based reverse engineering of interface structure
- The Design and Evaluation of an End-User-Deployable, Whole House, Contactless Power Consumption Sensor