La Réalité augmentée
(sa réalité)

déjeuners technologiques, Lille 1

Laurent Grisoni,
Polytech'Lille,
University Lille, INRIA/CNRS

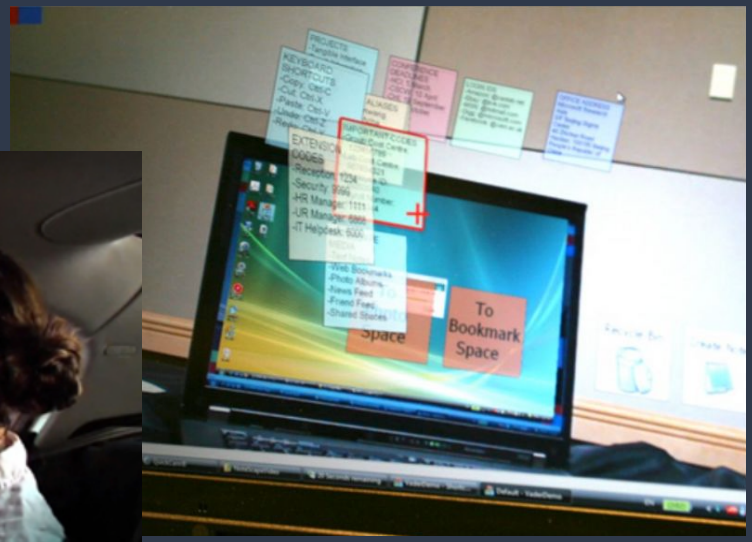
march 2015

Réalité augmentée : ce que dit wikipedia

La **réalité augmentée** désigne les systèmes informatiques qui rendent possible la superposition d'un modèle virtuel 3D ou 2D à la perception que nous avons naturellement de la réalité et ceci en temps réel.

Réalité augmentée : ce que dit wikipedia

La **réalité augmentée** désigne les systèmes informatiques qui rendent possible la superposition d'un modèle virtuel 3D ou 2D à la perception que nous avons naturellement de la réalité et ceci en temps réel.



En fait … (Deniaud & al, AFRV 2014)

« Aujourd'hui dans les milieux scientifiques il est pratiquement impossible de concevoir l'espace autrement que physiquement et matériellement » (Wertheim, 2000)

Sujet & objet ne peuvent se penser qu'en lien avec un projet :

le sujet exerce le projet sur un objet,

l'objet est ce qui entre dans le projet

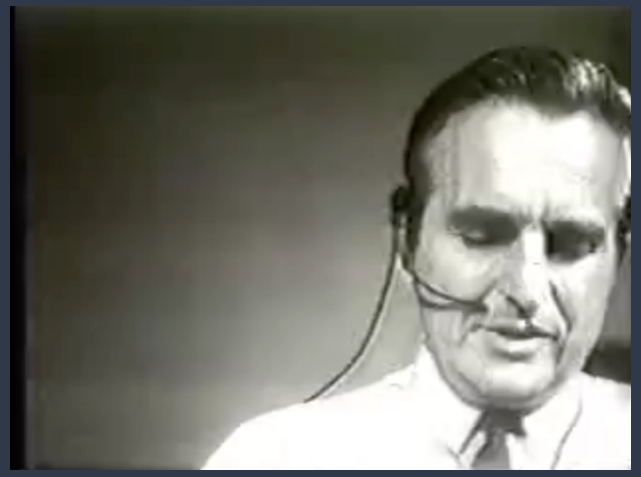
Our view of the problem

- Someone interacting with a computer achieves 3 things, at the same time:
  - **get data**: a lot through eyes, bit through ears, **roughly through hands**
  - **give data**: **mostly using hands** on keyboard/ mouse (may also be through speech/sound, or eyes)
  - **think & feel** : achieve the task he intends to (not necessarily computer-centered)

- Interaction needs to be *situated,* i.e. design should take into account :
  - user intend/task,
  - user age,
  - expertise,
  - context of use,
  - …

Standard Interaction devices

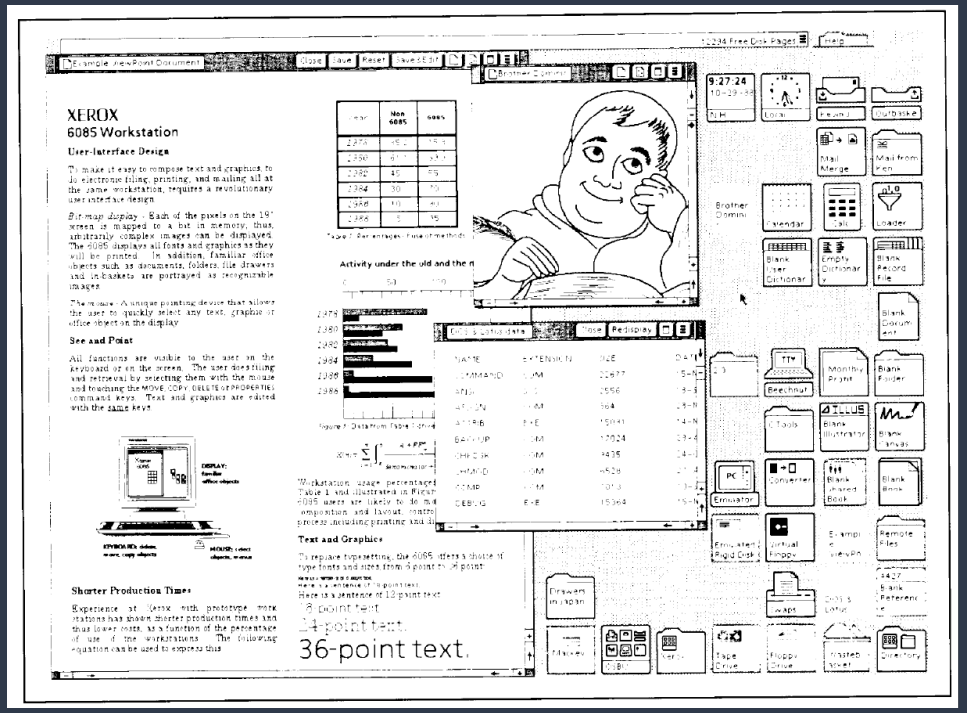
- D. Englebart, Augmentation Research lab, stanford, in the 60s.
  - aim was to allow people to **solve problems more efficiently**
  - mother of all demos, dec. 9th 1968
  - tools for collaboration and information processing



- Mouse-based interaction principles:
  - separation between DOFs
  - very accurate
  - hand movement combined with visual feedback -> control
  - independant from content

Standard Interaction schemes

- Xerox, desktop WIMP metaphor
- strategy:
  - observe real (non-computer based) **work** situation
  - try to get the best from:
    - real world
    - computer
  - try to have computer
    - bring only advantages to the work task
    - overcome non-computer based task drawbacks



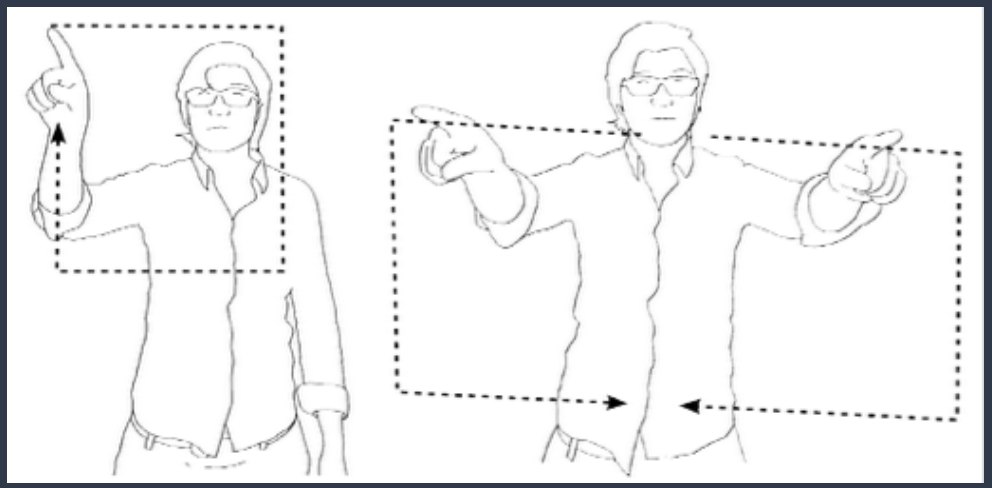
What do people do …

- with a computer-based application: **work**, but also
  - game,
  - learn/teach
  - buy/sell,
  - social interaction,
  - video viewing,
  - casual interaction
  - …
- anywhere, anytime:
  - achieve our task
  - learn, teach, think
  - interact with people
  - interact with objects
  - construct things
  - use tools
  - …

What do computer scientists do with a computer?

- all that users do, including **using** tools
- but also **make** tools, **imagine** tools, **adapt** tools… which standard user can not do (except imagining)

generic trend : enaction for gestural interaction



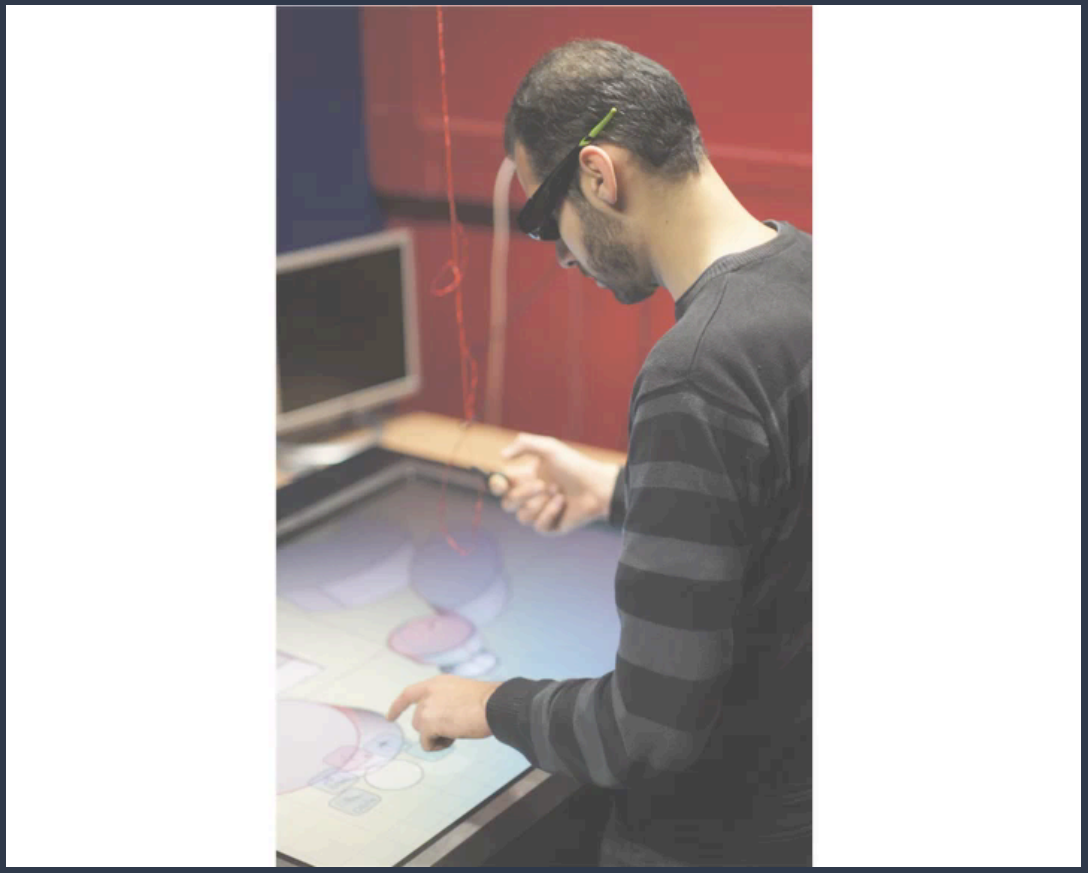
Mimetic Interaction spaces,
Rateau, Grisoni, De Araujo (IUI 2014)

- good acceptability
- algorithmically reachable
- large design space

potential applications to :
co-located collaborations
tangible interaction

- reflexive interactive systems?

generic trend : Gestural collocated interaction



making CAD systems to allow user to take the best of mental representation of shape, by combining:

- accurate modeling
- sketching

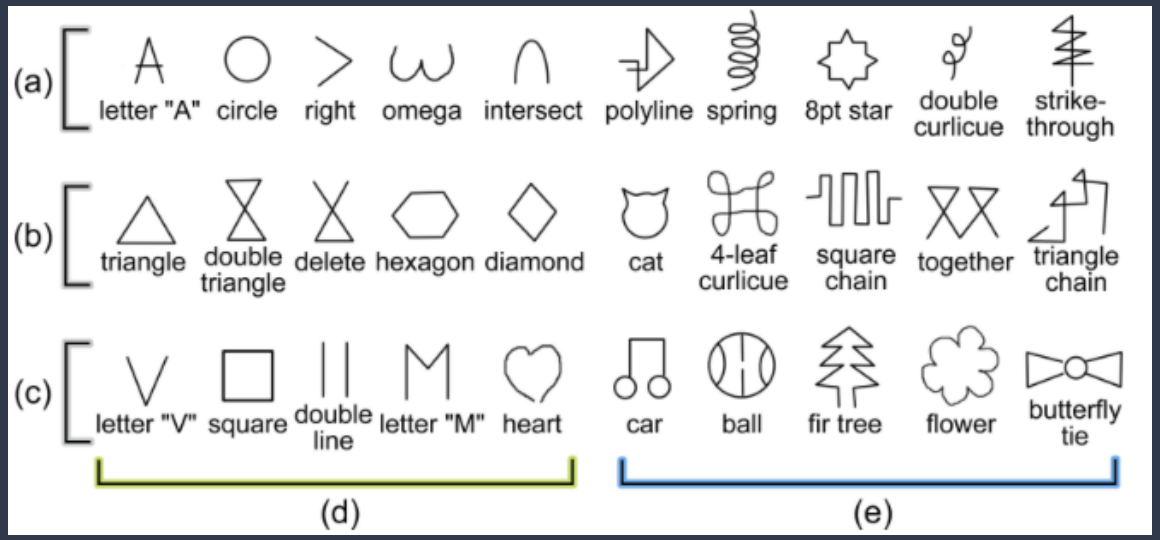
B. De Araujo, G. Casiez, J. Jorge, Graphics Interface‘2012

generic trend: From signal to symbol
gesture for command:
Understanding gesture variability

interaction gesture is much more than
a trajectory

Understanding gesture variability

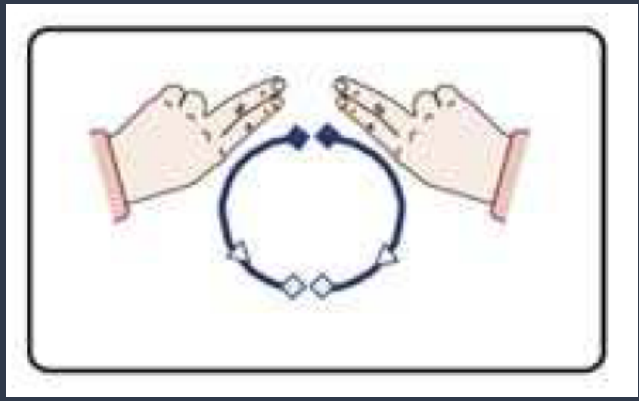
However in practice most research papers target :



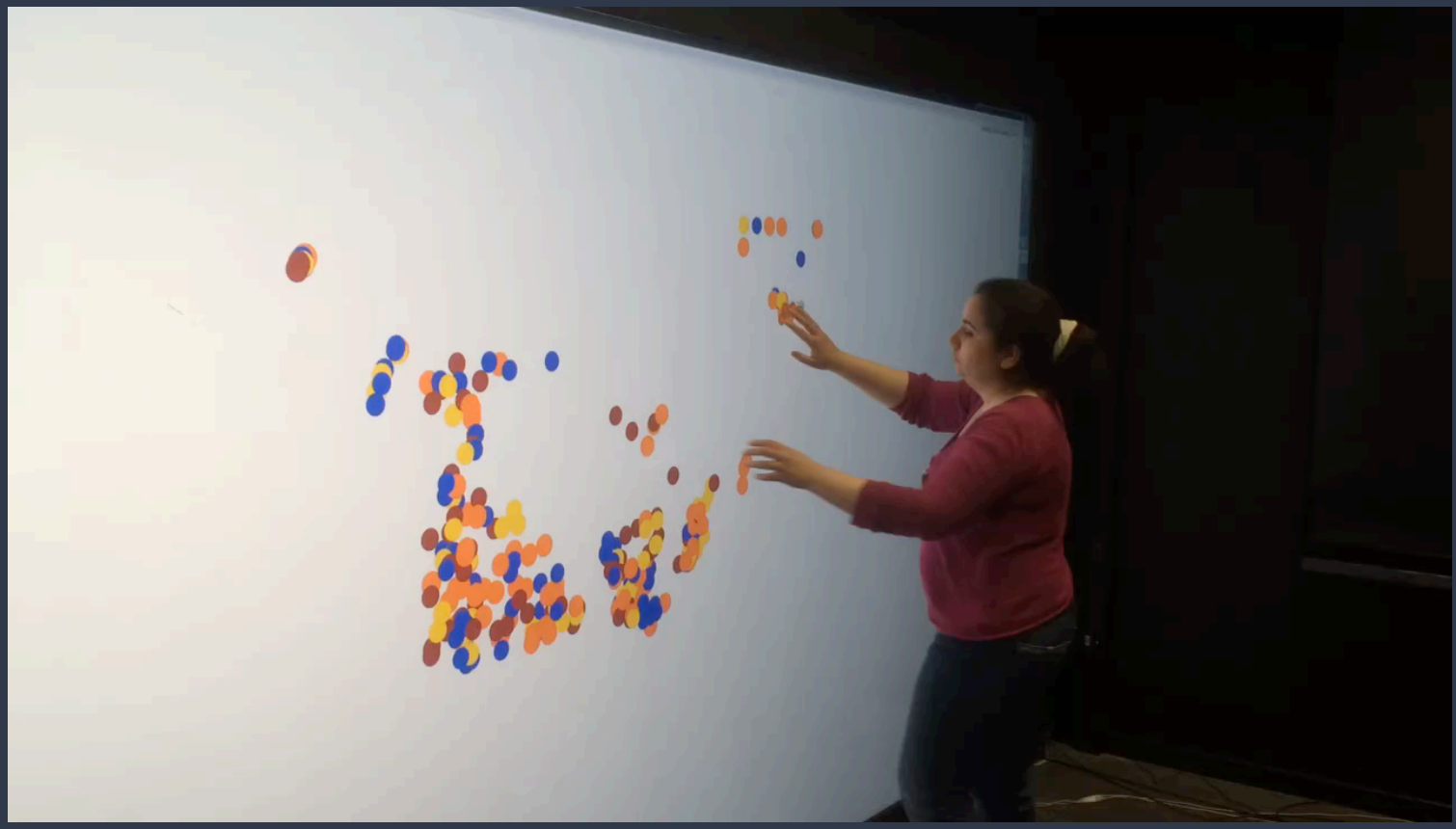
Whereas there is an infinity of different ways to make a single line segment.

Understanding gesture variability

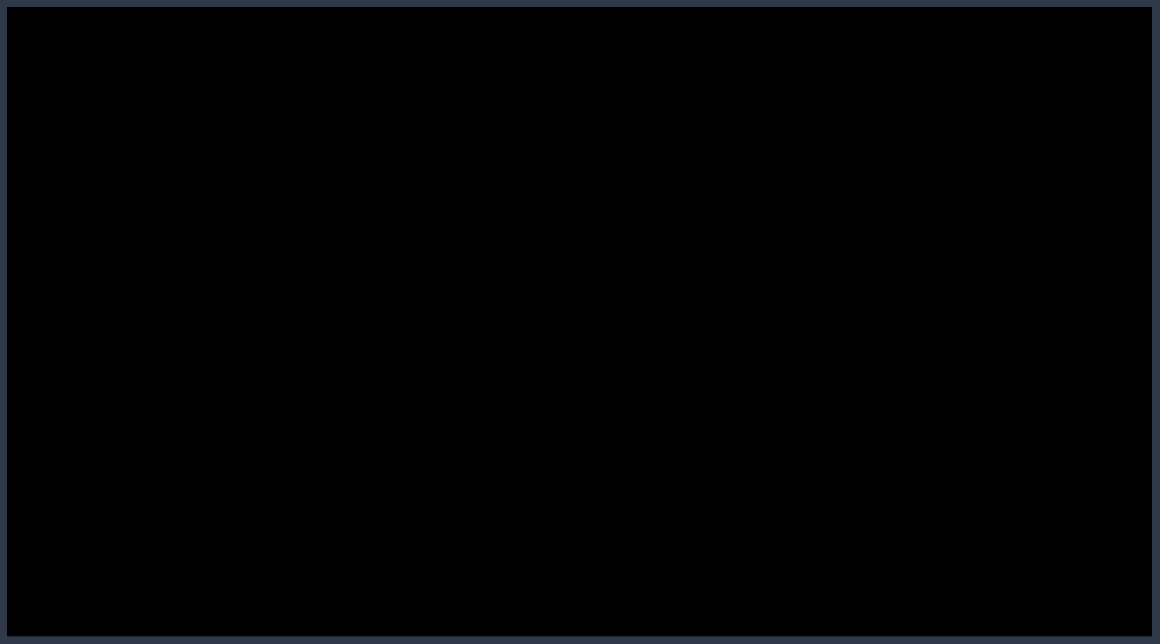
MT gesture variability:
Rekik, Grisoni, Roussel, Interact 2013
Rekik, Grisoni, Vatavu, AVI 2014
Rekik, Vatavu, Grisoni, ICMI 2014



Understanding gesture variability



MINT interactive art trials: Damassama (L. Mercier, 2011)



Microsoft TechDays (feb 2012), Brussel Music Instrument Museum (Feb 2012), Mons music festival 2012, Metz Pompidou Center (2014), Roma art exhibition (july 2014)

children feedback : « feel like magician »
-> human augmentation …

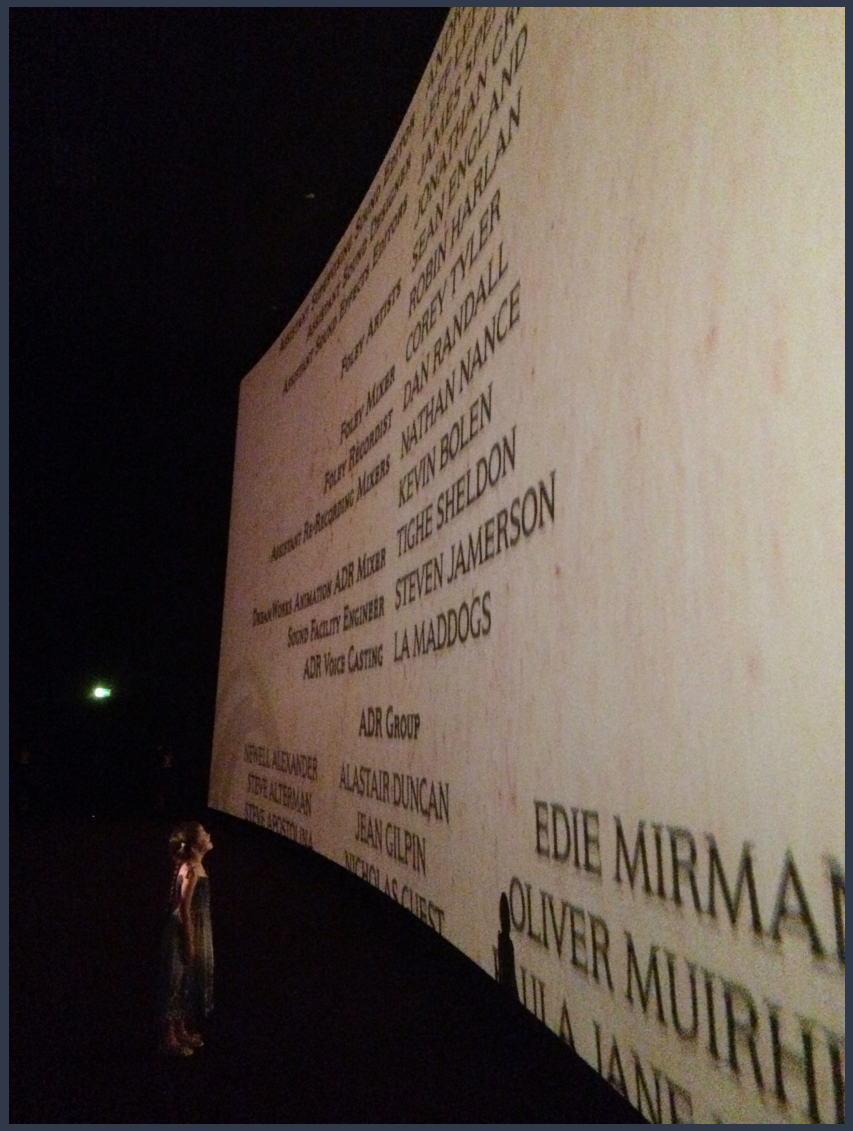
MINT strategy for next years

- Interaction on large displays
- collaboration (need to understand group interaction)
- small-size, tactile feedback, devices

application strategy:

- VR: archeology, architecture, rehabilitation
- non-VR: museums, contemporary arts

- reflexive interactive systems ? (-> children)



Thank you

http://cristal.univ-lille.fr/mint

(© S. Cotin)