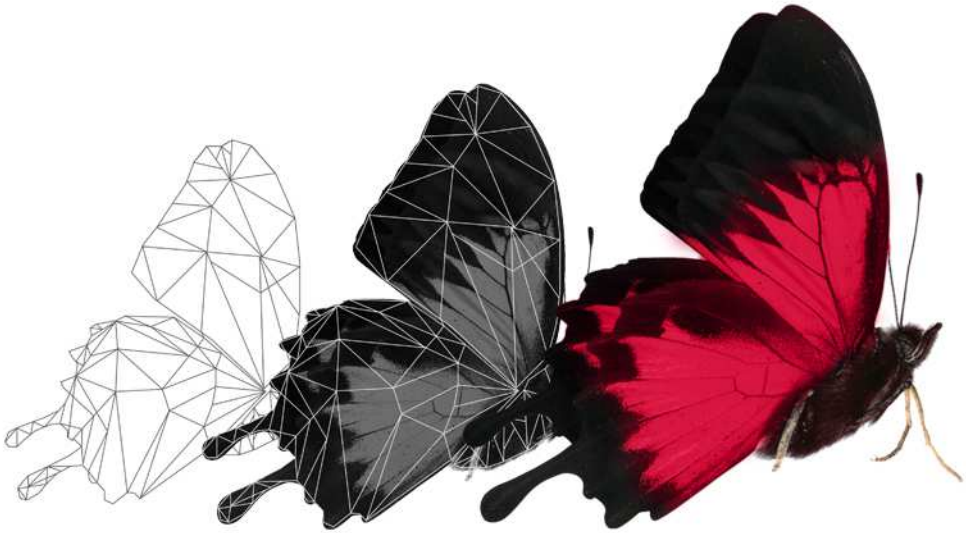
CREATING
EMOTION
WITH
TECHNOLOGICAL
EXPERTISE



UMONS numediart

INSTITUT DE RECHERCHE POUR LES TECHNOLOGIES CREATIVES DE L'UMONS

La réalité augmentée sans lunettes : projections, incrustations, holographie

Prof. T. Dutoit, UMONS

FEDER
UNION EUROPEENNE
Wallonie
LE FONDS EUROPÉEN DE DÉVELOPPEMENT RÉGIONAL
ET LA WALLONIE INVESTISSENT DANS VOTRE AVENIR

numediart
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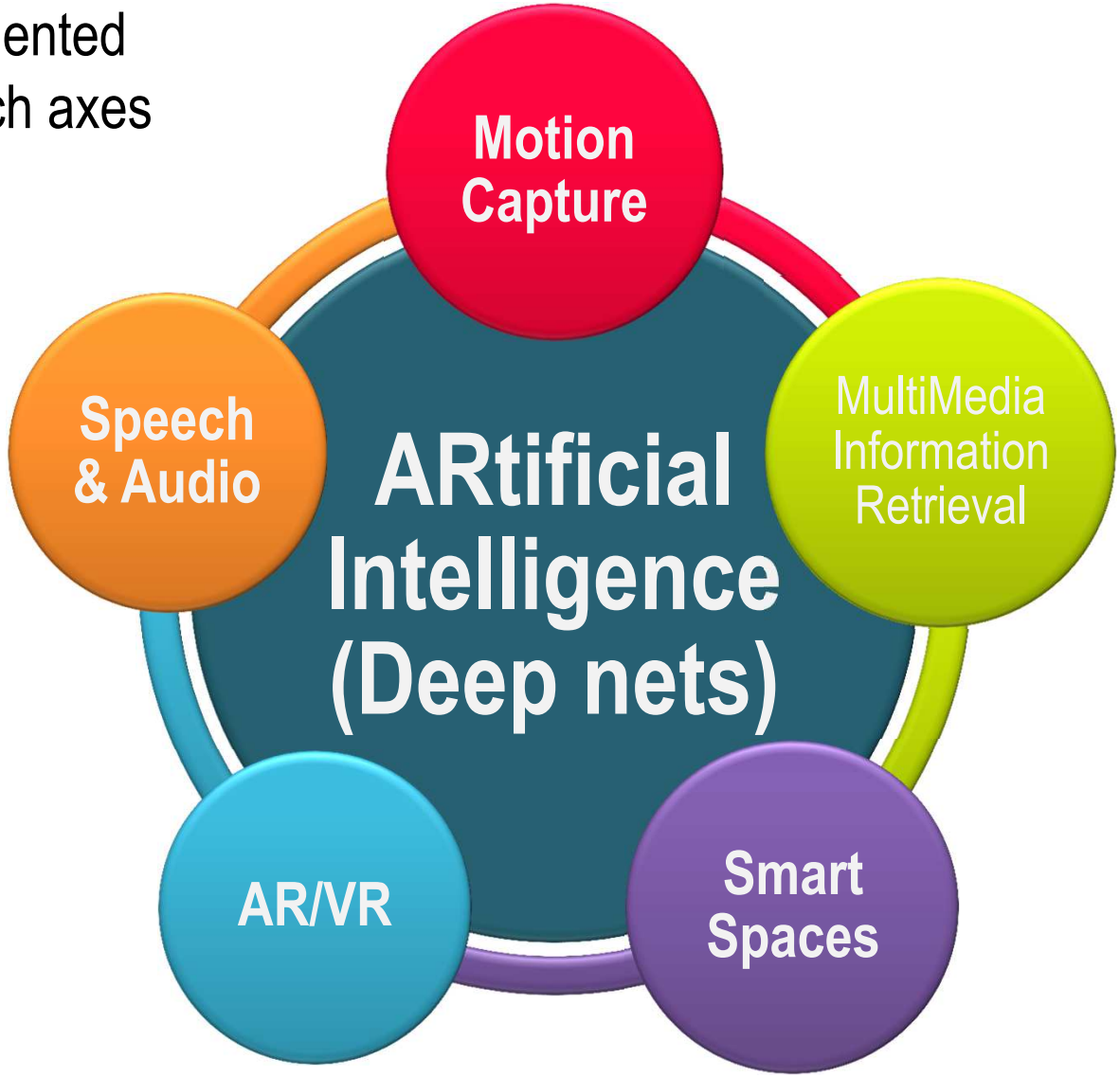
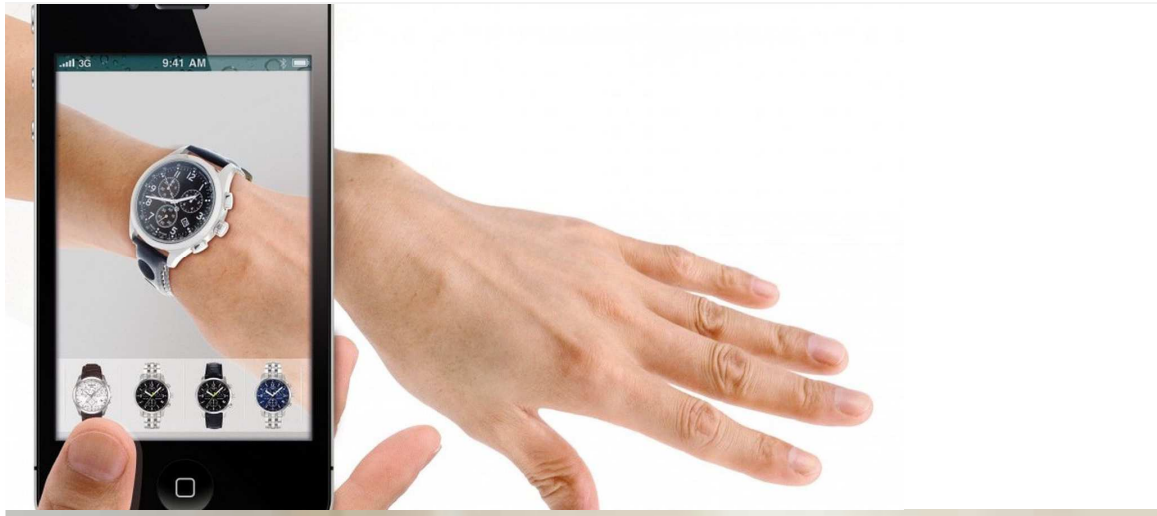
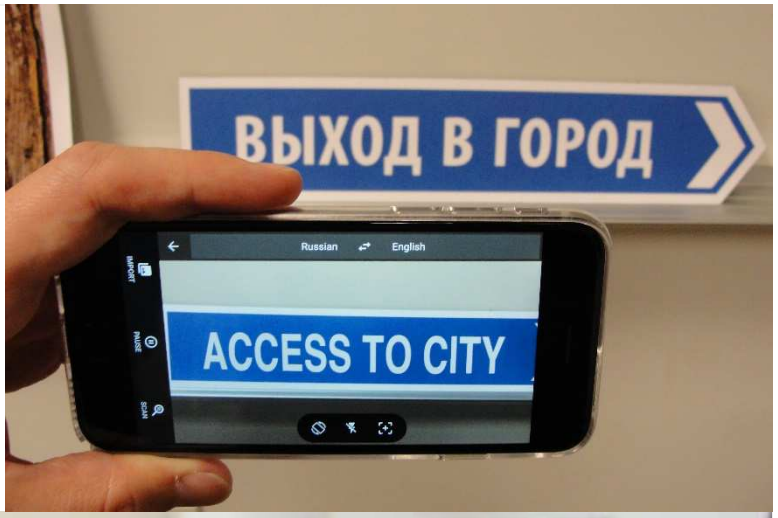
Tool-oriented research axes



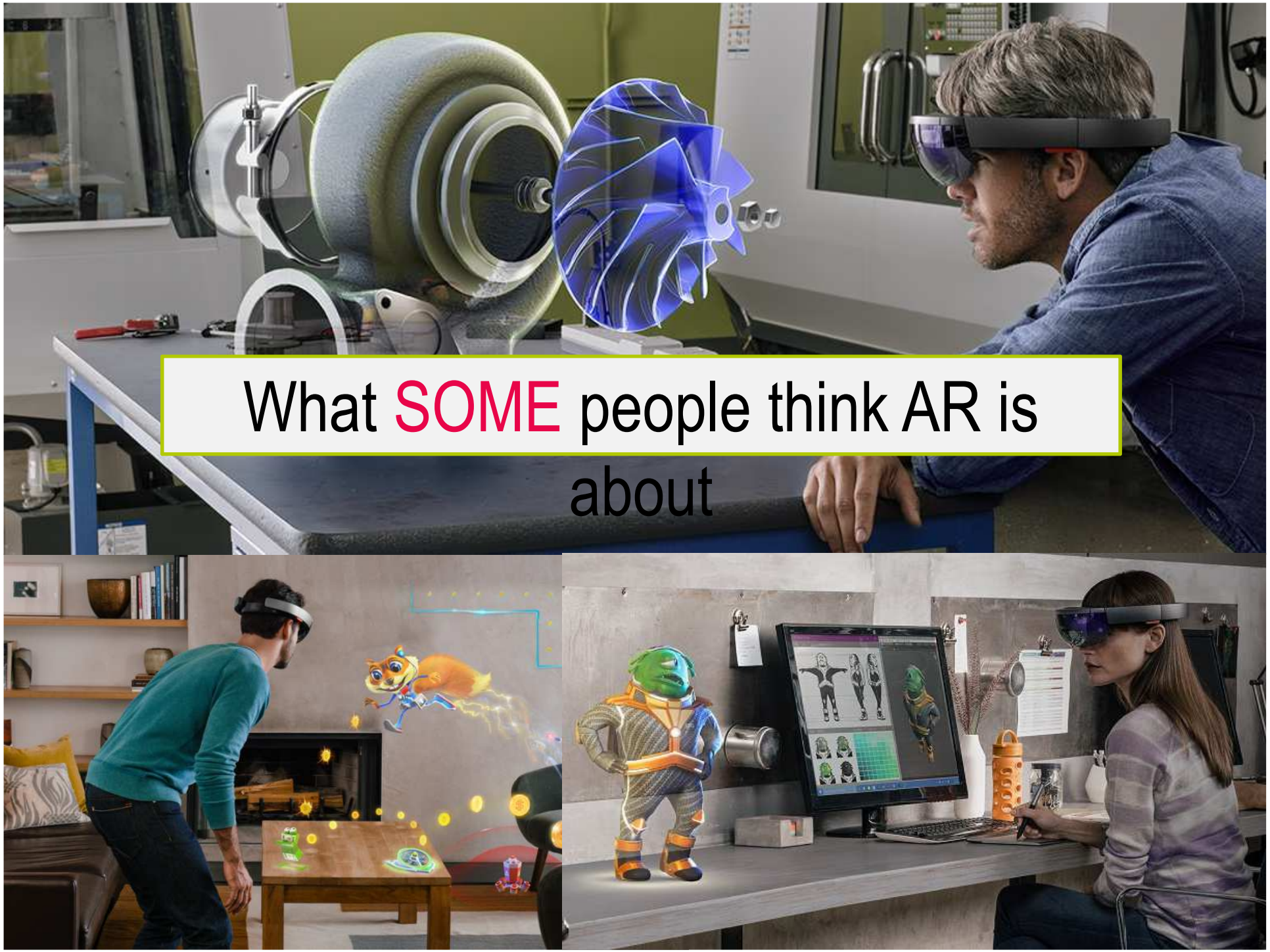
Contents

- AR for the masses
- « Low tech » AR : anamorphosis
- Spatial AR
  - Parallax
  - « Holographics » displays
  - 3D mapping
- Spatial AR challenges





What most people think AR is about


What SOME people think AR is about

What IS AR about?

Strictly speaking
The technologies developed for increasing perception by transferring **more** information and data **about the real world** we perceive through our senses.

*More broadly (**"MIXED REALITY"**)*
The technologies developed for increasing perception by transferring **virtual** information and data **into the real world** we perceive through our senses.

What ABOUT AR for the masses?

The technologies developed for increasing perception by transferring **virtual** information and data **into the real world** we **collectively** perceive through our senses.

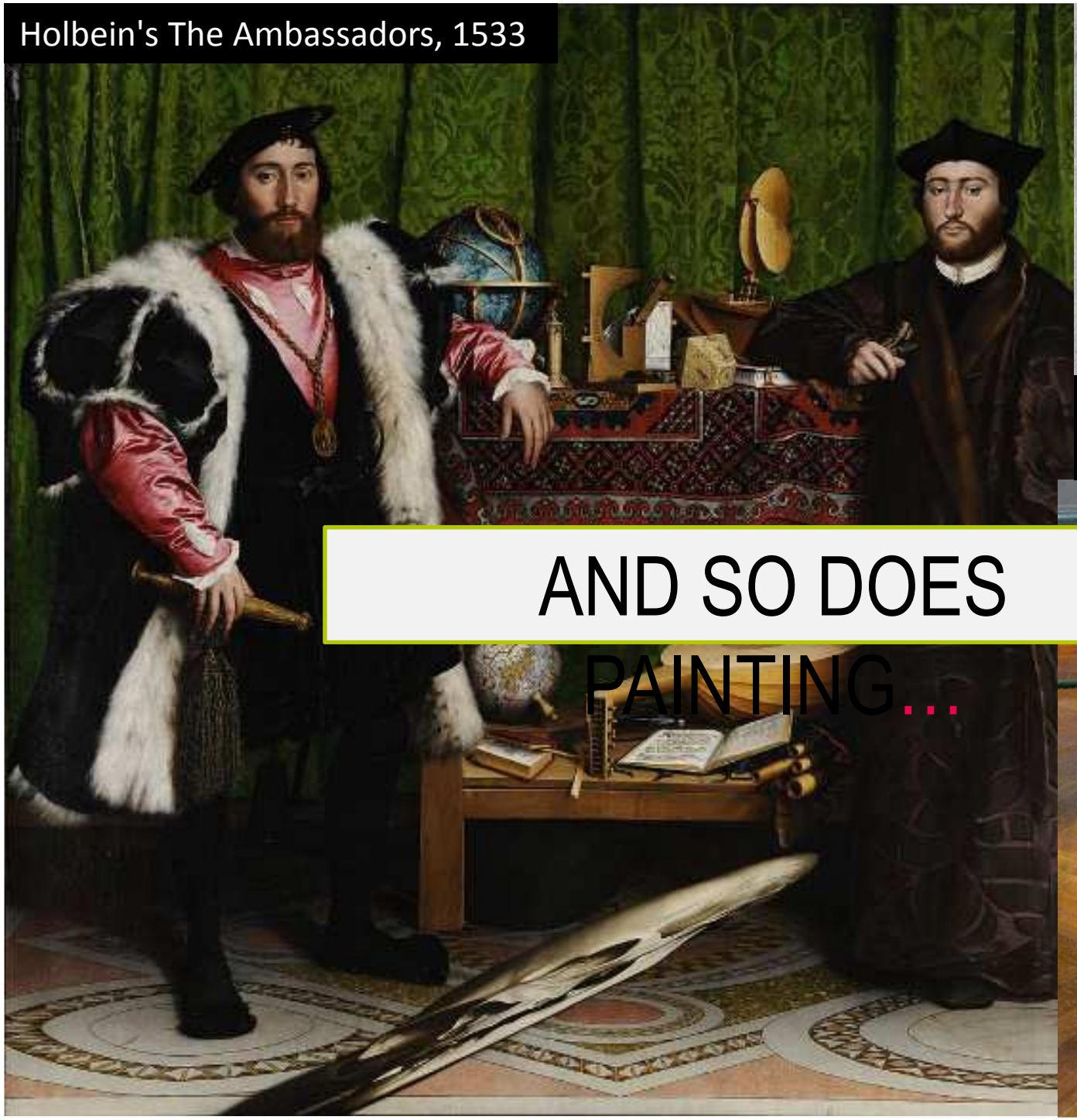
IS PAINTiNG AR?

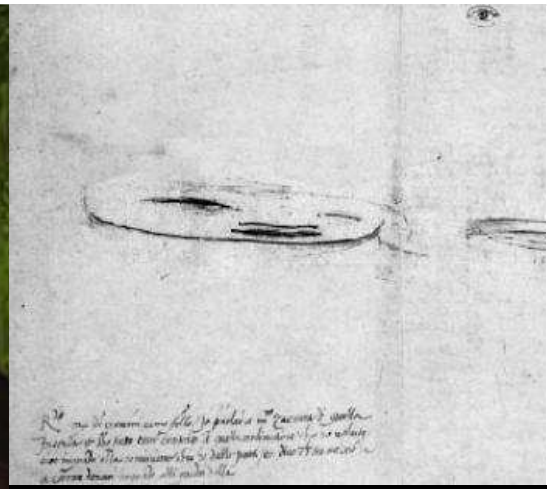
Giant Slug (Julian Beever, 2013, street art, NYC)

BUT Anamorphic PAINTiNG can be…

BUT Anamorphic PAINTiNG can
be…

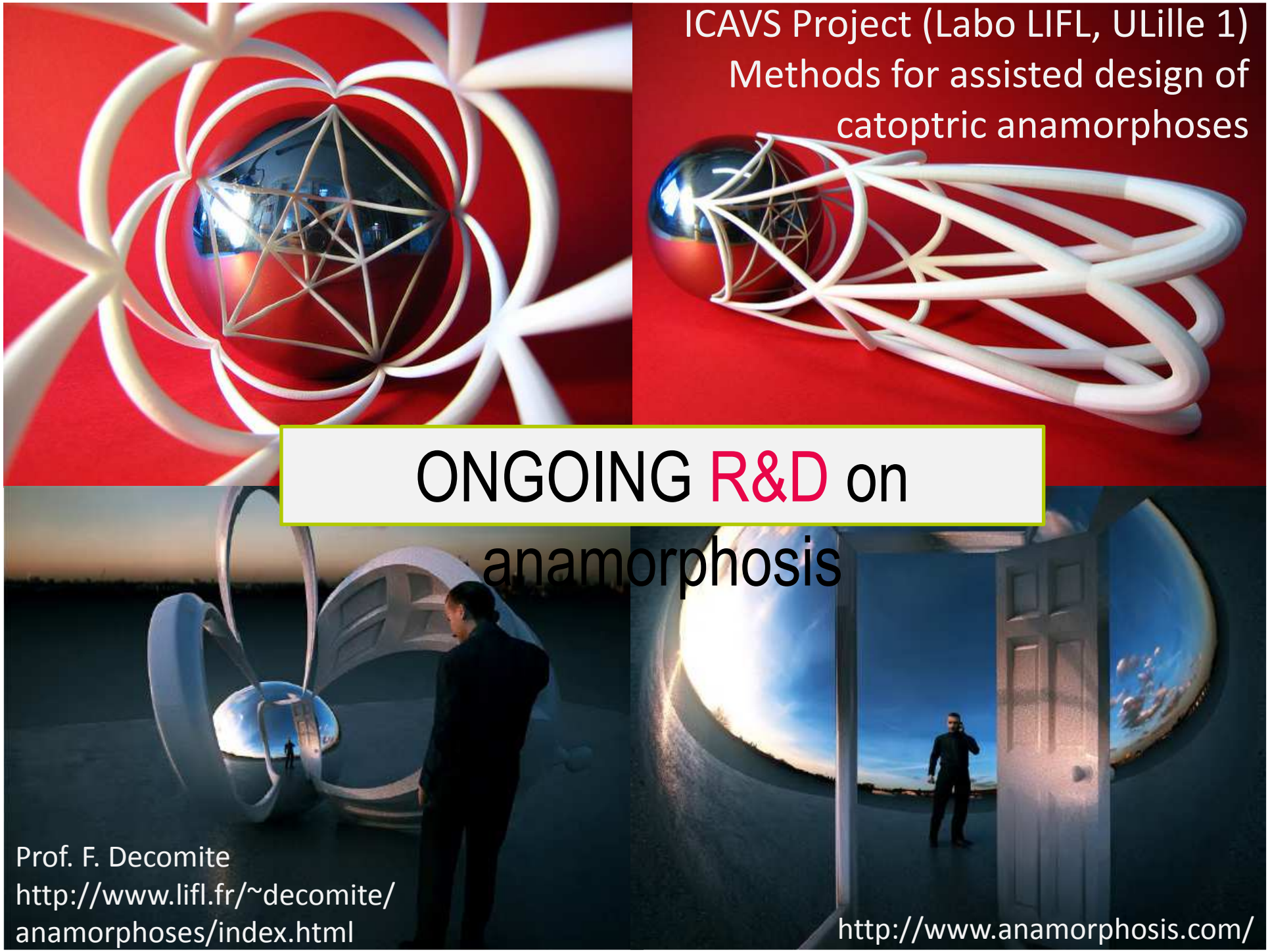
Holbein's The Ambassadors, 1533





Leonardo da Vinci,
(1452-1519)

AND SO DOES PAINTING...


ICAVS Project (Labo LIFL, ULille 1)
Methods for assisted design of catoptric anamorphoses
ONGOING R&D on anamorphosis
Prof. F. Decomite
http://www.lifl.fr/~decomite/anamorphoses/index.html
http://www.anamorphosis.com/

DynaMic anamorphosis

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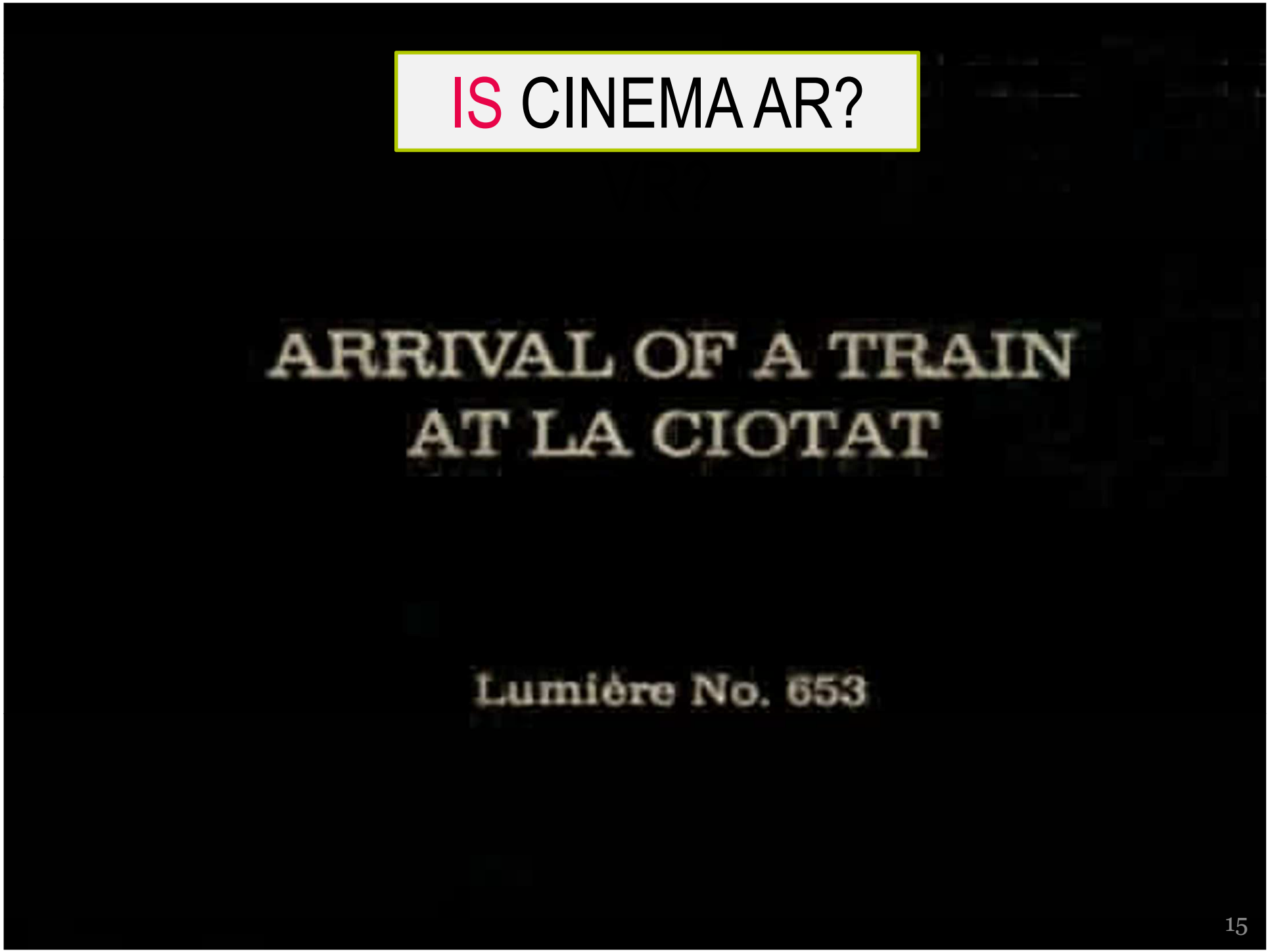
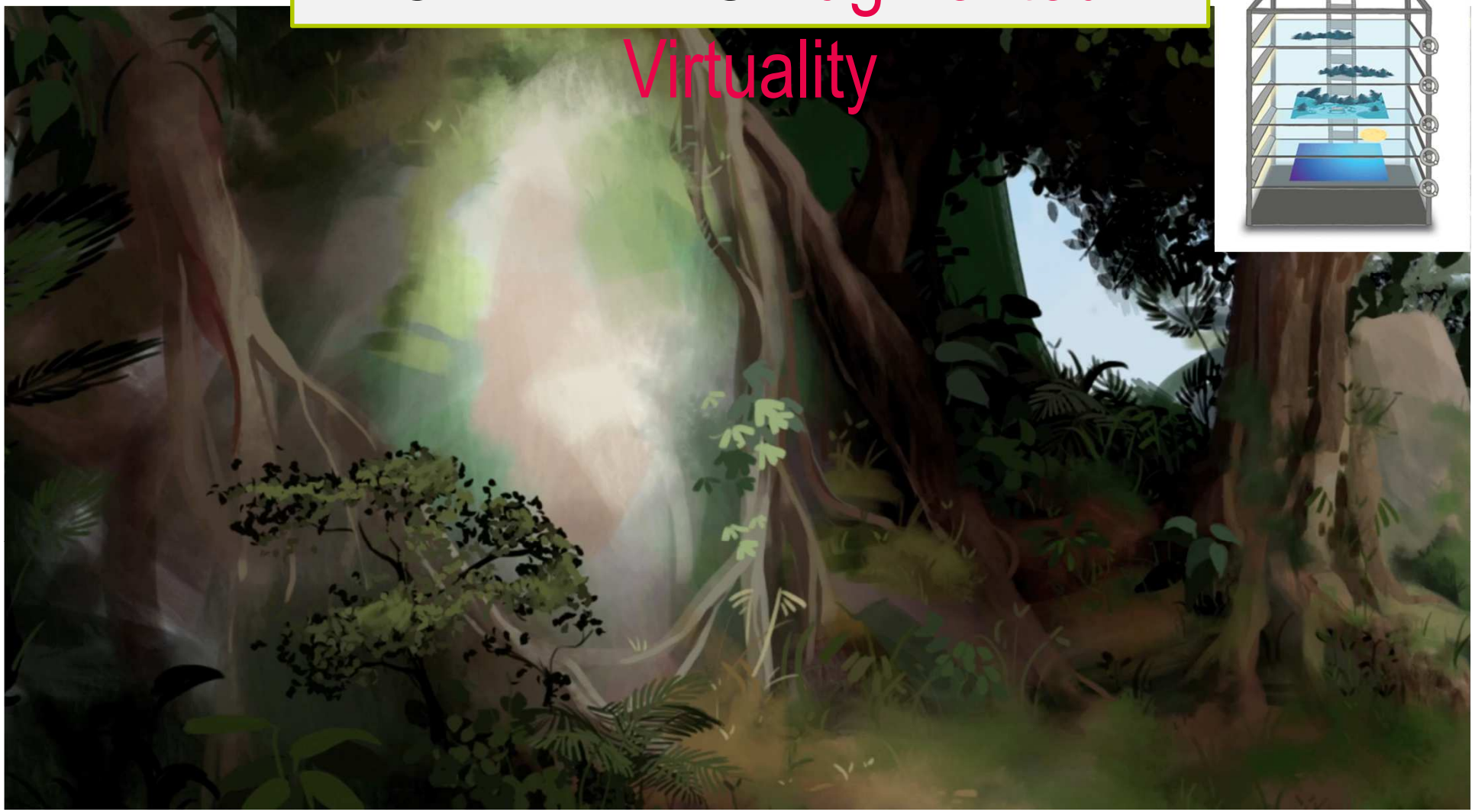
IS CINEMA AR?



But interactive IMAGES can

CINEMA AS Augmented Virtuality



3D presence from **parallax**

Multiplane camera, Disney studios (1933)

CINEMA AS Augmented Virtuality

3D presence from **parallax**

Parallaxe, Patrick Jean & NUMEDIART (2011)

CINEMA AS Augmented Virtuality

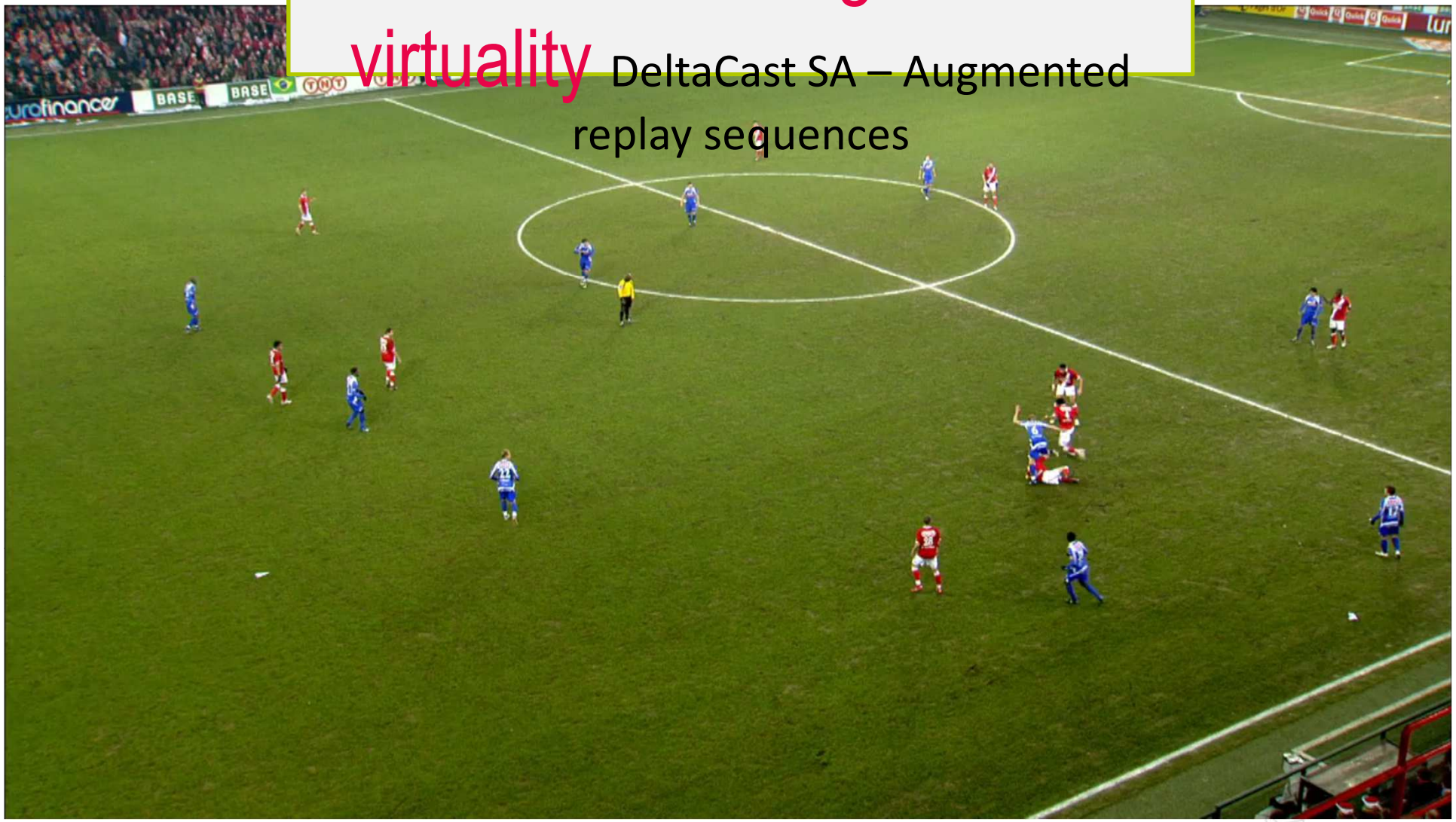
3D projections and 3D screens

CINEMA AS Augmented Virtuality

Autostereoscopic screens

CINEMA AS Augmented virtuality

DeltaCast SA – Augmented replay sequences



CINEMA AS Augmented virtuality

Keyall SA – Interactive Greenkey

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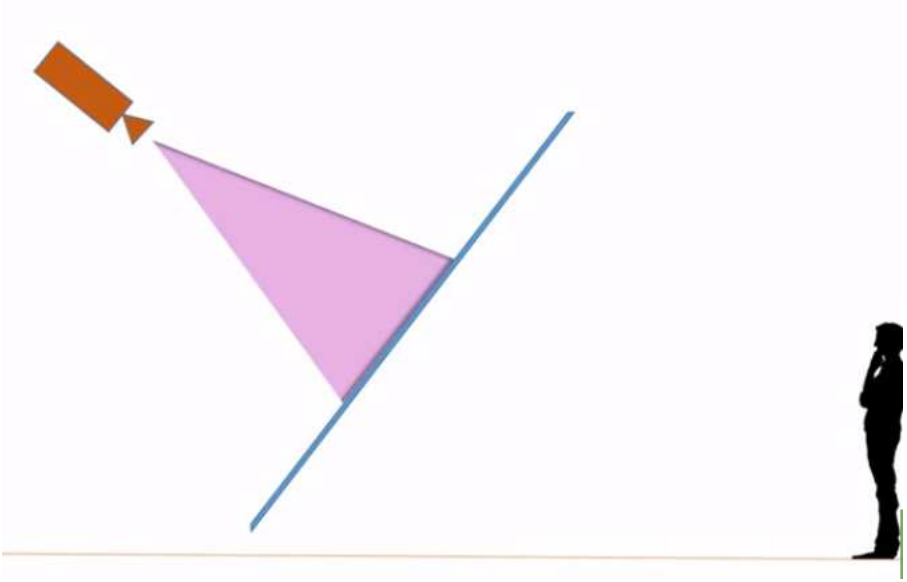
AR WITH Holographic projections

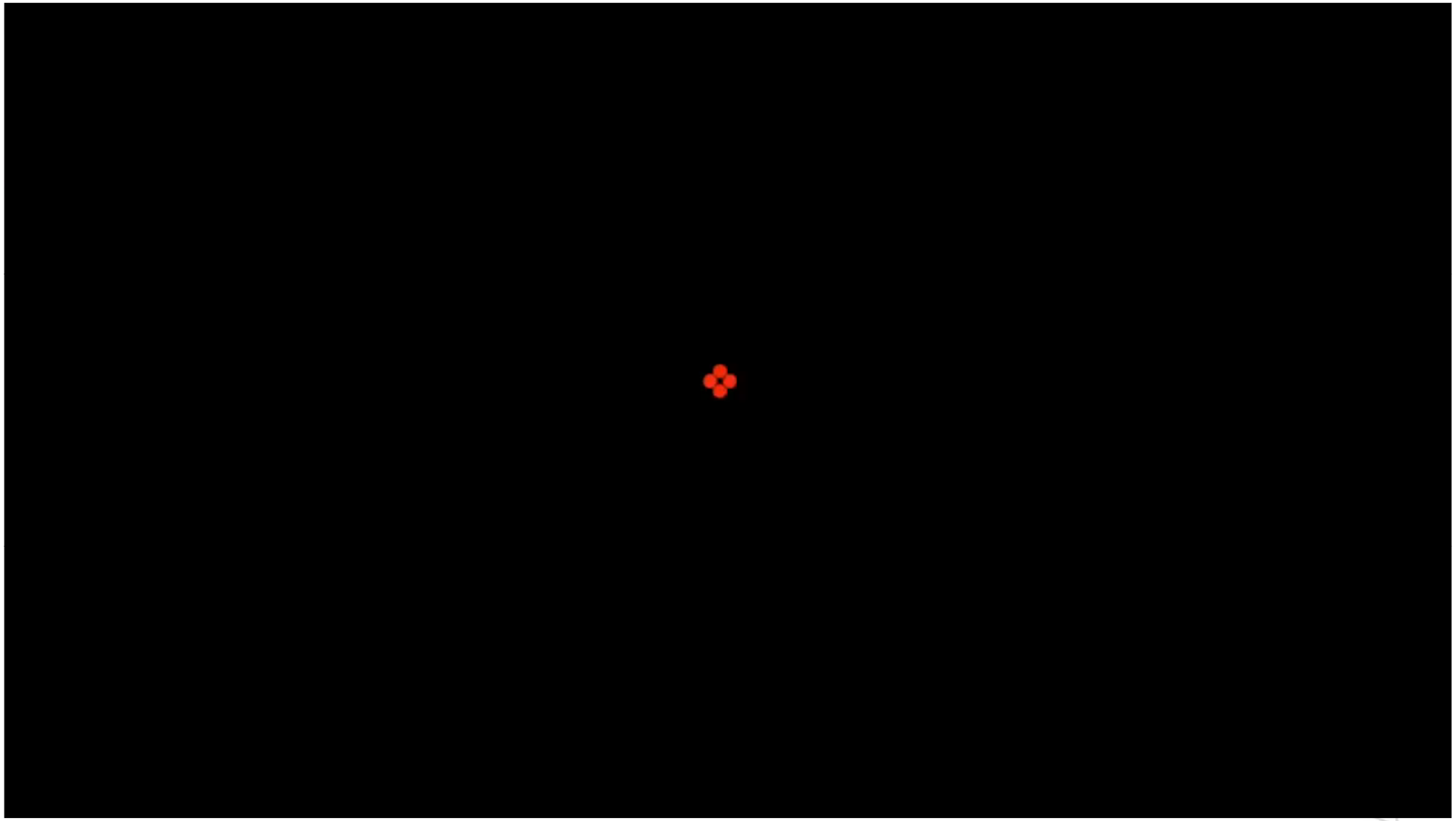


AR WITH Holographic projections

Hatsune Miku (2007…)

AR WITH Semi-Transparent screens

(OLED screens, CES 2016)



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3D MAPPING

(3D mapping – Dirty Monitor Charleroi, WOM)

3D MAPPING

(3D face mapping – D. Marleau, 2011)

3D MAPPING

(BattleKart, Dottignies, 2016)

But also B71, Manu Di Martino, Alterface SA, etc…

INSIDE-OUT SPATIAL AR

(Map-In, First Spinoff project, UMONS, 2014 - …)

DRAGONSLIDE SERIOUSLY FUNNY STUDIO

Monumental gaming :
(collab. DragOnSlide SPRL)

SPATIAL AR WITH Semi-Transparent WINDOWS

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SPATIAL AR challenges
Dynamic spatial AR

http://www.k2.t.u-tokyo.ac.jp/vision/DPM/

SPATIAL AR challenges
Beyond projection

- Beyond projection : Mass interaction
  - Mass positionning (indoor)
  - Mass tracking (indoor)
  - Mass gesture understanding
- Augmented Audio Reality

Beyond projection : Mass interaction

Skemmi SA

Augmented Audio reality

- ***AR Audio*** vs. ***Audio AR*** ☺
  for mixing real sounds and virtual content in real environments – e.g. whisling in a virtual bottle,
  vs.
  for interacting virtual objects by voice commands

- Combined with contextual noise canceling, or audio beamforming (superhuman audio), cognitive services (personal interpreter)
- Combined with holographic audio (via inertial sensors)
- Combined with gaze detection : hearing additional sounds based on what you look at… (language learning, audio description for the blind)

Augmented Audio reality

Smart earphones – *Hearables* (BRAGI GMBH)

"By combining Bragi's smart earphones 'The Dash' with IBM's Watson IoT platform, the companies hope to transform the way people interact, communicate and collaborate in the workplace."