

Infliction of Reality Upon Virtual Models

"Digital Physicality | Physical Digitality"

Prague, 14. 09. 2012



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Infliction of Reality Upon Virtual Models

Concept of the compilation

How it started ... (... and continued here)

If it is real, how can it be inflicted, maybe augmented?
Some examples and remarks about AR/MR, especially Markers

Experiment

There will be no conclusion



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The ACADIA's general list:

"Digital Physicality | Physical Digitality"

Henri did start it somehow.

Wassim Jab: <peeking his head up to see what all the excitement is about>

Volker Mueller: <picking up where Wassim left off:>

Henri's defense

electronic - digital
digital - analog - hybrid
digital - non-digital
digital - real
digital - material
digital - physical
built (physical) drawing - actual work

idea digital models - analog modls
virtual models - physical models
model - real digital/virtual - real world materiality real -
simulated realities of the situation - perfect digital simulation
digital technologies mediation
information - communication
simulation practice - education responsible practice

proper education computer/virtual

Inputs from Brian Johnson, Ted Hall, Murali Paranandi, Rich Nitzsche, and others,

Henri still on defense

Werner missed 2 points (after 3 days of discussion):

- There is an existing model in Augmented Reality: the Milgram- continuum.
- Discussions in architecture have almost always an inherent aspect of Utopia.



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Continuation here at the conference: "Digital Physicality | Physical Digitality"

... taken some notes in Prague, neat picking:

"virtual forces"

"visual voids"

"Interreality"

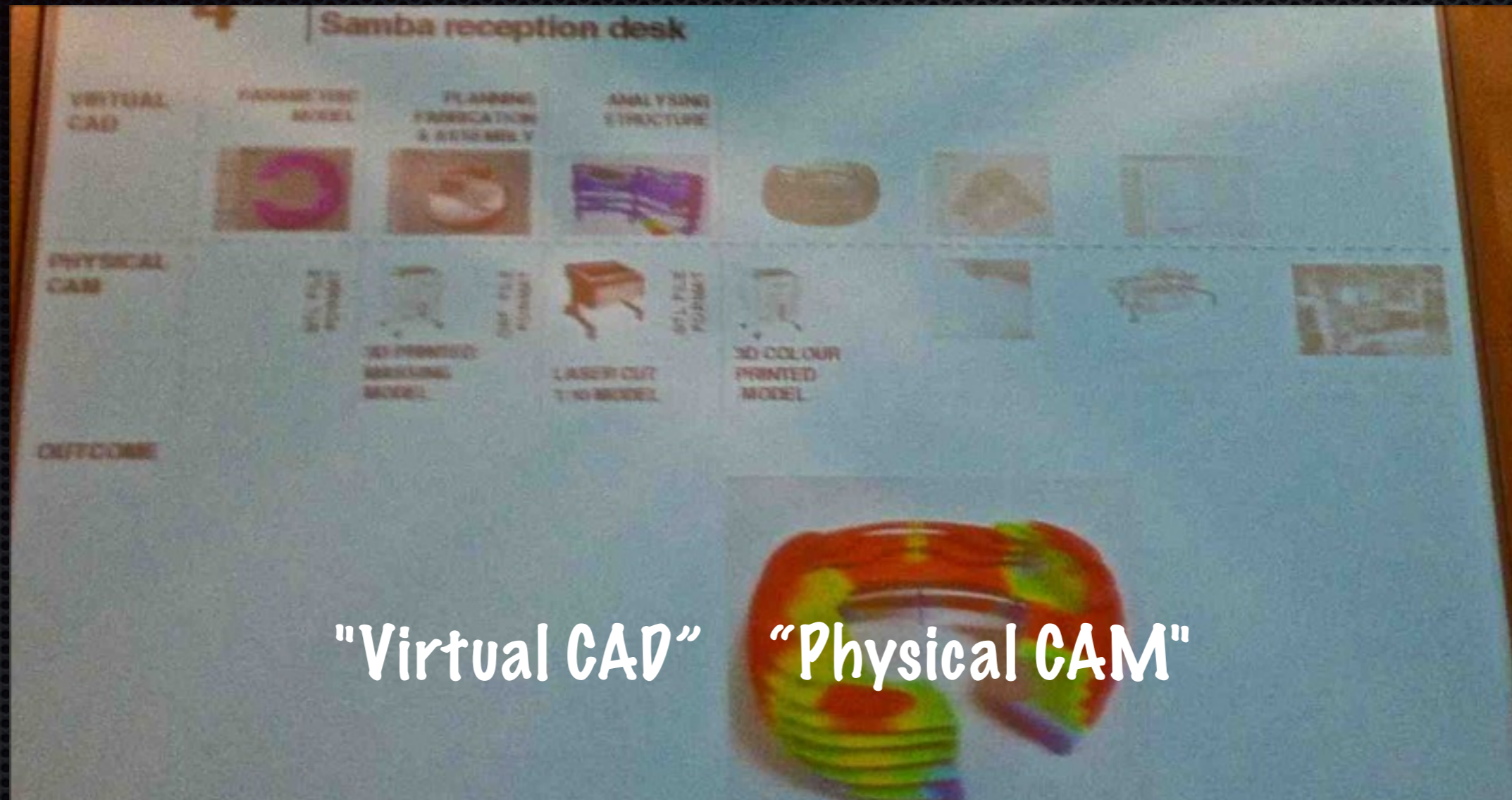
What are we dealing with?



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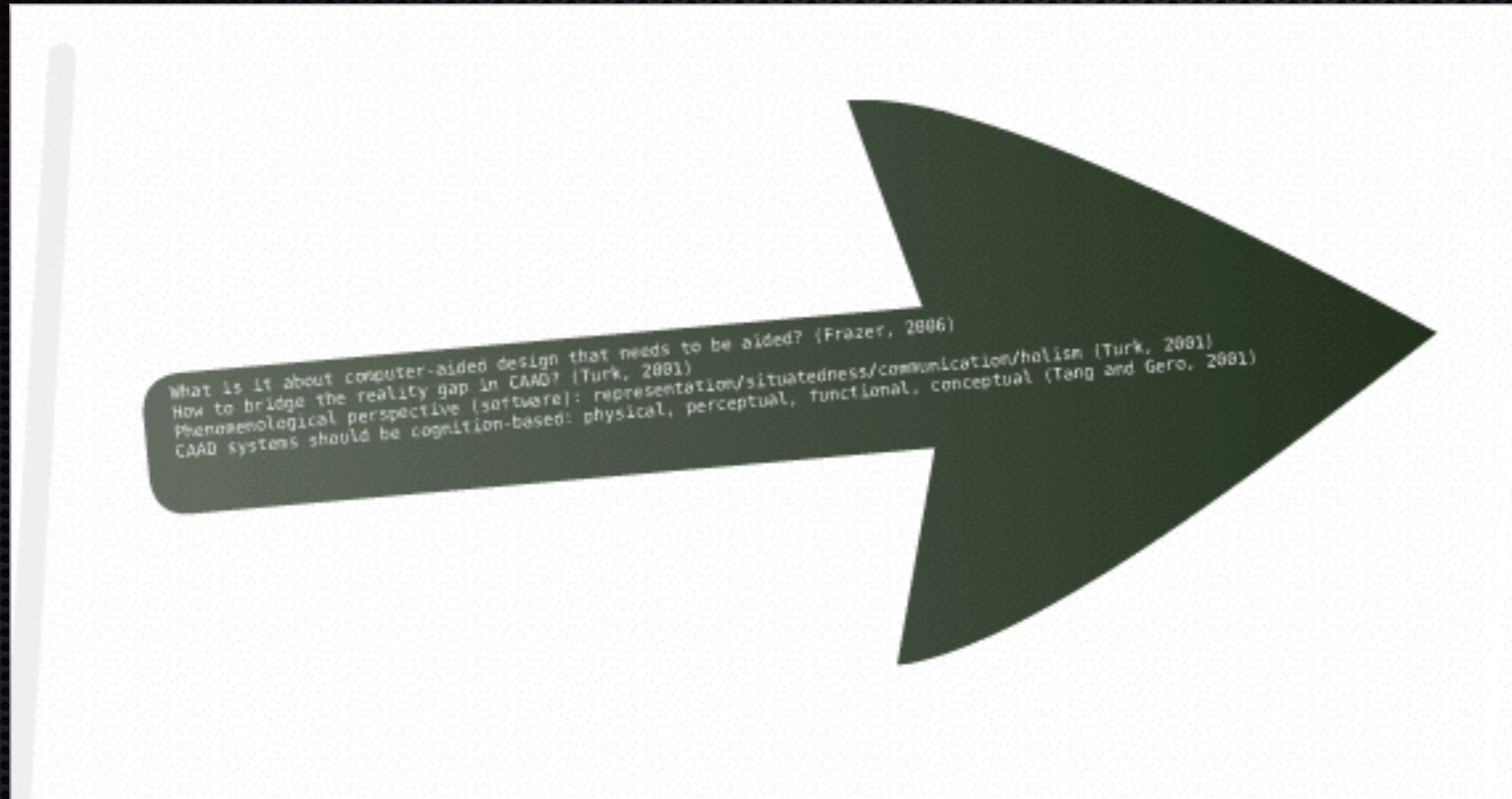


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by [163], Samba reception Desk

Questions from [138]



...
How to bridge the reality gap in CAAD? [Turk 2001]
...



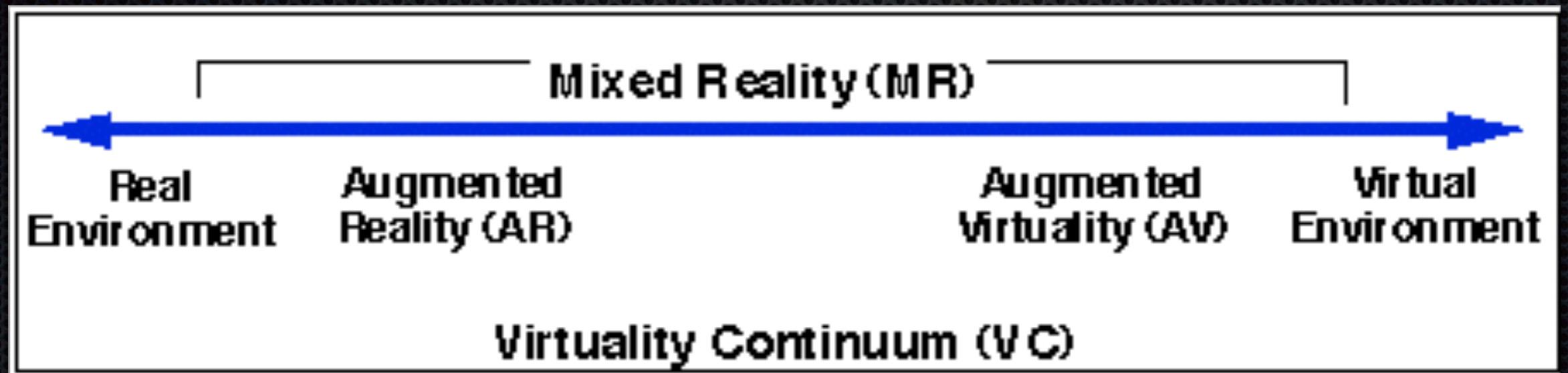
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Milgram Continuum

Paul Milgram and Fumio Kishino (1994):

A TAXONOMY OF MIXED REALITY VISUAL DISPLAYS



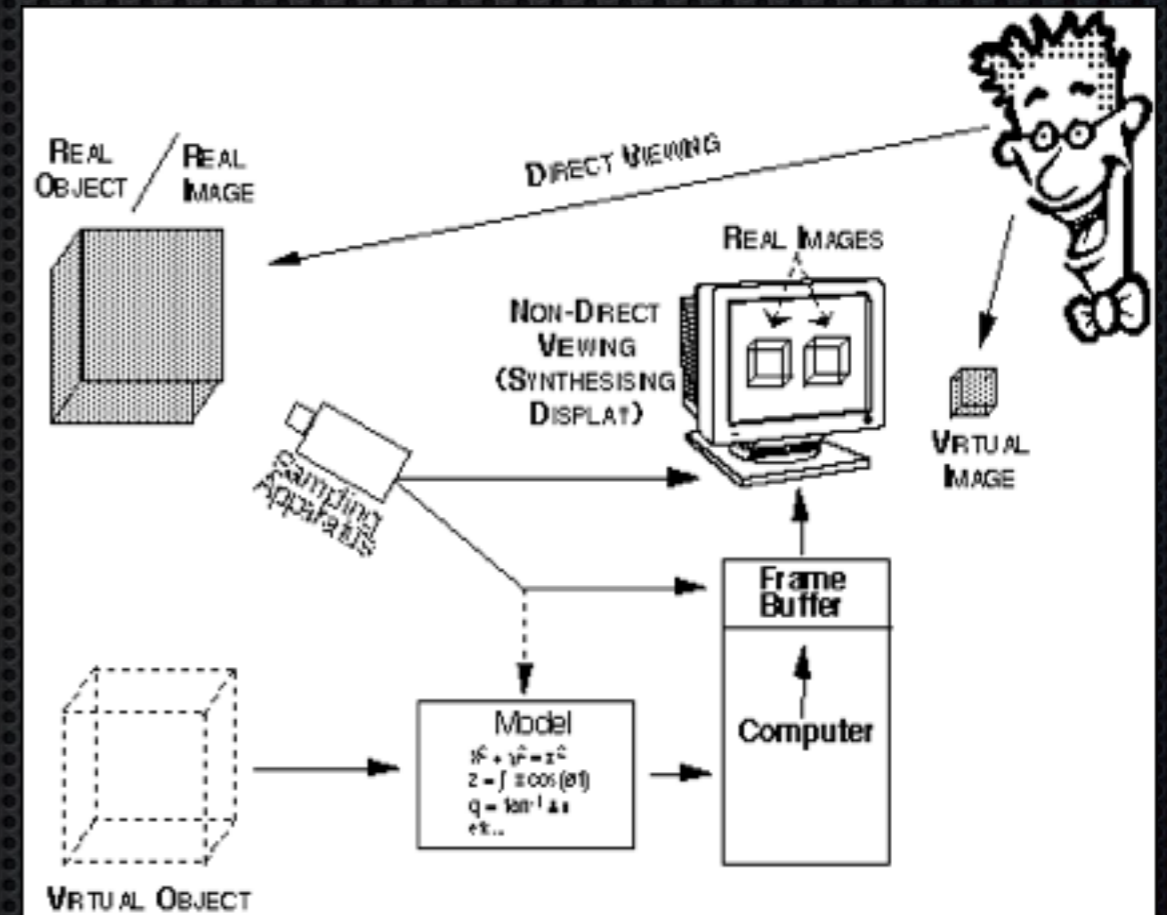
Original from their paper

Paul Milgram and Fumio Kishino

A TAXONOMY OF MIXED REALITY VISUAL DISPLAYS

Augment Reality with 2 views,
one directly into the real world
the other into a virtual world.

Composition of images.



Original from their paper

Introducing Augmented Reality

Invented by Boeing in the late 80s, early 90s.
Inspired by the movie Top Gun, with Tom Hanks.
Others: Mixed-, Composed-, Hybrid Reality or - Virtuality;
Hybrids; Hybrid Space etc.

10+ years of silent development, only for insiders.
First booth after 2000
Since 2007 common on smart phones.

Explanation: To become real, it has to be in real time.



Augmenting Reality...



Linie	Ziel	Abfahrt in
12	Mitte Am Kupfergraben	1 min
M13	Wedding Virchow-Klinikum	5 min
M13	Wedding Virchow-Klinikum	17 min



... maybe is related to computation, but not necessarily

Explaining Augmented Reality

Augmented Reality is understood as visual augmentation.

**A registered camera provides images from the real world.
A virtual image is rendered accordingly.**

Both images are composed into one composite image.

:

- Haptical augmentation.**
- Olfactional augmentation.**

Tracking based AR as on smart-phones

Pro:

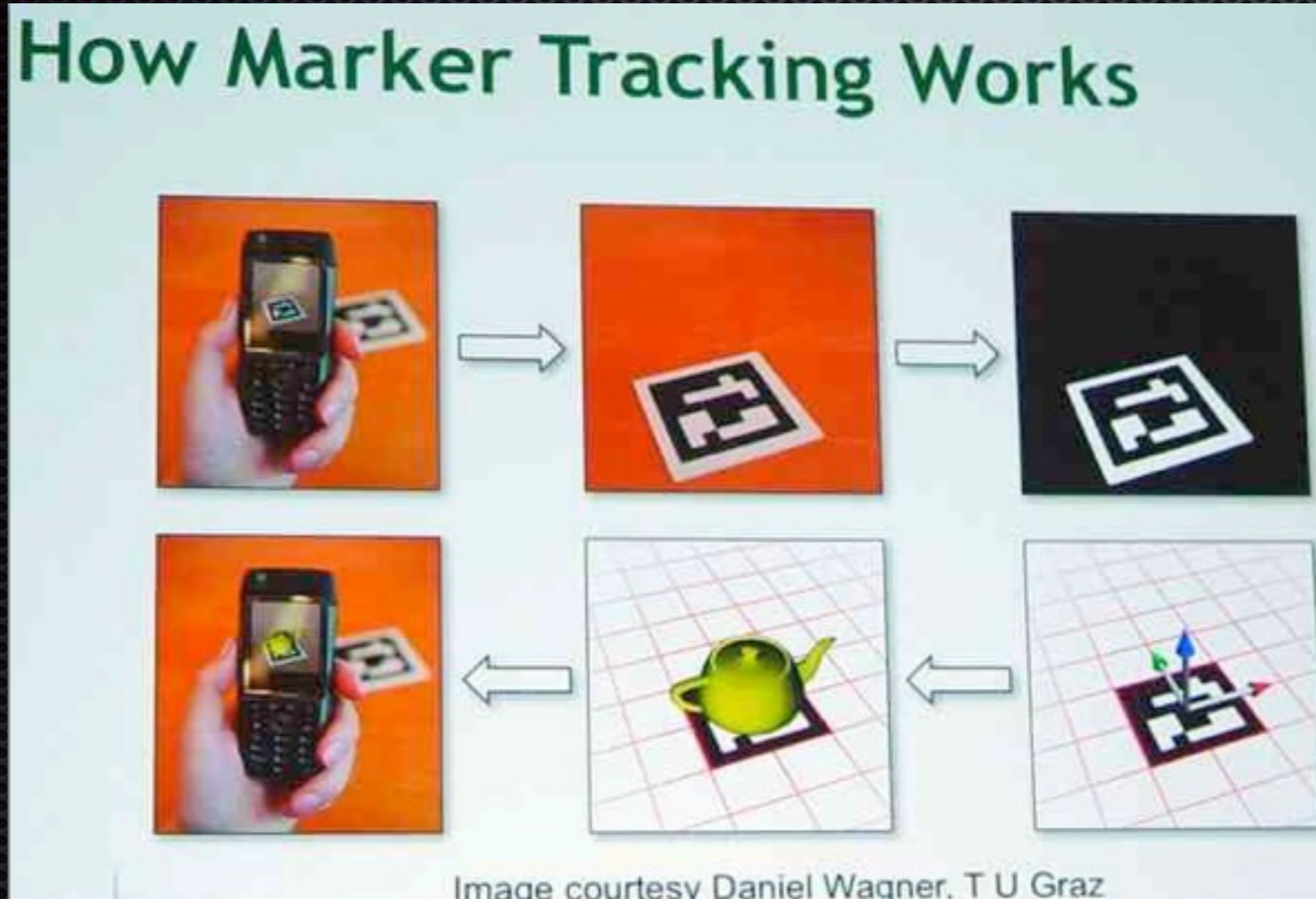
- Affordable with in-built GPS etc.
- Everywhere accessible, deployable etc.

Con:

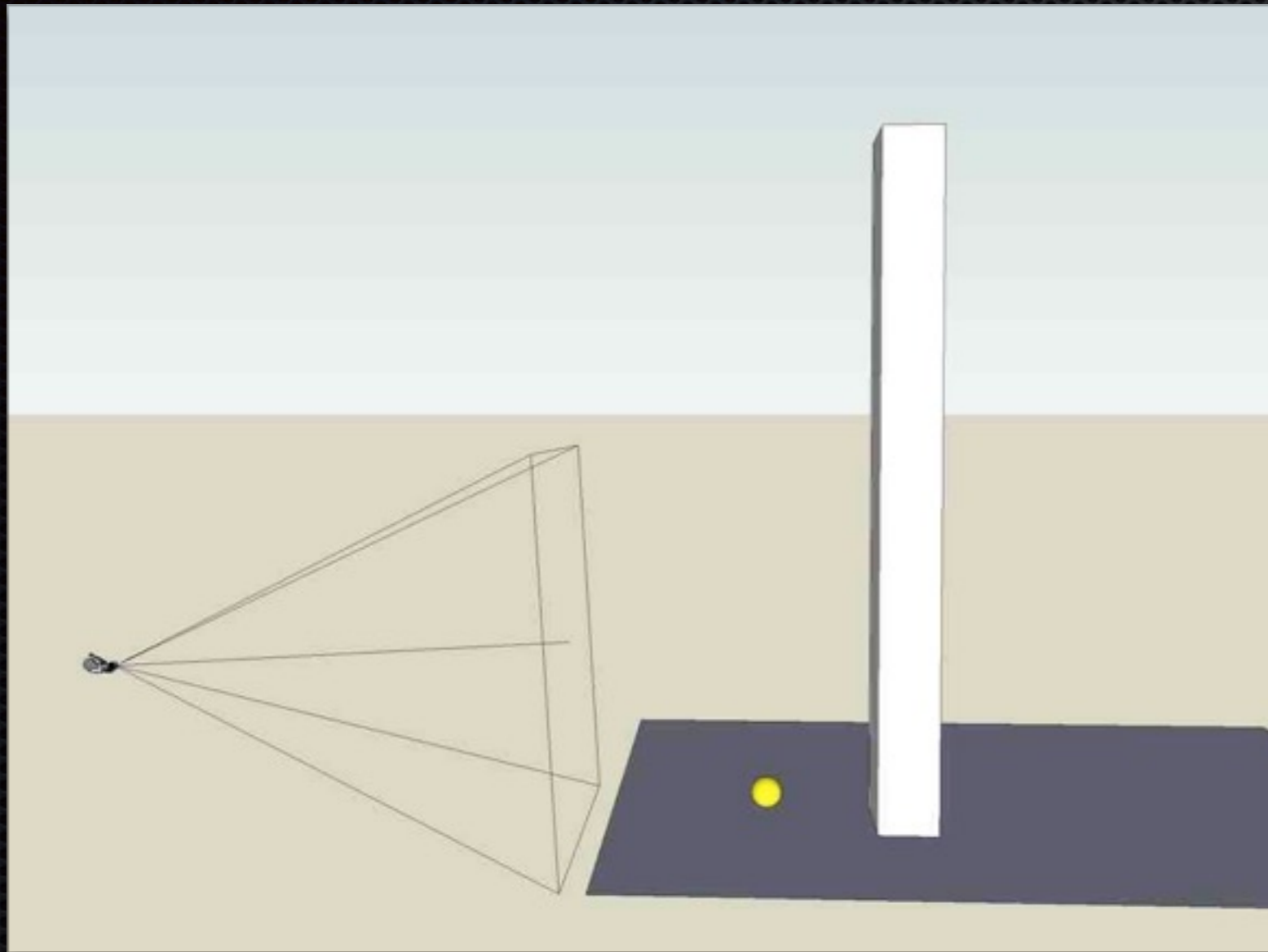
- Delayed processing
- Images are not really synchronized, jagged.



Marker based AR



Marker and Tracking based AR



Combination of both systems for large scale outdoor augmentations

Camera with viewing volume, model and fiduciary feature

About Augmenting Reality ...



... or the composition of images.

ACADIA conference Chicago 2009

Panel discussion



Screenshot of a
live Augmentation
with an iPhone 3G
W. Lonsing

on the right: Tristan d'Estree Sterk

Examples



Column in a backyard



by Peter Anders

Shapes, only one is real.

Other Examples



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lifeClipper3 by Jan Torpus,



Setup:

HMD, earphones and backpack
Tracking based.

Outdoor, but needs guidance.

Single user experience



Result:

Unique spatial impressions
in space and time.

ToeInput



**Toe Input with Mobile
Projector and Depth Camera**

by:

**Daiki Matsuda, Keiji Uemura,
Nobuchika Sakata, Shogo
Nishida**

...search on Youtube

Milgram Continuum

Paul Milgram and Fumio Kishino: Virtuality Continuum

Enhanced presentation.



Source: Giovanni Vincenti

This principle is subject to a lot of variations

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Appearances

Virtuality:
Physical presence of a technical machinery

Reality:
Acts as blue-print for virtual models.



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Gaming



Concepts introduced:

- Gravity
- Lighting
- Color
- Solid Objects

Usage: Physical Engine

Total immersion



The technical machinery demonstrating its real presence.



Markers

Markers are inflictions on purpose.



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Fiduciary feature:

Captured balloon:

- diameter: 3 m
- max. height: 100 m
- volume: 20 cubic m



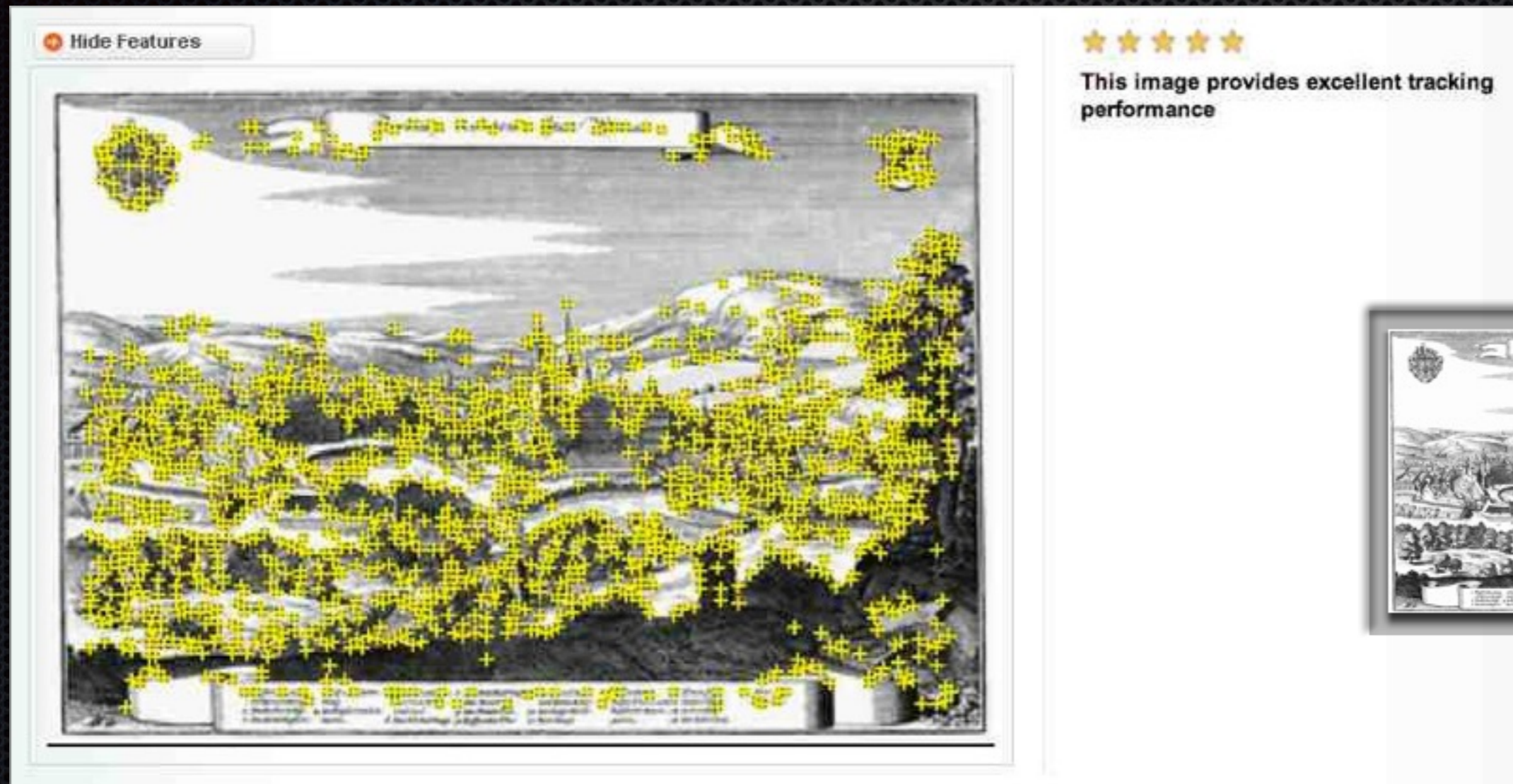
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Large scale
fiduciary feature
in the air.

Marker: Hidden Pattern

Instead of markers the QCAR SDK provides image targets. Images are uploaded, examined and processed.



Weimar 1650,
Merian

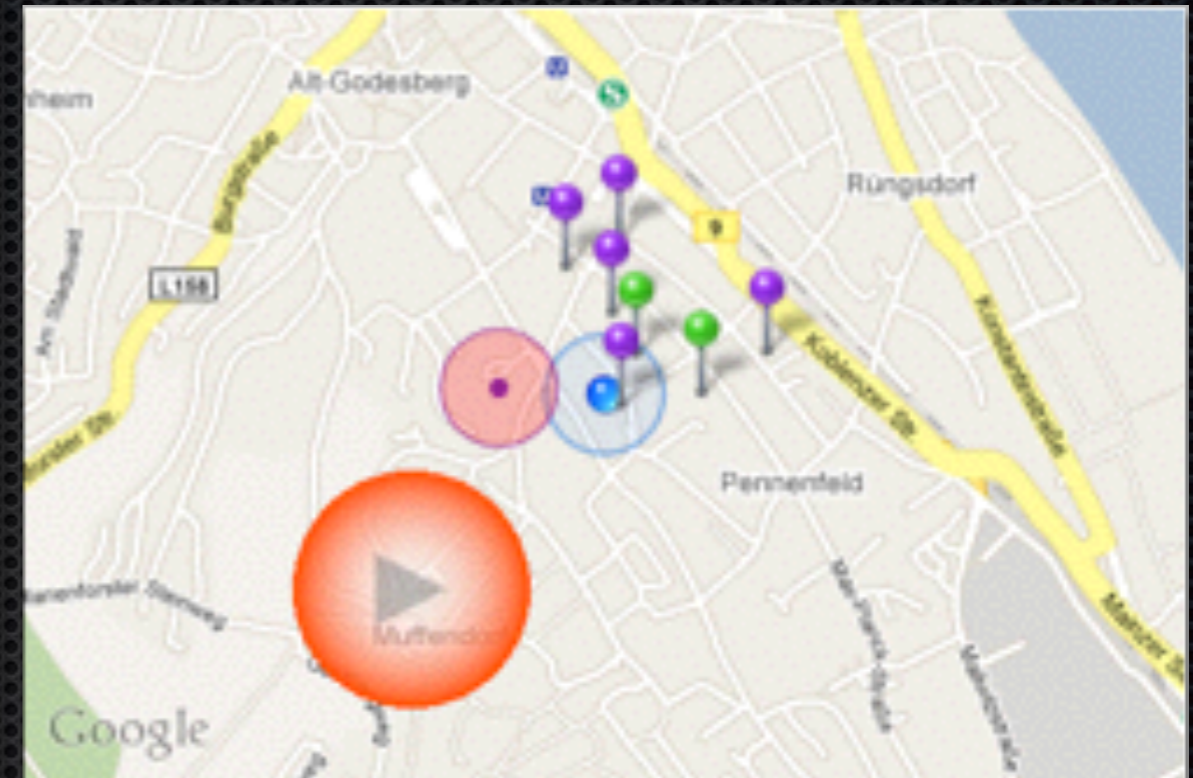
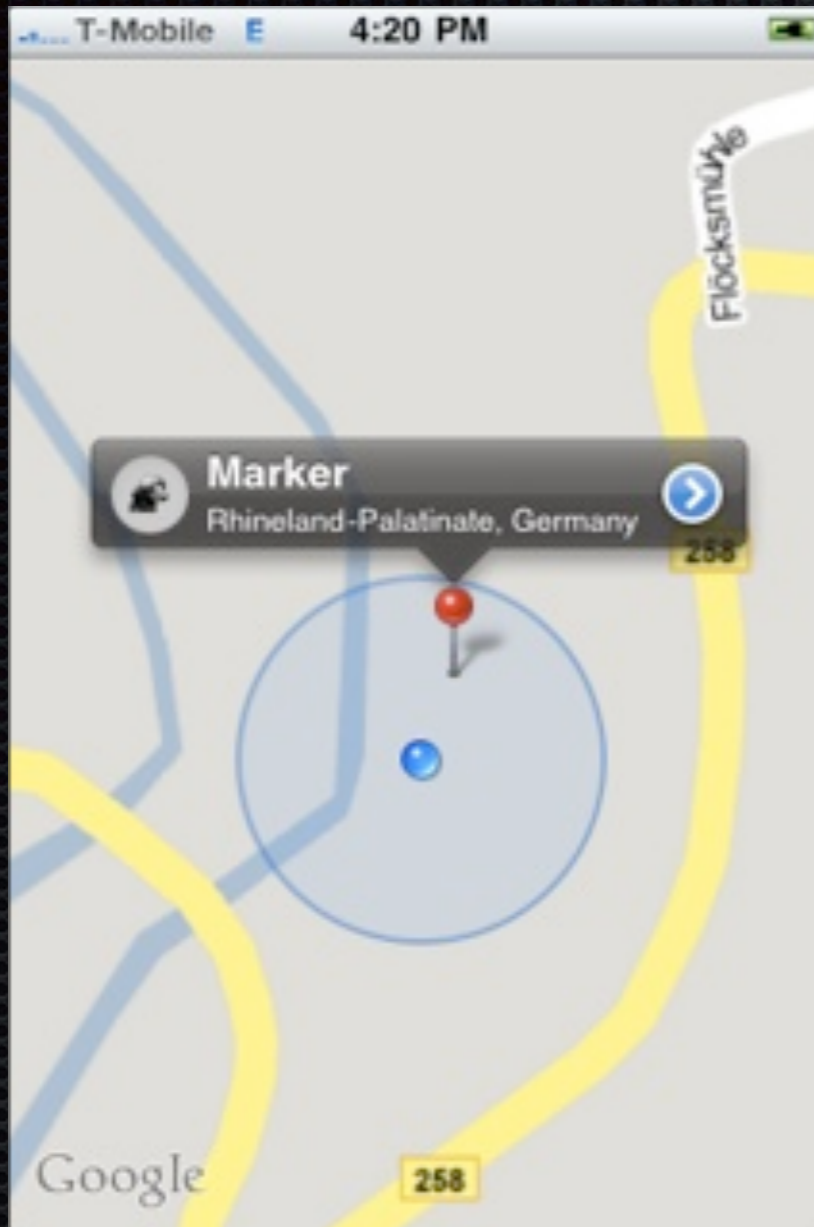
Marker: Hidden Pattern

These Markers have a dual nature, with or without a computational device.



Marker image from the Qualcomm SDK

Reflections on the map



A "real" position is transferred to a position on a map

Other infliction:

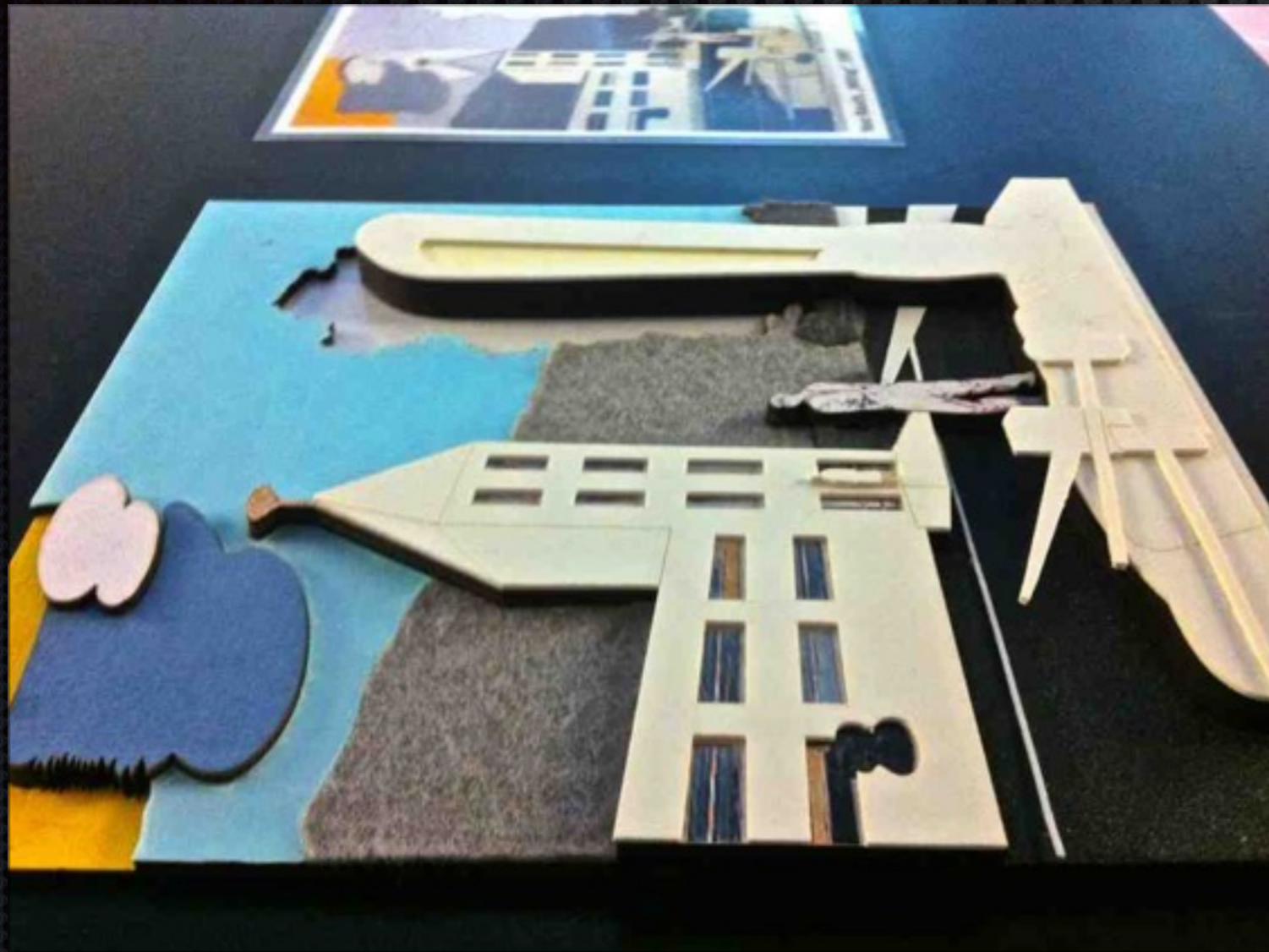
e.g. disabilities



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Infliction: Visually impaired



Neo Rauch, "Mittag", 1997

Haptic paintings [133]:

Using rapid prototyping technologies to grant visually impaired persons access to paintings

Experiment

Two images are following....



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Experiment



A



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Experiment



B



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ETNA

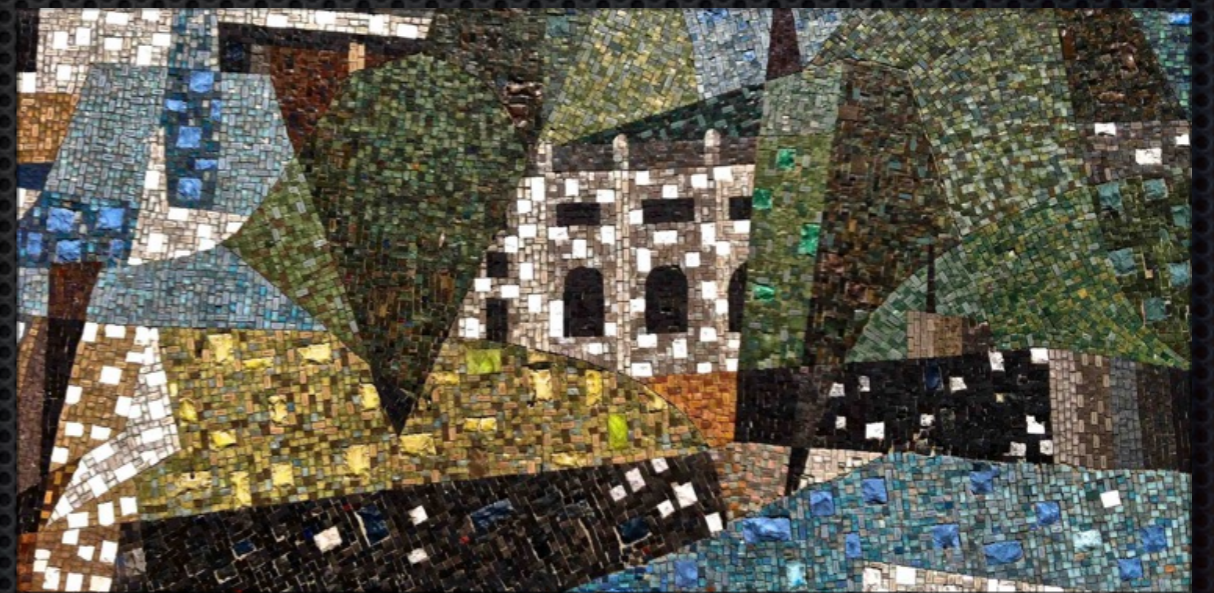
Experiment



A

The difference is time.

Where are the differences?



B

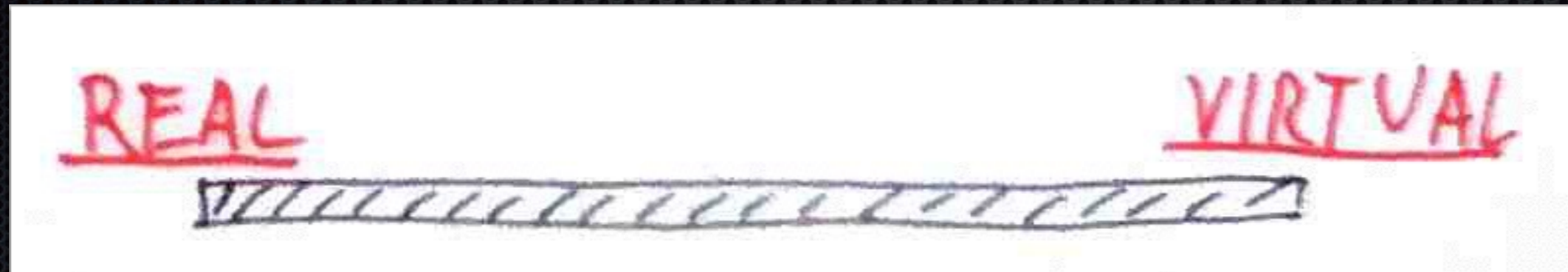
Reality



The stone is not a stone



Simplified Continuum



based on Paul Milgram and Fumio Kishino (1994)