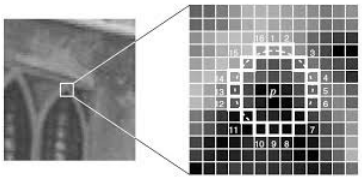
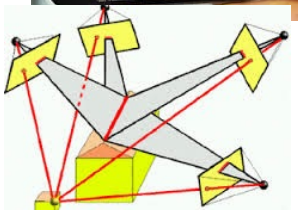
Computer Vision for Augmented Reality

2014





T. Chateau

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2. Detectors and Descriptors for Augmented Reality
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Introduction

Augmented reality is nowadays a wonderful communication tool

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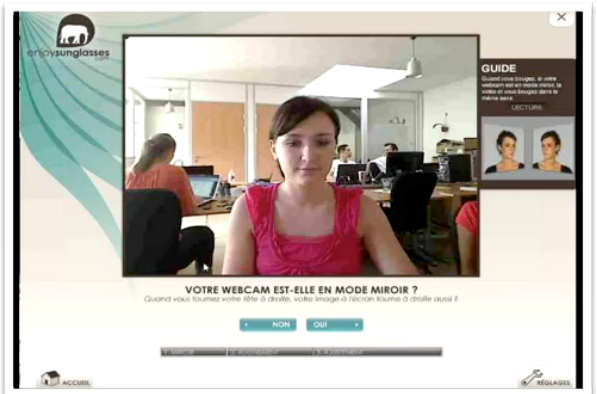
Augmented reality is nowadays a wonderful communication tool



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AR: definition

Defining characteristics [Azuma 97]

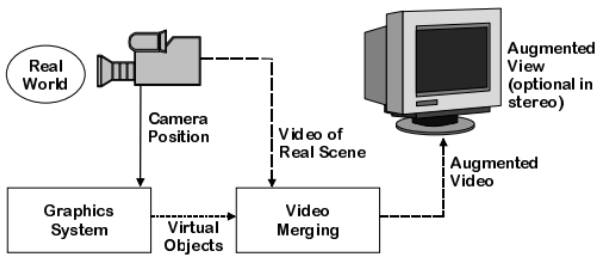
1. Combine real and virtual images (both can be seen at the same time)
2. Interactive in real-time
3. Registered in 3D (virtual objects appear fixed in space)

AR Vs RV

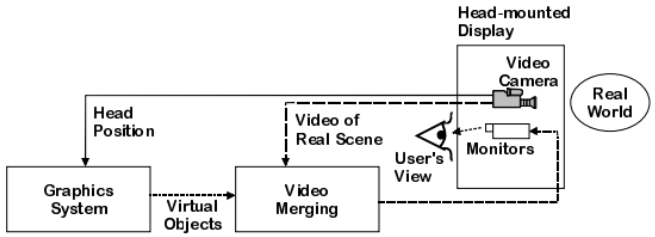
Virtual reality: replaces reality

Augmented reality: enhances reality

AR: how does it works?



AR: how does it works?



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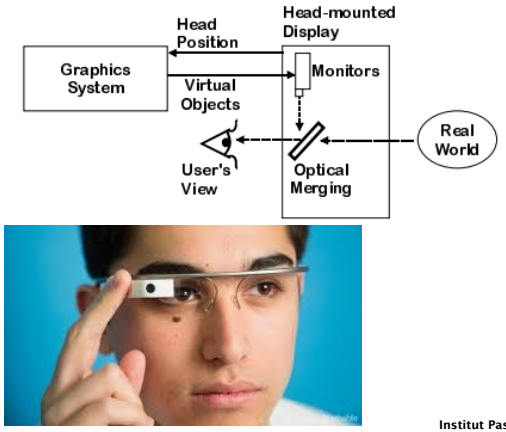
AR: how does it works?



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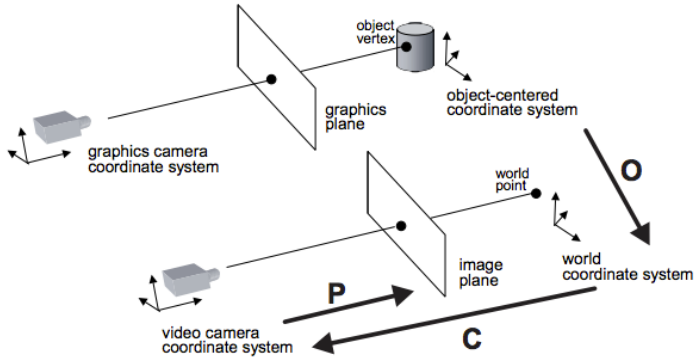
AR: how does it works?

a geometrical point of view



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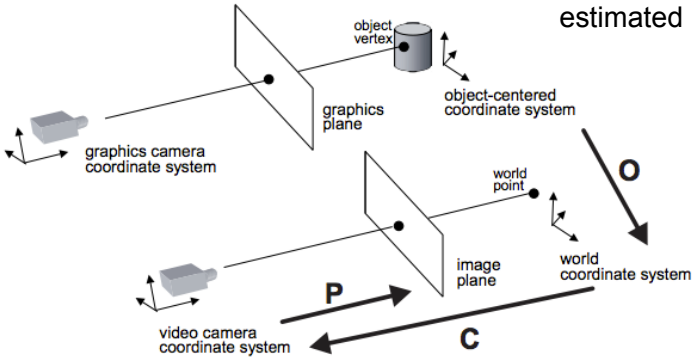
AR: how does it works?

a geometrical point of view

To be estimated



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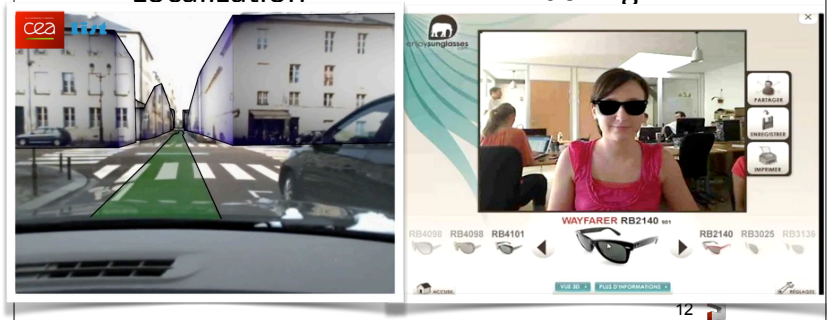
AR: how does it works?

a geometrical point of view

Scene augmentation: Localization

Object augmentation: Tracking



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AR: how does it works?

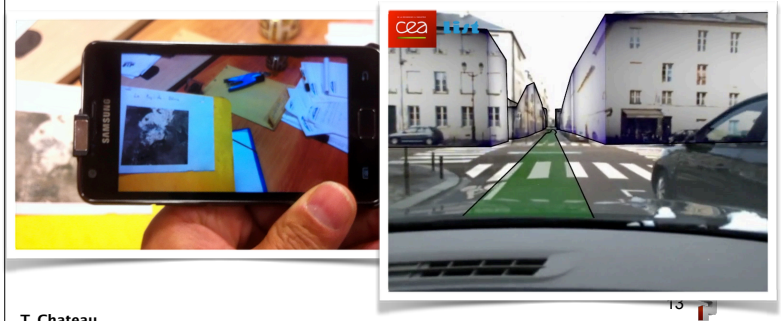
a geometrical point of view

2D localization

planar geometry

3D localization

more complex geometry



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AR: how does it works?

a geometrical point of view

The Classical AR localization process

1. Interest Point Detector
2. Descriptor
3. Matching
4. Pose Estimation
5. Augmented objects projection

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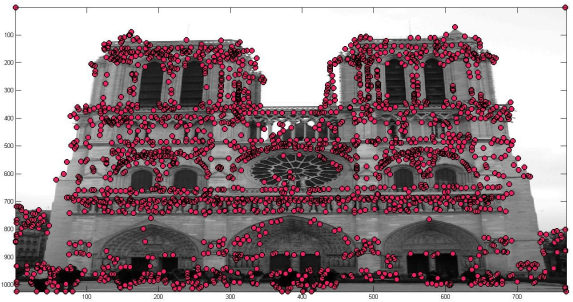
AR: how does it works?

a geometrical point of view

The Classical AR localization process

1. Interest Point Detector



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AR: how does it works?

a geometrical point of view

The Classical AR localization process

2.)Descriptor

(z1,z2,z3,…,Zn)

(…)

(…)

…

(…)

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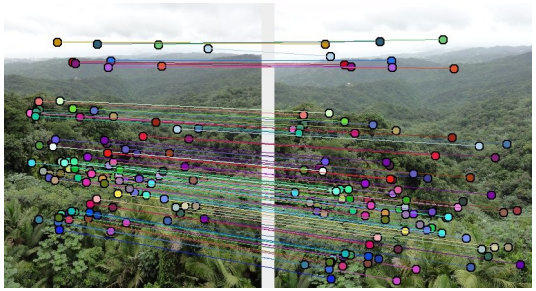
AR: how does it works?

a geometrical point of view

The Classical AR localization process

Matching

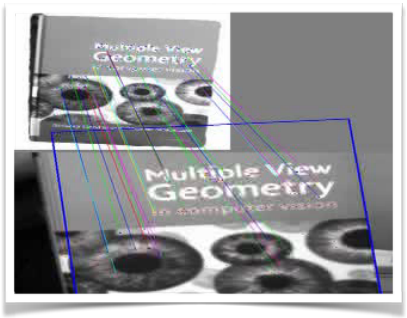


AR: how does it works?

a geometrical point of view

The Classical AR localization process

Pose estimation



AR: how does it works?

a geometrical point of view

The Classical AR localization process

Augmented objects projection