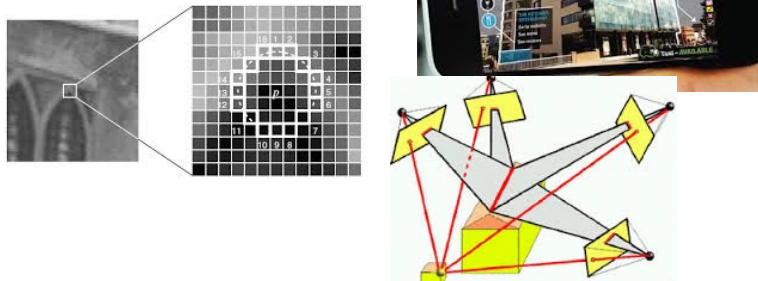


Computer Vision for Augmented Reality



2014



T. Chateau



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1. Introduction
2. Detectors and Descriptors for Augmented Reality
3. Geometry for Augmented Reality
4. Localization and Tracking for Augmented Reality

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Introduction

Augmented reality is nowadays a wonderful communication tool



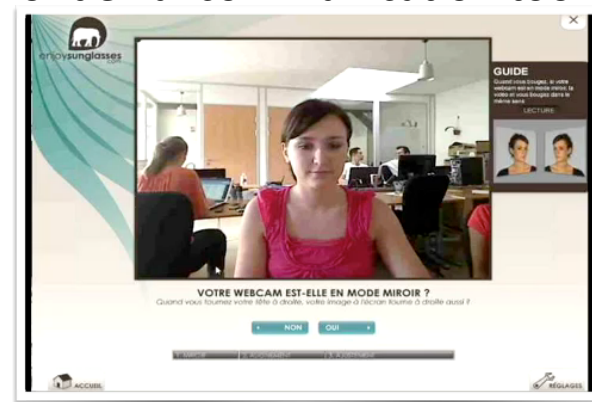
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Introduction

Augmented reality is nowadays a wonderful communication tool



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Introduction

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)

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Introduction

AR Vs RV

Virtual reality: replaces reality

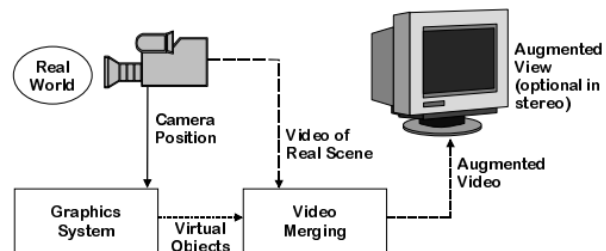
Augmented reality: enhances reality

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Introduction

AR: how does it works?

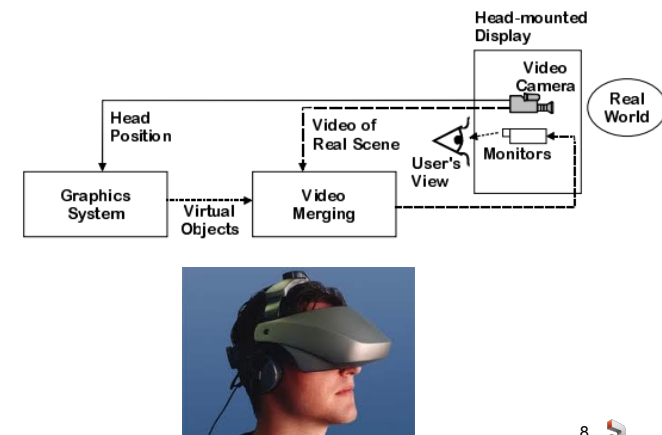


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AR: how does it works?

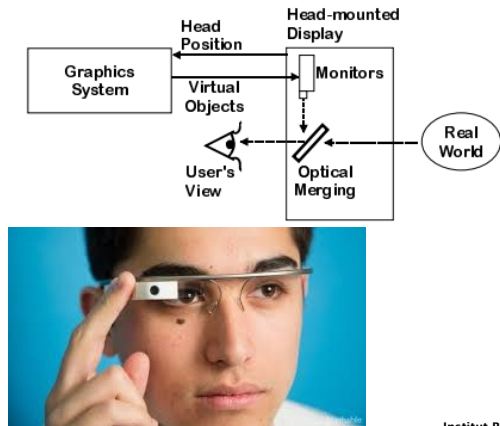


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AR: how does it work?



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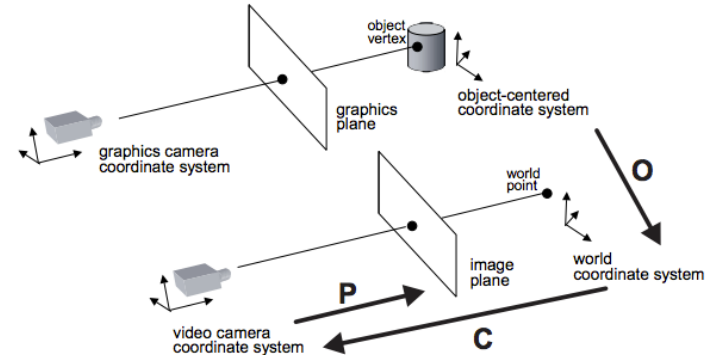
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Introduction

AR: how does it work?

a geometrical point of view



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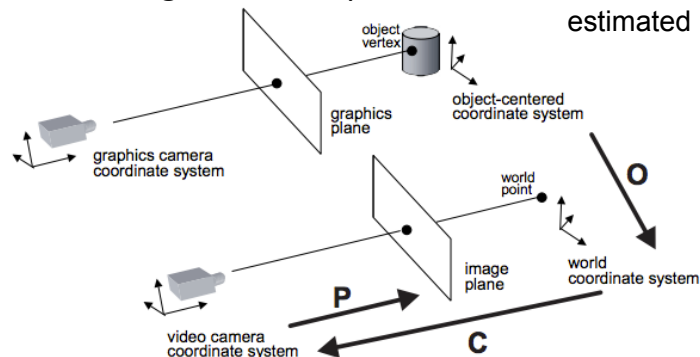
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Introduction

AR: how does it work?

a geometrical point of view To be estimated



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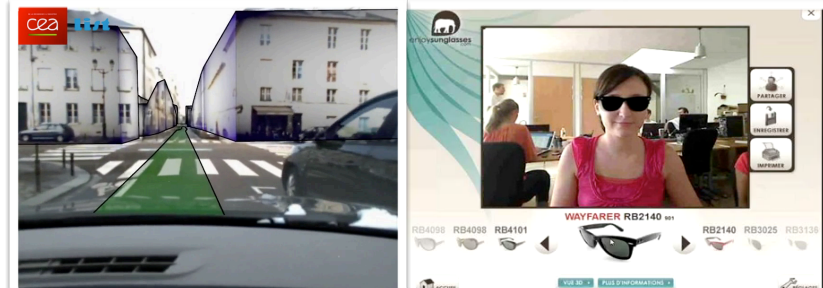
AR: how does it work?

a geometrical point of view

Scene augmentation: Object augmentation:

Localization

Tracking



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AR: how does it works?

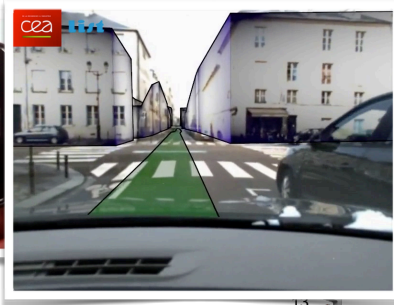
a geometrical point of view

2D localization

3D localization

planar geometry

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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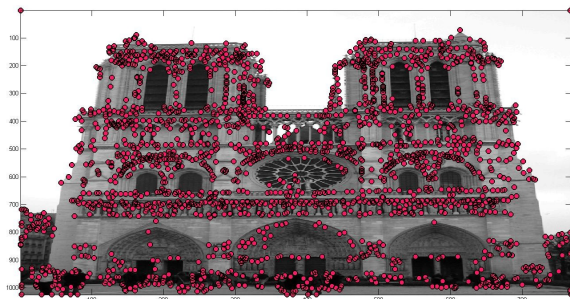
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AR: how does it works?

a geometrical point of view

The Classical AR localization process

1. Interest Point Detector



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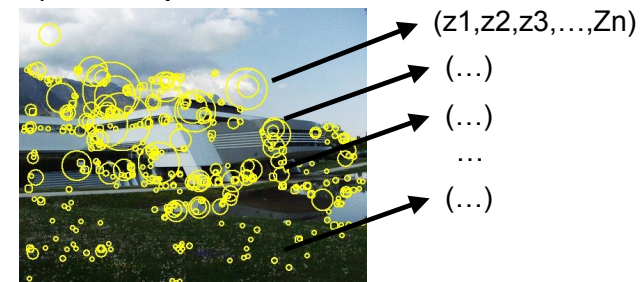
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AR: how does it works?

a geometrical point of view

The Classical AR localization process

- 2.) Descriptor



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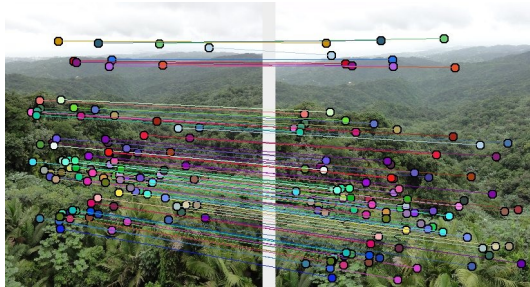
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The Classical AR localization process

Matching



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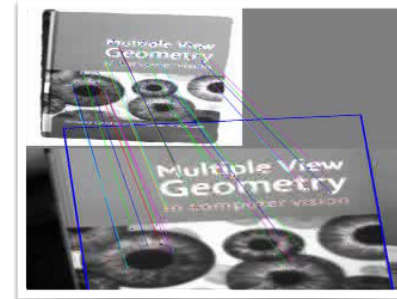
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The Classical AR localization process

Pose estimation



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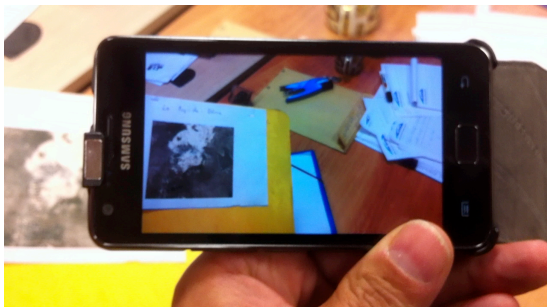
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The Classical AR localization process

Augmented objects projection



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