LABORATORIO DI REALTÀ AUMENTATA

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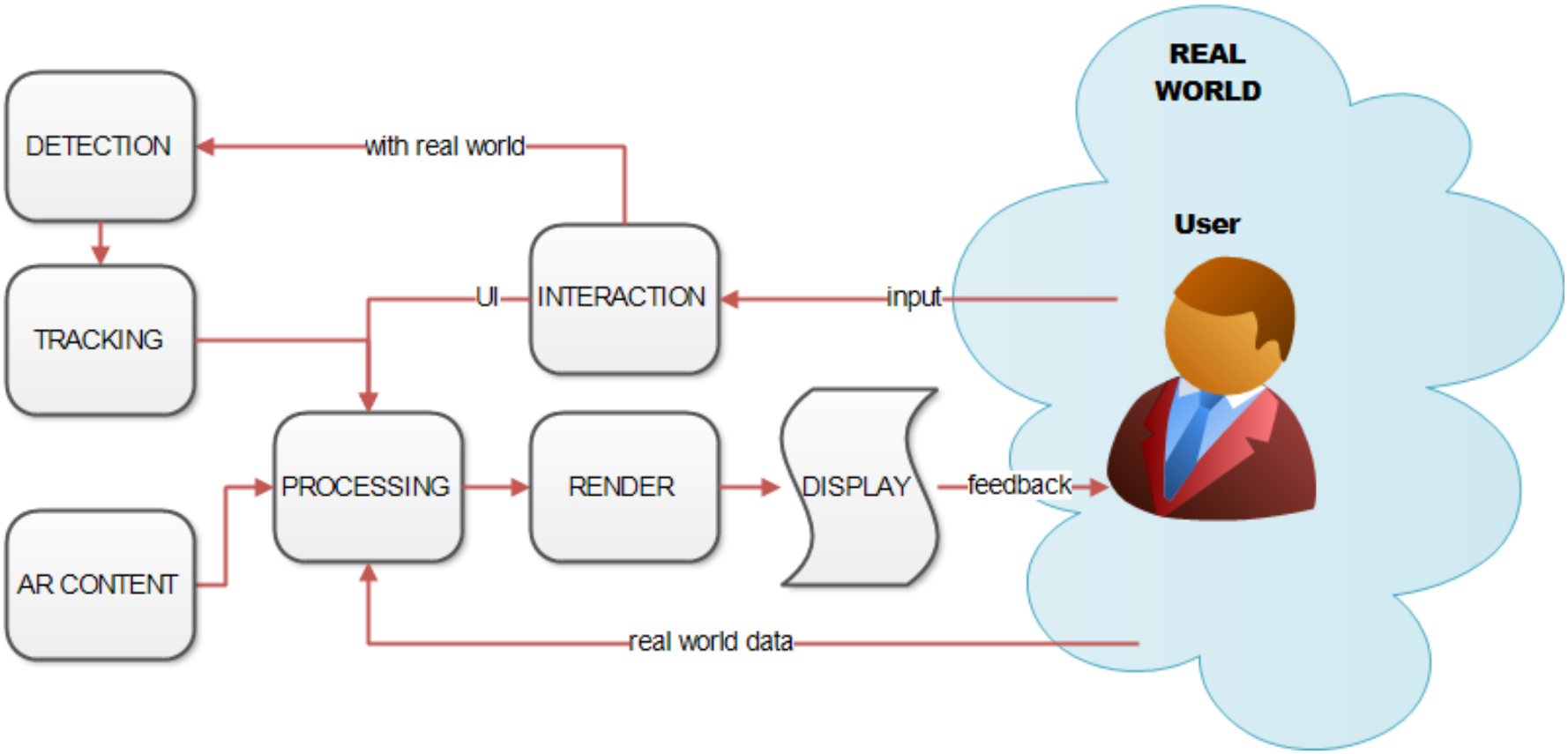
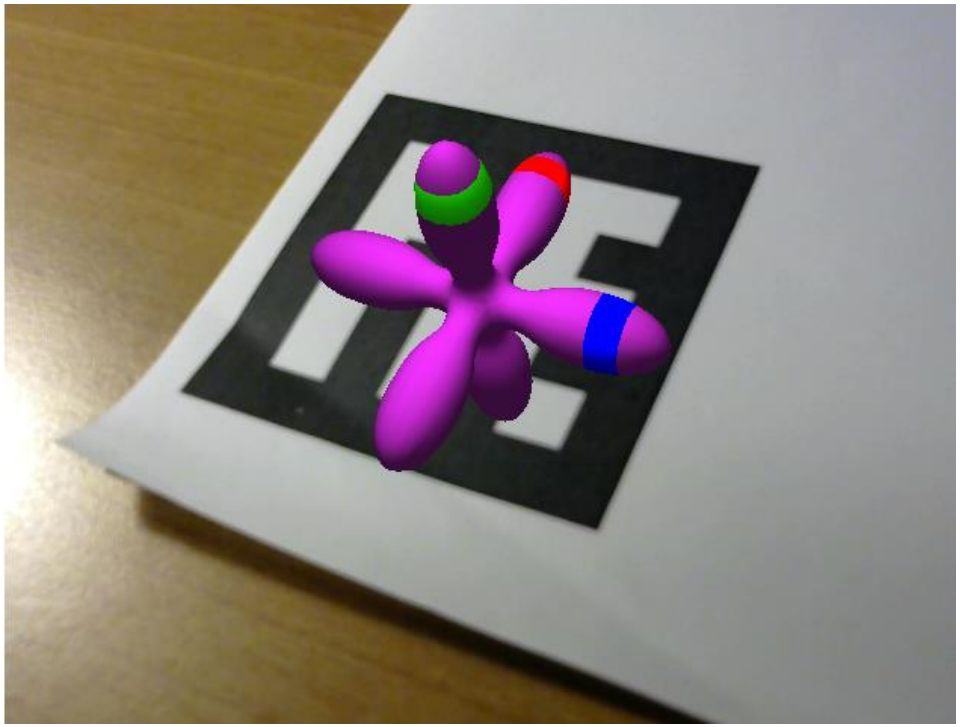
Project introduction

Architecture of an AR system



A simple AR project

- In the next lessons, we will develop a simple AR system based on visual tracking of fiducial markers



AR tools

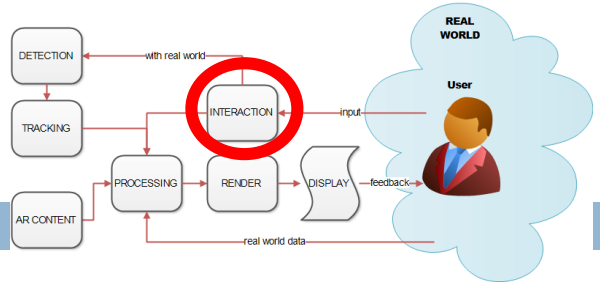
- There is a plethora of AR SDK…
  - Vuforia
  - Metaio
  - Wikitude
  - D'Fusion
  - DroidAR
  - ARLab
  - …
- Our aim is to be the most independent possible from a specific development tool / environment

- Web-based augmented reality (***augmented web***)

Web-based AR

- In Web-based AR, we use standard web development techniques
  - HTML 5
  - Javascript
  - …
- Major advantage: you just need a web browser to run the AR application!
- Easily portable to mobile apps too (e.g. through Android's webview…)

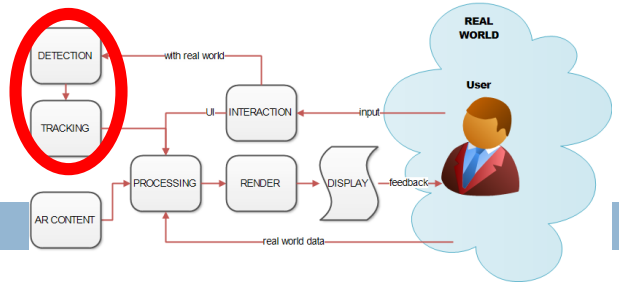
Input



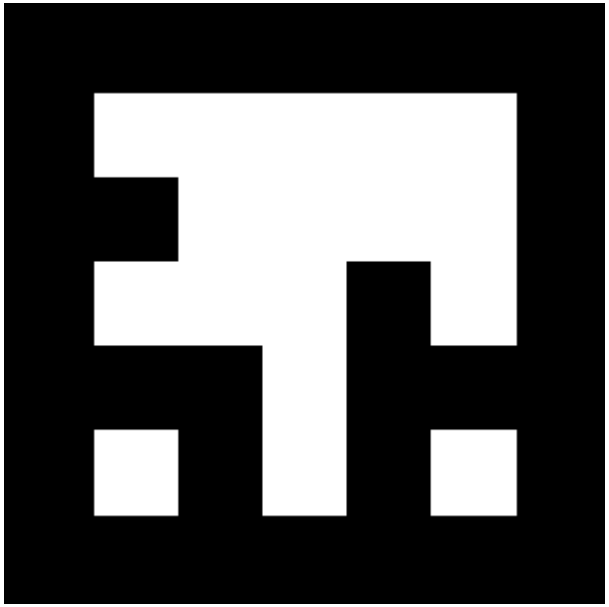
- Video input will be acquired from a webcam, or simulated with a video
- Videos in web pages: HTML 5 `<video>` tag
- Access to webcams: WebRTC API

WebRTC

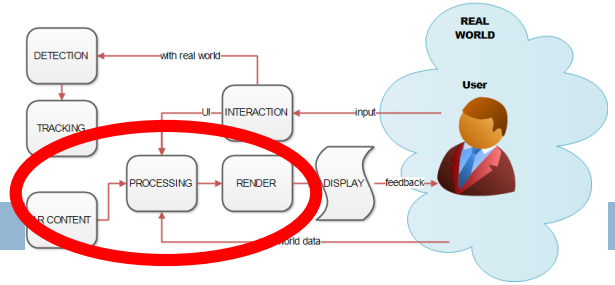
Detection & tracking



- Our system will be based on fiducial markers
- We will use jsartoolkit.js, a simple javascript library for fiducial marker tracking in video sequences

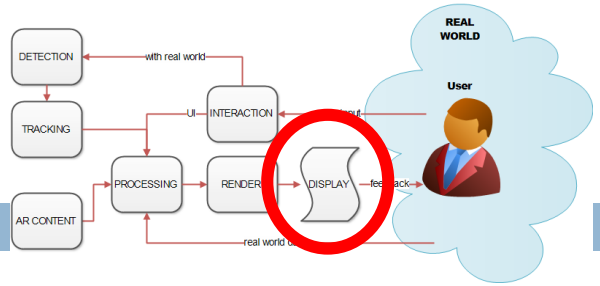


Processing

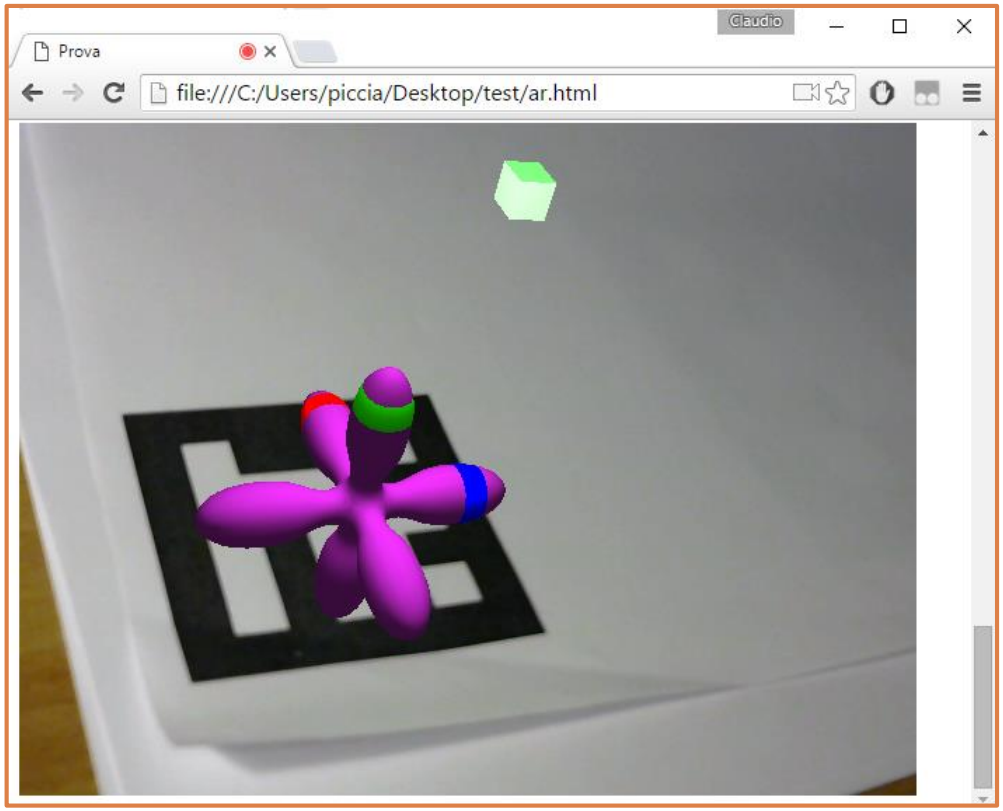


- 3D content can be either created “online” from the javascript code or loaded from external files
- The three.js library will be used to handle all the 3D content, aligning it with the markers detected by jsartoolkit and rendering the final scene

Display



- Of course the display will be a browser window!
- We will use Firefox as the default browser



Rationale

- There are several augmented web development tools, maybe easier to use than our approach
- But our goal is to learn what happens “behind the curtain”
- At the end of the course, you will have gained a comprehensive understanding of the computational steps involved in reality augmentation

Prerequisites

- Prior knowledge needed:
  - Javascript programming (basic)
  - HTML 5 (very basic)