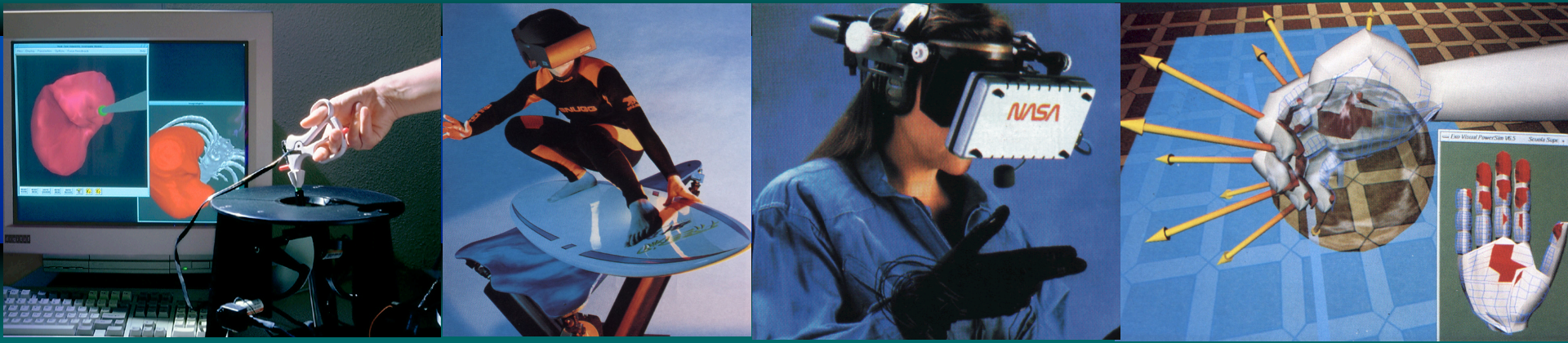




Department of Engineering for Innovation
University of Salento
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Virtual and Augmented Reality Applications in Cultural Heritage

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Augmented and Virtual Reality Laboratory (AVR Lab)

VR in Cultural Heritage

MediaEvo Project

Development of a multi-channel and multi-sensory platform for the edutainment in cultural heritage

Otranto as an example town

It played an important role in the Middle Ages from a political and cultural point of view

Due to its geographical position Otranto was like a bridge between East and West

We focused on the Swabian Age (XIII century)



MediaEvo Project

- Geographical context
- Socio-cultural analysis
- Historical analysis
- Narrative analysis

- Learning by doing
- Collaborative learning
- Education & entertainment

- Multi-channels and multi-sensory platforms
- Scenario's modelling with CAD and game engine

Historical
and literary research
experiences

Learning methods

High Technologies
and ICT

Prototype of digital didactic game
set in Middle Ages

Game

APPLICATIONS

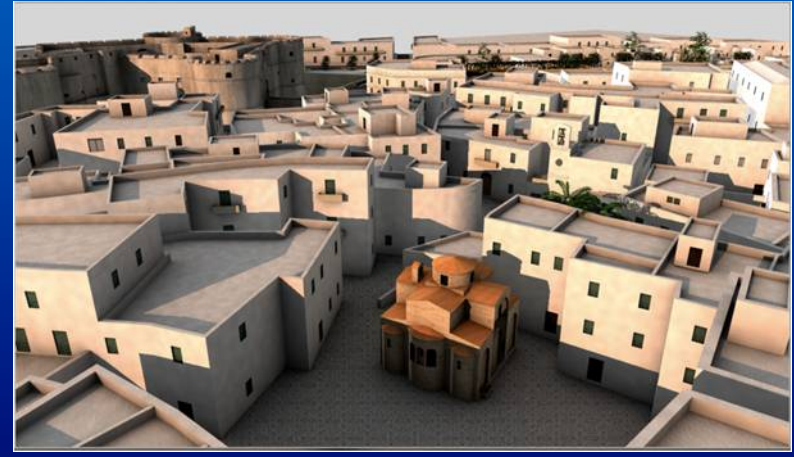
Virtual Landscape



Virtual Landscape



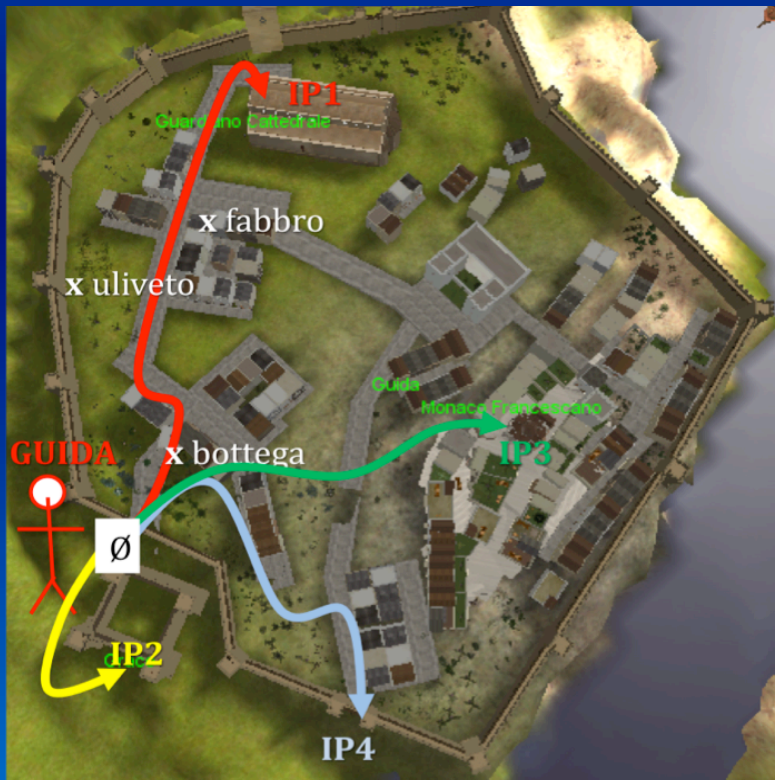
Ages Comparison



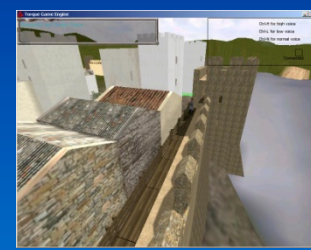
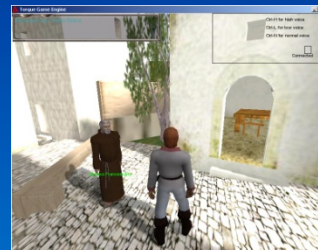
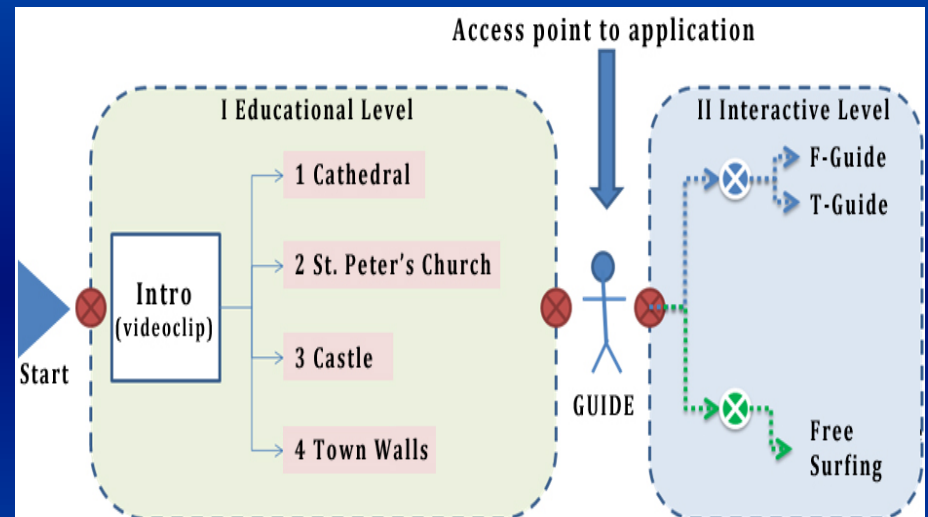
Paths and Interest Points

Navigation modes

- Guided navigation (4 main paths)
- Free navigation

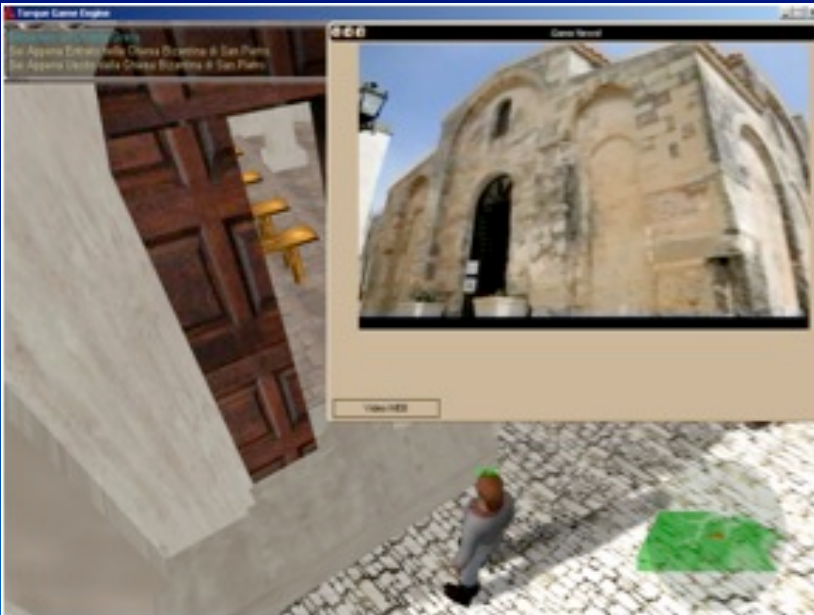


Access and interaction levels of the avatar-player



Interactions

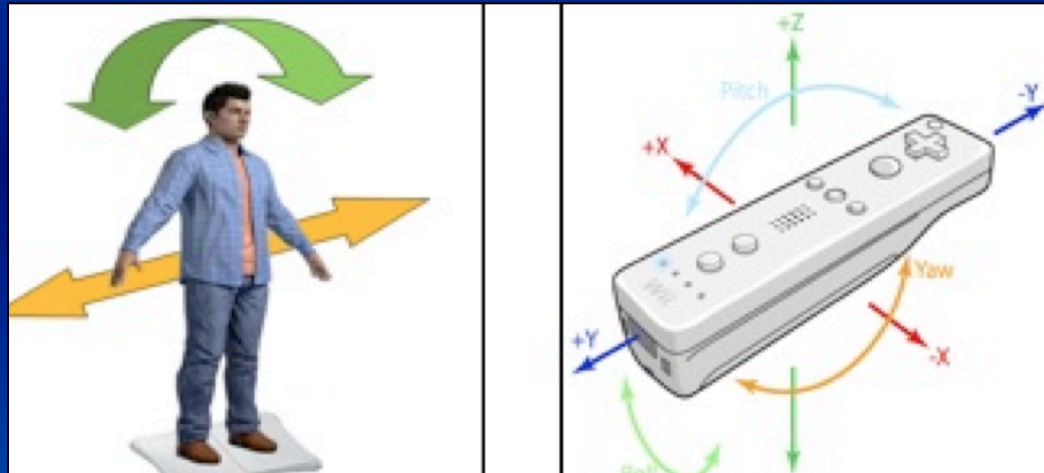
- Graphic interaction (triggering)
- Textual interaction among players (chat)
- Vocal interaction among players (external vocal module)



Navigation with WiiMote and Balance Board

The aim is to make the interaction easier for users without any experience of navigation in a virtual world and more efficient for trained users

We use some intuitive input devices that can increase the sense of immersion



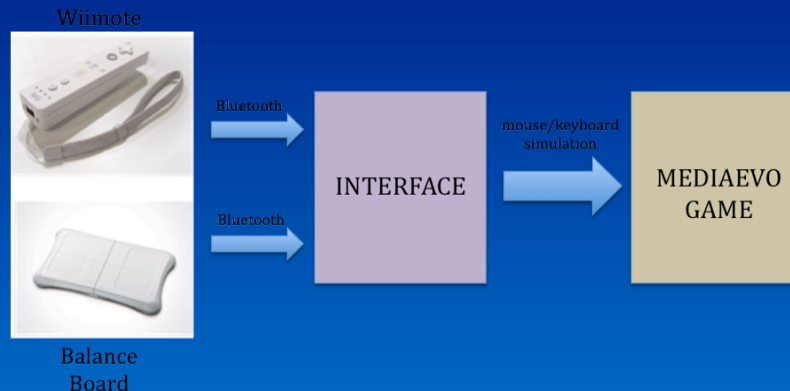
Since the frequency of communication between the Wii console and the Wiimote/ Balance Board are those of the standard Bluetooth, these devices can be used as tools to interact with any computer equipped with the same technology

Navigation with WiiMote and Balance Board

Because we walk on our feet, controlling walking in Virtual Reality could be felt as more natural when done with the feet than with other modes of input

The Nintendo Balance Board as input device for navigation that offers a new and accessible way to gain input

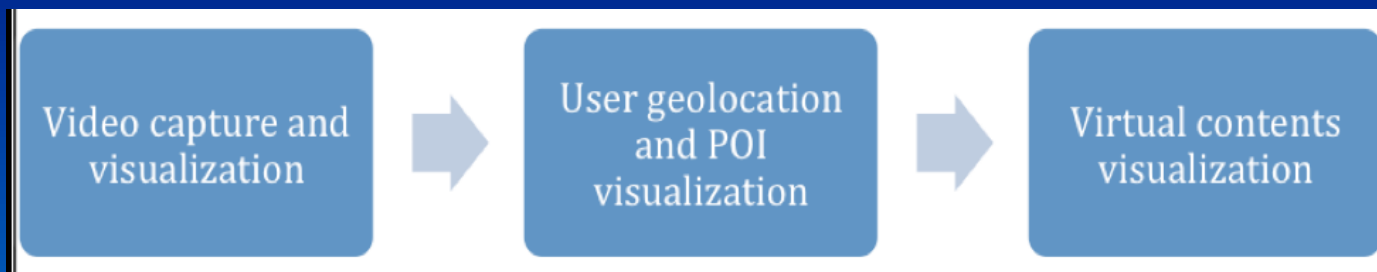
In addition, in order to implement the control of different views and to change the point of view of the user, we use the Nintendo Wiimote



Virtual Treasure Hunt

Within the MediaEvo Project it has been also developed a “virtual treasure hunt” using an iPhone as a device to find and read the clues of the game

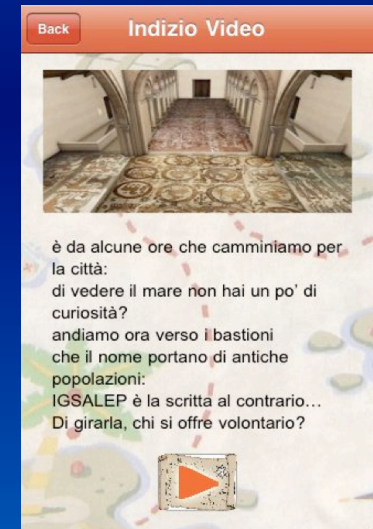
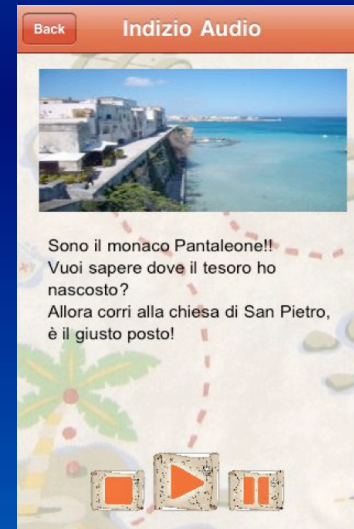
The Augmented Reality has been used for geolocating the points of interest (POI) and the visualization of useful and interesting data that are overlapped on the video stream of the iPhone camera



Virtual Treasure Hunt

Once the player is close to a POI, a marker that indicates the presence of a clue is visualized on the iPhone screen and superimposed on the images captured by the camera

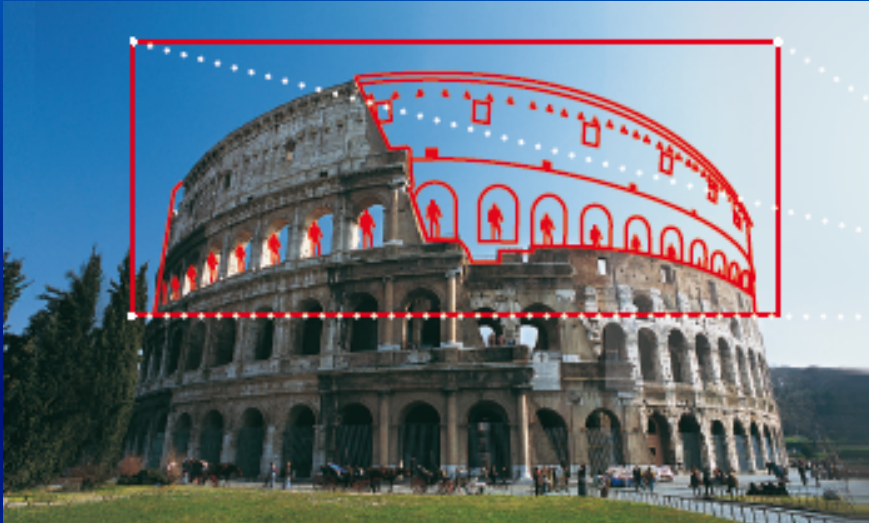
Touching the marker in the screen, the description of the stage is shown



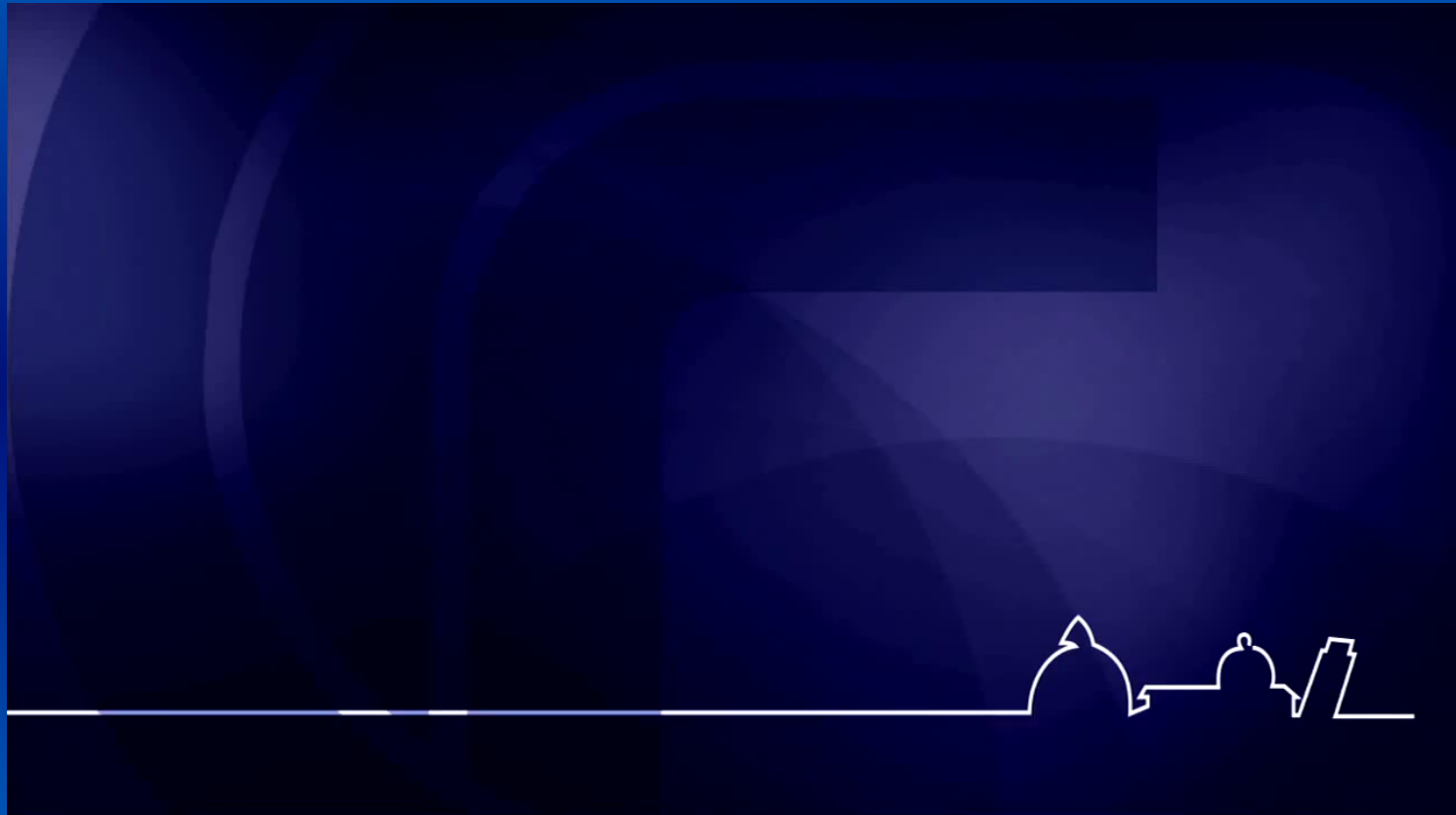
Augmented Reality Applications



Augmented Reality Applications

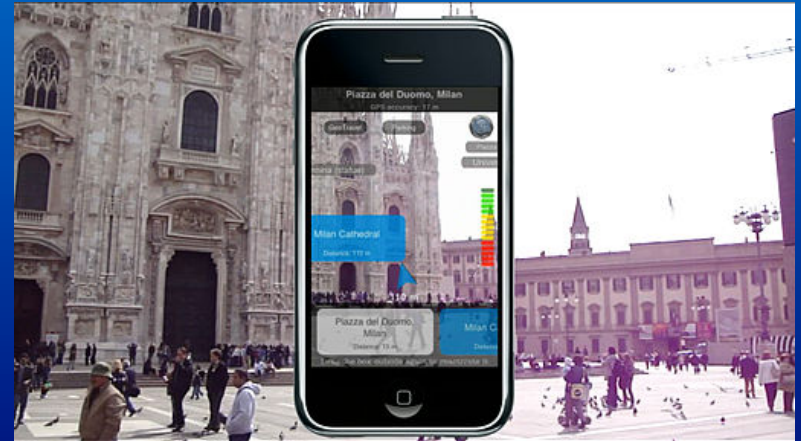


Museo delle Pure Forme



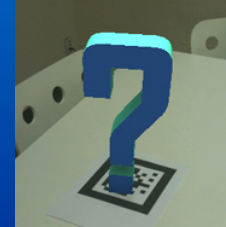
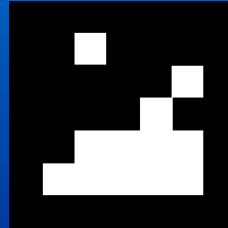
Augmented Reality on mobile

Augmented Reality Applications



Augmented Reality

- Marker detection



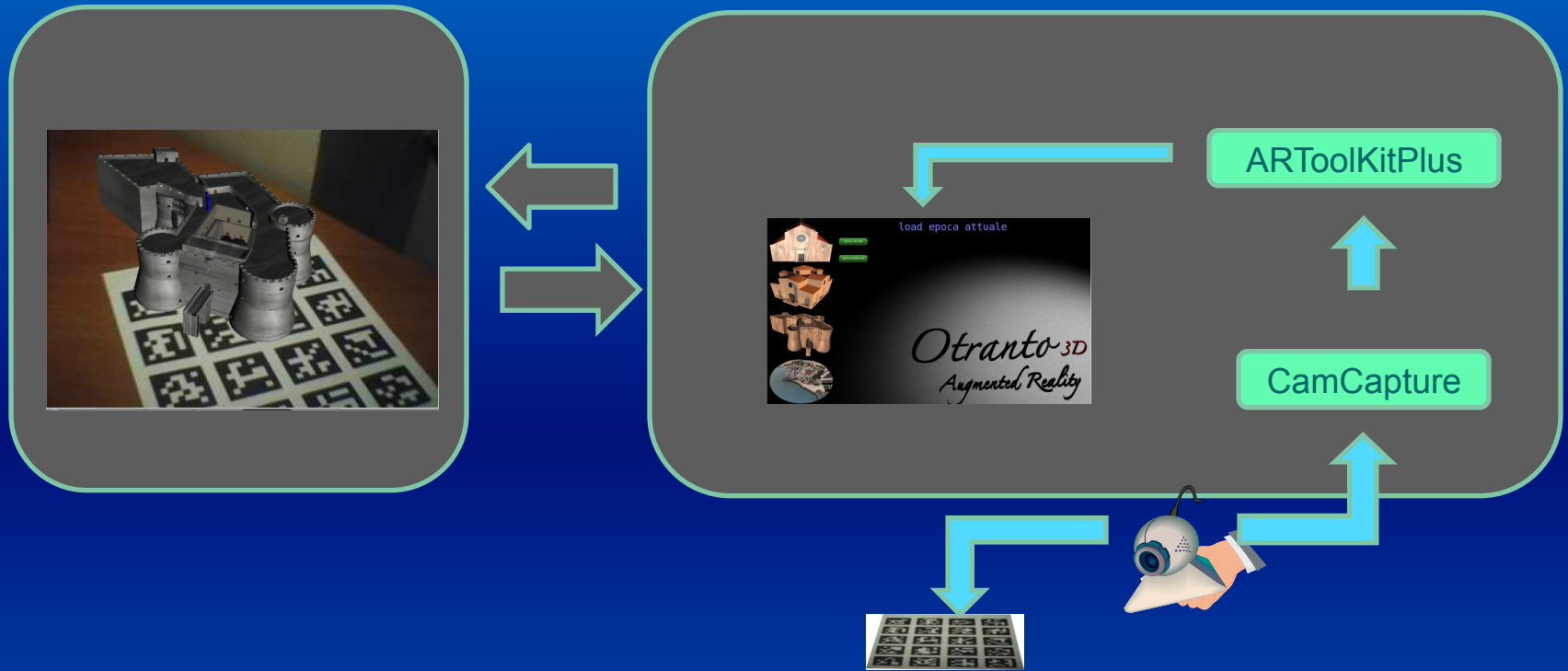
- Markerless detection



- GPS + compass



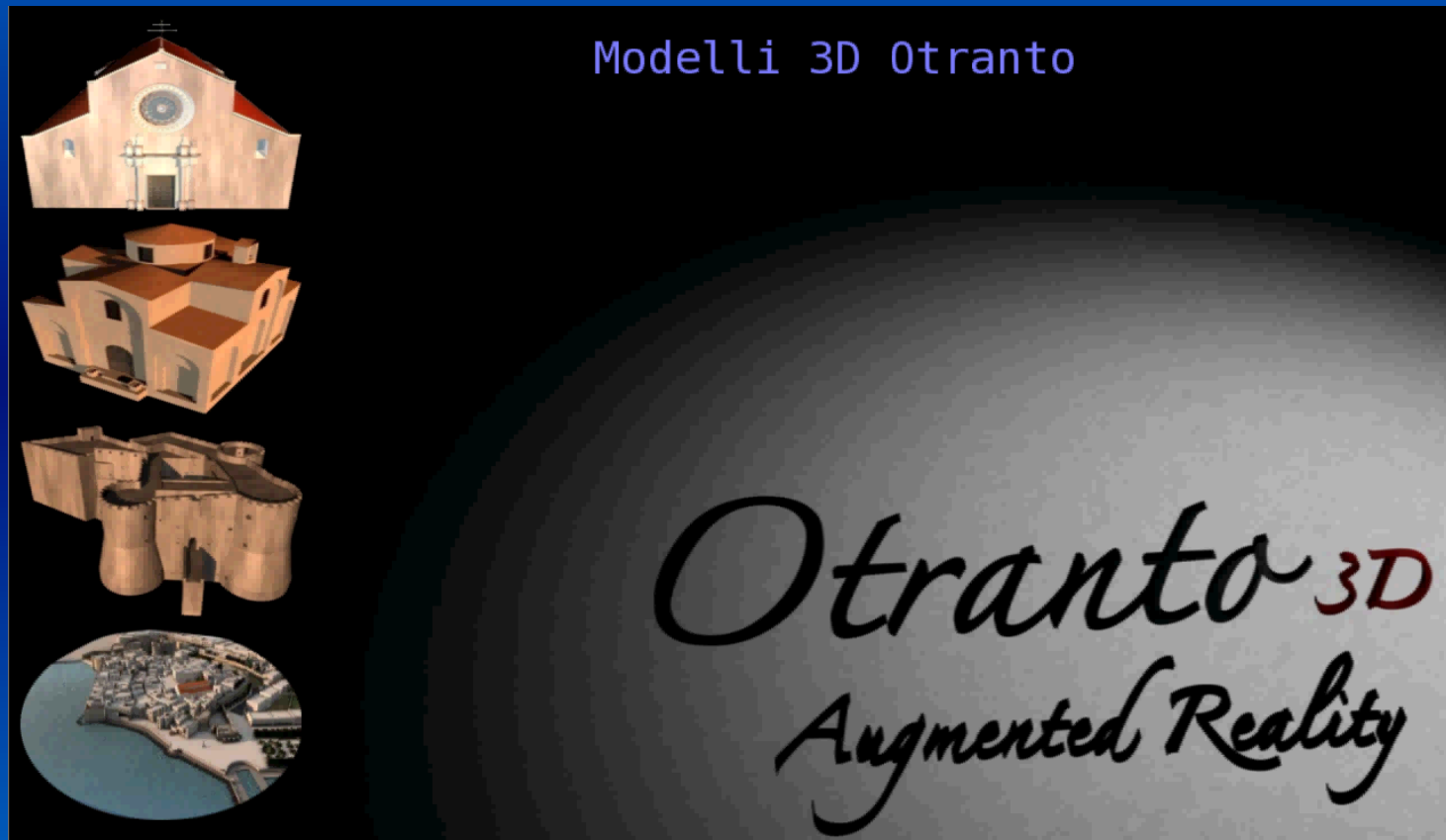
Augmented Reality Visualization



The markers are observed by a webcam and the tracking software is able to calculate the marker position and orientation from the captured image

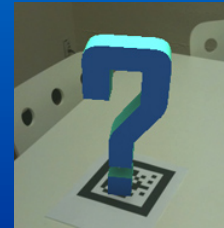
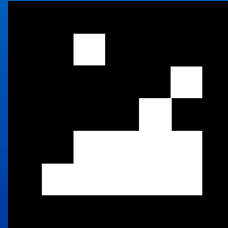
In this way it is possible to visualize the virtual information associated with the specific marker which can be used as a tangible interface to handle virtual artefacts or as user interface elements

Augmented Reality Visualization



Augmented Reality

- Marker detection



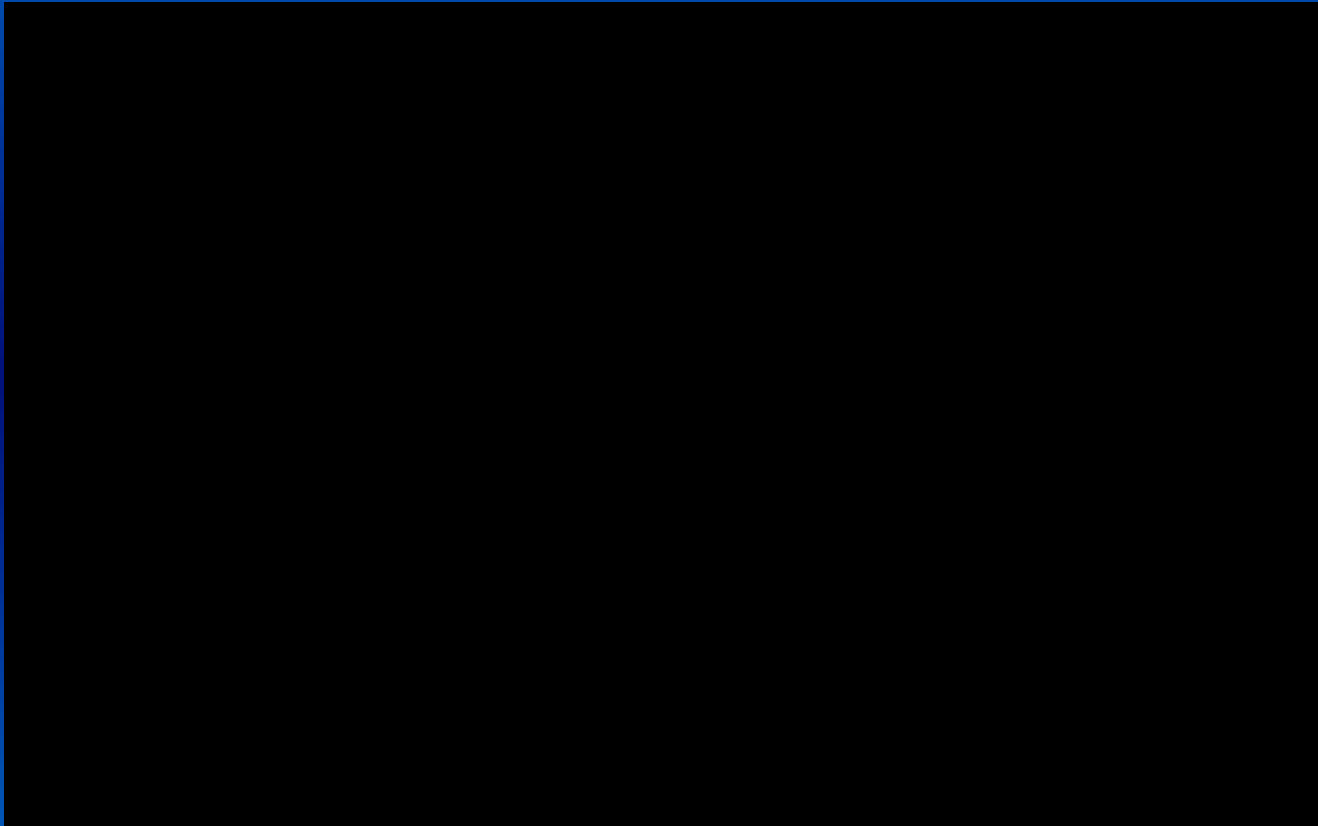
- Markerless detection



- GPS + compass

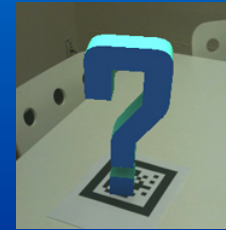
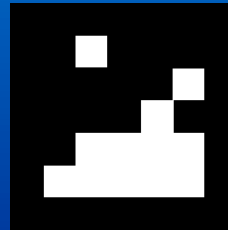


AR in Cultural Heritage – St. Caterina Church



Augmented Reality

- Marker detection



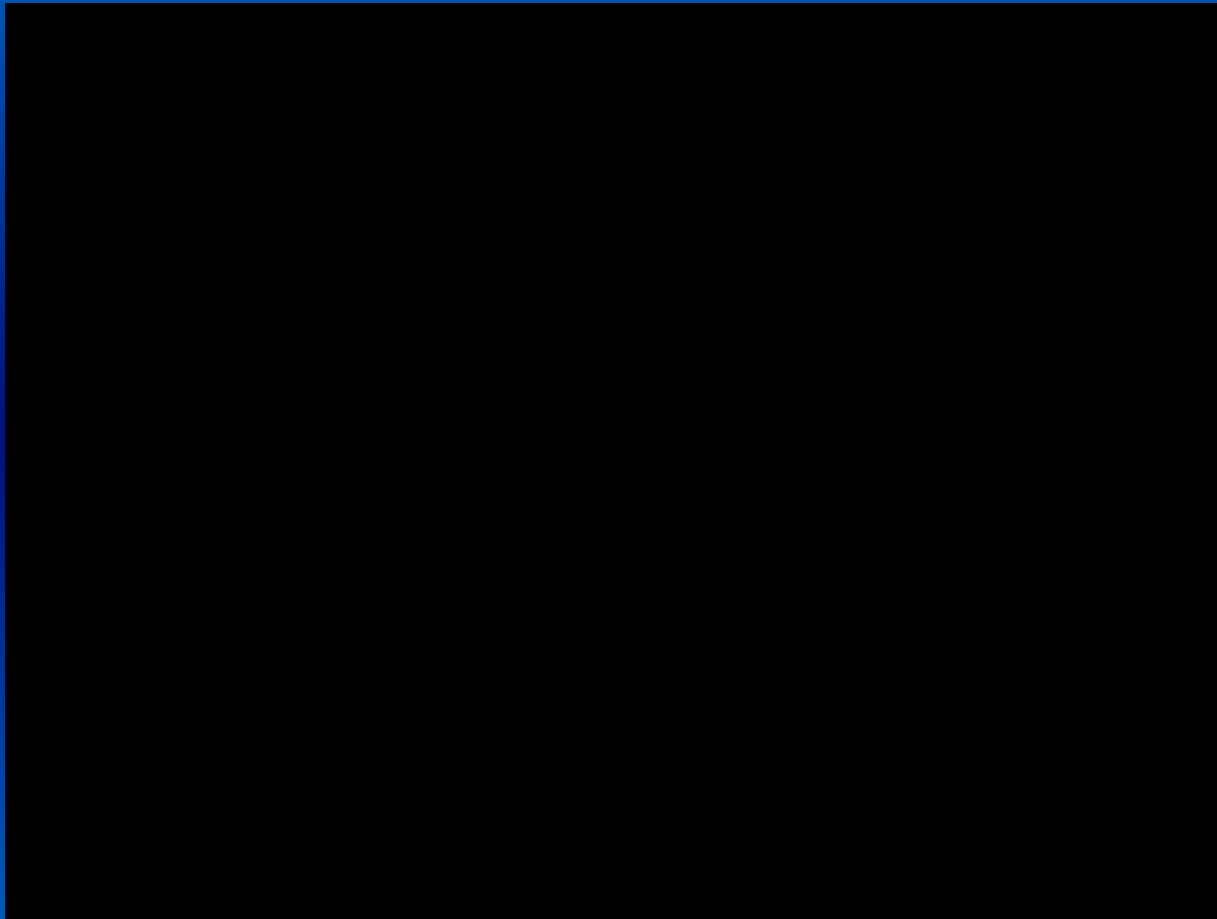
- Markerless detection



GPS + compass



AR in Cultural Heritage – Ancient Rome





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