

Interactive Augmented Reality

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• Definitions

• Handheld AR/AV

- Pointing at physical targets
- Pointing at virtual targets

• HMD-based AR/AV

- 3D pointing

Augmented Reality (AR) Augmented Virtuality (AV)

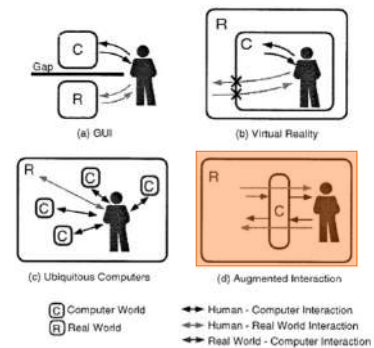
- Combination of the perception of physical and digital objects
- Mostly visual augmentation (even if other senses can be augmented)



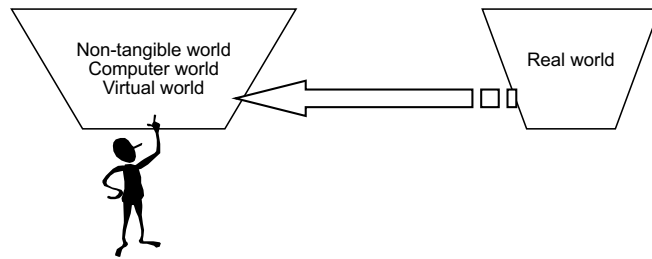
Augmented Reality (AR)

• [Azuma 97]

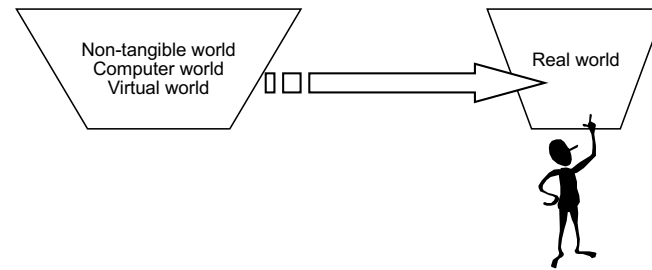
- Combines real and virtual
- Interactive in real time
- Registered in 3D



Combining the real and virtual worlds



Combining the real and virtual worlds



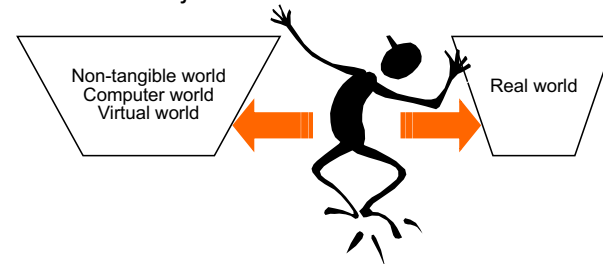
Combining the real and virtual worlds

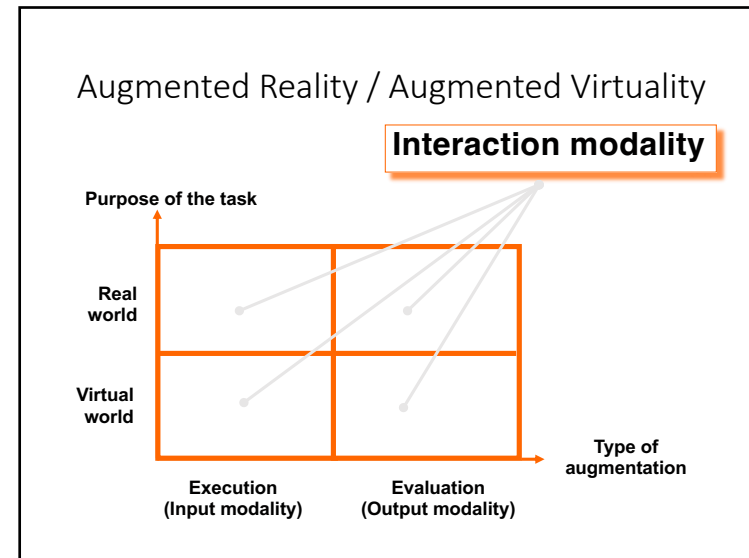
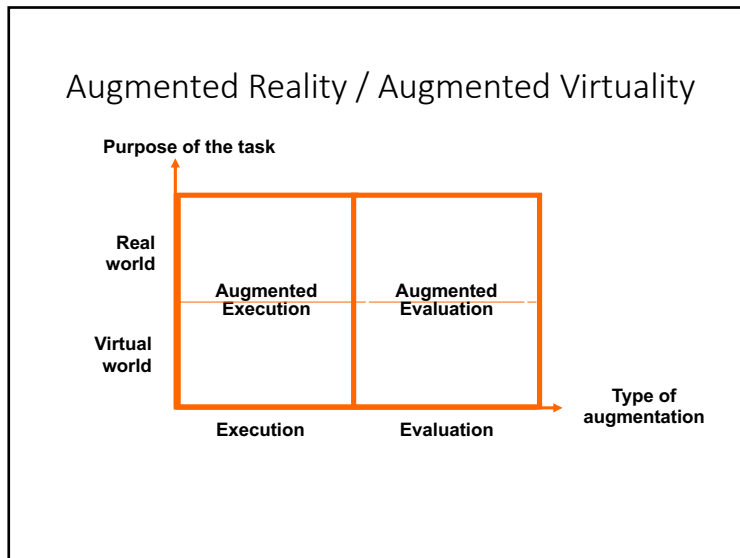
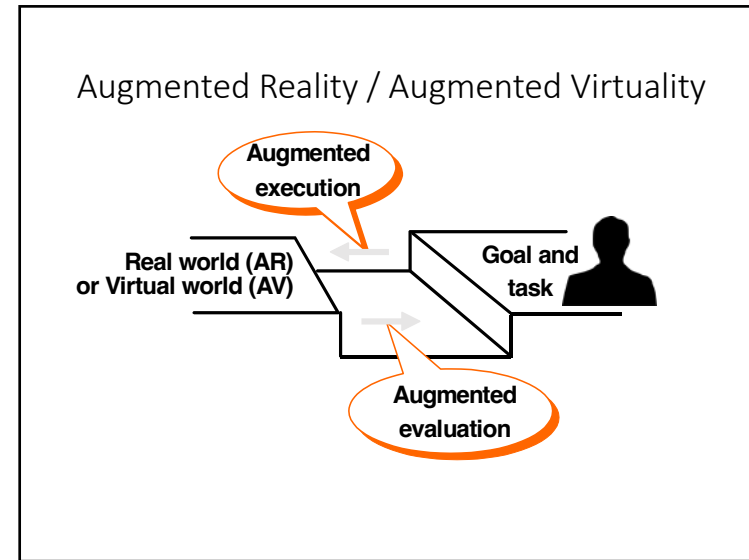
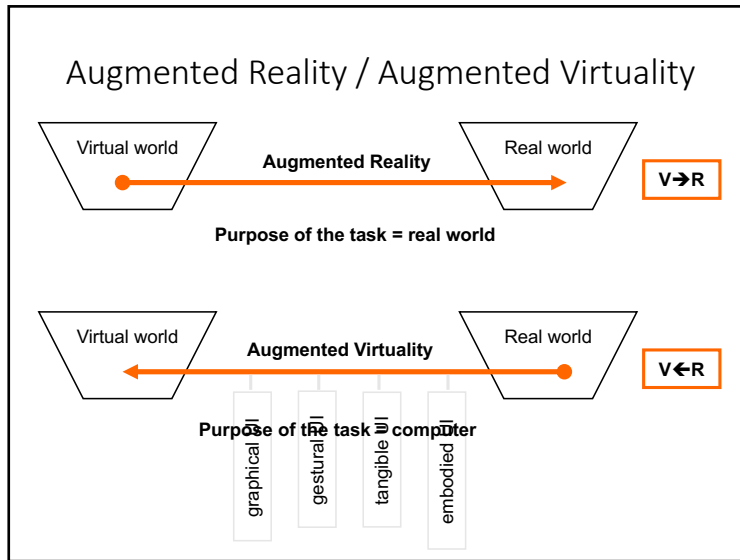
- Profusion of terms

- Virtual reality
- Bit / Atom
- Computer Augmented Environment
- Augmented Video
- Augmented Interaction
- Augmented Virtuality
- Augmented Reality
- ...

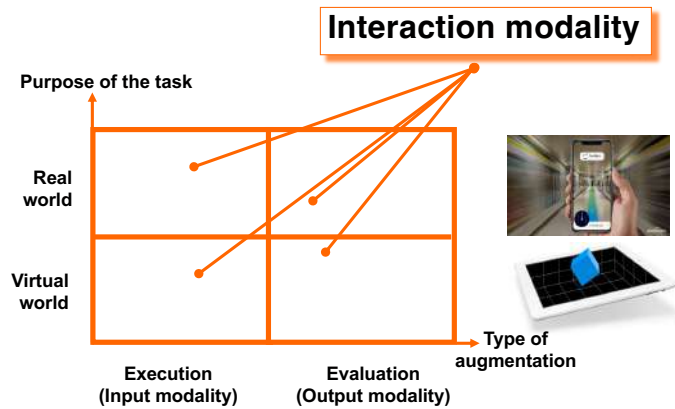
Combining the real and virtual worlds

- Common objective

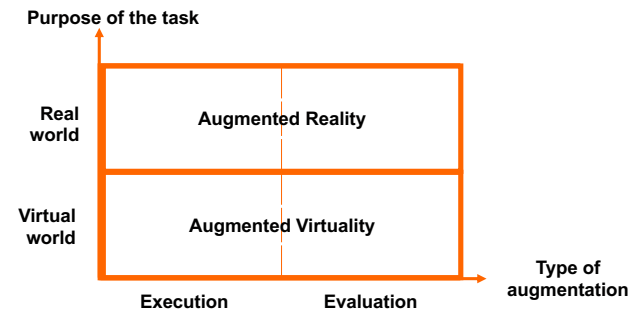




Augmented Reality / Augmented Virtuality

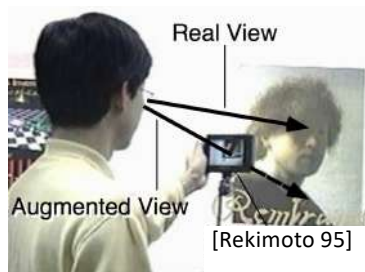


Augmented Reality / Augmented Virtuality



- Difficulty : Identify whether the task belongs to the real world or the virtual world

Augmented Reality / Augmented Virtuality

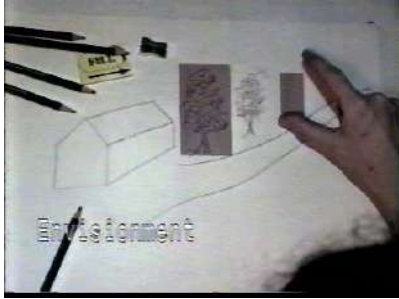


- Difficulty : Identify whether the task belongs to the real world or the virtual world



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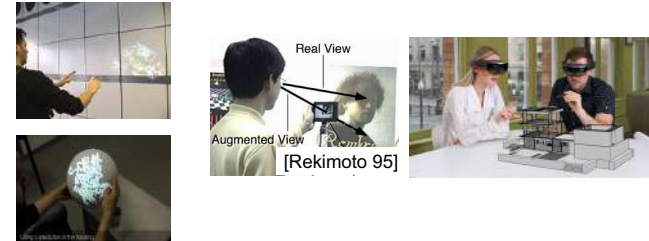
Augmented Reality / Augmented Virtuality



- Difficulty : Identify whether the task belongs to the real world or the virtual world

Augmented Reality/Virtuality (AR / AV)

- Projector-based Displays
- Handheld AR: Handheld devices used as physical 'magic lens'
- Head-Worn Displays



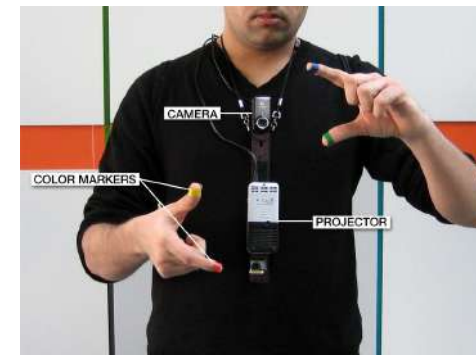
Mobile and projector-based interactive AR/AV: Sixth sense

- Sixth sense is a wearable gesture interface that augments the physical world around us with the digital world.
- It lets us use natural hand gestures to interact with the digital world.
- It comprises a pocket projector, a mirror and a camera. The hardware components are coupled in pendent like mobile wearable device.

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Sixth sense Components

- Camera
- Projector
- Mirror
- Colour markers



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APPLICATIONS

TAKE PICTURES

If you fashion your index fingers and thumbs into a square ("framing" gesture) we can take a snap.



After taking the photos, we can project them onto a surface, and use gestures to sort through the photos, and organize and resize them.



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APPLICATIONS

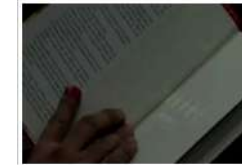
ZOOMING FEATURES

We can arrange those pictures. The user can zoom in or zoom out by just using hand movements



GETS BOOK INFORMATION

The system can project Amazon ratings on that book, as well as reviews and all other relevant information



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APPLICATIONS

FEED INFORMATION ON PEOPLE

The system will project some relevant information about a person such what he/she does, where they work, and so on.



GET FLIGHT UPDATES

The system will recognize your boarding pass and you know whether your flight is on time and if the gate has changed



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APPLICATIONS

MAKE A CALL

You can use sixth sense to project a keypad onto your hand, then use the that key pad to make a call.



CREATES MULTIMEDIA READING EXPERIENCES

Sixth sense can be programmed to project related videos onto news paper articles you are reading.



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APPLICATIONS

DRAWING APPLICATION

The drawing application lets the user draw on any surface by tracking the fingertip movements of the user's index finger



CHECK THE TIME

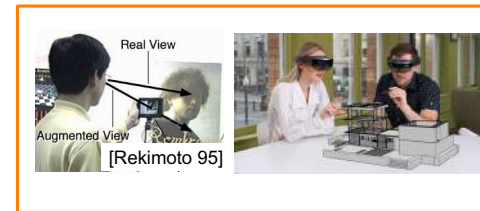
Draw a circle on your wrist to get virtual watch that gives you the correct time



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Augmented Reality/Virtuality (AR / AV)

- Challenges
 - Tracking



Augmented Reality/Virtuality (AR/AV)

- Challenges
 - Tracking
 - Rendering



Augmented Reality/Virtuality (AR/AV)

- Challenges

- Tracking

- Rendering

- Interaction

