

Einführung in die Erweiterte Realität

- 1. Introduction -

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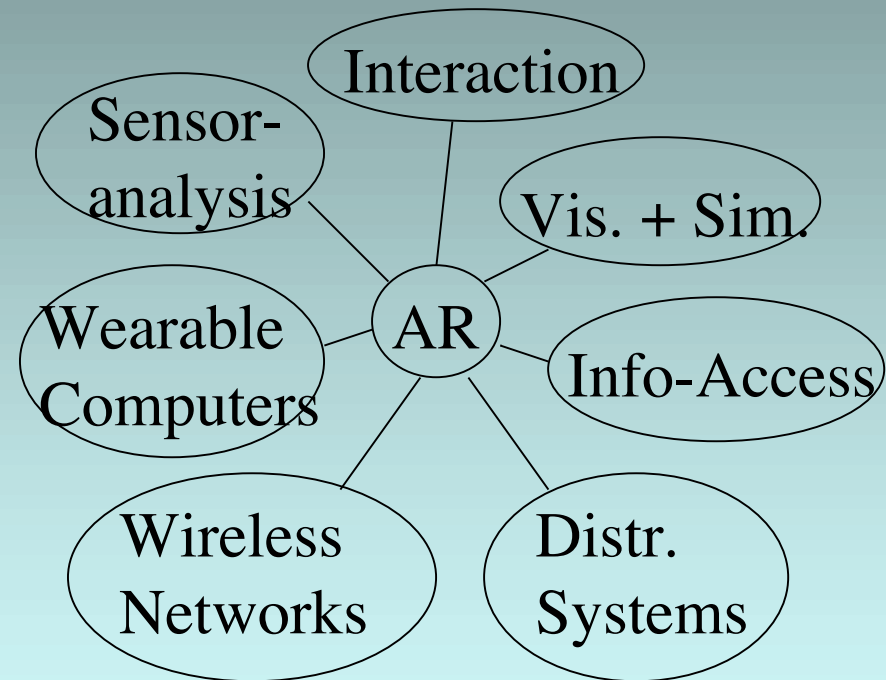
Oct 28, 2003

Agenda

1. Augmented Reality -
Definition, Different Approaches
2. Applications
3. AR-Related Trends/Enablers
4. Research Issues
5. Requirements

1. Augmented Reality

- Definition -



- Real + virtual
- Interactive in real-time
- Registered in 3 Dimensions

[Azuma 98]

1. Augmented Reality - Different Approaches -



[FhG-IGD 97]

Head-based



[Sony 98]

Hand-based



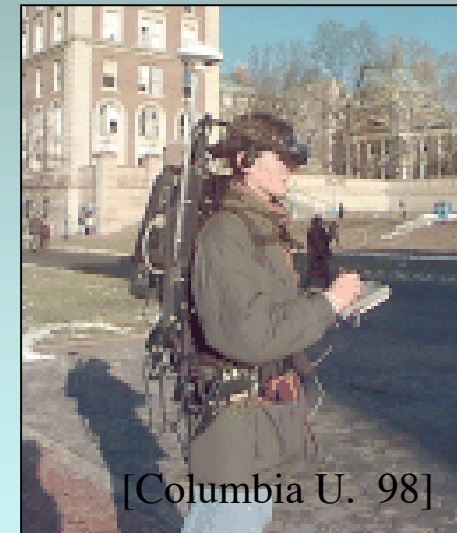
[FhG-IGD 97]

Desktop-based



NOV. [MIT 94]

Wall-based



[Columbia U. 98]

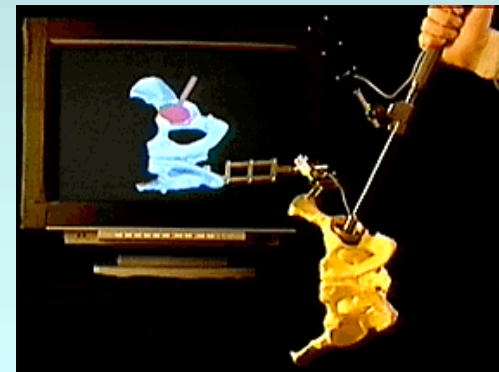
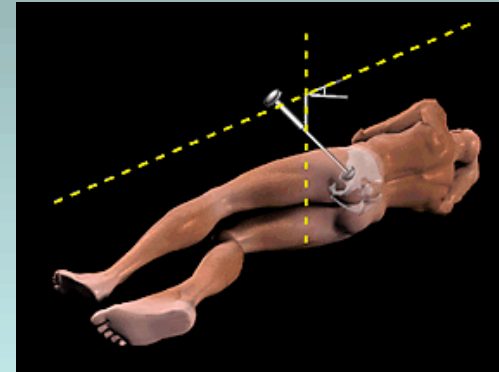
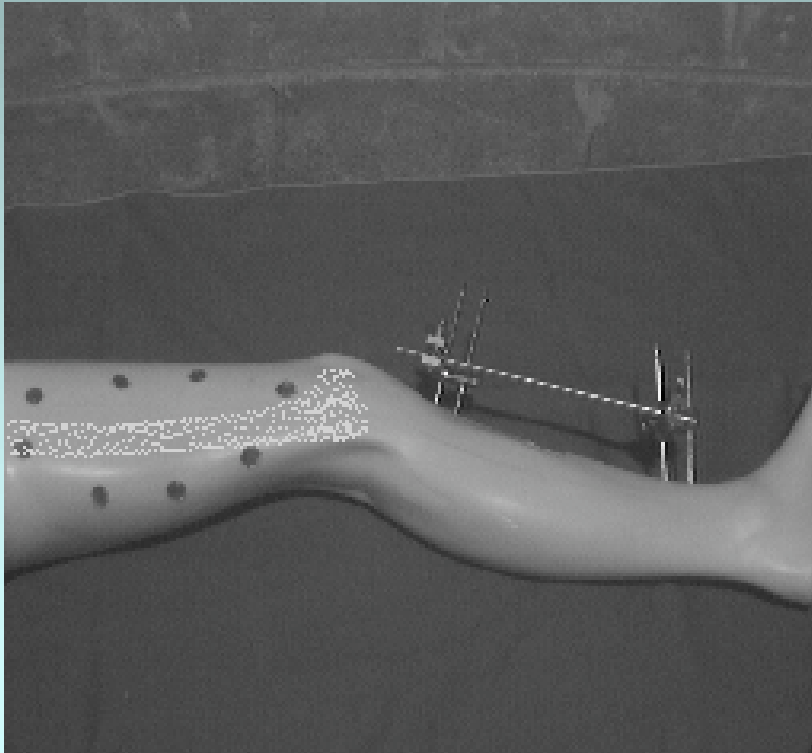
Hybrid

2. Applications

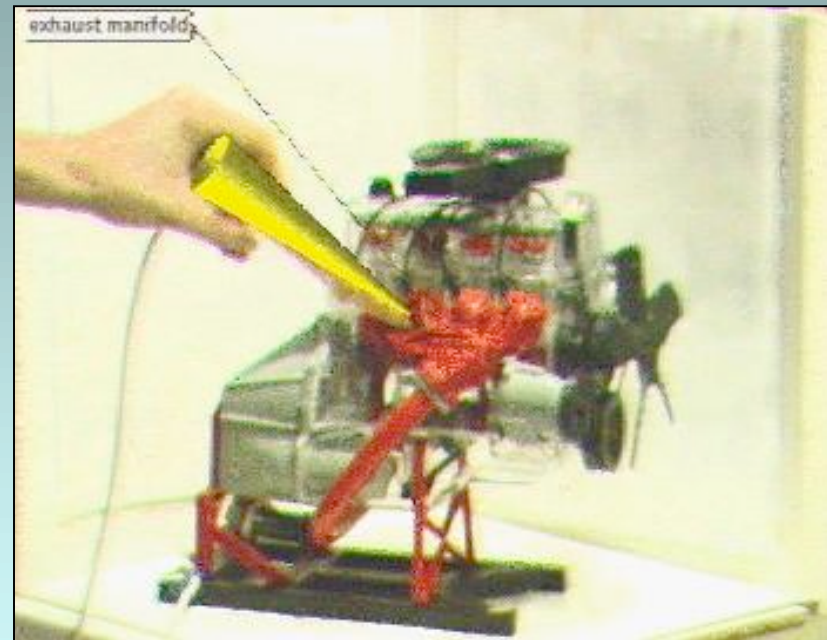
- Medicine
- Machine Assembly and Repair
- Building Construction and Maintenance
- Architecture, Interior Design
- Edutainment, Games
- Tourism

Medicine

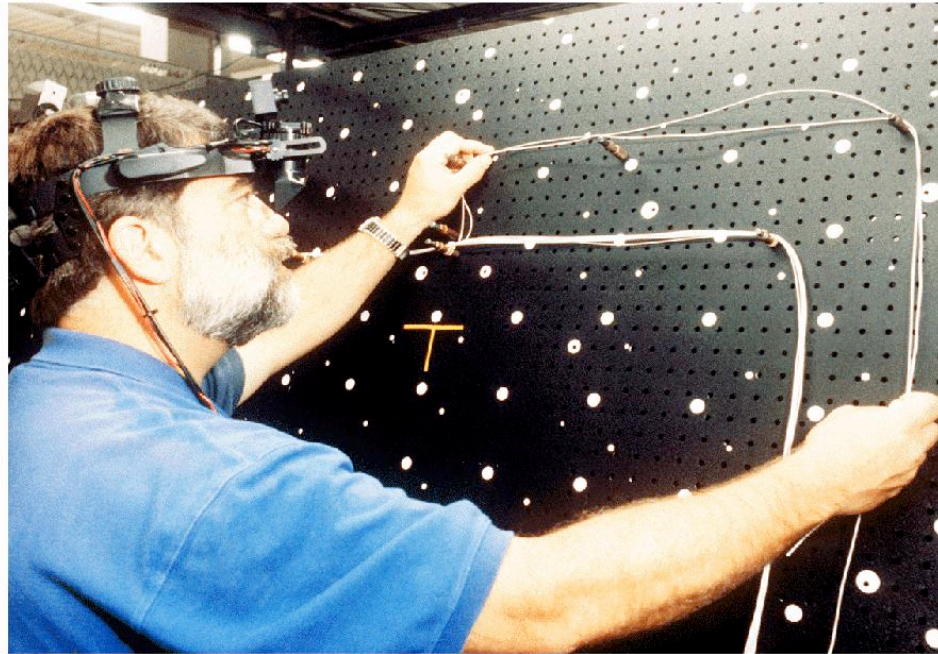
- Bone Surgery -



Machine Assembly and Repair



Wire Bundle Assembly



Building Construction and Maintenance



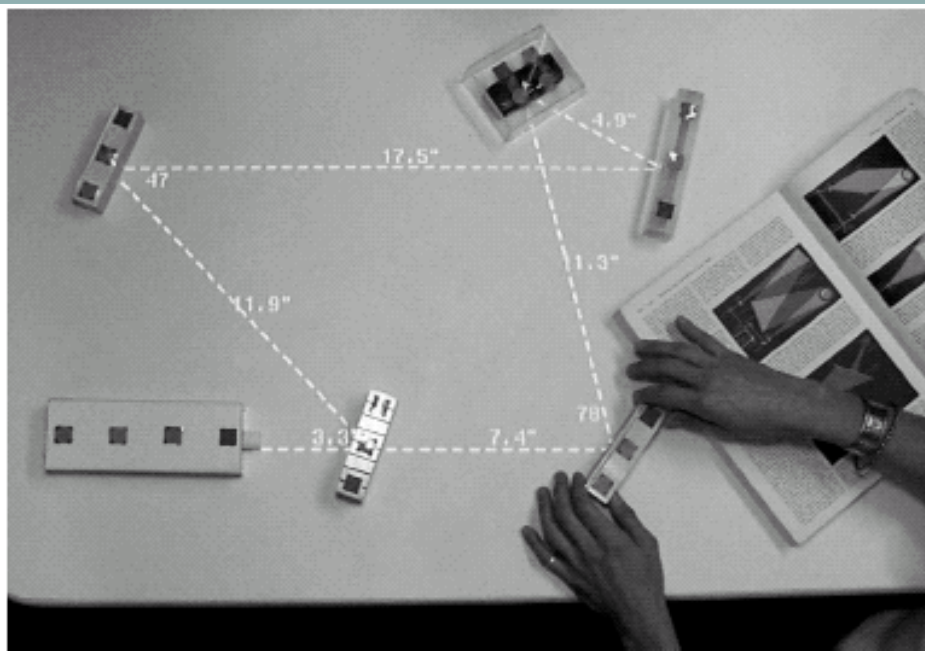
Architecture



Architecture



Edutainment



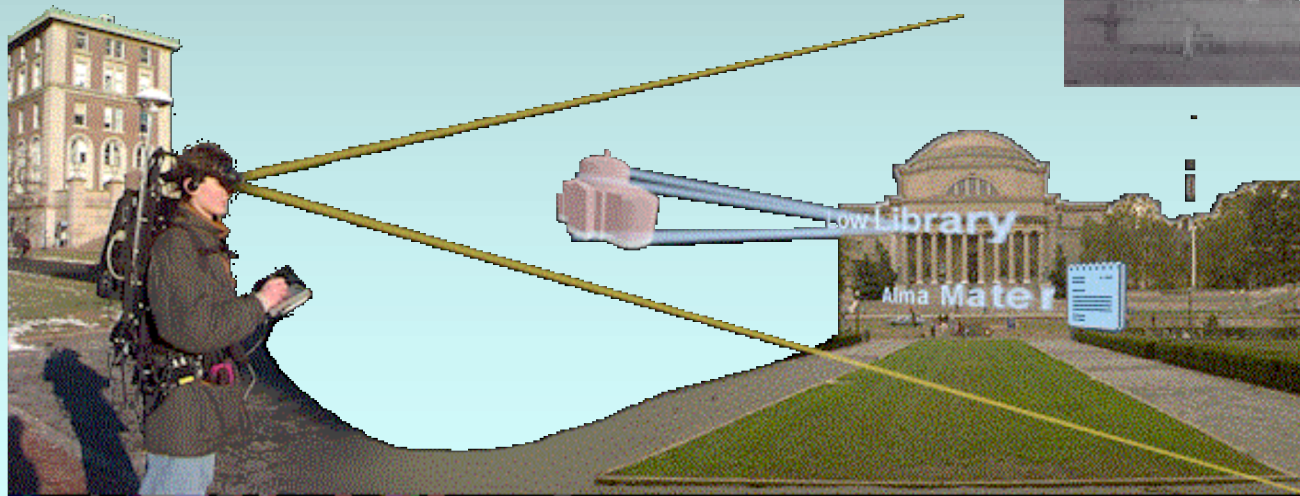
Games



Figure 2. Outdoor ARquake example.



Tourism



3. AR-Related Trends/Enablers

- Wireless Networks
- Wearable/mobile Devices
- Multi-media (sound & speech, video)
- Virtual Reality (3D)
- Tracking Systems (GPS: navigation system in cars)
- Tele-presence, Tele-manipulation,
Tele-collaboration
- Games

4. Research Issues

- **Sensor Analysis** (user tracking, scene modeling)
- **Information Presentation** (Multi-media data; storage, access, data security, visualization)
- **Mobile Communication** (distributed systems)
- **Wearable Devices** (Hardware), **Ergonomics**
- **HCI** (multi-modal interaction)
- **Efficient Algorithms** (real-time)
- **Software Engineering** (extendable, scalable, efficient system)

5. Requirements

- Efficiency
- Flexibility
- Quality of Service in Networks
- Load Balancing
- Adaptive System Behavior
- System Security (Datenschutz)
- User Safety, Acceptance

Multimedia Combination of Reality und „Virtuality“

