



Augmented Reality Anyplace

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Ubiquitous Consumer Services & Augmented Reality
HIIT, Dec 8, 2006



Outline

- Who are we?
 - VTT Technical Research Centre of Finland (2700 people)
 - Digital Information Systems (400 people)
 - Virtual Models and Interfaces (35 people)
 - Video Processing team (8 people)
- AR Anyplace
 - Marketing / Media
 - Games / Entertainment
 - Homes / Interiors
 - Collaboration
 - Architecture
 - Production
 - Web
- Future visions
 - AR with Google Earth
 - Augmented Digital Products



AR in Marketing / Media

- ARCatalogue
 - Enhanced "Magic Book" application
 - In real marketing use by Lappset Group
- ARCipher
 - Implementation on camera phones
 - Augmenting on matrix codes



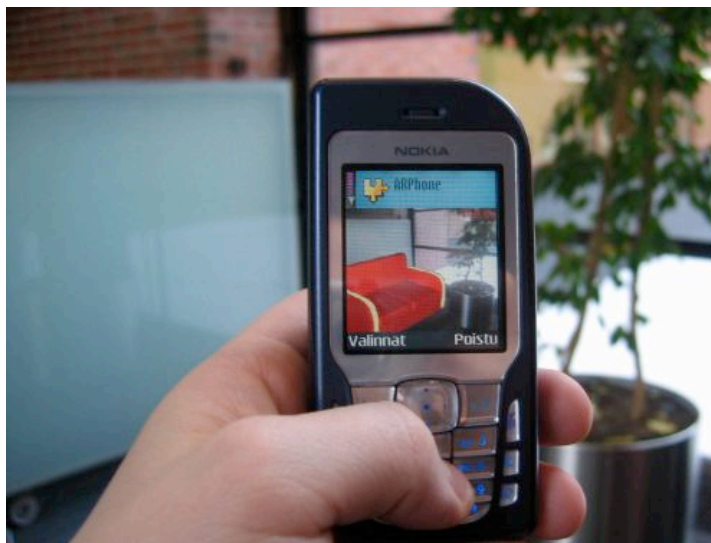
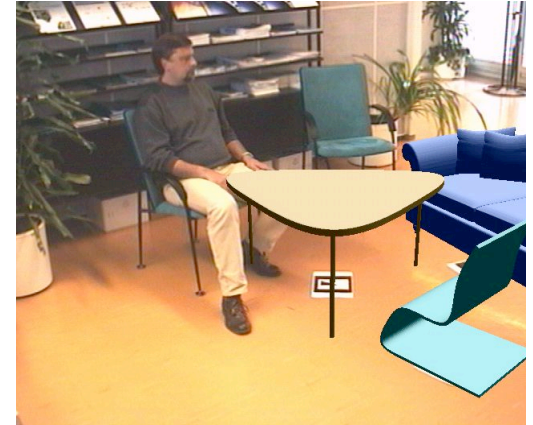
AR in Games / Entertainment

- CamBall
 - Augmented networked table tennis
- SymBall
 - Virtual table tennis for camera phones
- ARPhone
 - AR on camera phones
 - E.g., augmenting objects & faces



AR at Homes / Interiors

- Basic solution
 - Virtual furniture object tied to each marker
- ARInteriors
 - Augmented digital images
- ARPhone
 - Virtual furniture on phone's camera image
 - Downloading models by matrix codes



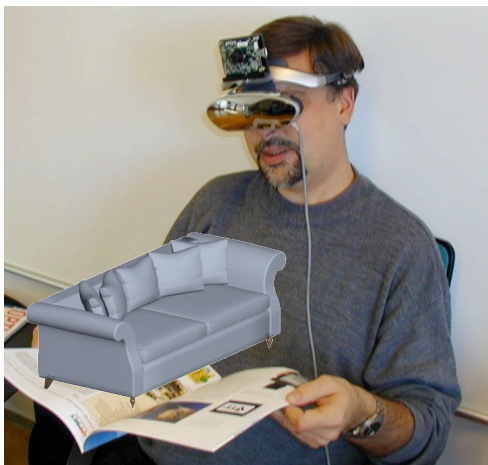
AR on the Table / Collaboration

- ARScaleModel

- Virtual scale model augmented on table
- Stereo viewing using data glasses
- Virtual cursor for user interaction

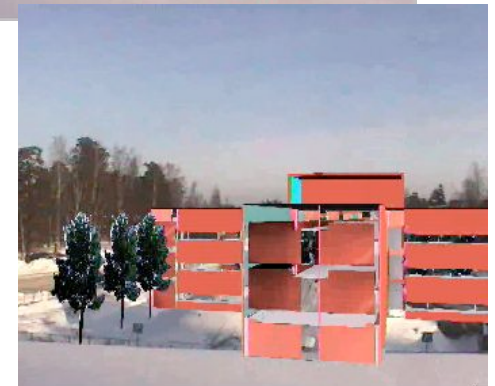
- Including

- ARCatalogue for selecting components
- Virtual reality walk-through inside the model



AR in the Web

- ARWebCam
 - Augmented reality webcam
 - Application during Digitalo construction 2003 – 2005
 - VTT being the first in the world to implement



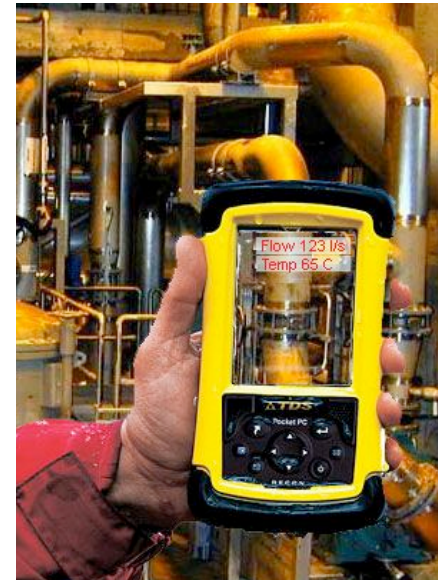
AR Outdoors & Indoors

- ARMobile
 - Virtual objects augmented on handheld device
 - Client/server solution with Digitalo visualisation 2003
- Current implementation
 - Tablet PC (Sony Vaio), camera integrated
 - Dedicated user interface, lots of functionality
 - Feature based tracking when markers disappear
 - etc. ... Petri will continue on this ...



AR in Production

- Project Plamos
 - “Plant Model Services for Mobile Process Maintenance Engineer”
 - E.g. augmenting on-line simulation data onto plant floor equipment
- Project NOSE
 - “Nomadic Use of a Plant Model”
 - Studies methods and tools for ubiquitous plant model usage
- Project NASE
 - “Natural Affordances for Smart Environments”
 - Studies (augmented) affordance table concepts e.g for nuclear power plant control rooms
- Project Augmented Assembly
 - Augmenting 3D model information at assembly lines
 - Focus on short production series with complex products



Now Some (Near) Future Visions ...

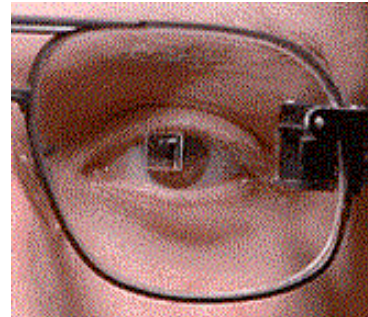


Magic Window Metaphor

Headsets often too uncomfortable for outdoors or every day use?



Solution 1:
More comfortable
headsets



Solution 2:
Magic window
metaphor



Magic Window

- Intuitive and natural to use
- User feels in control
- Lower nerdiness factor compared to walking on a street with a headset
- ...



AR-Viewer (exists)

Free object placement on the view

Always ready for demonstration.
No need for preparations beforehand



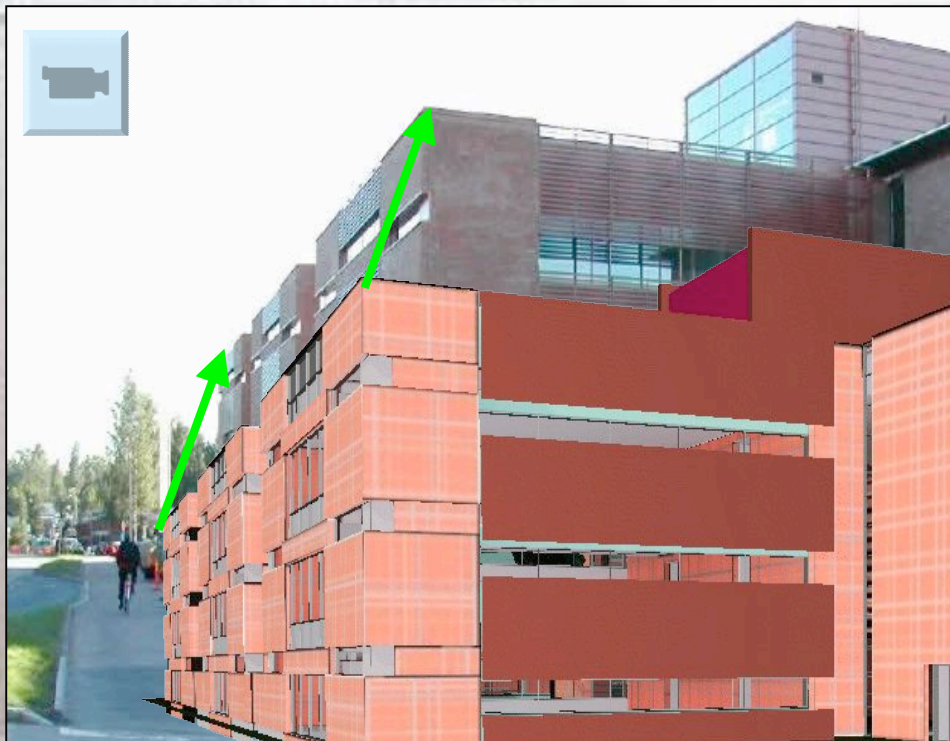
User needs to:

1. Manually scale and turn the virtual object to right orientation
2. Visually place the object on the right place
3. Start tracking

AR-OnSite (exists)

Automatic orientation using GPS

The building is placed on the map (e.g. Google Earth) beforehand. This way GPS can be used to find automatically the right scale and orientation for the object in the view

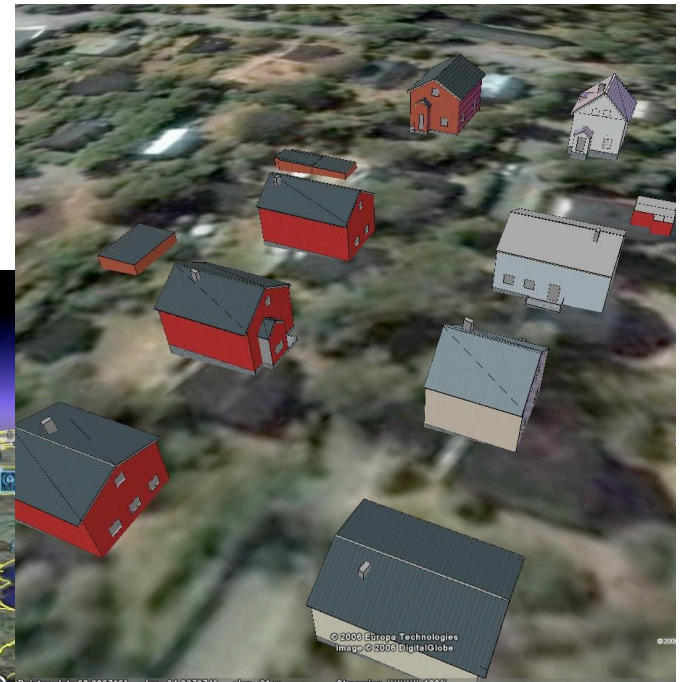
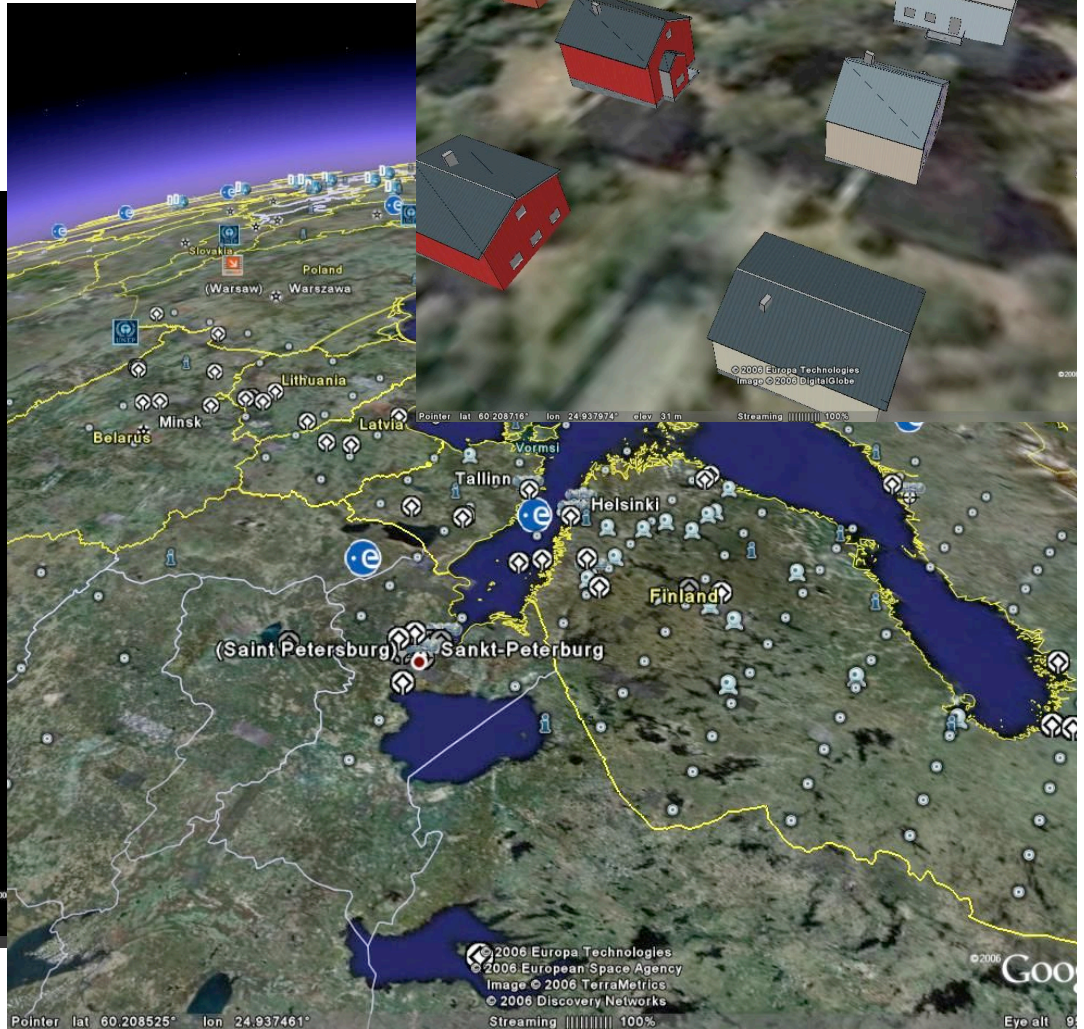


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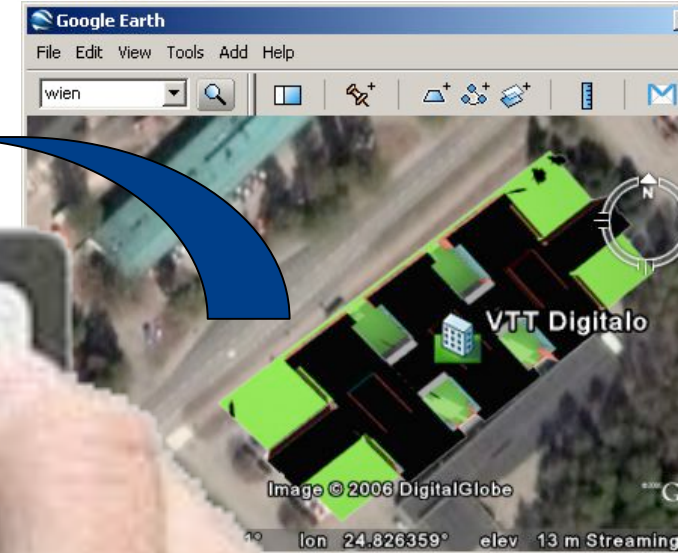
Google Earth

Lots of location-based content



Google Earth on Earth (in near future)

Google Earth content augmented on a mobile device



3D models and Placema
in Google Earth augmen
automatically on a locat
aware mobile devi

DigiProducts

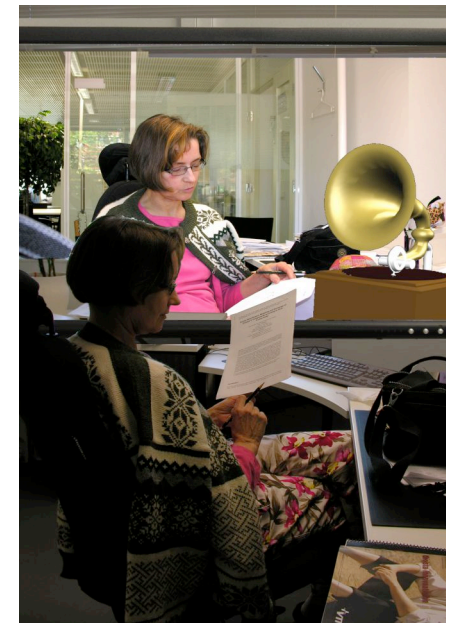
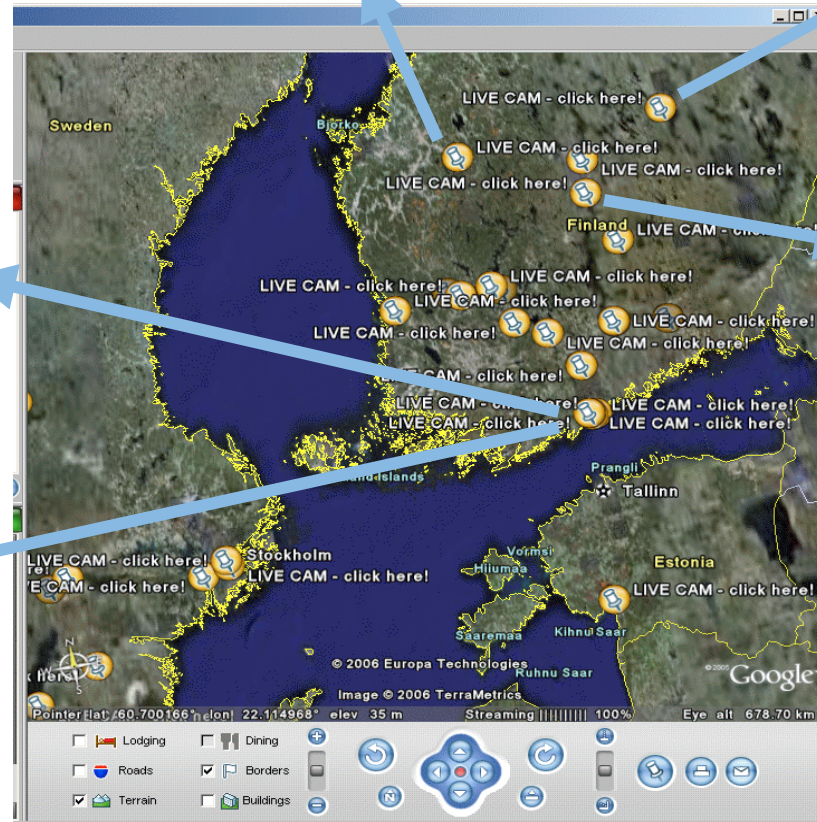
- Digital Virtual Products
 - Products with “100% brand value”
 - Furniture / home decoration
 - Equipment / user interfaces
 - Games, Visual Music, Arts
 - Etc.
- Display devices
 - Camera phones / Data glasses
 - Magic Screen / Virtual Mirror
- Sharing of Experiences
 - Google Earth linked with webcams
 - Virtual visits to friends and public places
 - Places augmented with DigiProducts

= “Habbo Hotel on Earth” !



DigiProducts / State of the Art

- The technology is already here !
- Applications just around the corner



Thank You!

Charles Woodward & Petri Honkamaa

Videos and Demos available at:

<http://www.vtt.fi/multimedia>

