

**amire**   
*authoring mixed reality*

# Authoring Mixed Reality A Component and Framework- Based Approach

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# State of the Art in MR

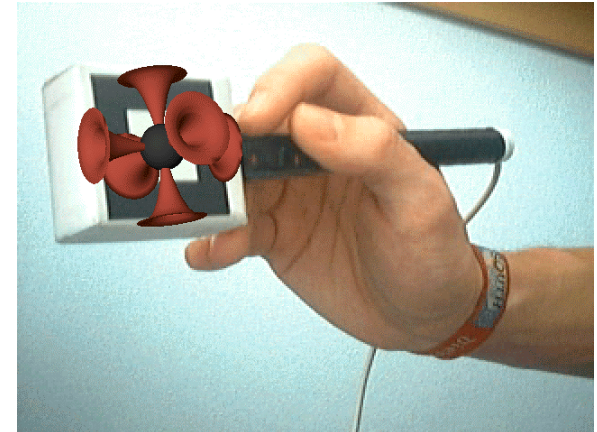
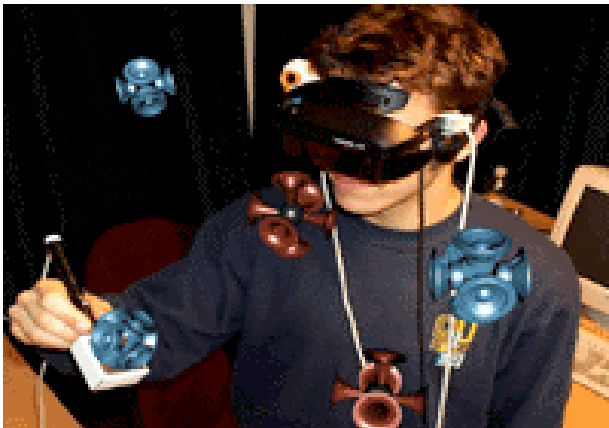
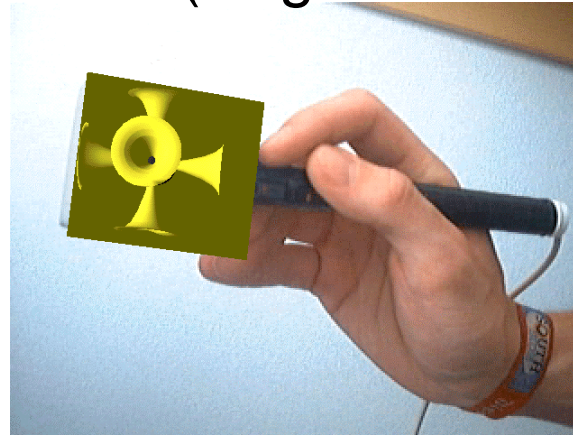
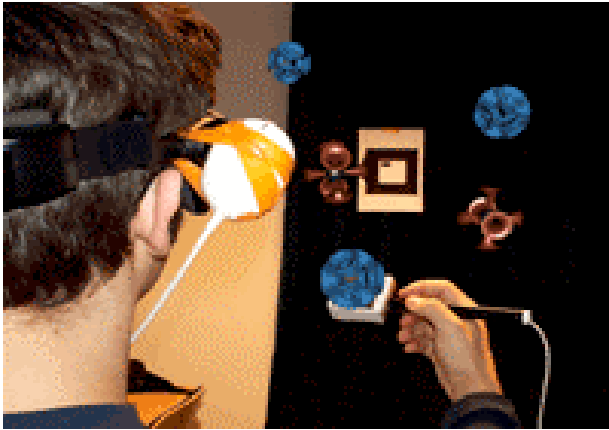
- Base technologies
- European projects (ARVIKA, STAR,...)
- Focus on Image/video based techniques
- Human/Avatar like interaction interfaces (VIRTUE)
- Japanese MR projects

# Work of C-LAB



# Work of FH Hagenberg

## ASR (Augmented Sound Reality)



[www.fhs-hagenberg.ac.at/staff/haller](http://www.fhs-hagenberg.ac.at/staff/haller)

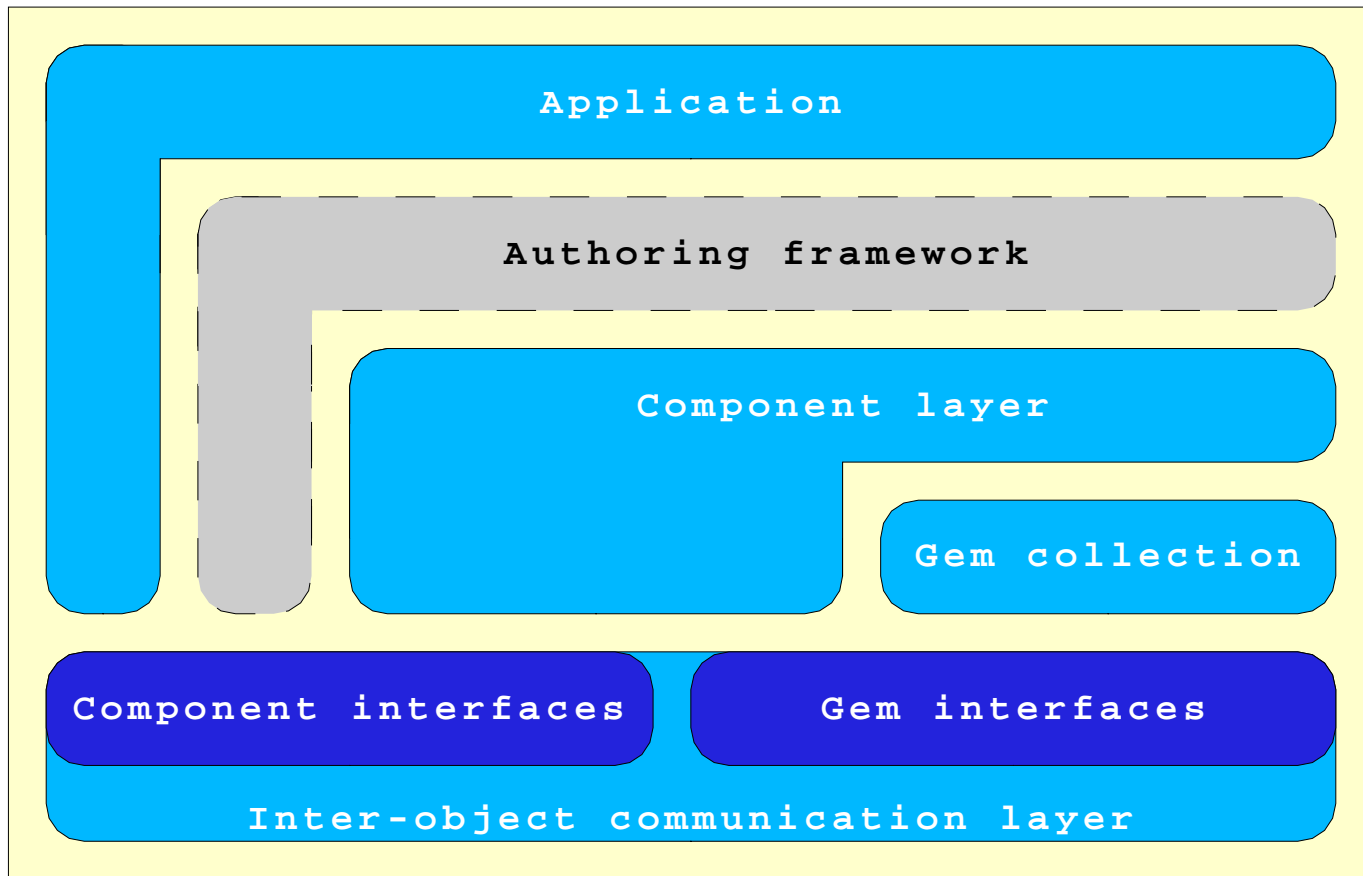
# AMIRE

- = Authoring Mixed Reality
- IST Project (European Funded)
- 9 Partners coming from Austria, Finland, Germany, and Spain
- Computer graphics / MR specialists + usability experts + end users
- April 2002 - July 2004

# Objectives

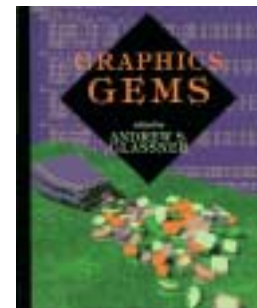
- Efficiently facilitate the creation and modification of mixed reality applications
  - More widespread use
  - Transfer of MR into different application domains
  - Authoring as new application domain
- Two demonstrators:
  - Training application for an oil refinery (OMV)
  - Museum application (Museum of Bilbao)
- Trigger and contribute to standardization

# Gems, Components, Framework



# Gems

- Collection of techniques and algorithms for programmers
- Share and reuse ideas and tools
- Provide a variety of innovative solutions to programming problems



# MR Gems

- Solutions for tasks in MR applications
- 3<sup>rd</sup> party libraries/APIs
  - Existing solutions are extended to support their application in AMIRE components and other applications (e.g. through appropriate classifications, documentation, coding conventions)
- Hardware specific
- E.g. object recognition, tracking, camera control,...

# MR Gems II

- **Problem:**

- Efficient 3<sup>rd</sup> party solutions for common tasks in MR applications are difficult to find and reuse.

- **State of the Art:**

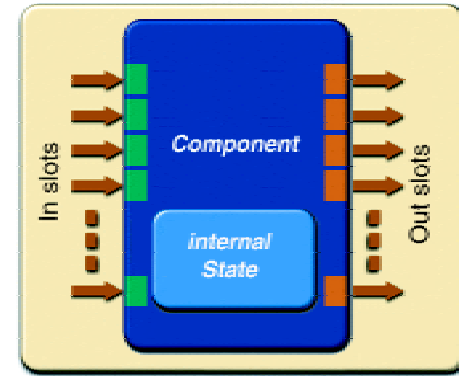
- Many projects build their own MR algorithms and techniques – there are no established standards and sharing/reuse is not supported as a primary goal.

- **Approach:**

- Collect established solutions to individual tasks into a library of MR GEMs.

# MR Components

- Well designed interface
  - Consist of geometry model and behavior
  - High-level and domain-specific
  - Re-usable, customizable and adaptable
- Inter-Object Communication
- Stored in component library
- Cost effective application development



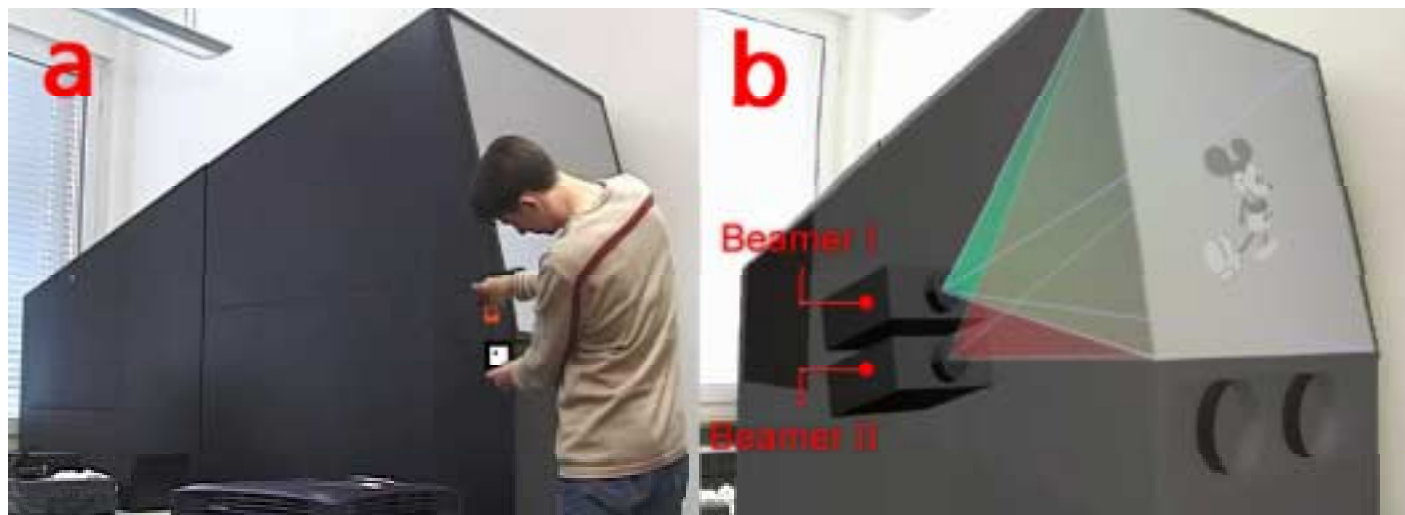
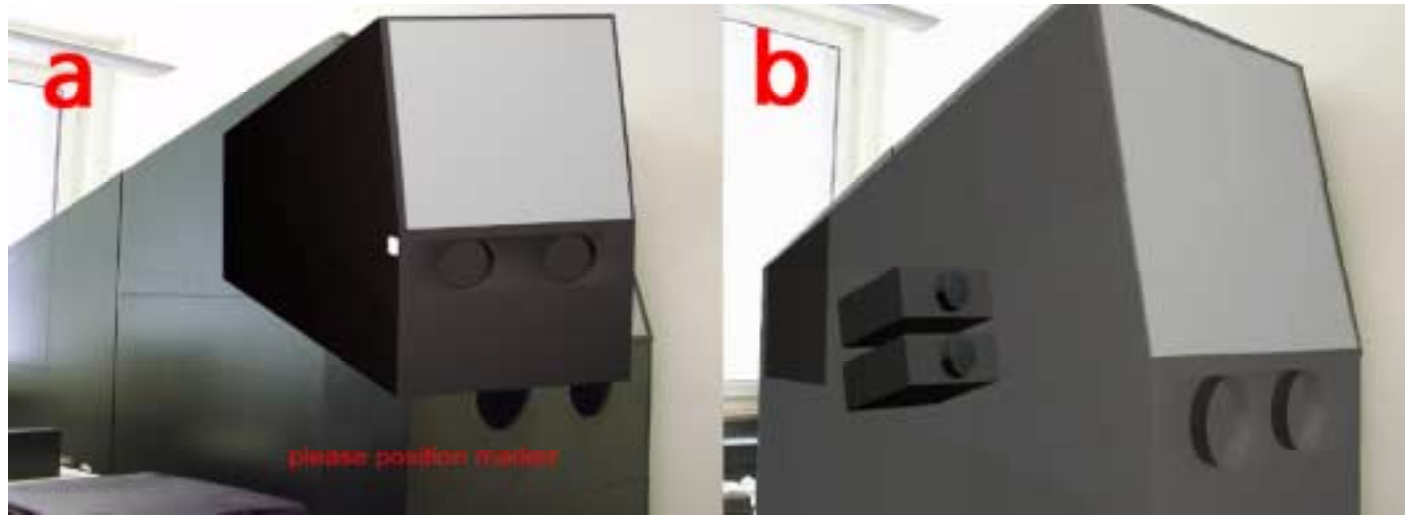
# MR Framework

- Framework as glue between gems and components
- Framework offers a High Level API and an Interface for the components
- MR Runtime Framework
- Authoring Framework

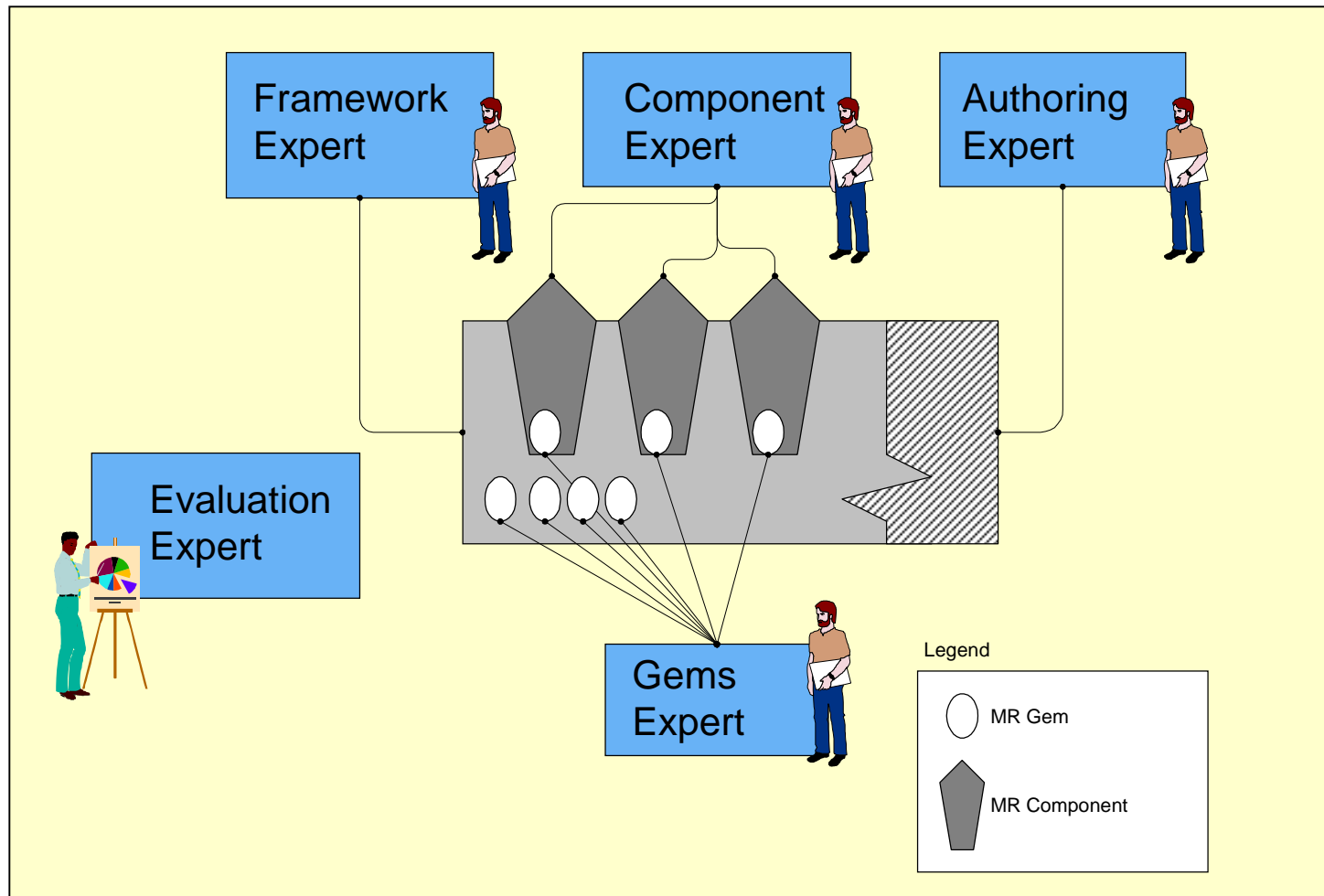
# Authoring Process - Ideas

- Do not simulate Reality – use Reality during the authoring process
- No traditional Modelling (Authoring tools) for the Design Process of a MR application
- Leave the author in his familiar surroundings
- Make interfaces “realistic”

# Authoring process



# The different MR experts...



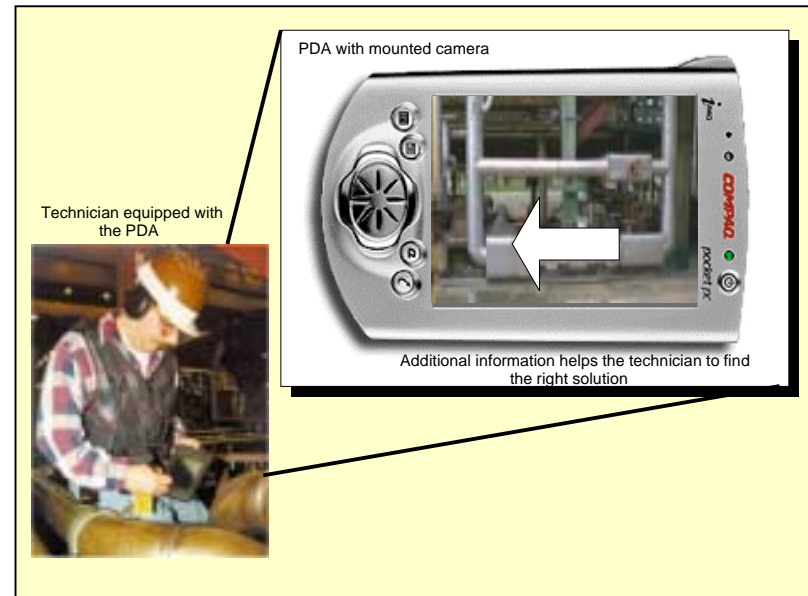
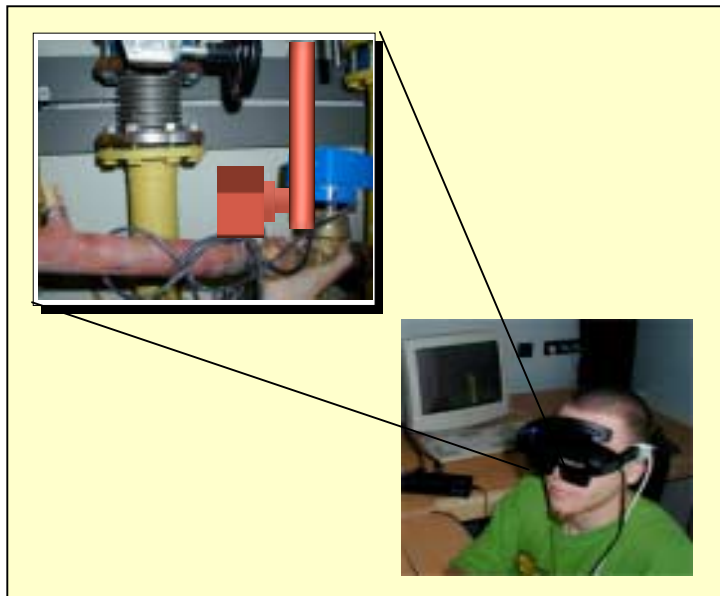
# The OMV Refinery



- Complexity
- Walkthrough (Outdoor solution)
- Training / Learning scenario

# Oil Refinery Application

- Indoor solution (Tracking system, iGlasses)
- Outdoor solution (Handheld/Tablet PC)



# The scenario



- Checkpoint
- More details
  - Product pipeline
  - Look inside (magic lens)
  - Voice output
  - Technical data
- Usage of markers would be possible

# The scenario II

- Complex object (i.e. pump) => 3D animation
  - What's inside?
  - Simple and easy to use
- The pipeline:
  - A short movie shows the path of the pipe X



# Museum Application

- Establishing personalised visiting path
- Provide adapted information for disabled people
- Visualisation of missing pieces...



# Museum Application II



- Interactive virtual museum
- Presentation of information in creative ways
- Establishing personalised visiting path
- Provide human-like assistance:
  - What should I visit next?

# Conclusion and future work

- Development of the framework, of the gems and the components
- Authoring tool for MR
- Open Source (LGPL) ?
- Standardization of MR applications
  - We are looking for MR solutions (e.g. ARToolkit, 3DS Loader, MDL-, MD2-Loader etc.)
  - Good solutions are welcome!
  - We offer a solid MR base
  - Help us to make MR more popular!

# Special thanks to...

all partners & members of the  
AMIRE project



# Contribution to Standards



Production Process of 3D Computer Graphics Applications-  
**CAMPFIRE Structures, Roles and Tools**  
ACM SIGGRAPH AND EUROGRAPHICS  
Snowbird, Utah



- June 1-4, 2002 in Snowbird USA
- Interdisciplinary Workshop

# Questions?

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