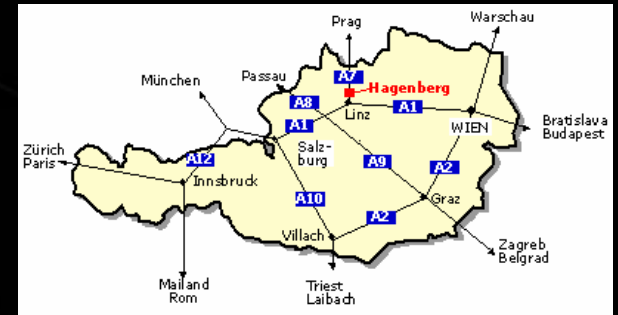


# Computer graphics, Virtual Reality, and Augmented Reality @ MTD

Michael Haller  
Jürgen Zauner

# MTD Overview



- Media Technology and Design (MTD)
- College of Engineering at Hagenberg as part of the Upper Austrian University of Applied Sciences (Europe)
- is a 4-year engineering program focused on
  - technical and
  - creative aspects of digital media



# Teaching computer graphics

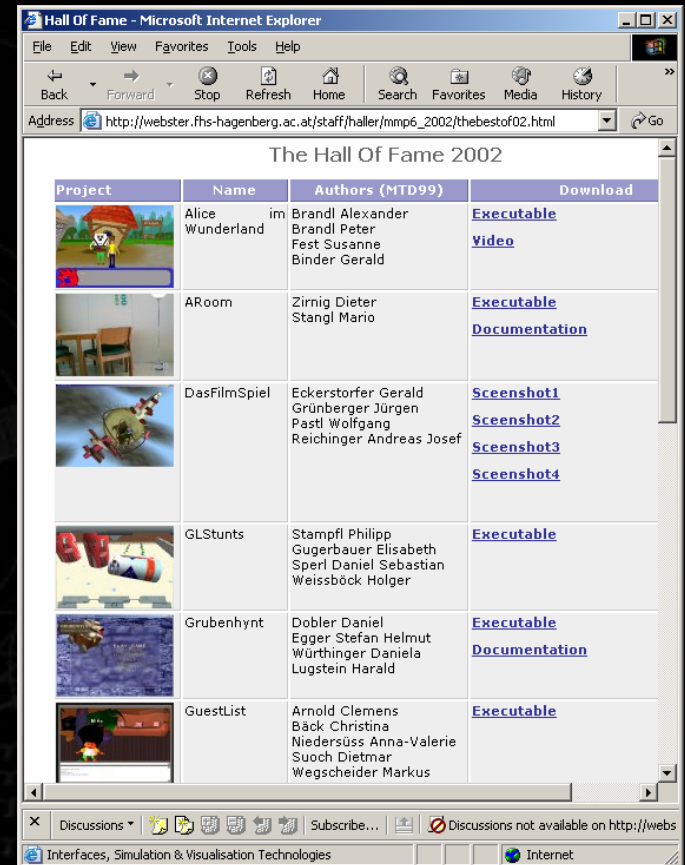
- **Computer graphics (I+II) (CGR3/4)**
  - Overview + Basics of computer graphics
  - Java, C, OpenGL
- **Multimedia programming (I+II) (MMP5/6)**
  - High Level API (Java3D)
  - Sound programming
  - Low Level API (OpenGL), Special effects
  - Game programming
  - Virtual + Augmented Reality

# Student projects

- Game programming

- No game engine
- OpenGL
- 4-5 persons for 1 semester

- [http://webster.fhs-hagenberg.ac.at/staff/haller/mmp6\\_2002/thebestof02.html](http://webster.fhs-hagenberg.ac.at/staff/haller/mmp6_2002/thebestof02.html)



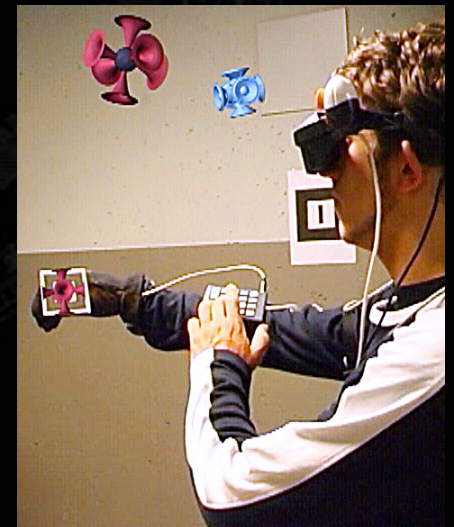
# StepIT, Orgasmic Ride

- Fitness center => Ergo Bike
- Stepper & bike
- Ergometer
- Own game engine
- Based on Quake models
- GtkRadiant (Quake modeling tool)
- 1 year project (8 persons)



# ASR (Augmented Sound Reality)

- 3D Sound + Augmented Reality
- ARToolKit (Reference markers => Tracking system)
- Creative EAX Library => Dolby Digital
- PIK (Personal Interface Keypad)
- SIGGRAPH 2002:
  - Sketches & Applications
  - Emerging Technologies



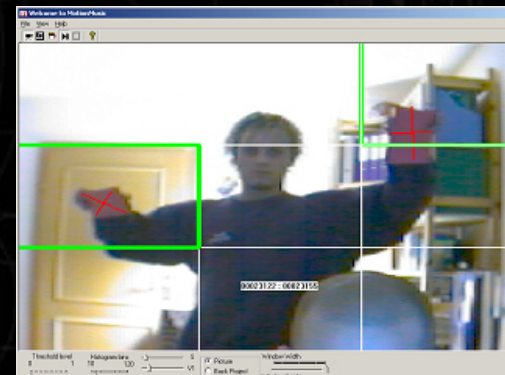
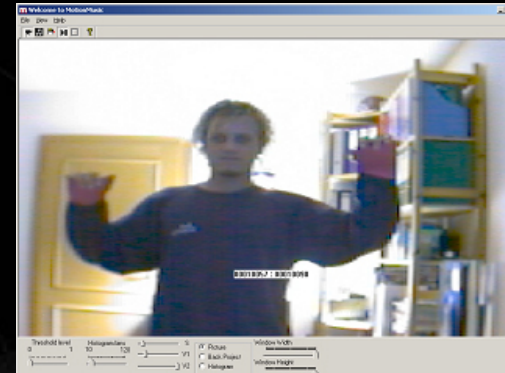
# SmellWare

- Olfactory
  - The flavor is missing in most VR/AR applications
- HMD + Tracking system
- Olfactory hardware was developed by HSSE (Hardware/Software Engineering)
  - 6 aerosols



# MotionMusic

- The music plays according your dance style
- 9 fields
- OpenCV
- DirectSound



# EyeCursor

- The cursor follows the movements of the eye
- Using a USB camera
  - Cursor positioning
  - Scrolling
  - Navigation in the 3d world



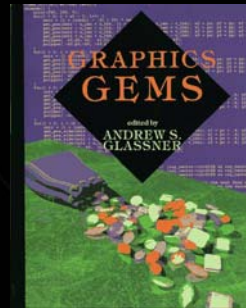
# Activities, Cooperations

- GI/OCG Informatik 2001
- SIGGRAPH Campfire 2002 @ Snowbird
  - [www.agc.fhg.de/campfire](http://www.agc.fhg.de/campfire)
  - Ken Perlin, Randy Pausch, David Ebert, ...
- ART02 - 1st IEEE ARToolKit Workshop
- Cooperations (excl. Vienna :-)
  - C-Lab, Fraunhofer AGC, National Univeristy of Singapore, HITLAB New Zealand, University of Hiroshima, University of Southern Australia, ...

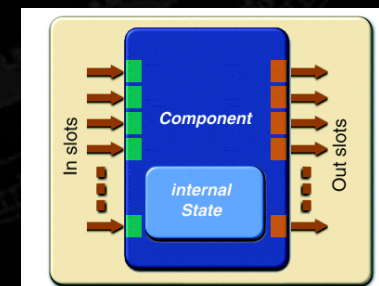
# AMIRE

- = **A**uthoring **M**ixed **R**eality
- IST Project (European Funded)
- 9 Partners coming from Austria, Finland, Germany, and Spain
- April 2002 - July 2004
- Budget: 2,1 Mio €
- <http://www.amire.net>

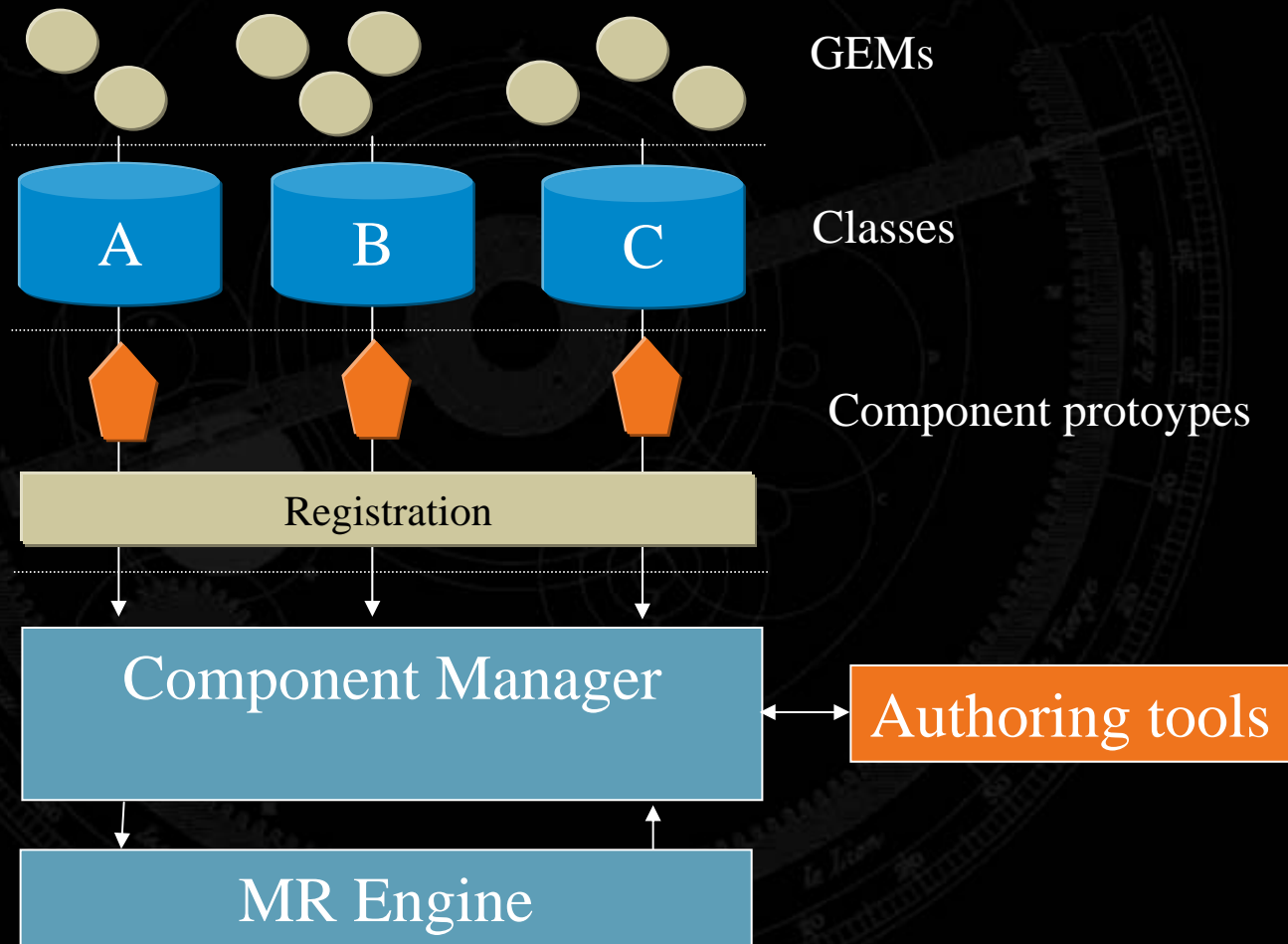
# AMIRE II



- Efficiently facilitate the creation and modification of mixed reality applications
  - Make it more easy for developers to implement AR/MR applications
  - AMIRE is based on gems (solutions for AR problems, i.e. ARToolkit, lib3DS,...)
  - AMIRE's framework is based on a component oriented approach



# AMIRE III



# AMIRE IV

- Two prototypes:
- OMV - oil refinery application:
  - Find common MR/AR gems => components
  - Tablet PC
  - Implemented by MR/AR experts using the component approach
- Guggenheim museum application:
  - Tablet PC
  - Implemented by content experts using the authoring tools



# Questions?

[mtd.fh-hagenberg.at](mailto:mtd.fh-hagenberg.at)

[jzauner@fh-hagenberg.at](mailto:jzauner@fh-hagenberg.at)

[haller@fh-hagenberg.at](mailto:haller@fh-hagenberg.at)