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# Industrial Application Systems Using AR Technology

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ISMAR2006

Workshop on Industrial Augmented Reality

October 22, 2006

**OLYMPUS CORPORATION**

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Opto Digital Technology

# Cotents

- ◆ 1. Introduction
  - The background of Olympus's AR activity ( Navigation system for the Neurosurgery )
  
- ◆ 2. AR in Nuclear Power Plant
  - Fugen ( Objective , System outline )
  
- ◆ 3. AR in Entertainment
  - Optical See-Through Viewer ( Handy Terminal )
  - Applications using Viewer
  
- ◆ Others
  - MO Drive Maintenance
  - Motor Cycle Race Monitoring System
  - Application on Cellphone

# 1. Introduction

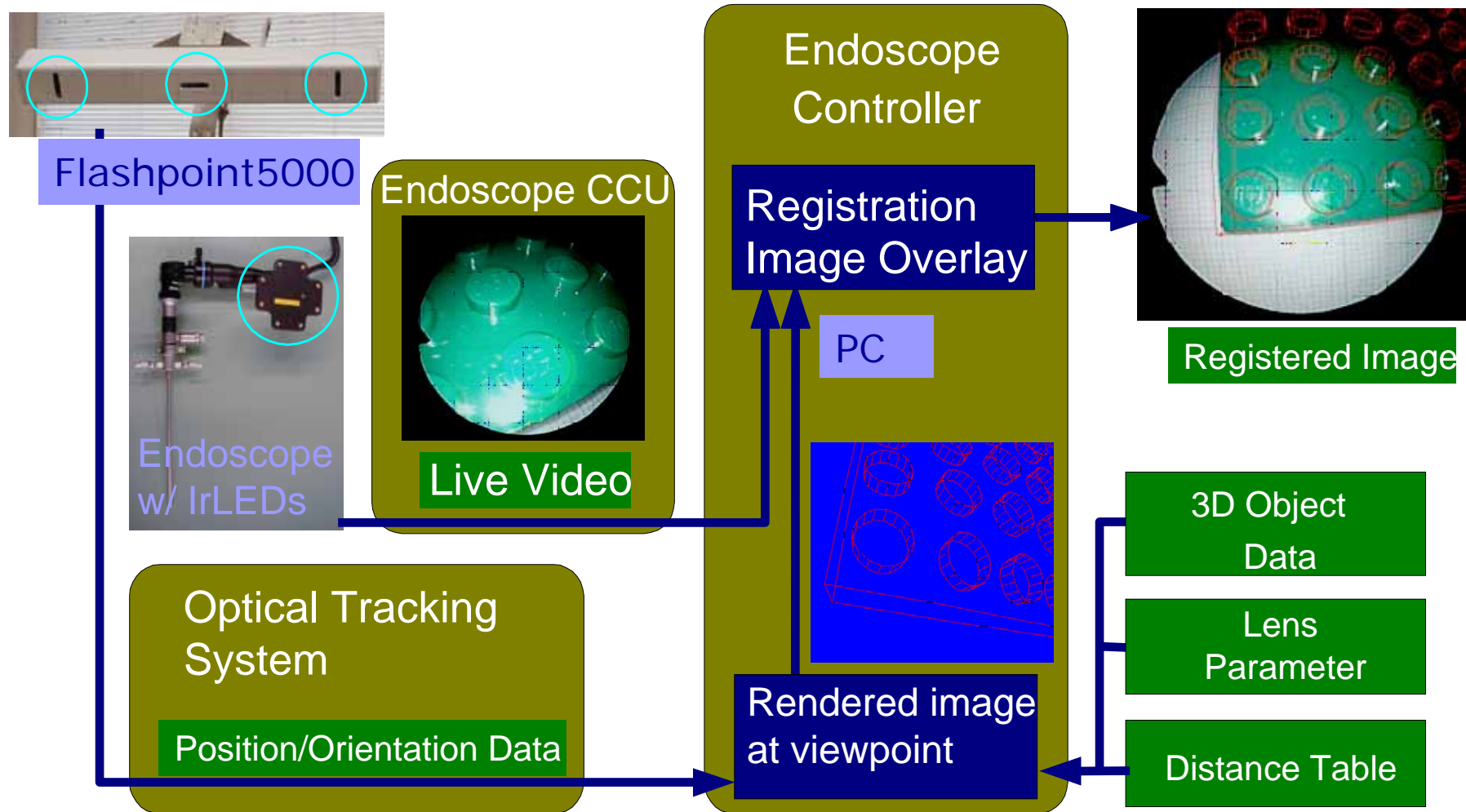
## ◆ Medical Use

- Navigation System for Neurosurgery

## ◆ AR Navigation System for Neurosurgery

- Collaborate w/ Tokyo Women's Medical University

# System Configuration



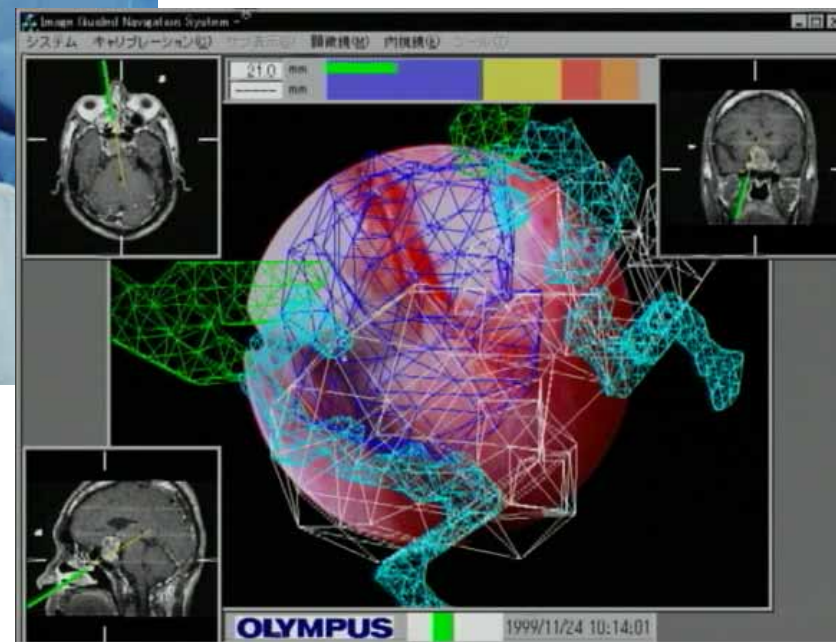
# Clinical test



Reference:

MICCAI2000 3rd Int I Conference pp833-

838, October 11-14, 2000, Pittsburgh, PA, USA





◆ **Movie**

# References

◆ **MICCAI2000 3rd Int I Conference**

pp833-838, October 11-14, 2000, Pittsburgh, PA, USA

◆ **Medicine Meets Virtual Reality 2000**

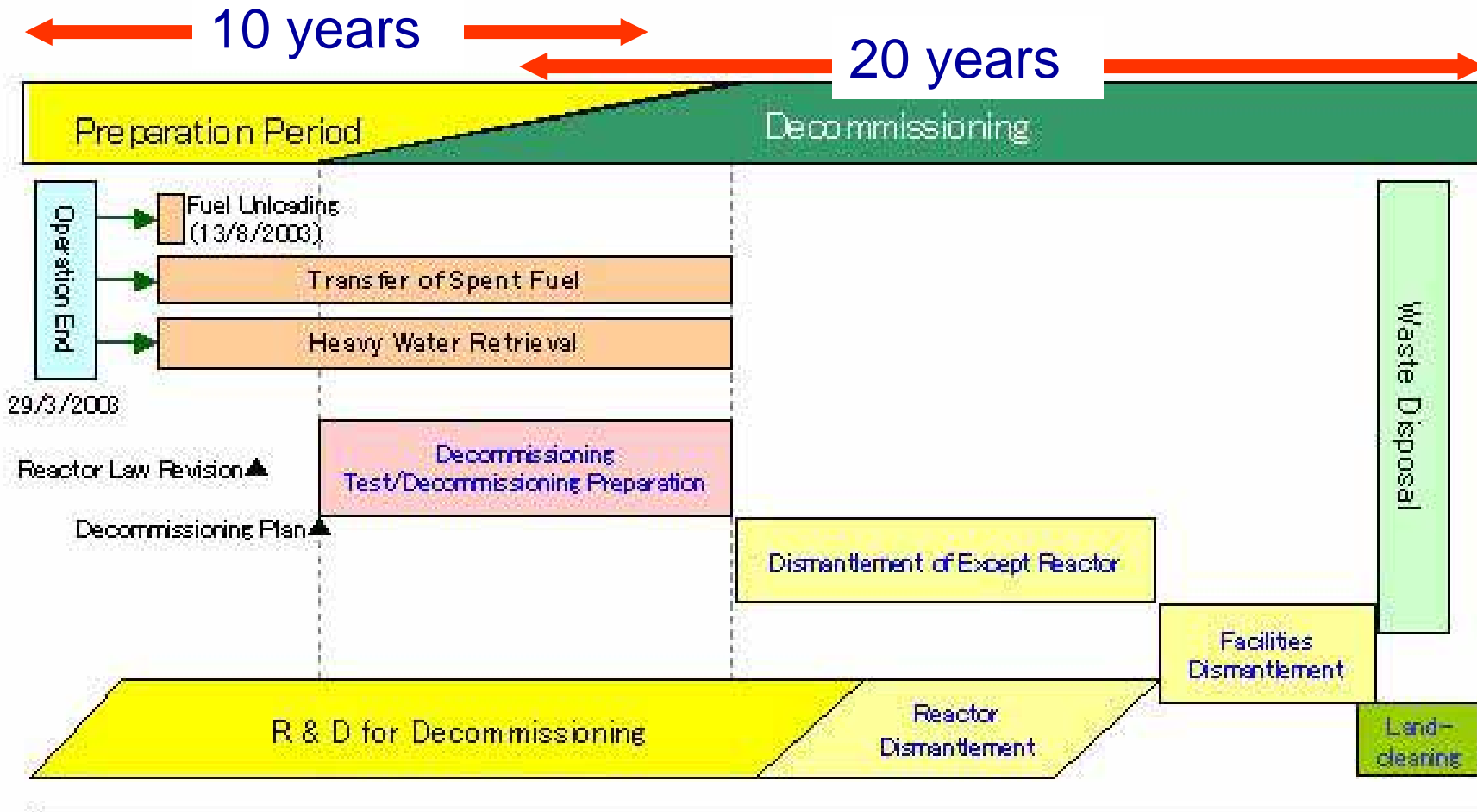
Proceedings pp10-16 27-30 January 2000 Newport Beach, CA

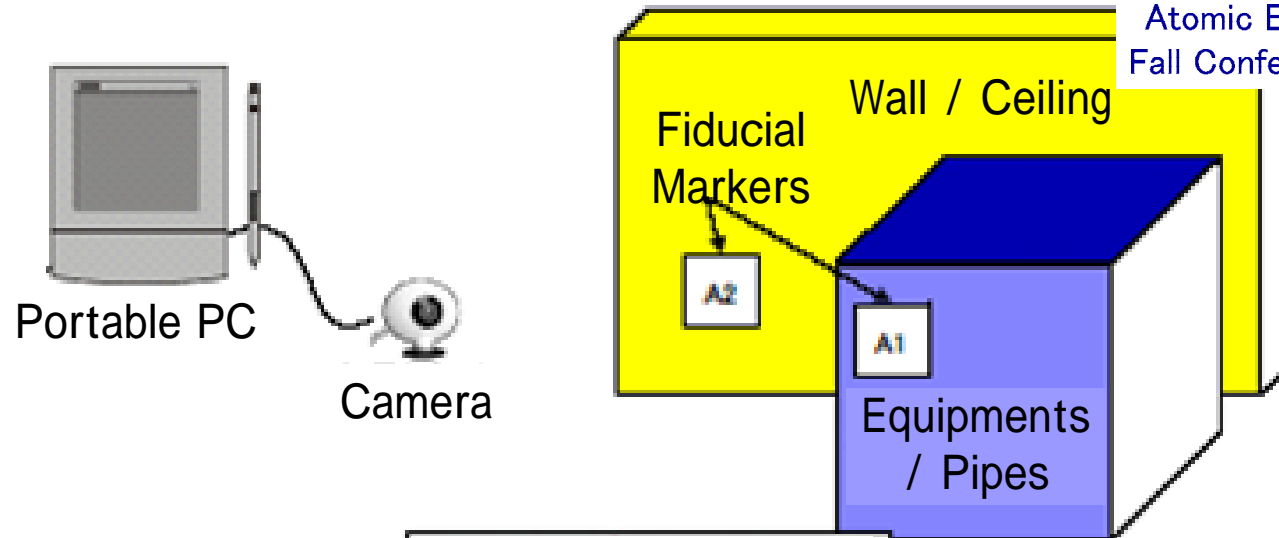
## 2. AR in Atomic Power Plant

- ◆ Fugen Nuclear Power Station (Japan Atomic Energy Agency ) terminated its operation on March 29, 2003.
- ◆ Preparation period of decommissioning of ten years
  - Development and study of necessary technologies to flesh out the details of the decommissioning of Fugen
  - Transfer of spent fuels to the site outside of the nuclear power station, removal and transfer of the heavy water from heavy water system



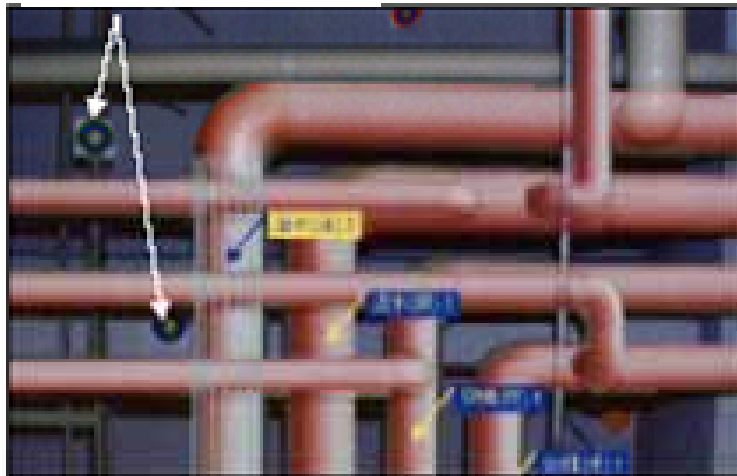
Outline Schedule after the End of Operation Decommissioning





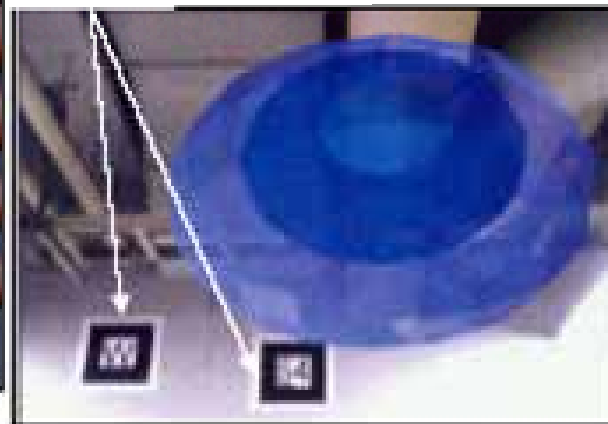
Overview of information overlay

Fiducial Markers



3D model is overlaid on the real image

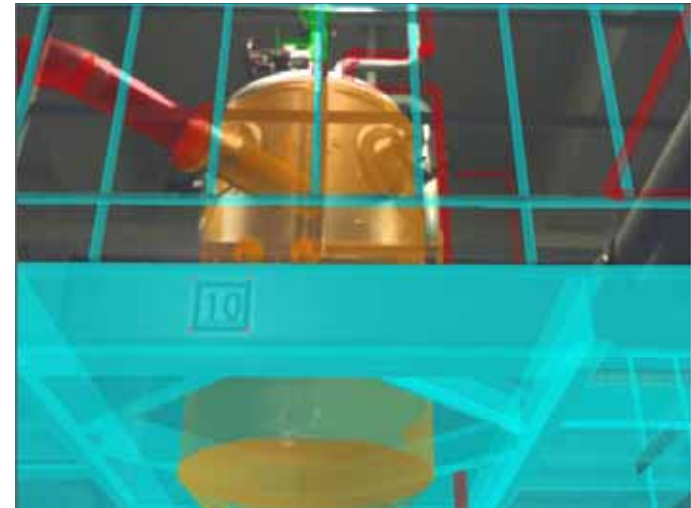
Fiducial Markers



Visualize radioactive area

# Visualizing System

- ◆ Supporting information to the workers for decommission
  - 3D shape of the equipment
    - » Overlay 3D models based on the camera view point
  - Detailed equipment information
    - » name, weight, material, amount of radioactivity
  - Classify the equipments by color
  - Visualize radioactive inventory



< 3D Overlaid >

◆ **Movie**

# Reference

Atomic Energy Society of Japan 2004  
Fall Conference Proceedings F67, 2004

## AR in Entertainment

- ◆ A portable viewer using  
Optical See-Through Information Combiner





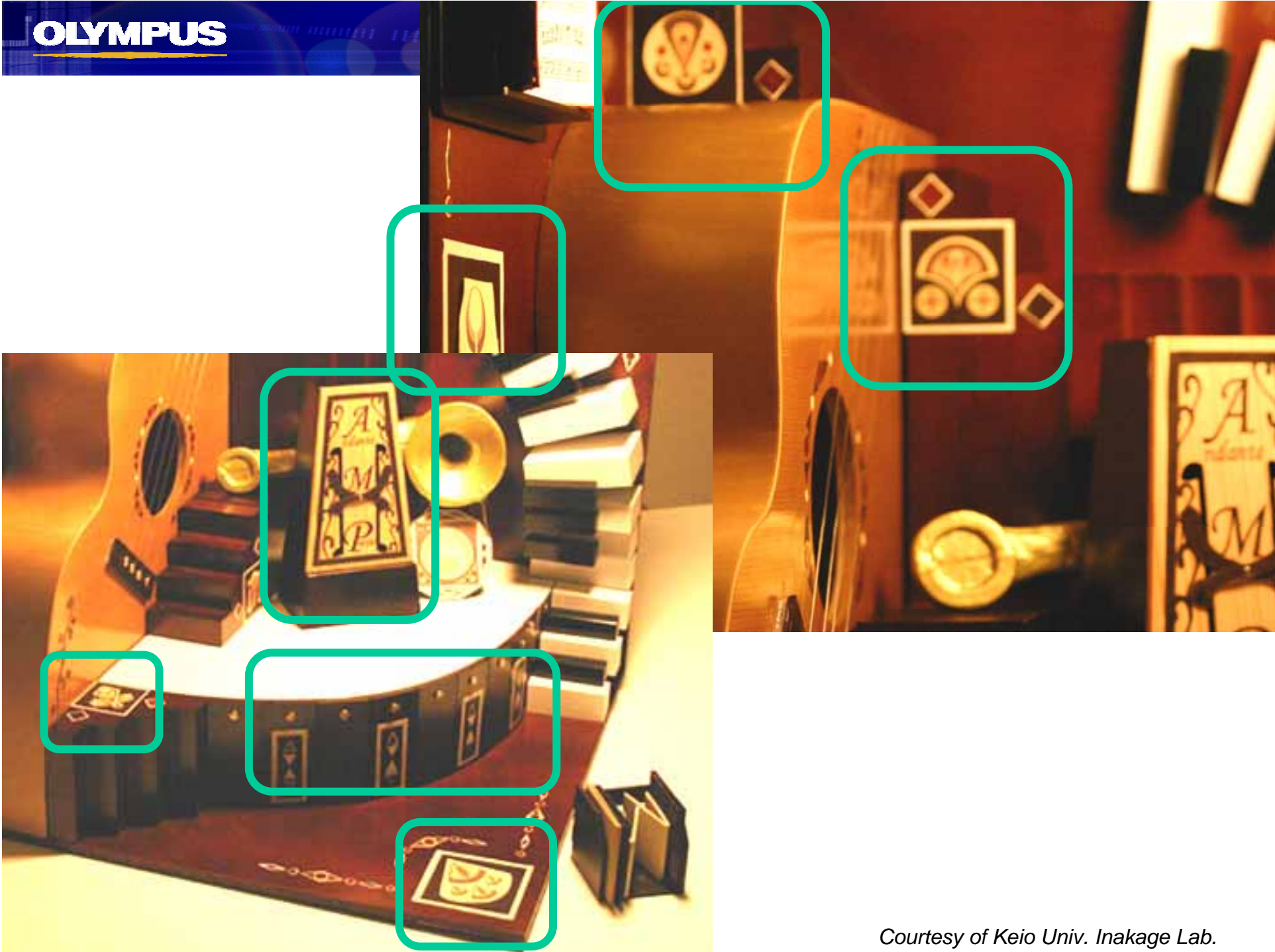
# Optical See-Through Viewer

- ◆ 245x60x20mm and weighing 260g  
(9.6 x2.4x0.8 in / 0.57lb)
- ◆ Optical combiner displays
- ◆ camera that acts as a vision sensor



# Hakone AR Hybrid Musical Entertainment





*Courtesy of Keio Univ. Inakage Lab.*



# As a new Music Entertainment



◆ **Movie**

## Reference

- ◆ Transactions of the Virtual Reality Society of Japan Vol.10 No.3 pp.281-284, September 2005

## Related Works

- ◆ imgl - MR Ground Zero “Little Red MR” (2003)
  - Storytelling in MR books
- ◆ imgl - MR Ground Zero “Veggie Diaries” (2004)





SynchroReality  
Technologies

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