Introduction of IVEs in Japan
Chuo University ISE Department

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Makino Laboratory

- Started at Chuo University in April, 2002 (almost 20 years old)
- Research topics:
  - Computer graphics (3D representation onto 2D images)
  - Virtual reality (3D representation onto 3D space)
  - Augmented reality (embedding CG into real scene)
  - Modeling & algorithm
  - Education & entertainment (edutainment)
  - Application system (e.g., geographic information systems: GIS)
  - Human interface
  - Information visualization
  - Scientific visualization

- ChuoCAVE, mini CAVE with 3 faces (2003)
  - 3 Windows2000 PCs (2003)
  - 100 inches parallax projection (2005)
  - 7 WindowsXP 64bit PC clustor with Orad-DVG (2006)
  - Some PCs with stereoscopic display (CRT) (2006)
- Autostereoscopic 42' LCD (2007-2009)
  - 5 standalone displays
  - Coupled displays
- 12 Tiled LCD (Samsung UD) (2010)
  - Applicable to AR

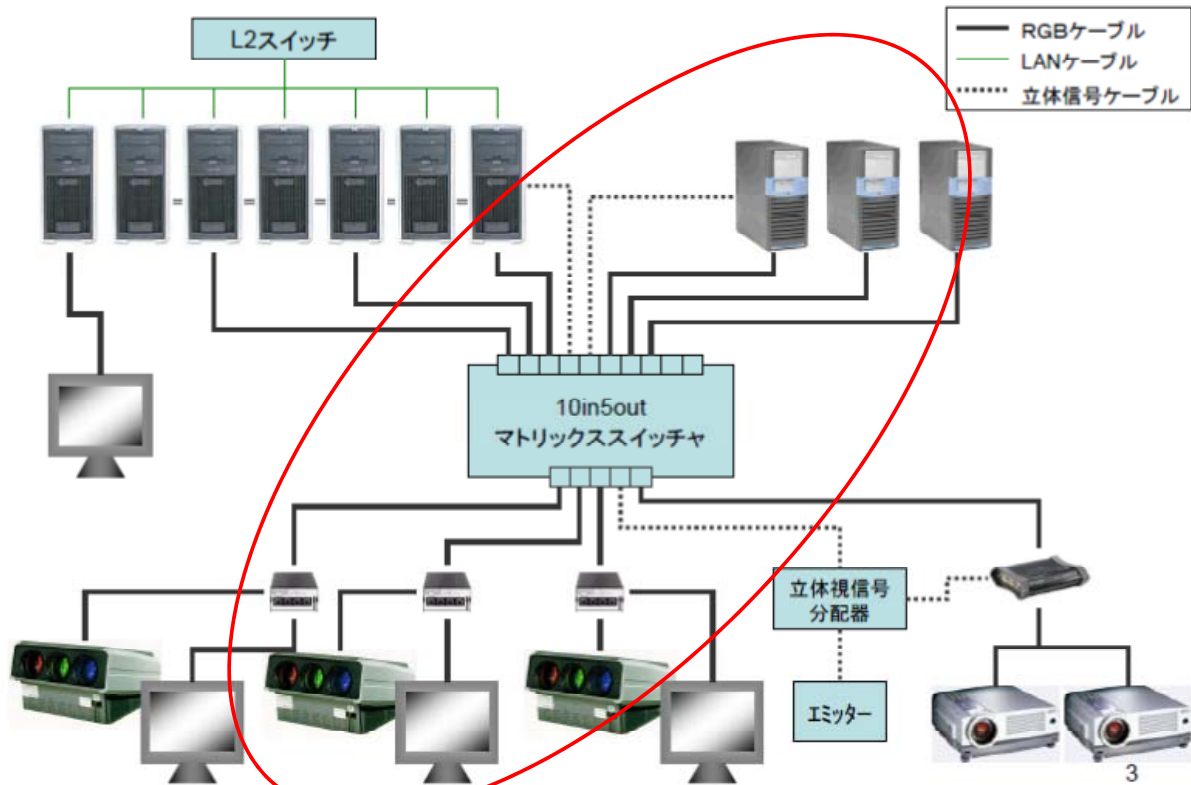**OpenGL applications are executalbe in all systems!**

ChuoCAVE Project

- March, 2003: ChuoCAVE was installed.
- April 2003-March 2004: Makino visited the Electronic Visualization Laboratory (EVL), the University of Illinois at Chicago, USA, which firstly developed the CAVE in 1992.
- 2005: connected to parallax projection
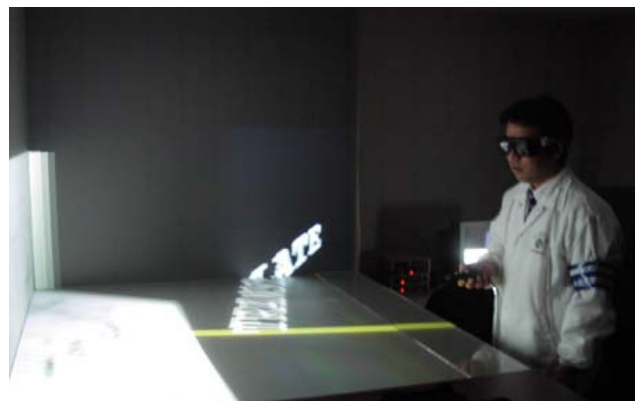- 2006: graphic PC cluster (ORAD DVG)

ChuoCAVE & related facilities

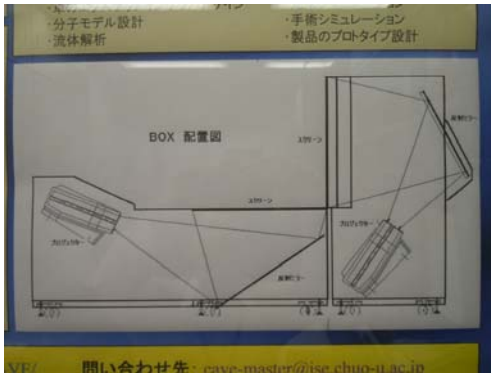It may be the smallest in Japan among multi-faced screen type

W4587mm x D2687mm x H2600mm (8 ft. 6 in.)

in room of W6400mm x D5600mm x H2700mm

(only 100mm to ceiling from the top!)

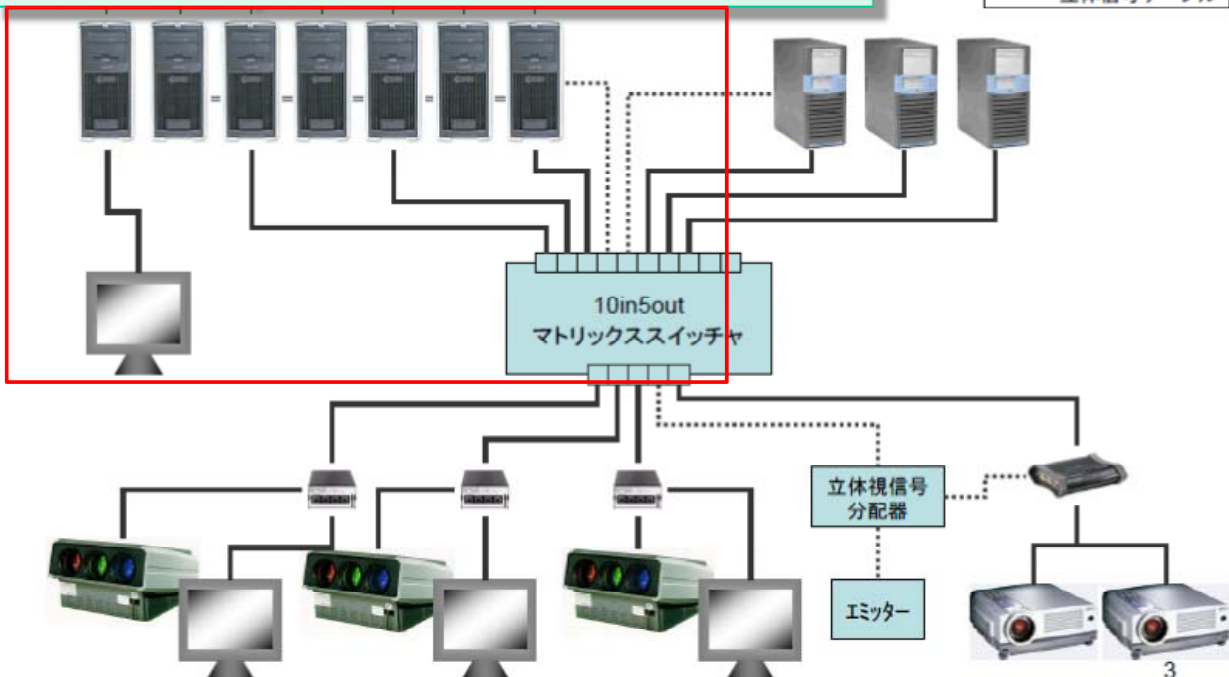We can also move the CAVE, if necessary ! (However the door is too small !)

- PC: HP X4000
  - CPU: Xeon 2.4GHz x 2
  - 2GB memory
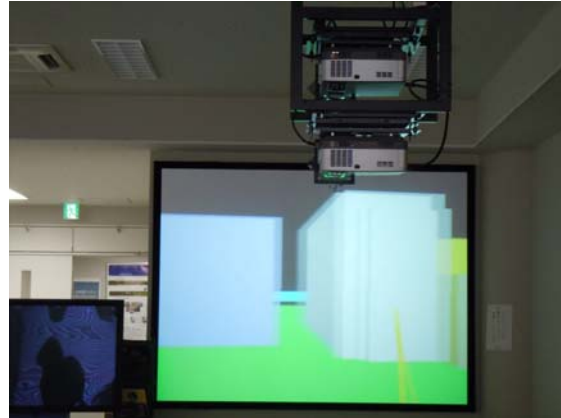 - 80GB HDD
  - Videocard: 3Dlab wildcat6210

ChuoCAVE 2nd Generation

Dual Core AMD Opteron285 2.59GHz × 2 with 4 GB RAM, NVIDIA Quadro FX 4500 under Windows XP 64 bit Pro, inter-connected by ORAD-DVG

RGBケーブル
LANケーブル
立体信号ケーブル

10in5out
マトリックススイッチャ

立体視信号
分配器

エミッター

C-SESP

Chuo University Shared Environment of Stereoscopic Pictures

- 2 DLP projectors with parallax film
- 100 inches silver screen

Simultaneous representation

Front Display

 9

Autostereoscopic LCD (Phillips WoW42)

Autostereoscopic LCDs and 3D camera

 10

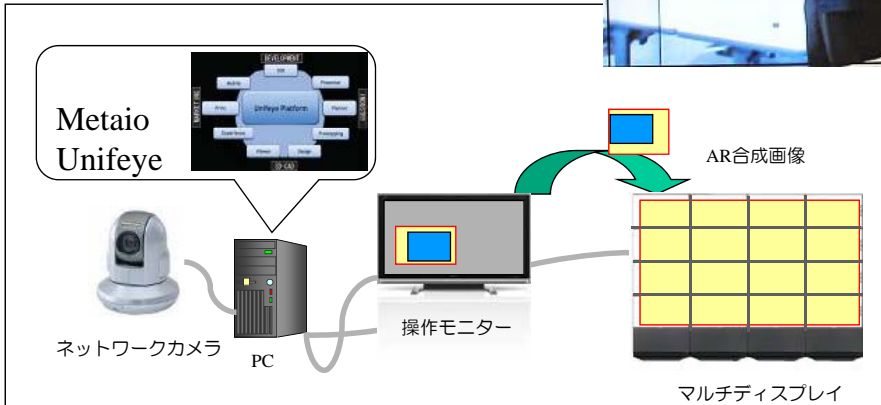# Realtime & Interactive autostereoscopic CG game

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Coupled autostereoscopic LCD

- For vertically-long 3D images
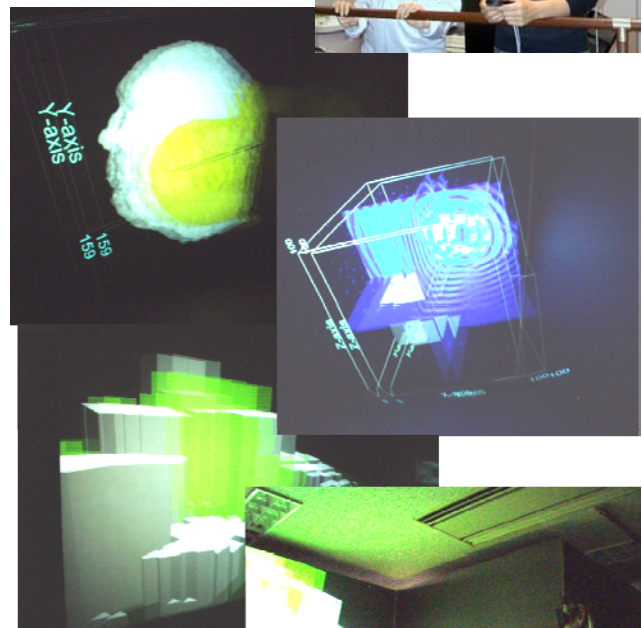- Driven by OpenGL Freedom for multi (uppper-compatible to standalone type)

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12 Tiled LCD (Samsung UD)

- Non-stereo, but huge image and/or multi images
- High quality (12K)
- Applicable to OpenGL applications and AR

Metaio Unifeye

ネットワークカメラ　PC　操作モニター　AR合成画像　マルチディスプレイ

For what?

- Research activities
  - CG & VR
  - Visualization

- Edutainment
  - Open laboratory for kids & high school students
  - Laboratory workshop for high school students (since 2007)

- Collaborative projects with industries, institutes and universities

- Department education
  - Modeling project in freshman course (since 2006)
  - Software design projects in junior and senior courses (since 2009)
  - Visualization projects in graduate course (since 2006)

Thank you for your attention!

Any questions?

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