

# Introduction of HoloStage™ in Tokai U. and its application to education and research/project

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- Introduction of HoloStage™ in Tokai U.
  - For what do we use HoloStage™ ?
    - Education
      - "Virtual Reality"
    - Research
      - Takanawa Campus Project
      - Virtual Sickness in IVE (to research session)
      - Digital signage (to research session)
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## HoloStage™ in Tokai U.

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- SIZE: 5.4m x 3m x 3m
  - Projector
    - Christie Mirage WU7 x 10
    - 6600 lumens, WUXGA, Active shutter
  - Tracking sensor : Vicon
  - 3D sound : X-Spat boX
  - 7.1ch surround
  - Main cluster, sub cluster and 4K3D
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## Main cluster

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- HP xw8600 x 6
  - OS : Windows XP Pro. x64 Edition
  - CPU : Intel Xeon X5460(3.16GHz 4core) x 2
  - Main memory : 32GB
  - HDD : 146GB SAS 15000rpm
  - Video : NVIDIA QuadroFX5800 x 2 + G-Sync2
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## 4K3D

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- HP Z800 x 1
  - OS : Windows XP Pro x64 Edition
  - CPU : Intel Xeon W5590(3.33GHz 4coe) x 2
  - Main memory : 24GB
  - HDD : 1TB SATA 7200rpm
  - Video : NVIDIA QuadroPlex D2 2200
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## Others

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- Software
  - 3dsmax + VR4MAX
  - AVS/Express MPU
  - OmegaSpace
  - FusionVR
  - CAVELib
  - Stereoscopic Player
- Student PC(24 sets)
  - NVIDIA Quadro FX3800+NVIDIA 3D Vision



## Abstract of "Virtual Reality"

- Abstract of lecture
  - Getting the meaning of virtual reality as human interface to process spatiotemporal information, Learning its system through practice, Considering a change of the role of computer in next generation
- For 6 semester student
- 180 minutes / week, 15 weeks
  - Lecture : 7 weeks, Practice : 6 weeks and 2 examinations
  - HoloStage™ is used for one of the practices
- The number of students
  - 30 students x 3 classes

## Practice using HoloStage™ ①

- Projection of AVS and OmegaSpace contents
- Collaboration with "Computer Graphics"
- CG creation by 3dsmax and projection by VR4MAX



Collaboration with  
Computer Graphics

Collaboration with  
Practice of AVS

CG creation by 3dsmax

## Practice using HoloStage™ ②

- Investigation of relationship between taking and display in 3D
  - 3D photos taken by 32 different conditions
    - Distance to cross point
    - Length between cameras (Stereo Base)
    - Distance from CP to object
  - Display by changing screen size or distance to screen
    - Impression of 3D seeing
    - Calculation of parallax angle

The diagram on the left illustrates the geometry of taking a 3D photo. It shows two cameras separated by a distance labeled "Length between cameras[cm] stereo base". A "Cross point" is marked above the object. The "Distance to object [- cm]" is the distance from the cross point to the object, and the "Distance to object[+ cm]" is the distance from the object to the cameras. The "Distance to cross point[cm]" is the distance from the cameras to the cross point. The text "Taking 3D photo" is at the bottom.

Three pairs of stereo images are shown on the right, each with its own parameters:

- Top pair: CP:50cm, SB:2.0cm, +15cm
- Middle pair: CP:50cm, SB:6.5cm, +15cm
- Bottom pair: CP:100cm, SB:6.5cm, +15cm

The diagram shows two scenarios for displaying a 3D photo. Both have a "Length between eyes[cm] Fixed in 6.5cm" and a "Distance to screen or display[cm]".

Left scenario: "Object in front of CP". The parallax angle is  $\alpha - \theta$ . The diagram shows the object (blue dot) between the eyes and the screen. The angle  $\alpha$  is the angle from the eyes to the object, and  $\theta$  is the angle from the eyes to the screen. The "parallax" is the horizontal distance between the two rays at the screen level.

Right scenario: "Object behind CP". The parallax angle is  $\theta - \beta$ . The diagram shows the object (blue dot) behind the screen. The angle  $\theta$  is the angle from the eyes to the screen, and  $\beta$  is the angle from the eyes to the object. The "parallax" is the horizontal distance between the two rays at the screen level.

The text "Display 3D photo" is at the bottom.

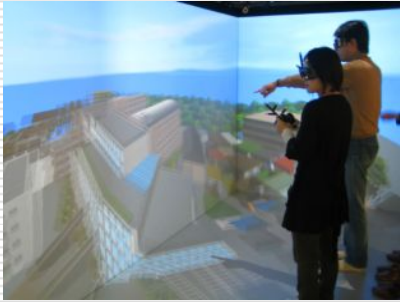
実習2 立体映像の撮影時条件・提示条件・立体感・視差角の比較検討実習 結果記録用紙

撮影時条件			提示時条件			結果	
クロスポイント	カメラ間距離	物体位置	画面種類	距離	視差量	立体感	視差角
50	2	20					
		15					
		10					
		5					
		0					
		-5					
		-10					
		-15					
		-20					

## Takanawa Campus Project(1/3)



# Takanawa Campus Project(2/3)



Virtual experience of Takanwa Campus before its completion

# Takanawa Campus Project(3/3)



Completion in 2010 March



## Introduction of the contents

- Takanawa campus

- [exterior](#) [interior](#) [change interior](#)

- [Shonan campus](#)

## Others (high school education)



## Others(University festival)

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[contents](#)  
[In 2009](#)

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