

Research on Tangible Virtual Museum

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Imaging Media Research Center

Korea Institute of Science & Technology

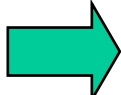
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Introduction

- Technology in the 21st Century
 - IT (Information Tech.), BT (Bio Tech.), NT (Nano Tech.)
 - CT (Culture Technology)
 - New Technology for Human in the 21st Century

Virtual Heritage Technology

- Fusion: Technology + Technology
 - IT + BT (Bio-Informatics)
 - IT + NT (Nano-Informatics) etc.
 - Fusion: Technology + Culture
 - IT + Heritage
-  Virtual Heritage Technology

Research Issues

- *How to Model VH*
- *How to Manage VH*
- *How to Present VH*

- *How to use Network*
for the Share and Exchange of VH

Outline of Talking

- Virtual Heritage Modeling
- Virtual Museum Service
- DHX (Digital Heritage Exchange)

Virtual Heritage Modeling

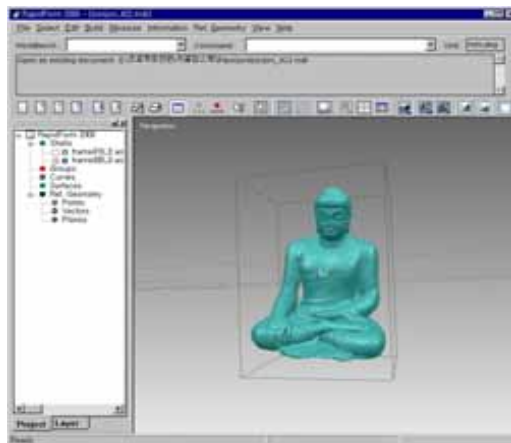
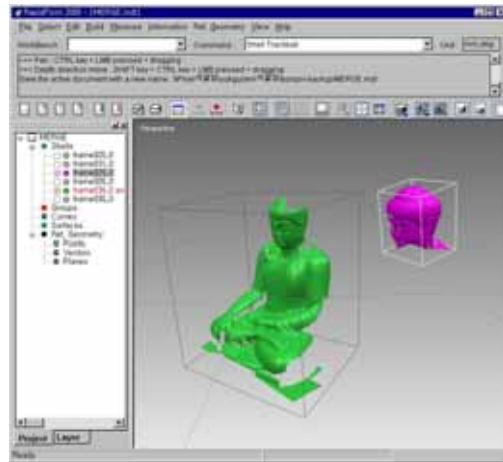
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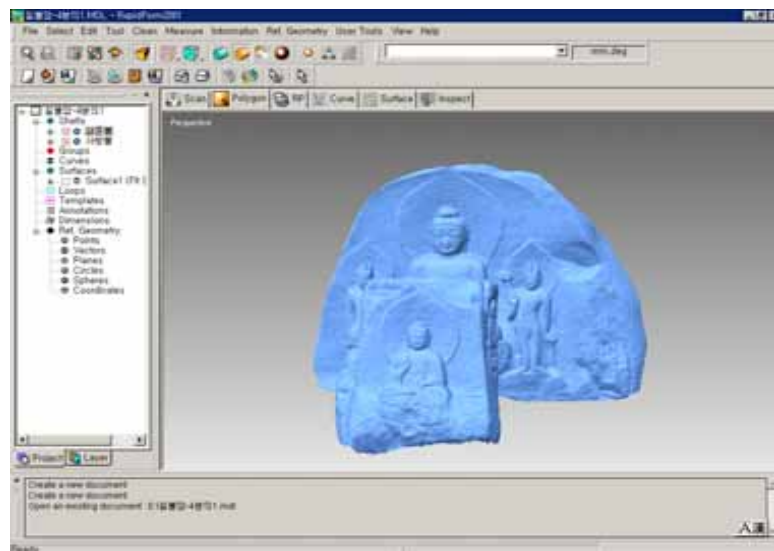
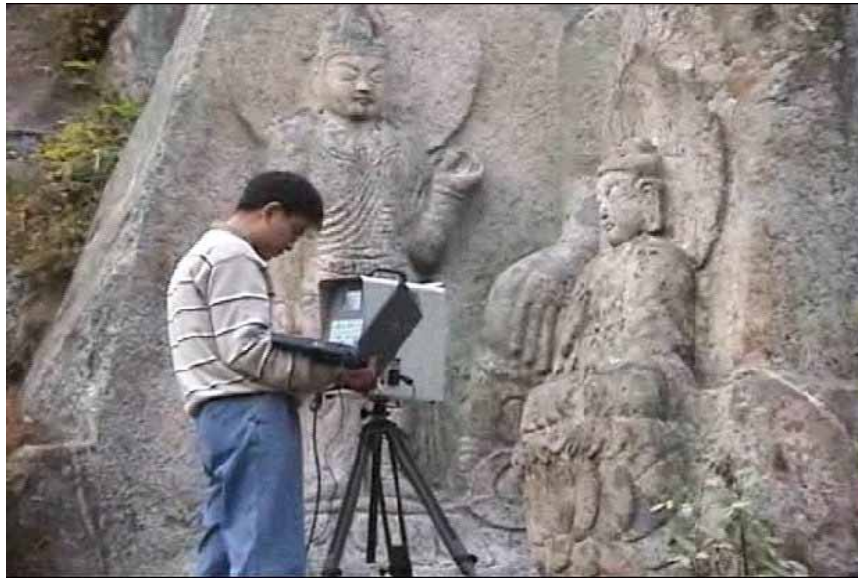
Virtual Heritage Modeling

- **3D Modeling**
 - Image-based 3D Modeling (IBM) Approach
 - 3D Laser Scanning Approach
- **Camera Imaging**
 - Infrared Reflectography: Mural Painting
 - X-Ray Imaging: Old Sword
 - Digital Camera: Panorama, TIP

UNESCO World Heritage 新羅 (BC57 - AD935) SukGulAhm

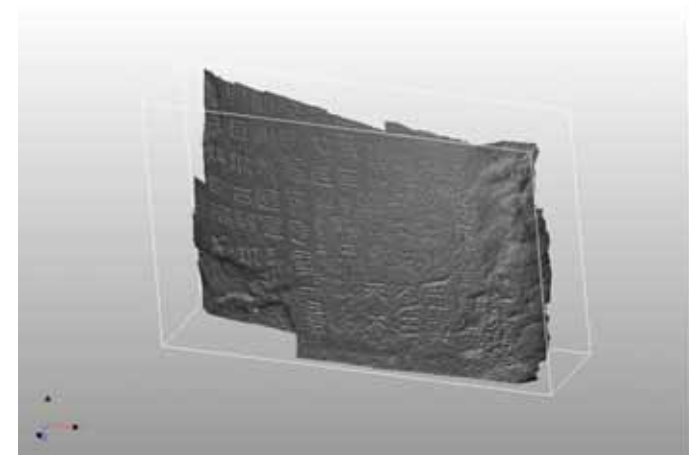


UNESCO World Heritage 新羅 (BC57- AD935) Gyeongju South Mountain Seven Buddhas



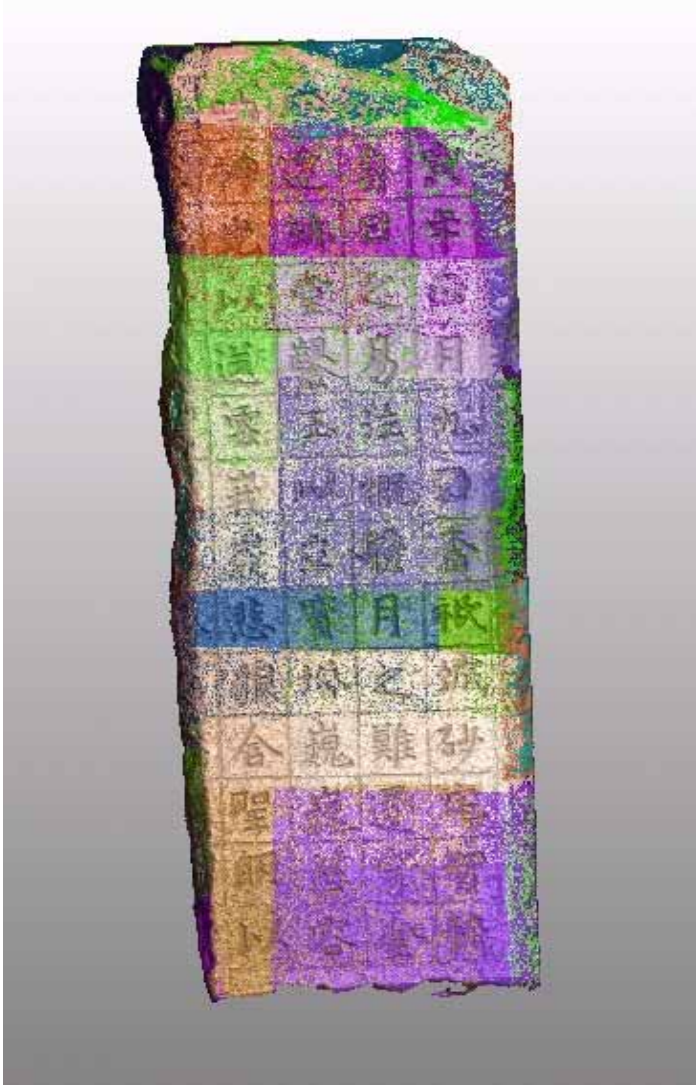
高句麗 (BC37 ~ AD668) Stone Monument (廣開土大王碑 Replica) KIST

Korea Institute of
Science and Technology



KIST, Solutionix Co., & Inus Technology Inc.

百濟 (BC18 ~ AD660) Stone Monument (砂宅智積碑, Original)

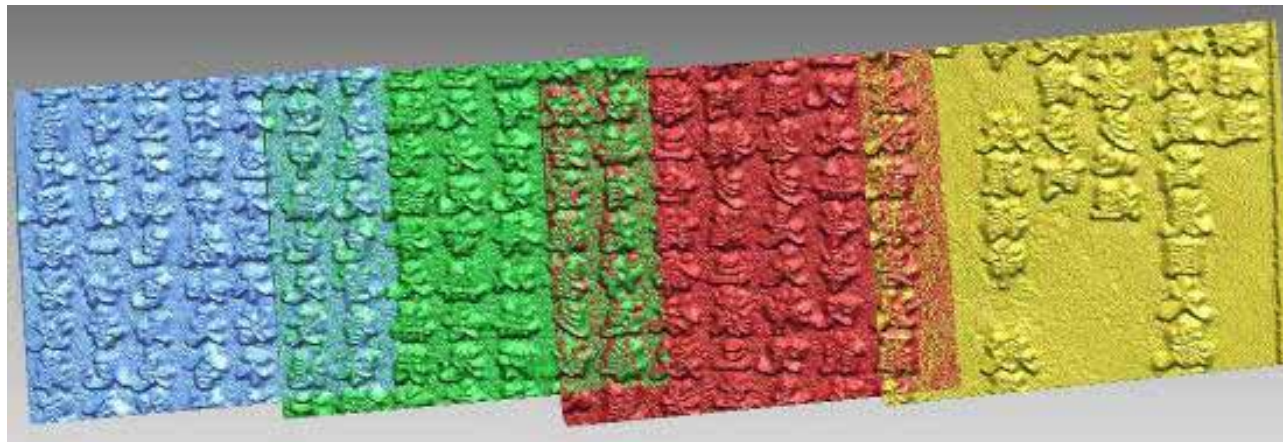
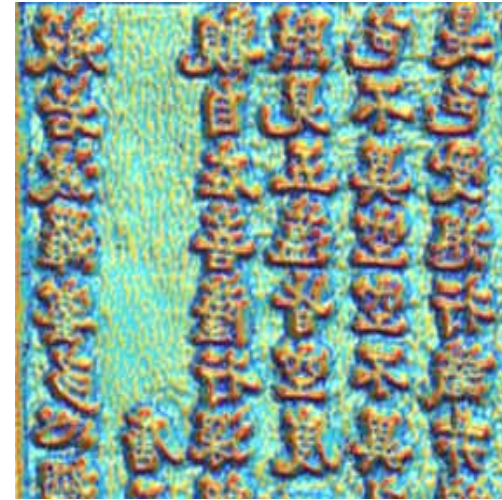


KIST, Solutionix Co., & Inus Technology Inc.

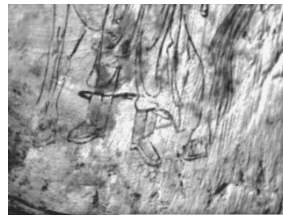
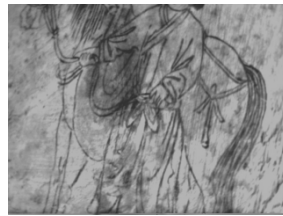
高麗 (AD918- AD1392) Wooden Block Monument

The Tripitaka Koreana consisting over eighty thousand blocks

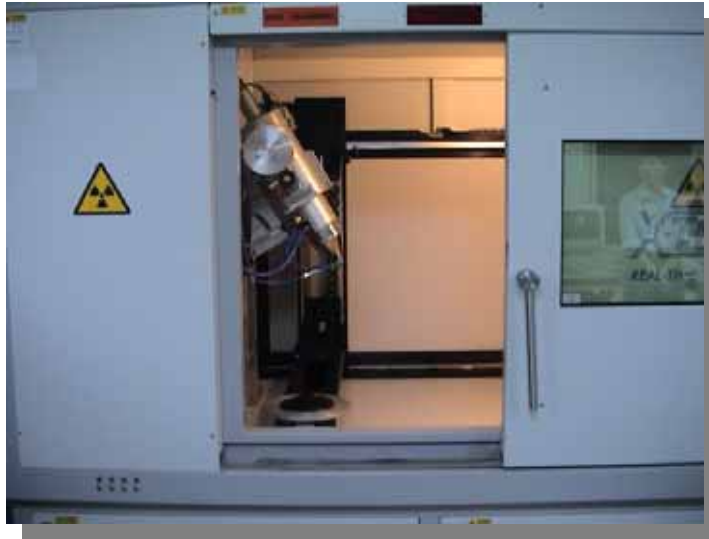
(八萬大藏經 Replica)



李朝 (AD1392~ AD1910) Mural Underdrawings KIST Korea Institute of Science and Technology



X-RAY Image Capture & Synthesis

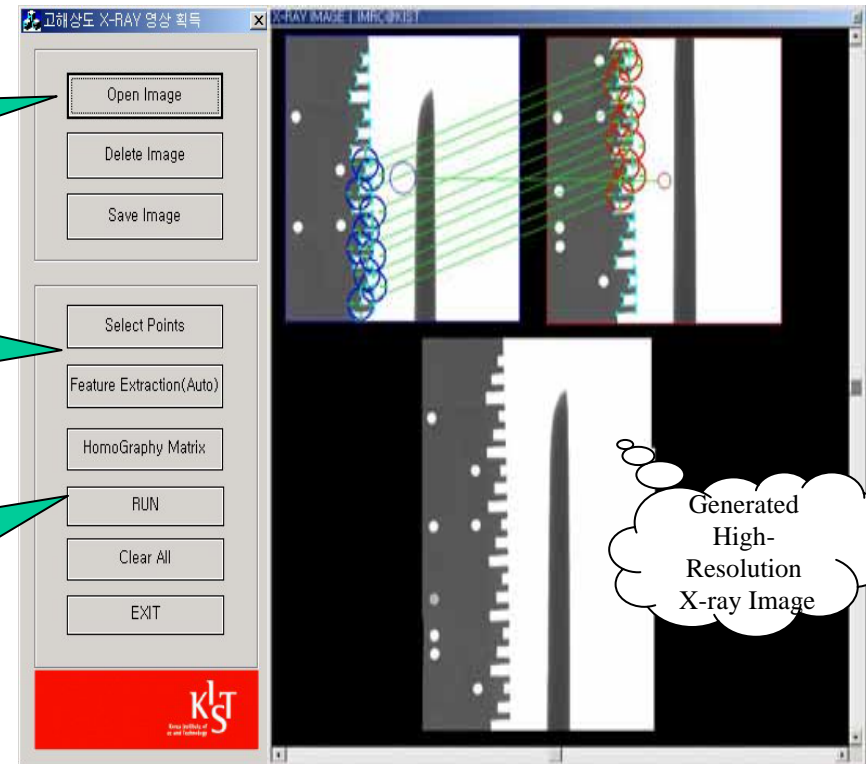


X-TEK X-Ray System

X-ray
Image
File
Handling

Feature
Extraction
&
Select
Points

Homograph
y Matrix
Estimation
& Stitching

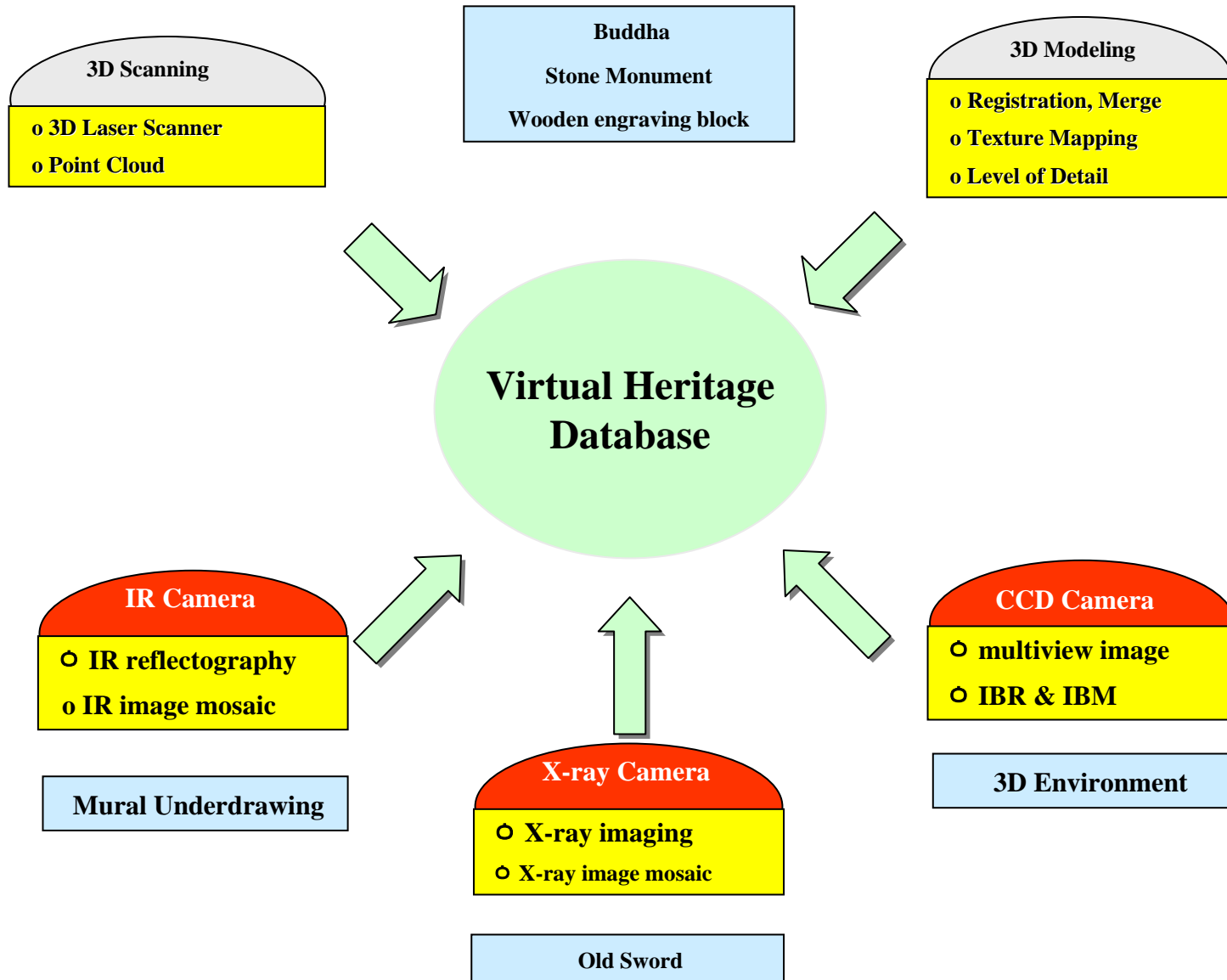


Tour Into the Picture, 申潤福 (廳琴賞蓮)

Listen to Gayageum (twelve - stringed Korean Harp), Look over Lotus Flower



Virtual Heritage Database



Virtual Museum Service

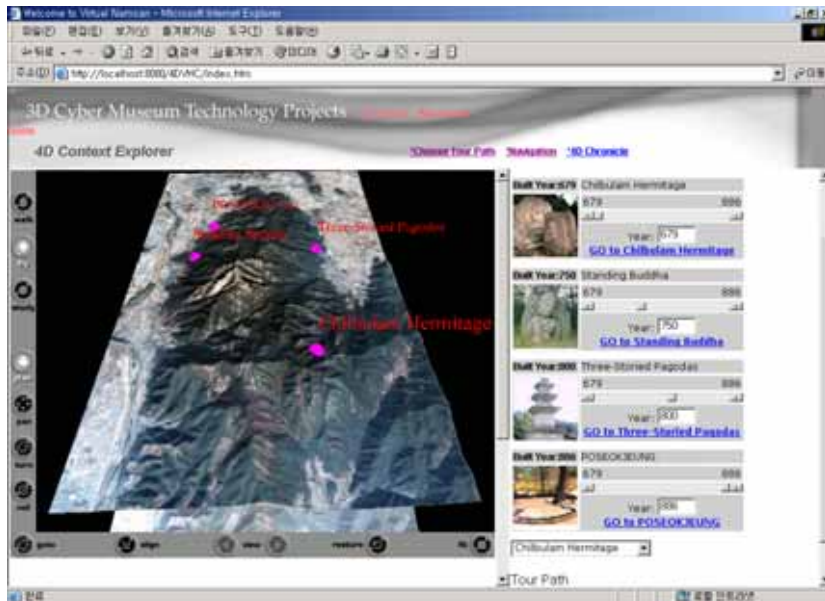
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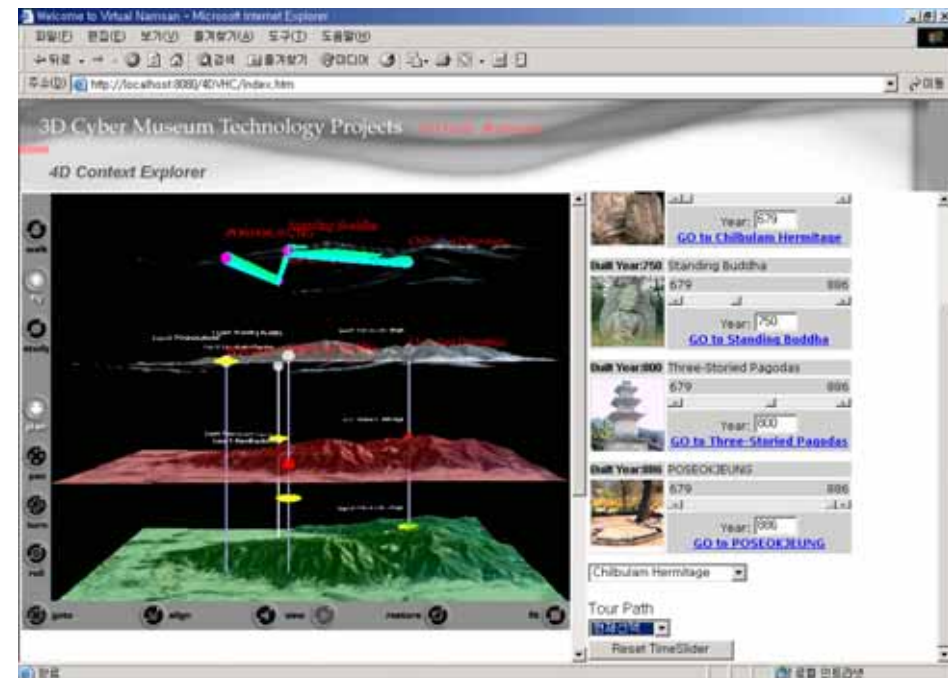
Our Researches for Virtual Museum

- Web-based VM
- CAVE-based VM
- VR Theater-based VM

Web-based Museum



3D Mountain + 3D Heritage



3D Model + Time Chronicles

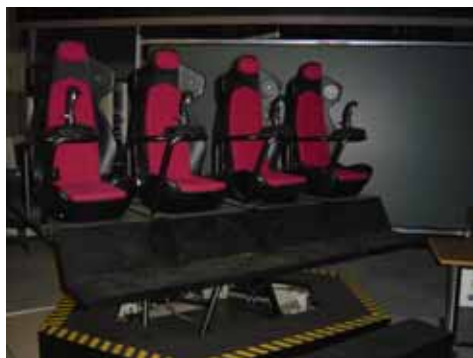
CAVE-based Museum



4-Sided CAVE System: Left, Front, Right, and Bottom

4 PCs, Linux Redhat, Open GL Performer

VR Theater based Museum



DHX (Digital Heritage Exchange)

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DHXY

digital artistic and ecological heritage exchange

transcontinental Guidance and Exploration in globally shared cultural heritage



Presentation





IST-2001-333476

DHX

Digital Artistic and Ecological Heritage Exchange:
transcontinental Guidance and Exploration in globally shared
cultural heritage

IST Key Action III – Multimedia Contents & Tools

Action Line III.5.1 x-Contents futures

(Shared-cost RTD)

KIST Matching Project

2001-2002: 3D Cyber Museum Technology, MIC

2003-2005: Tangible Space Initiative (TSI), KIST



Fraunhofer Institut
Medienkommunikation

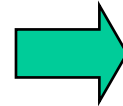


Università degli Studi di Milano
Dipartimento di Scienze dell'Informazione



Research Direction

- Cultural Heritage (traditional)
 - Single site
 - Limited knowledge/heritage sharing and discussion
 - Multimedia animations / terminals



⊕ Virtual Reality

- Multiple site, distributed
- Highly collaborative and interactive knowledge / heritage sharing and discussion
- New era of museum applications
- Added value for industry



Digital Beethoven (Bonn)



Shilla Culture



Baptistry of Pisa



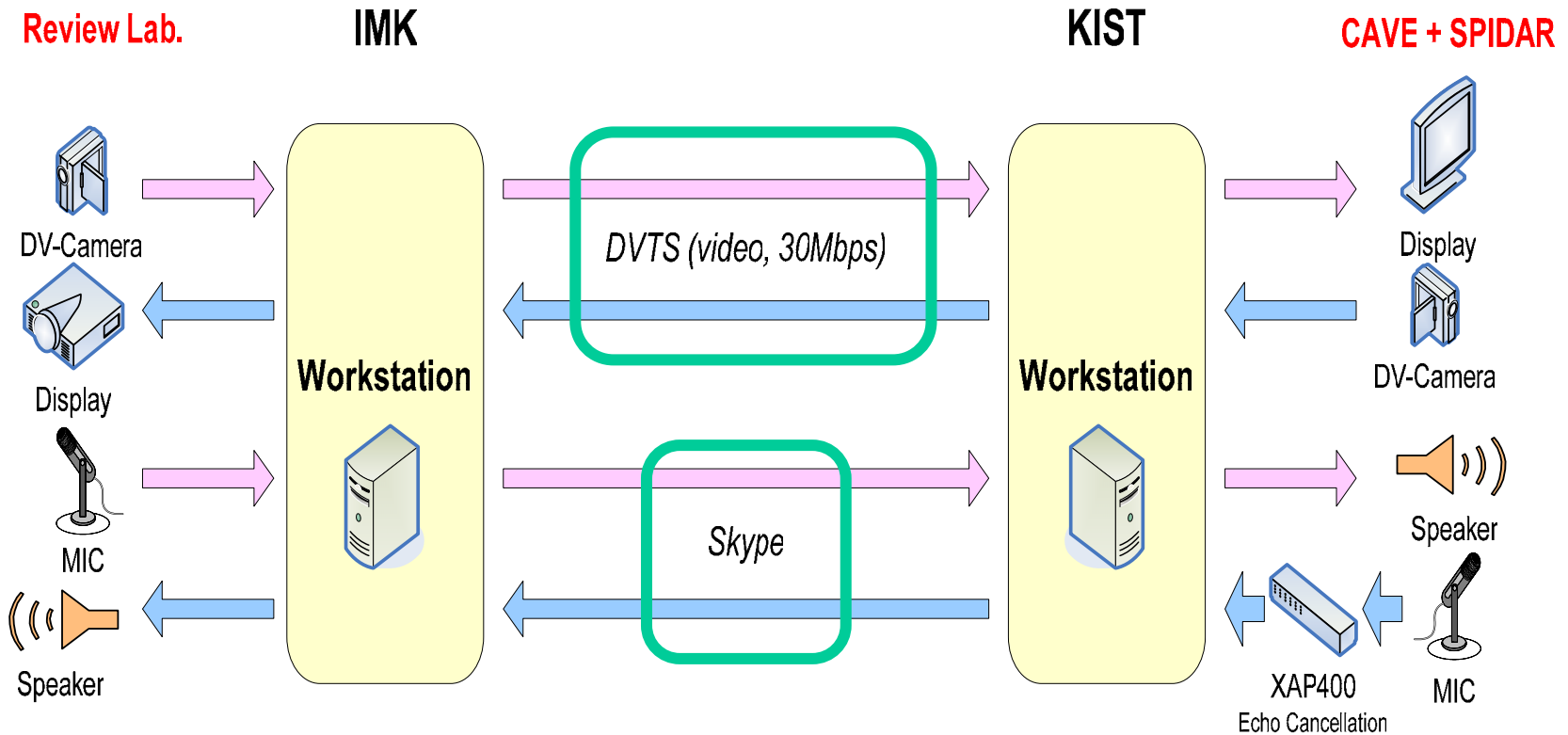
Milano Theatre



Samaria Gorge (Crete)

Virtual Experience of Shilla Culture

- Immersive Display + Haptic



CAVE (KIST, Korea) + SPIDAR (TIT, Japan)



Immersive Display

+



Haptic Display

Virtual Force Exp. with SPIDAR KIST Korea Institute of Science and Technology



Hit Bell



Open
Wooden Door



Feel
Shape of Pagoda

Summary

- Introduction of Our Researches on Virtual Heritage Modeling
- Virtual Museum Services
- DHX (Digital Heritage Exchange) Research

Thank you

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