

Proposal on Standardization of Free Viewpoint TV (FTV)

JVT-T140, m13612

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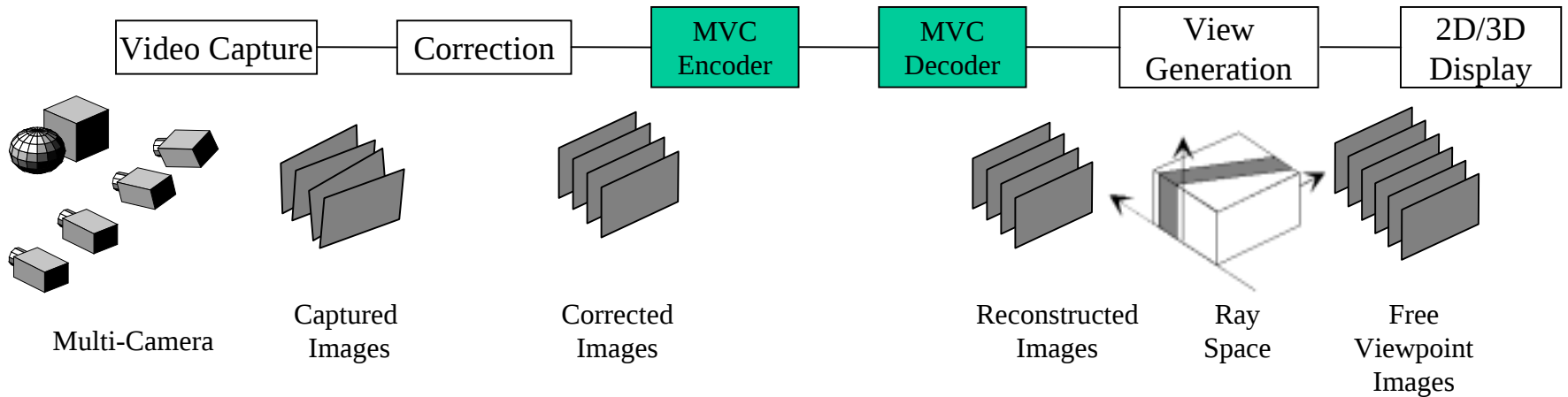
Nagoya University, KDDI, and NTT

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Background

- This proposal is the response for Mandate 4 of MVC AHG.
- FTV (Free Viewpoint Television) got a strong support from industries in response to “Call for Comments on 3DAV” and standard-based solution to realize FTV system was requested. Then, the standardization of MVC started.
- However, FTV system is not realized by MVC only.
- We propose to define FTV reference model that consists of several modules and to standardize the interface between modules to realize FTV system.

FTV Technologies



FTV system

FTV (Free Viewpoint TV) System



100-Camera System

(Nagoya University IMI-COE, Tanimoto Lab.)



Linear alignment of 100 cameras



MPEG test sequence
“Rena”

100-Camera System

(Nagoya University IMI-COE, Tanimoto Lab.)



Semicircular alignment of 100 cameras



captured scene

100-Camera System

(Nagoya University IMI-COE, Tanimoto Lab.)



Planar alignment of 100 cameras

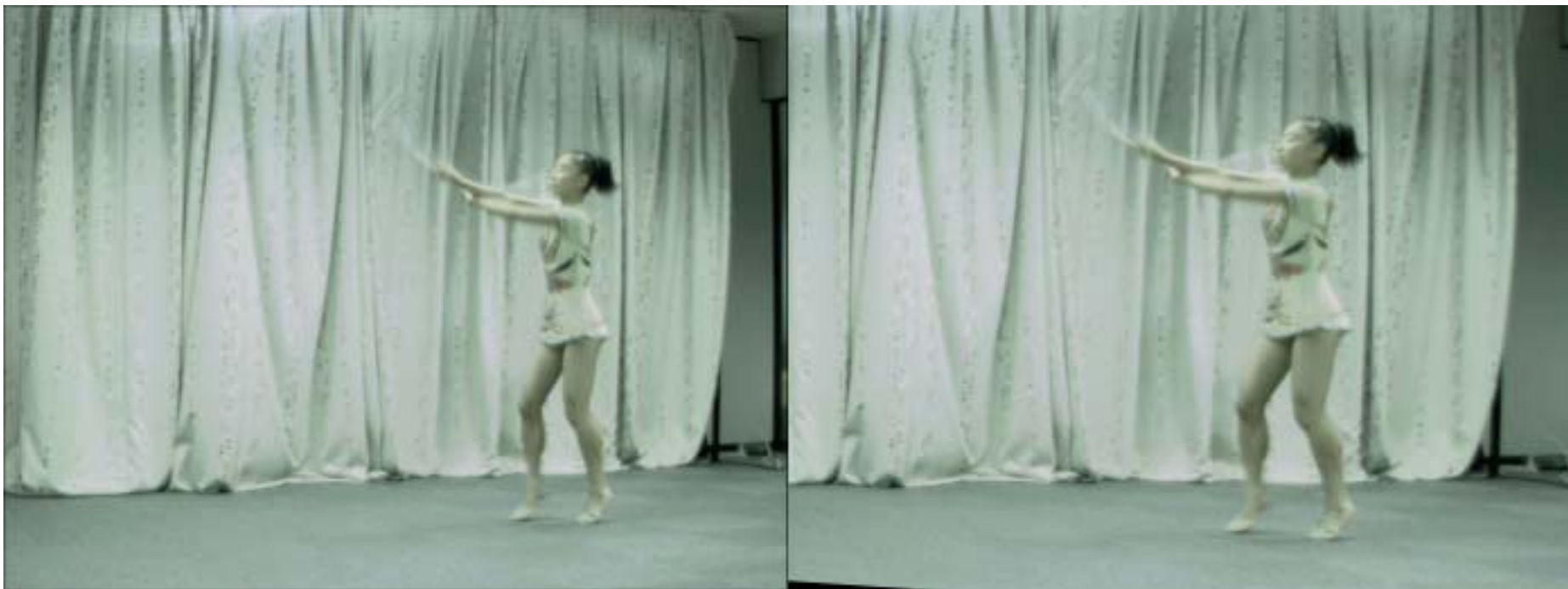


MPEG test sequence
“Akko & Kayo”

Captured Multi-view Images

Effect of Correction

Multi-view images



Before correction

After correction

FTV Demo: Aquarium

Original Camera Views (15 Cameras)



FTV Demo: Aquarium

Generated Free Views



Original Views



Generated Views - Interpolated -

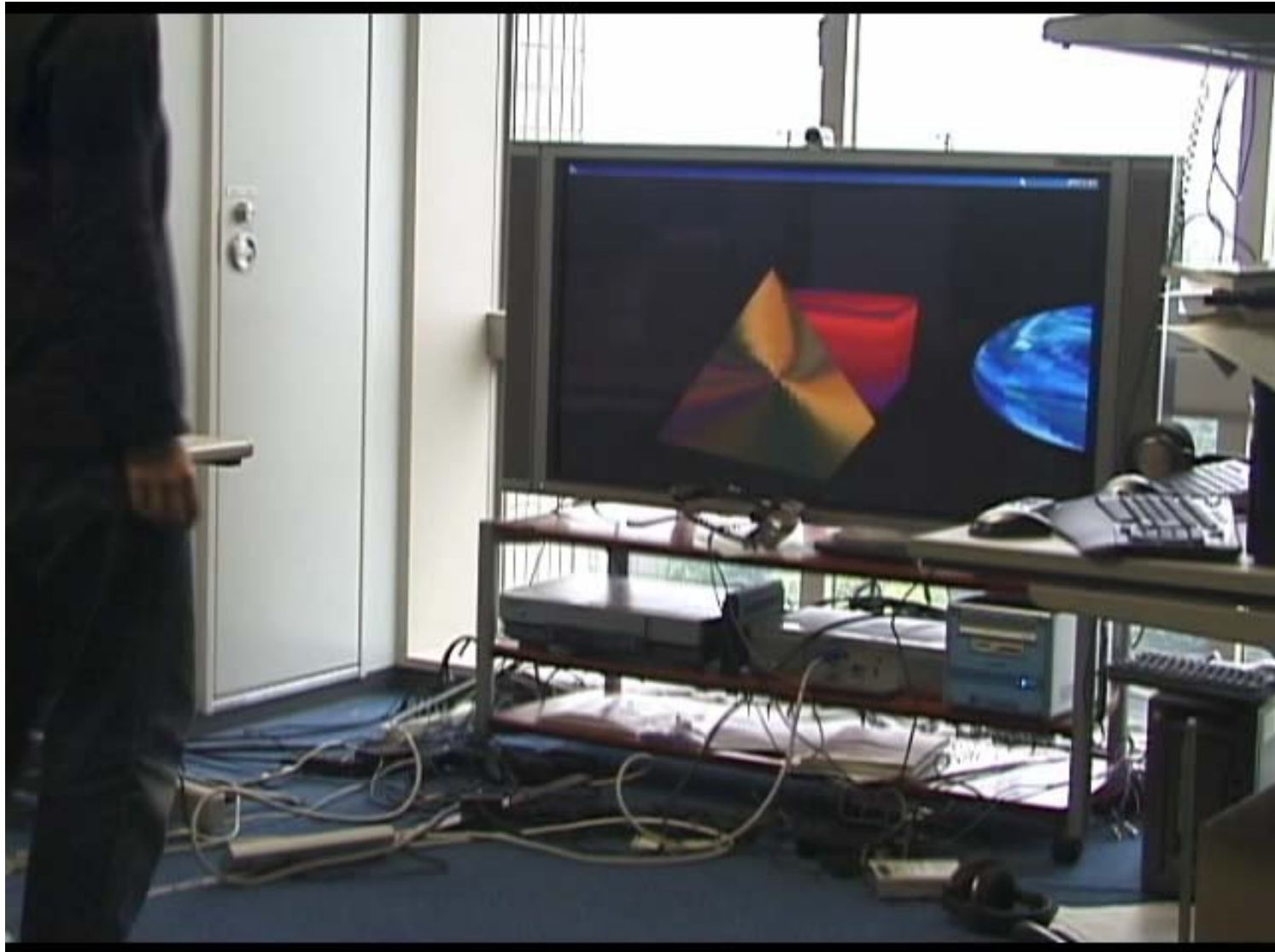


Generated Views - Forward and Backward -



FTV on a PC

2D Display with Eye Tracking



Extension of Viewing Zone and Elimination of Crosstalk for Multi-view 3D Display



without eye tracking



with eye tracking

Ray Reproducing 360-Degree Display: The SeeLinder

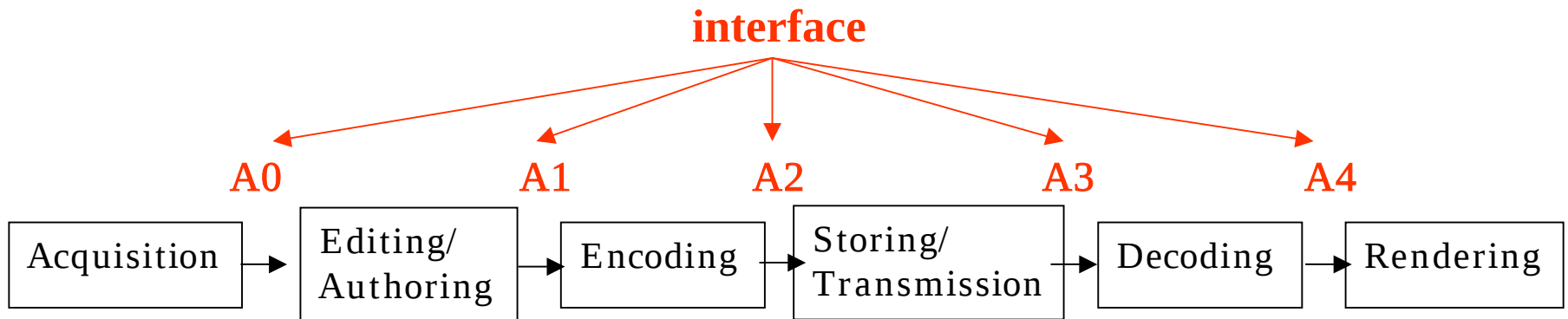


Applications of FTV

Fields	Examples
communication/broadcasting	very realistic, user-centered
entertainment	game, sports, event, exhibition, Expo
advertisement	new type of presentation
nature observation	bird watching, safari, undersea park
sightseeing	barrier-free
museum	new type of exhibition
art/content	creation of new type of media art and digital content
video production	capturing and production can be separated, even unrealistic camera motions can be achieved
archive	space archive, living national treasures, traditional entertainment
education	distant education, educational tool
medicine	examination, operation, education
security, surveillance	public facilities, nuclear facilities
transportation	traffic monitoring at intersection, ITS

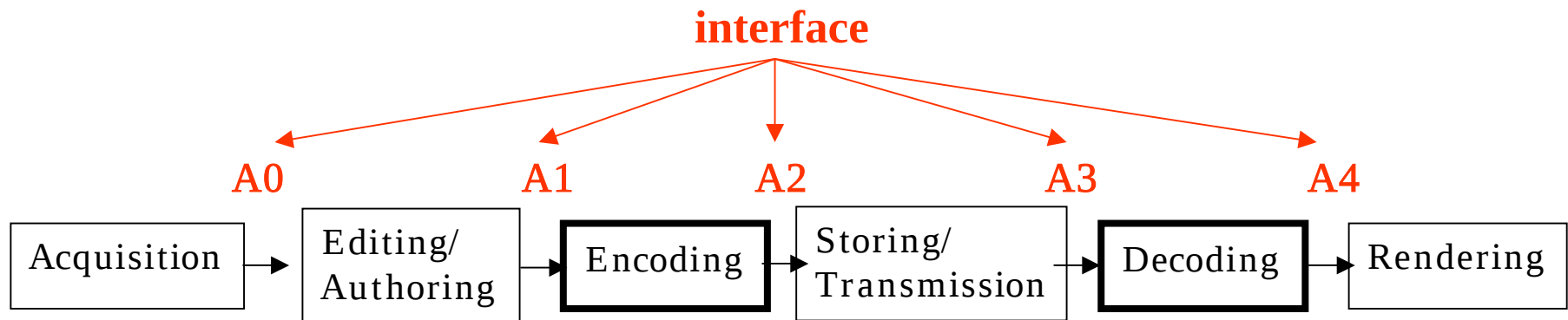
FTV Reference Model

- High level description of FTV system
- Processing chain of FTV system
- Module based model
 - define interface specifications between modules



Current Status of Activities for FTV

- Current activity is only limited to the following modules.
 - Encoding, where MVC encoder is supposed to be used
 - Decoding, where MVC decoder is supposed to be used
- At least it lacks A2 and A3 interface specifications.
 - Those interfaces are necessary for file storing and transmission services



Proposals and Discussions

- Proposals

1. Start standardization of FTV system.
 - define the reference model and interface specifications.
2. The interface A4 as well as A2 and A3 should be standardized.

- Discussions

- Standardizations of A0 and A1 interfaces are issues for MPEG or not?

Conclusions

- FTV has many promising applications.
- FTV technologies are maturing.
- We should start the standardization of FTV system in addition to MVC.
- We want to make the requirement document as the first step.