Is Multi-view Video the Future of IPTV?

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Fast Tracking Innovation to Market

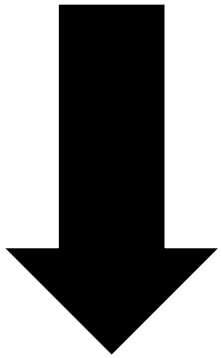
Possible Future of TV

- Personalization & advanced search
- Multi-screen TV
- Interactive Region of Interest
- Free Viewpoint TV
- Holographic TV with immersive interactivity

Dr. Heinrich Arnold
October 2008, Deutsche Telekom AG, Laboratories

Next Challenge for Television

- **To transmit only partial information**
  - **(single view) of 3D space**



- **To transmit all information**
  - **(all views) of 3D space**

FTV (Free-viewpoint TV)

What is Free-viewpoint TV (FTV)?

FTV users will be able to freely navigate using a virtual camera viewpoint

The TV scene is captured using a network of synchronised cameras.

Analysis and fusion of sensor data in order to produce a dynamic 3D-model of the scene.

Transmission of FTV data over IP and graphics rendering on the user's device.

User can navigate through the TV scene using his own "virtual" camera.

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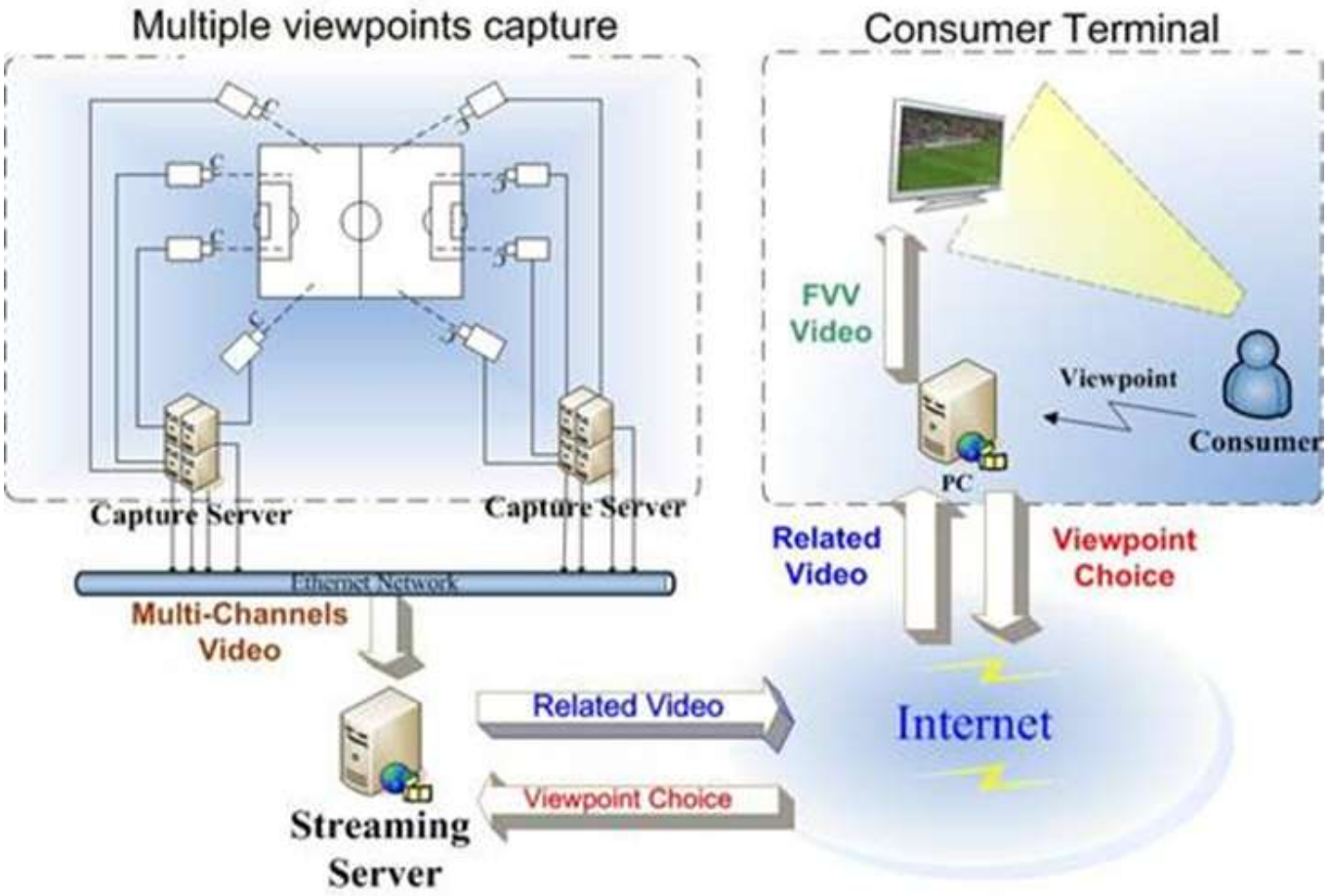
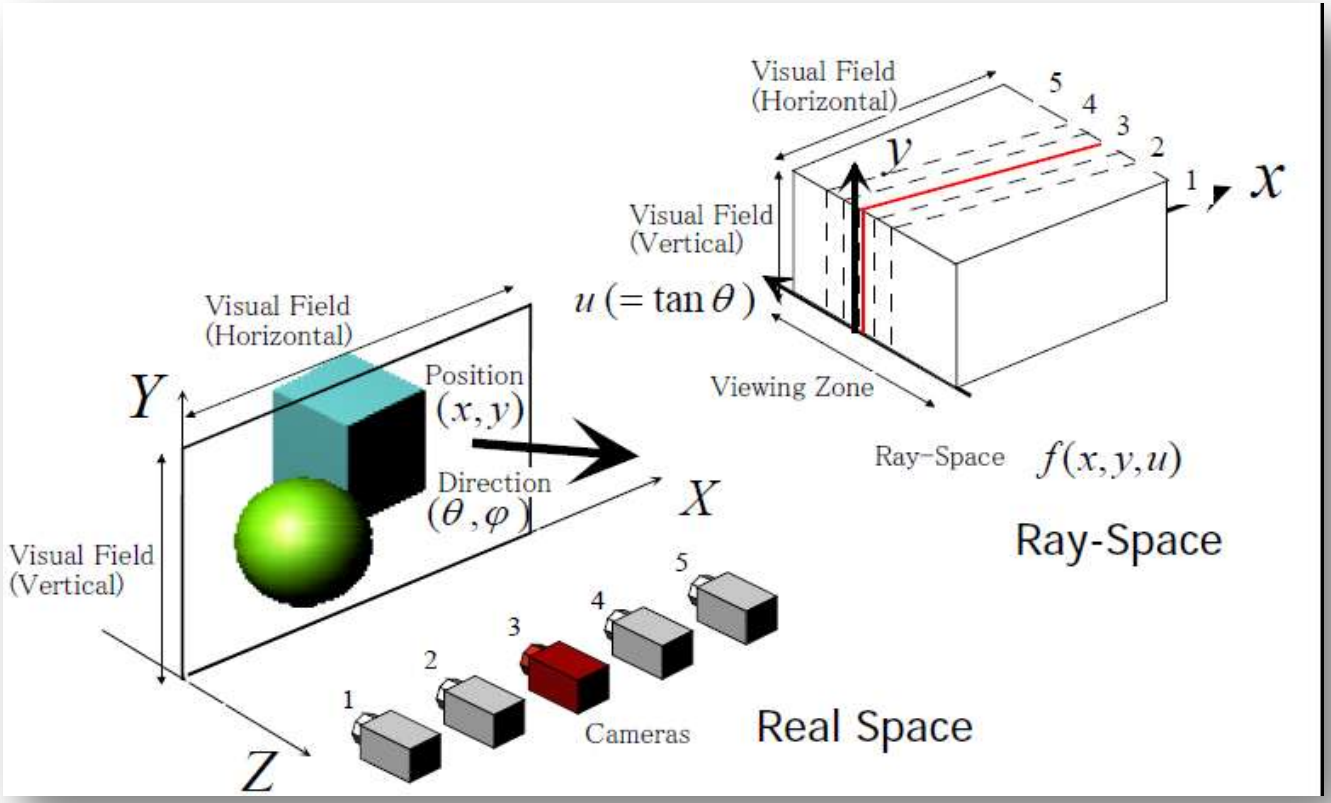
KDDI FTV Prototype

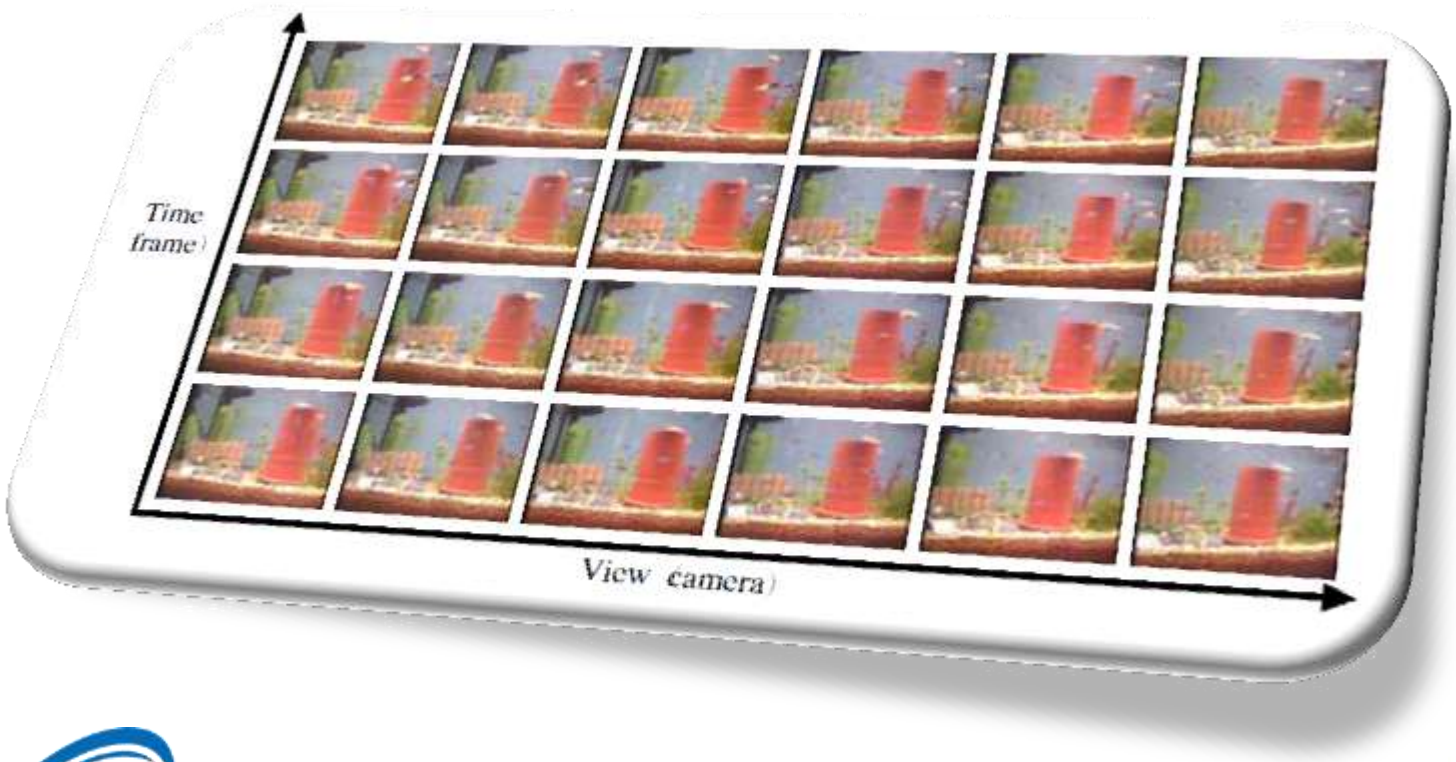
Typical FTV Processing Pipeline



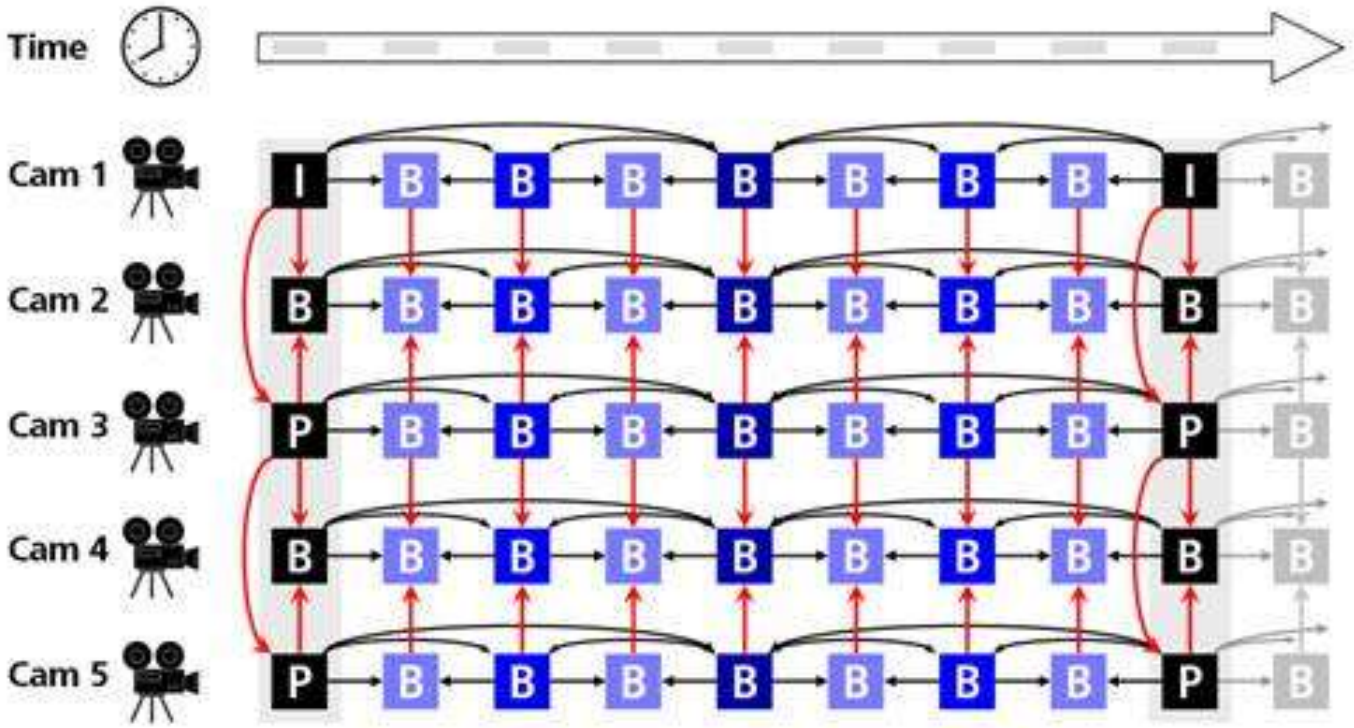
Capturing FTV Signal



Typical Video Stream



Multi-Video Compression (MVC): ISO/IEC 14496-10:2008



- Inter-frame and Inter-view differences
- Based on standard H.264 compression techniques

Project Objectives

To develop strategic technologies necessary for FTV

To add FTV capabilities to IPTV

To help our industrial partners to get an expertize in this field

To apply this technology for a tele-presence application for large public applications

Project Challenges

- View Interpolation between cameras
- Multi-cameras stereo calibration
- Multi-cameras stereo matching
- Multi-cameras compression
- Efficient delivery system
- Foreground/Background segmentation
- 3D Display Systems

OR Compatible Multi-video System

HP Multi-camera System

TELUS
the future is friendly

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hp

ISD S.A.
Integrated Systems Development
http://www.isd.gr

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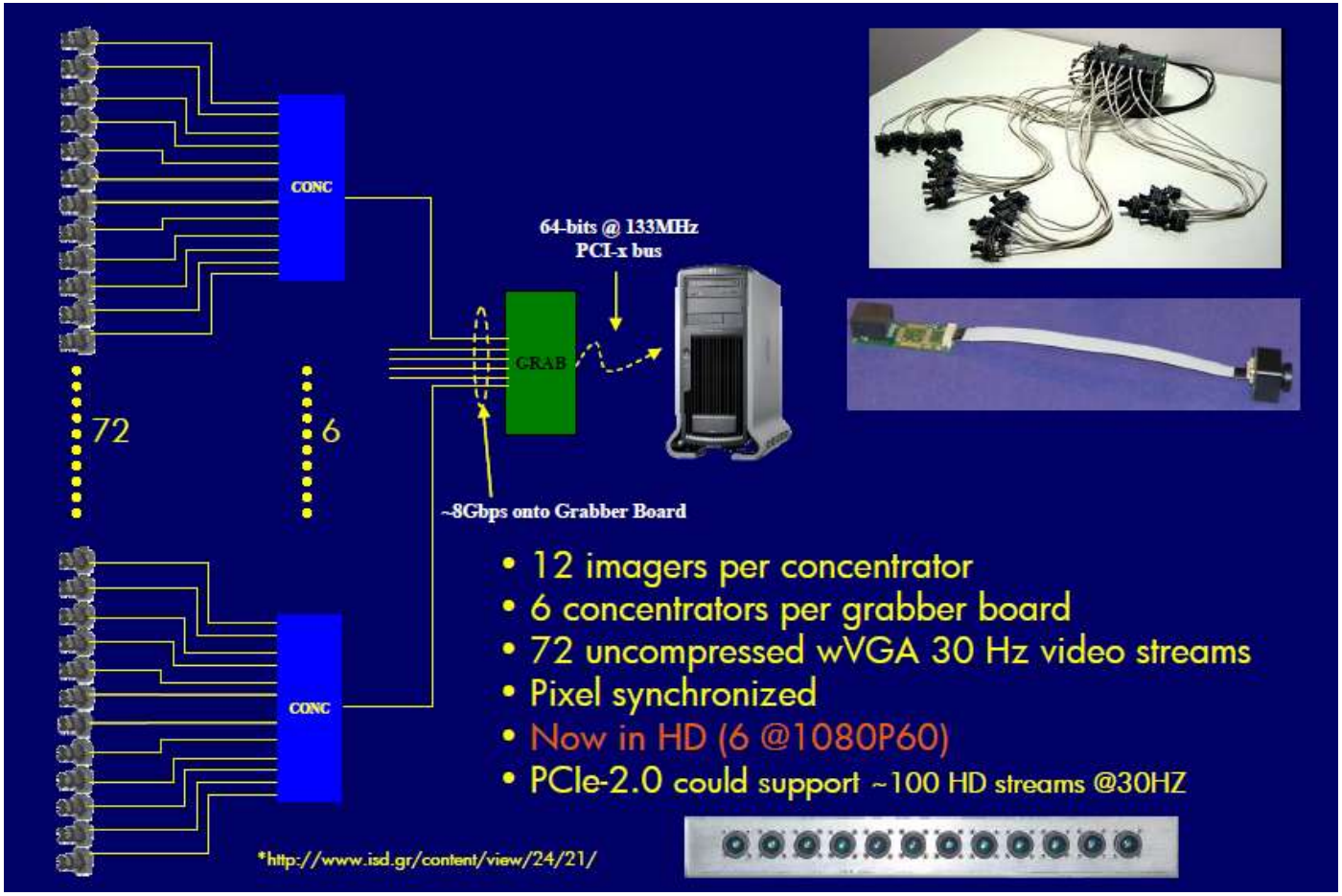
Herodion 72-Camera Architecture

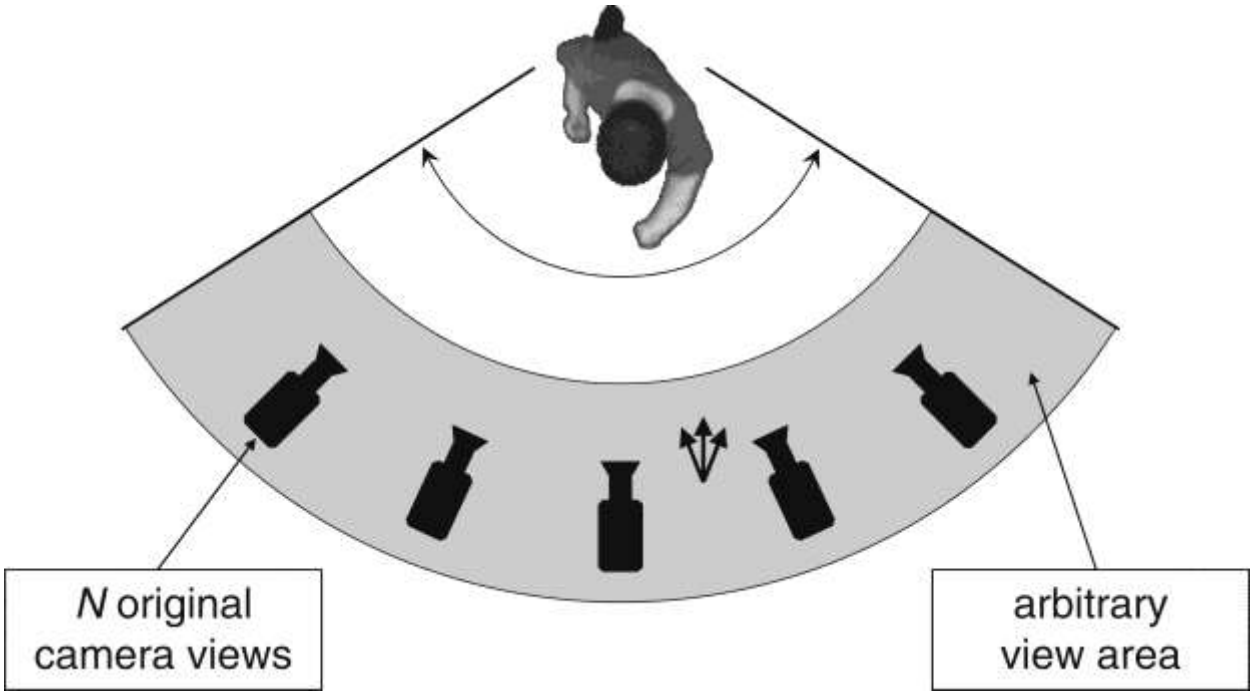


Hardware: Herodion HD system

- Capture and deliver uncompressed 6 HD video frames in real-time
- Hardware synchronized at pixel level
- True HD

First UofA FTV Cameras System

View-interpolation from a Camera Network



United State Patent # 6,583,808 B2

With Dense Disparity

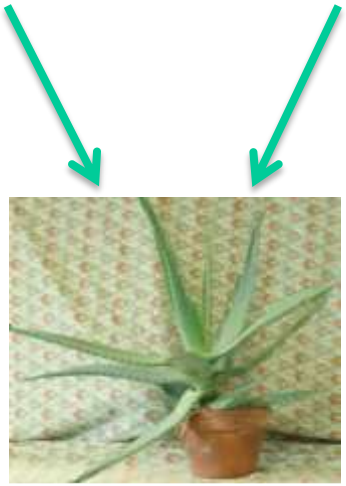
color image left

depth image left

color image right

depth image right

warped mid image from left



mid color image

warped mid image from right

Early Prototype of GPU-based View Interpolation

Conclusion

- It is now possible to get pixel synchronized true HD picture from multiple cameras at low cost
- Utilizing the capabilities of the GPU allow us to interpolate views in real-time even in HD
- FTV systems is the next generation of media, which gives the user the opportunity to be immersed in the action even over the network
- FTV not stereo maybe the future of TV

Thank you

Questions?

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