

FTV (Free viewpoint TV)

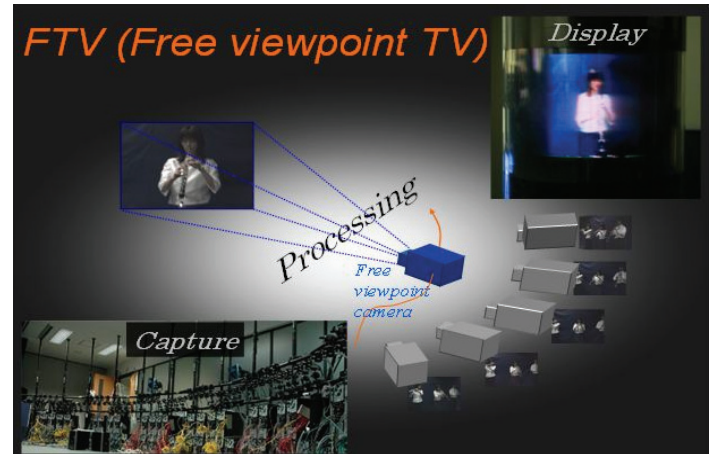
電子情報システム専攻 画像情報学研究グループ 谷本正幸, 藤井俊彰, Mehrdad Panahpour Tehrani

研究開発の概要

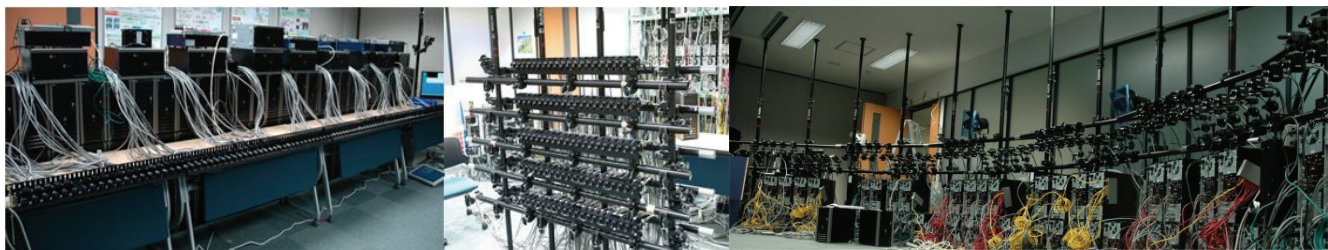
FTVとは視聴者が自由に視点を選ぶことのできる映像メディアである。多数のカメラで映像を取得し、光線空間法を用いて三次元空間を表現する。カメラが取得出来ていない光線を補間することで、任意の視点にカメラをおいた画像を生成する。
総務省SCOPEの助成を受け、MPEGにおけるFTV標準化の第2フェーズとして、3D映像(3DV)の国際標準化を推進している。

新規性・独創性

世界初の、カメラと同期したリアルタイム自由視点画像生成システムを構築した。



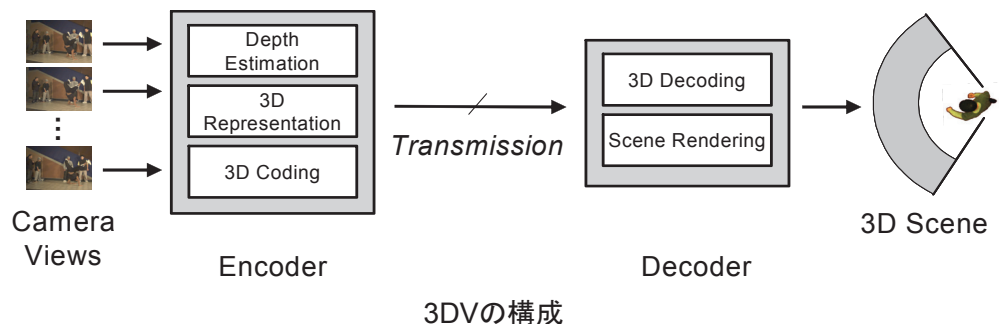
FTV



百眼システム

応用例

FTVは無限個の視点をもつため、3D映像(3DV)の生成に利用できる。
現在主流である2視点のディスプレイと、研究の盛んな多視点のディスプレイどちらにも適用可能。



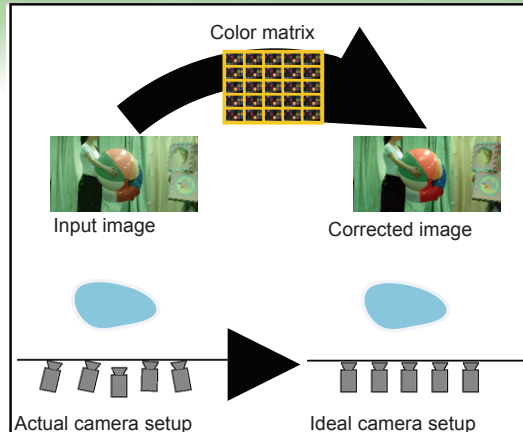
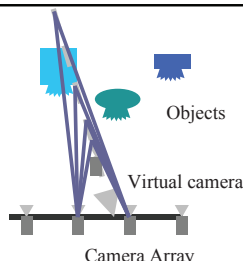
キーテクノロジー

Color and geometry correction

- Cameras have different gain, white balance and etc. These differences are minimized by using color chart.
- Cameras are not aligned well. Camera images are corrected by perspective warping with camera calibration.

Ray Interpolation by depth estimation

- It is too heavy to compute all depth of images in real-time. Ray based depth estimation with parallel computing is implemented for real-time processing

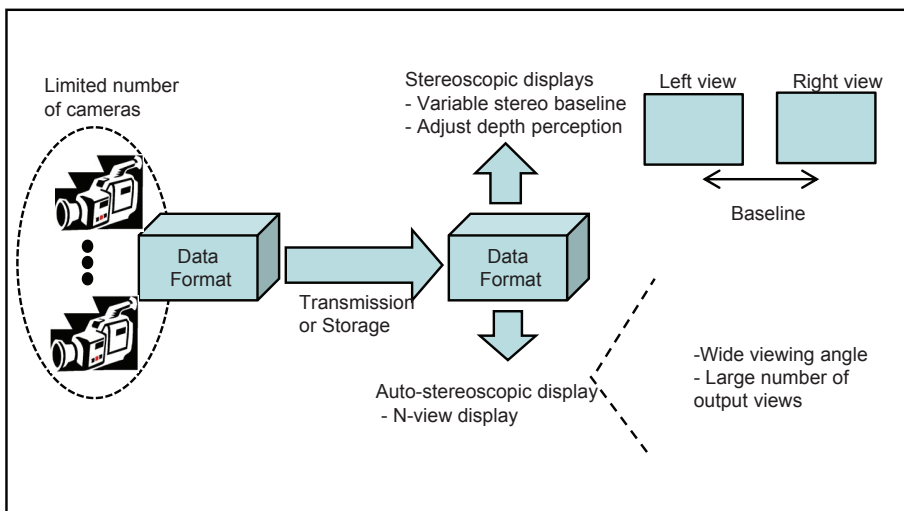


3DVの狙い

Display and Viewing Adaptations

- Enabling stereo devices to cope with varying display types and sizes, and different viewing preferences. This includes the ability to vary the baseline distance for stereo video to adjust the depth perception, which could help to avoid fatigue and other viewing discomforts.
- Support for high-quality auto-stereoscopic displays, in such a way that the new format enables the generation of many high-quality views from a limited amount of input data, e.g. stereoscopic video and respective depth maps.

- Generating free viewpoint images for stereoscopic and auto-stereoscopic displays can be achieved by FTV technologies.
- Therefore, 3DV is the second phase of FTV.
- Data format includes multi-view videos and depth maps.
- Using this data format, processing load for free-viewpoint image generation is light at user side.



MPEGでのFTV標準化活動

Moving Picture Experts Group

(MPEG) is a working group of ISO/IEC in charge of the development of standards for coded representation of digital audio and video and related data. Since 1988 when it has been established, the group has produced standards that help the industry offer end users an ever more enjoyable digital media experience.

