

GPU assisted light field capture and processing

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The presentation will cover the following topics. We will introduce light fields and the plenoptic function. We will explain the theory behind light field capturing and displaying. We will cover camera systems available for light field capture. We will differentiate between narrow baseline (e.g. Raytrix cameras) and wide baseline capture systems (e.g. the HV48GLFC camera array). We will also explain the difference between dense and sparse light fields. The following GPU image processing algorithms will be covered:

- GPU camera image color conversions. (YCbCr to RGB, Bayer filtered RGGB to RGB).
- Light field conversion for light field displays.
- Light field refocusing.
- Stereo disparity estimation.
- Multiview disparity estimation.
- Depth estimation for dense light fields.
- Image interpolation and post processing.

We will present possible hardware/software architectures for camera arrays. We will talk about the challenges of realizing the first commercially available light field telepresence system.