Display--Individual Projects

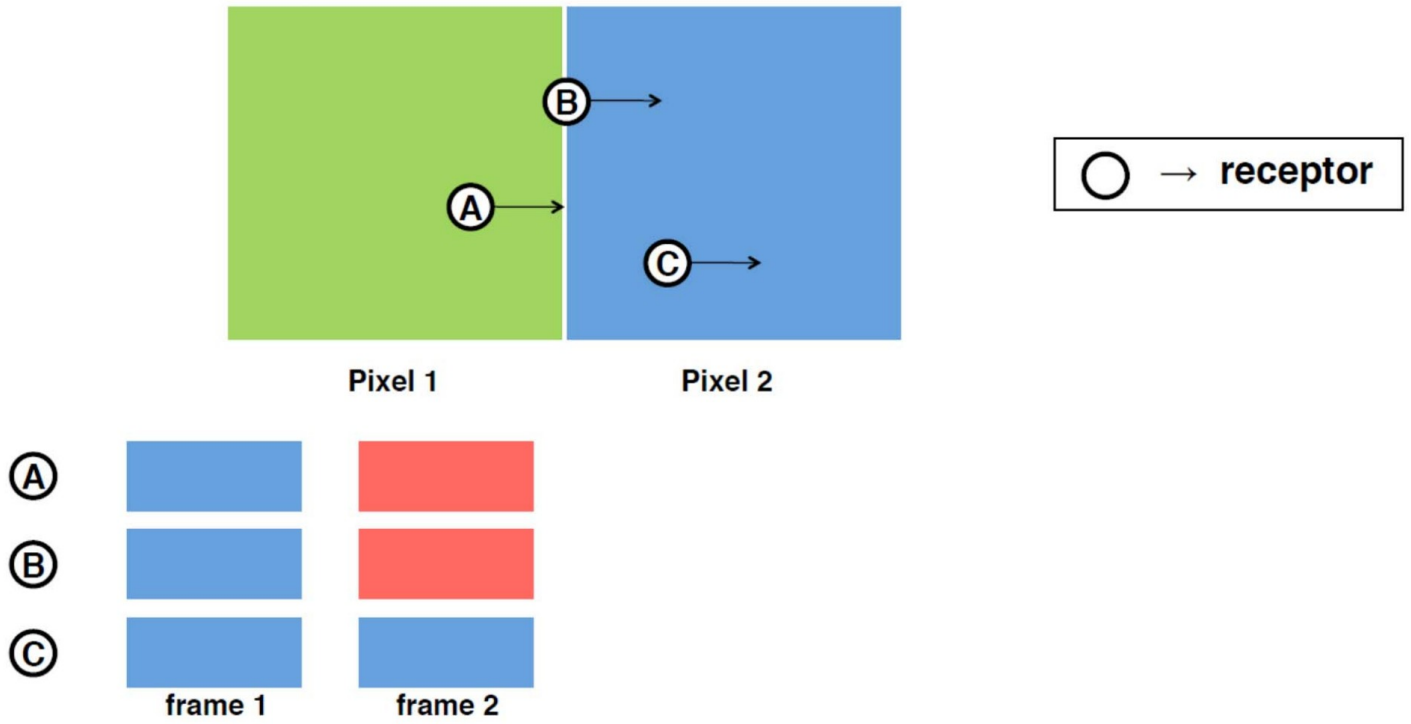
Display 2017/2018

List of Projects

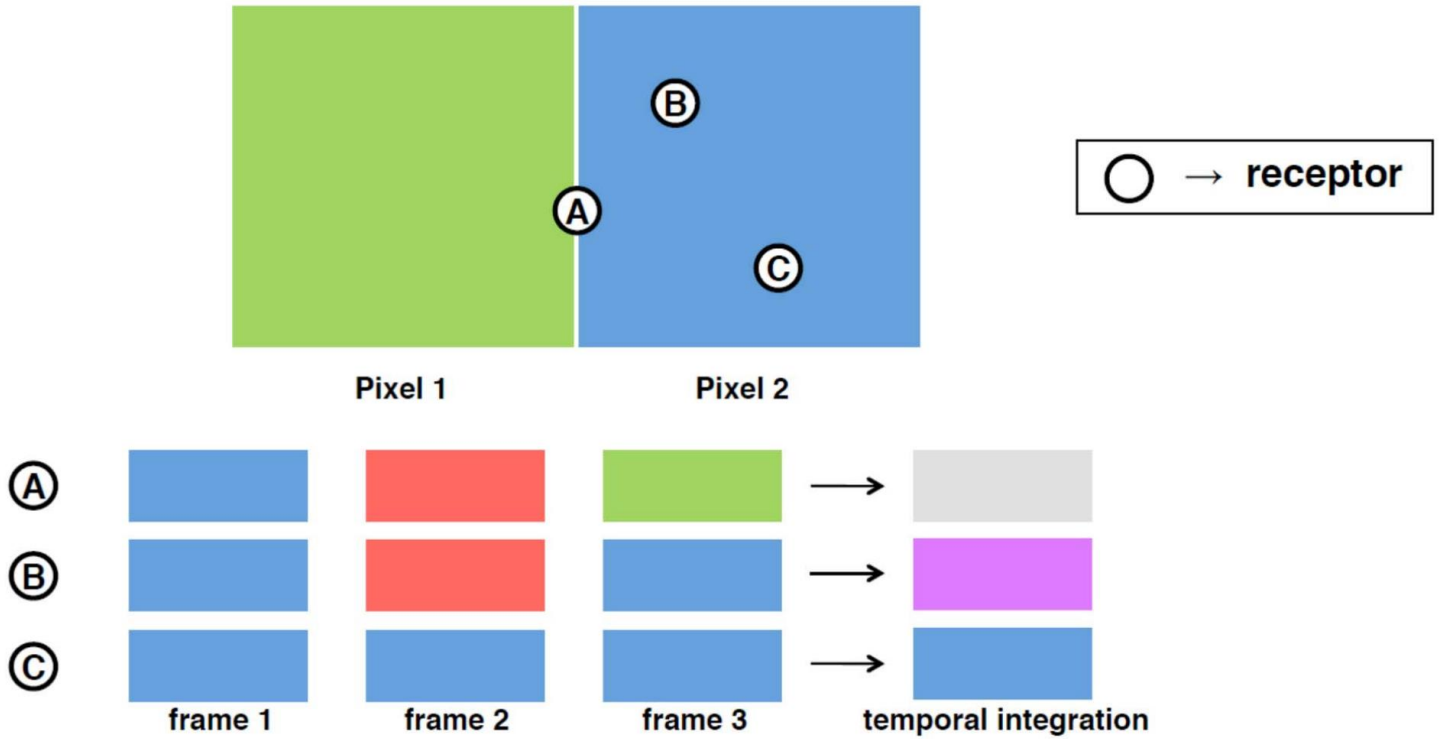
- Resolution Enhancement with Temporal Fusion
  - Software only
- Projection Depth Estimation, Defocus
  - Hardware+Software
- Occulus Rift with Leap Motion (application to be decided)
  - Hardware+Software
- Apparent Stereo: The Cornsweet Illusion Can Enhance Perceived Depth
  - Software only

- Simulation of Parallax Barrier Display
  - Software only
  - lectures on 13th and 20th. Dec. 2017
- Simulating Computational Caustic Design
  - Software only
  - Not highly recommended due to complexity
  - lecture potentially on 24th Jan. 2017

Resolution Enhancement with Temporal Fusion



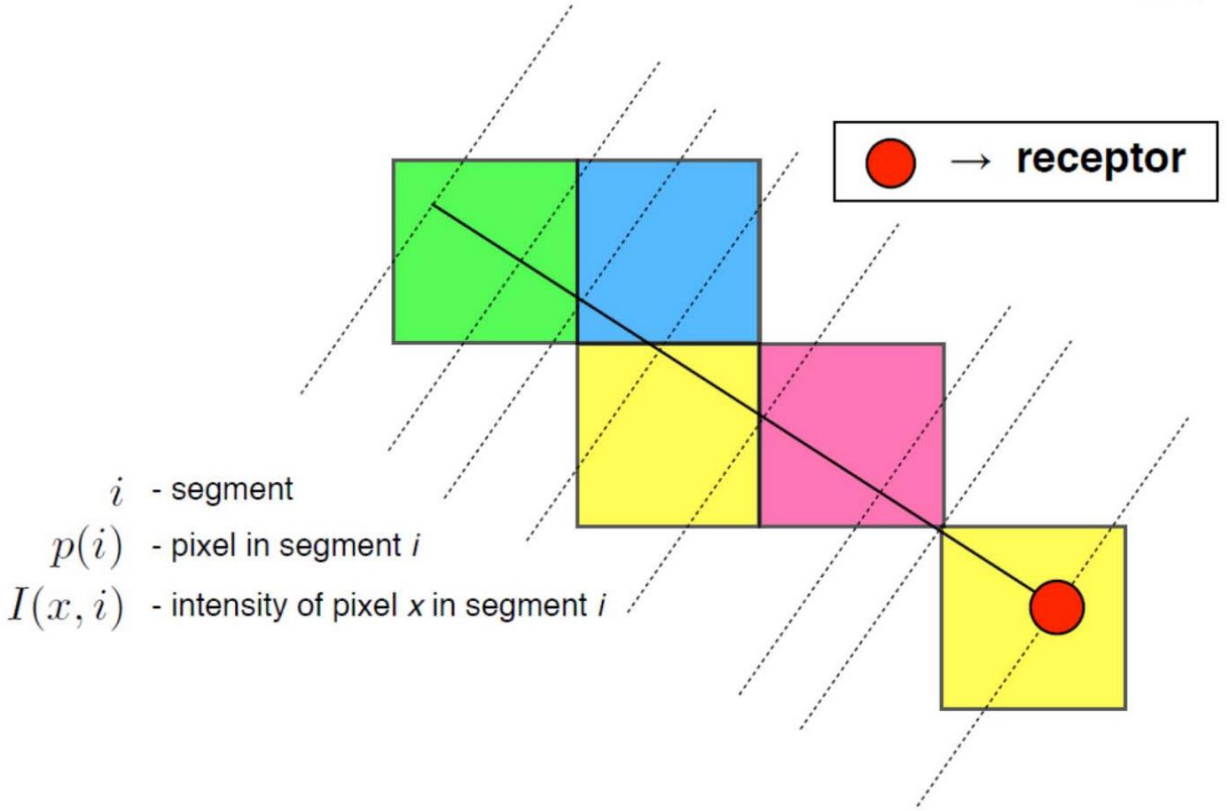
Resolution Enhancement with Temporal Fusion



Resolution Enhancement with Temporal Fusion

Receptor signal:

$$\sum_{i=0}^{N} w_i \, I(p(i), i)$$

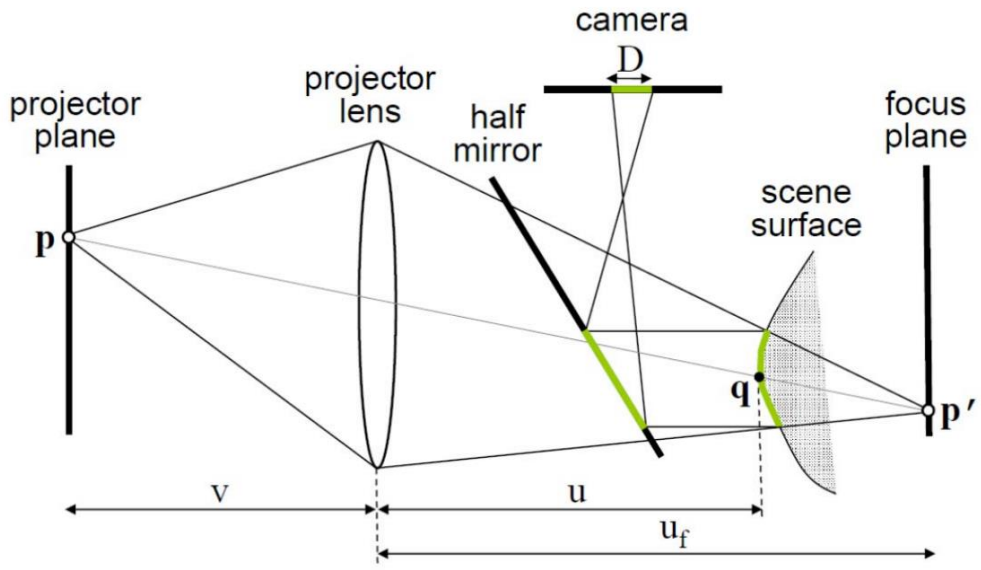


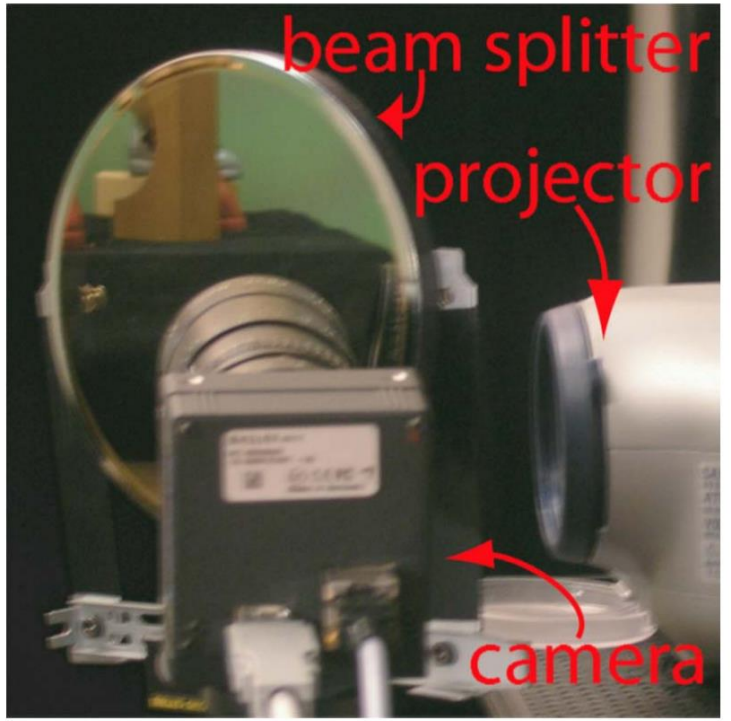
Resolution Enhancement with Temporal Fusion

- Link
- Software only
- Lecture 2

Projection Depth Estimation, Defocus

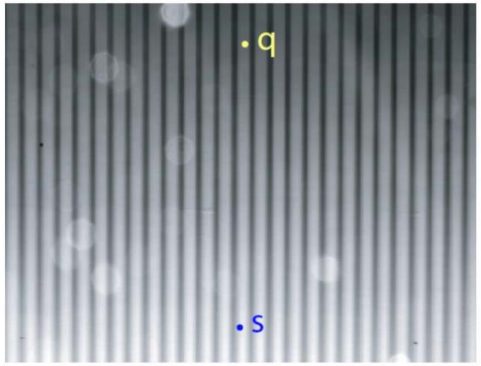
- Camera Projector Alignment

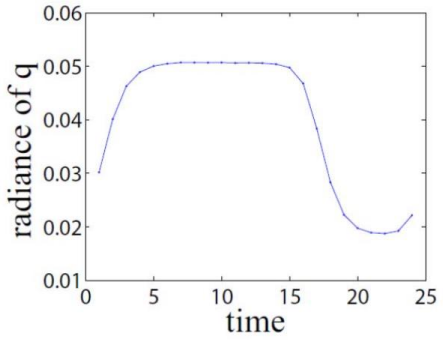


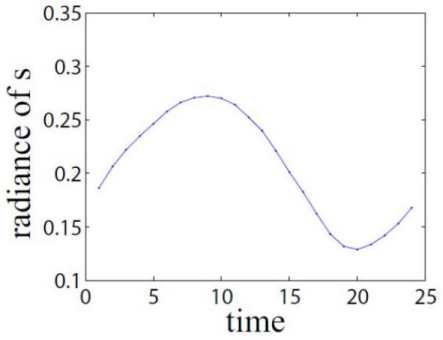


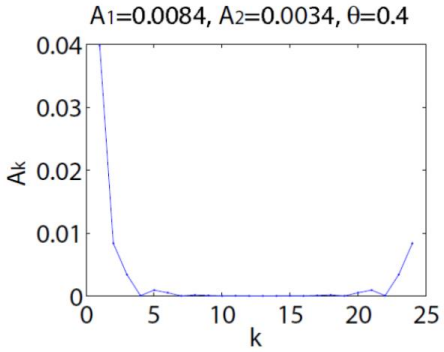
Projection Depth Estimation, Defocus

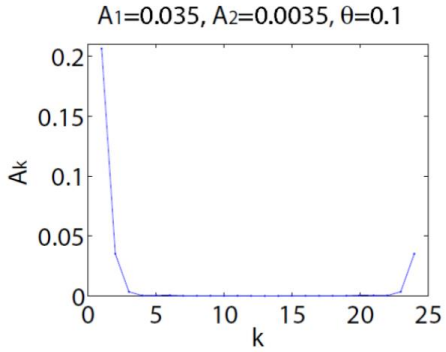
- Estimate Per-pixel Depth through Discrete Fourier Transform



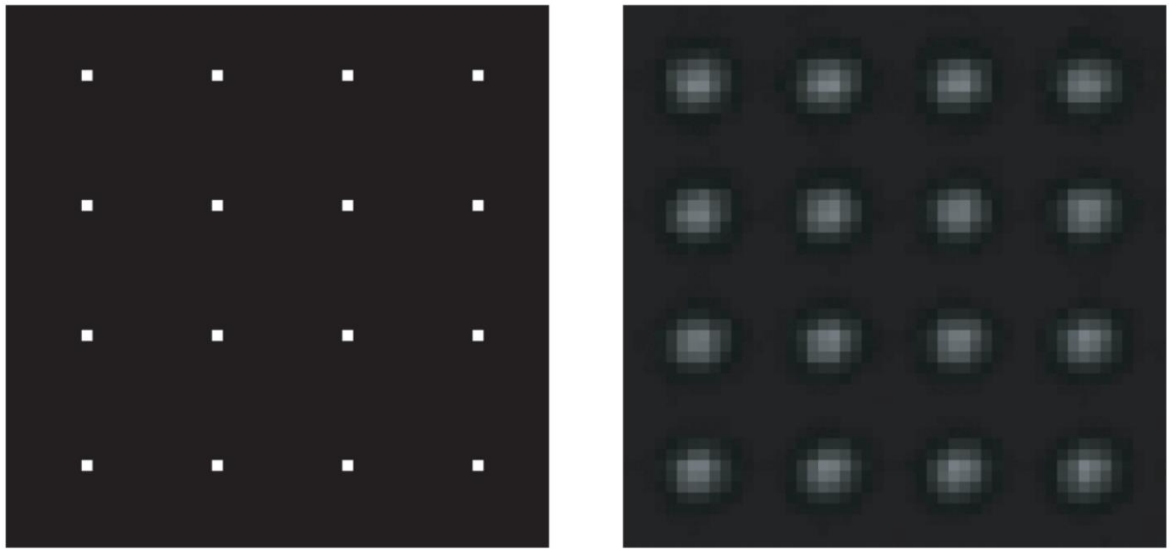








Projection Depth Estimation, Defocus



Projected Image Observed Blur

Projection Depth Estimation, Defocus

Projection Depth Estimation, Defocus

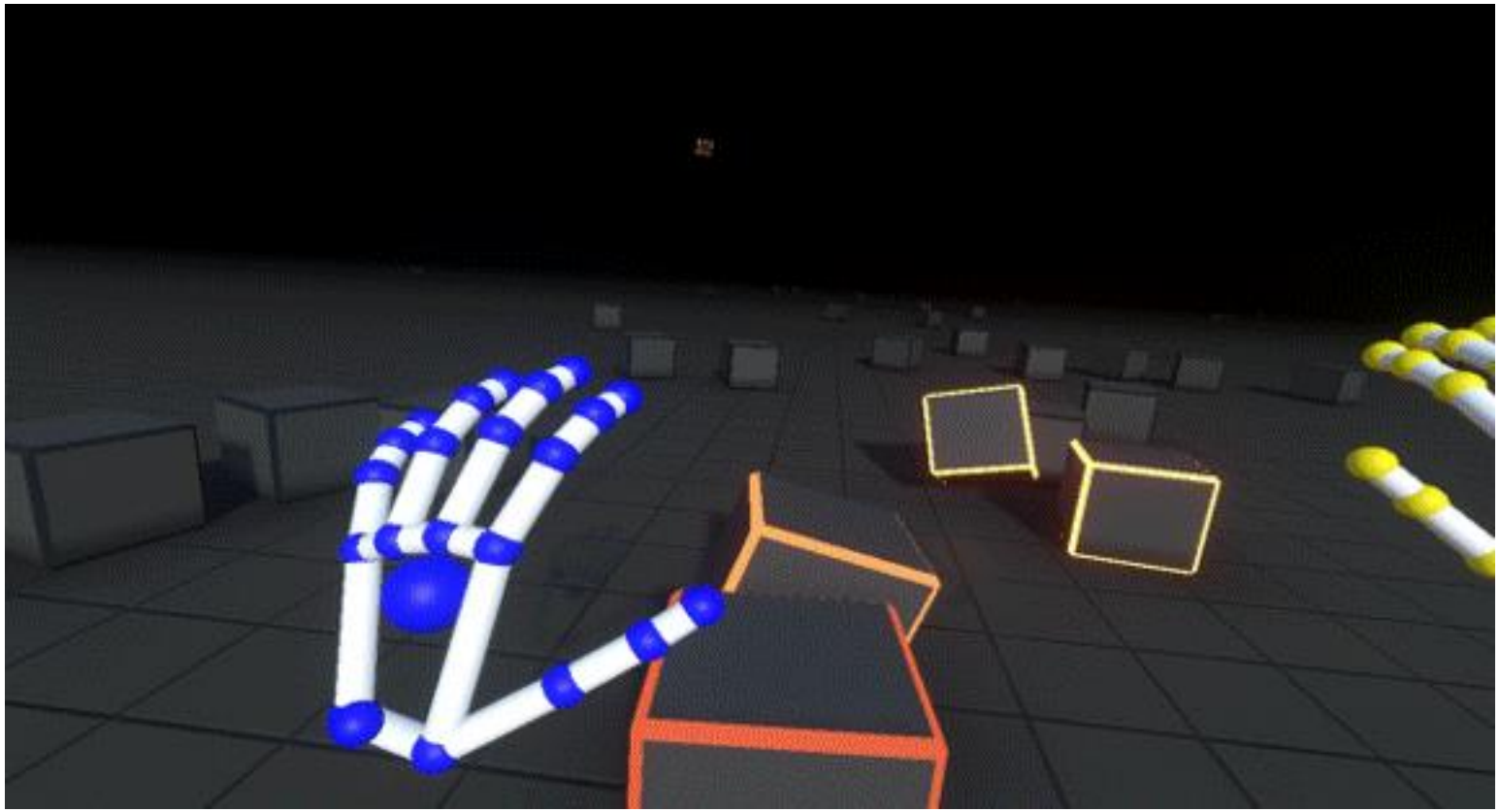
- Link
- Hardware+Software
- Lecture 3

Occulus Rift with Leap Motion

Occulus Rift with Leap Motion

Occulus Rift with Leap Motion

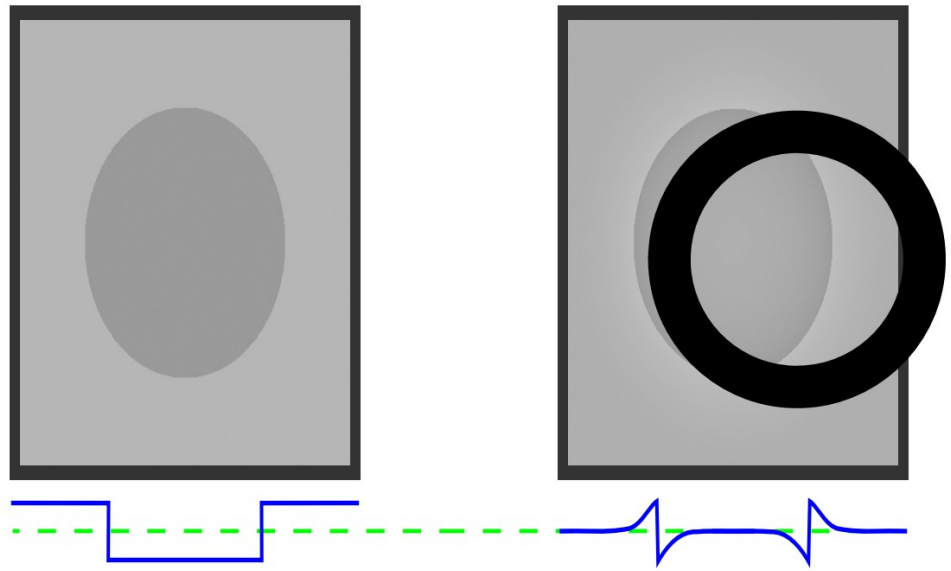
Occulus Rift with Leap Motion



Occulus Rift with Leap Motion

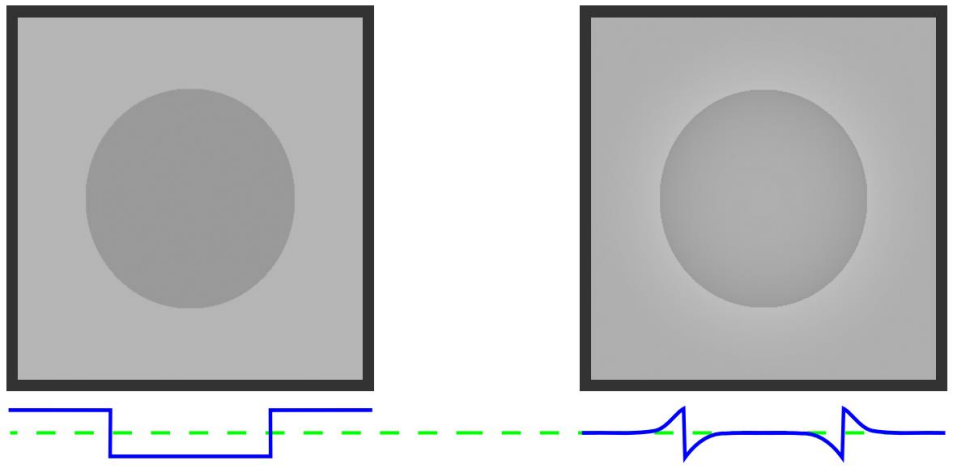
- Individually decided
- Link
- Hardware+Software
- Lecture 4

Apparent Stereo: The Cornsweet Illusion Can Enhance Perceived Depth

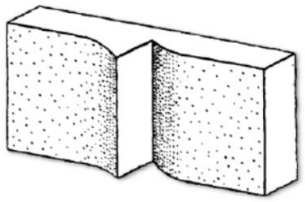


Apparent contrast due to **gradual darkening / brightening towards** a contrasting edge

Apparent Stereo: The Cornsweet Illusion Can Enhance Perceived Depth

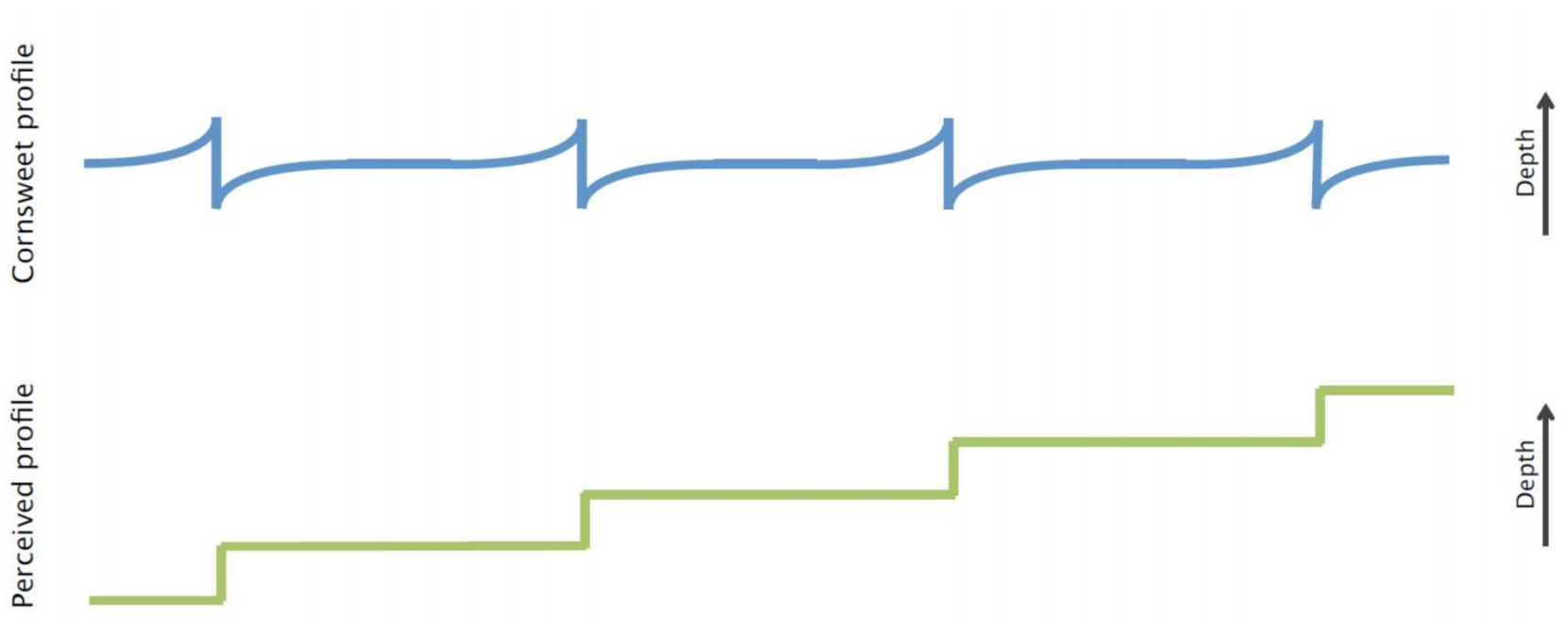


- Cornsweet illusion works for depth:



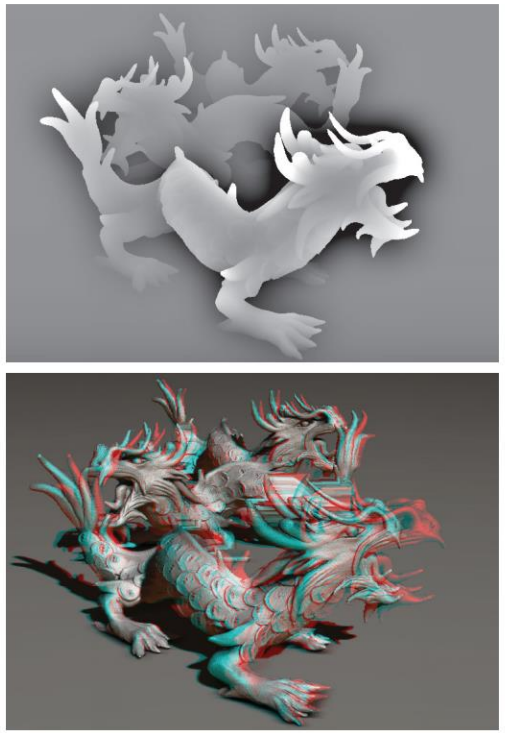
"A Craik-O'Brien-Cornsweet illusion for visual depth" [Anstis et al. 1978]

Apparent Stereo: The Cornsweet Illusion Can Enhance Perceived Depth



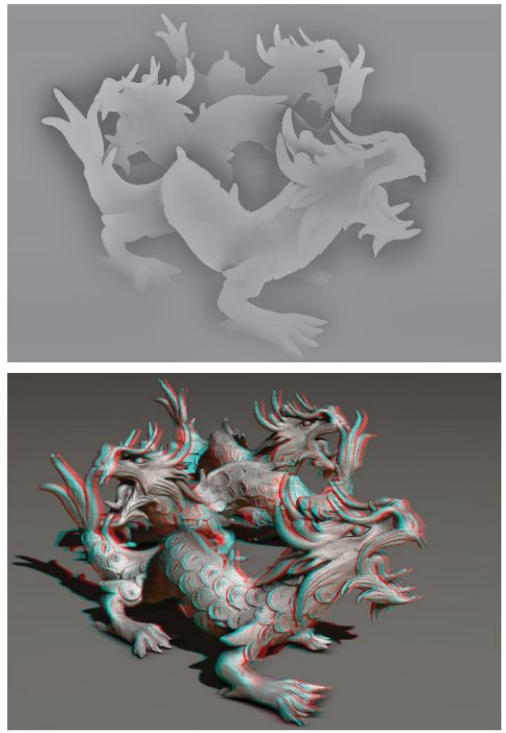
Apparent Stereo: The Cornsweet Illusion Can Enhance Perceived Depth

input image



a) unsharp masking profile

b) logaritmic



c) our local

Apparent Stereo: The Cornsweet Illusion Can Enhance Perceived Depth

Standard stereo

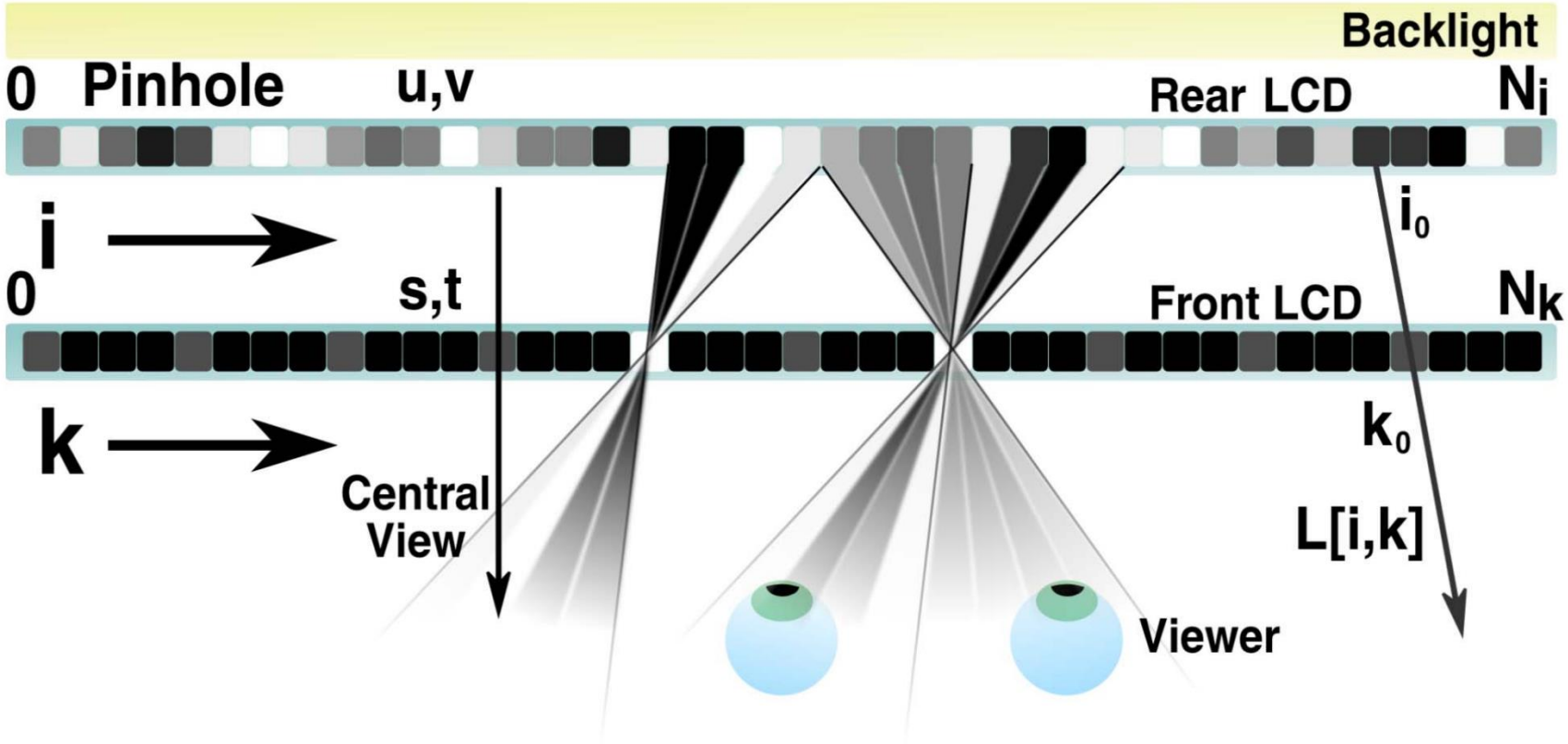
Backward-compatible stereo

Use only Cornsweet profiles

Apparent Stereo: The Cornsweet Illusion Can Enhance Perceived Depth

- Link
- Software only
- Lecture 7

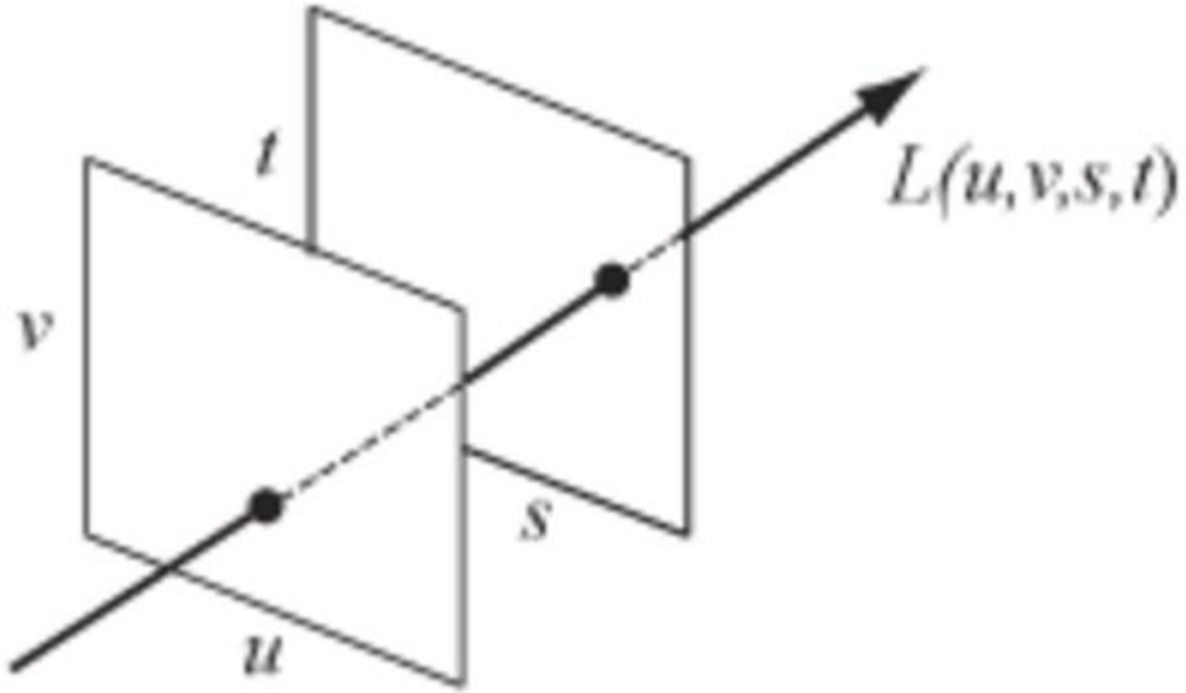
Simulation of Parallax Barrier Display



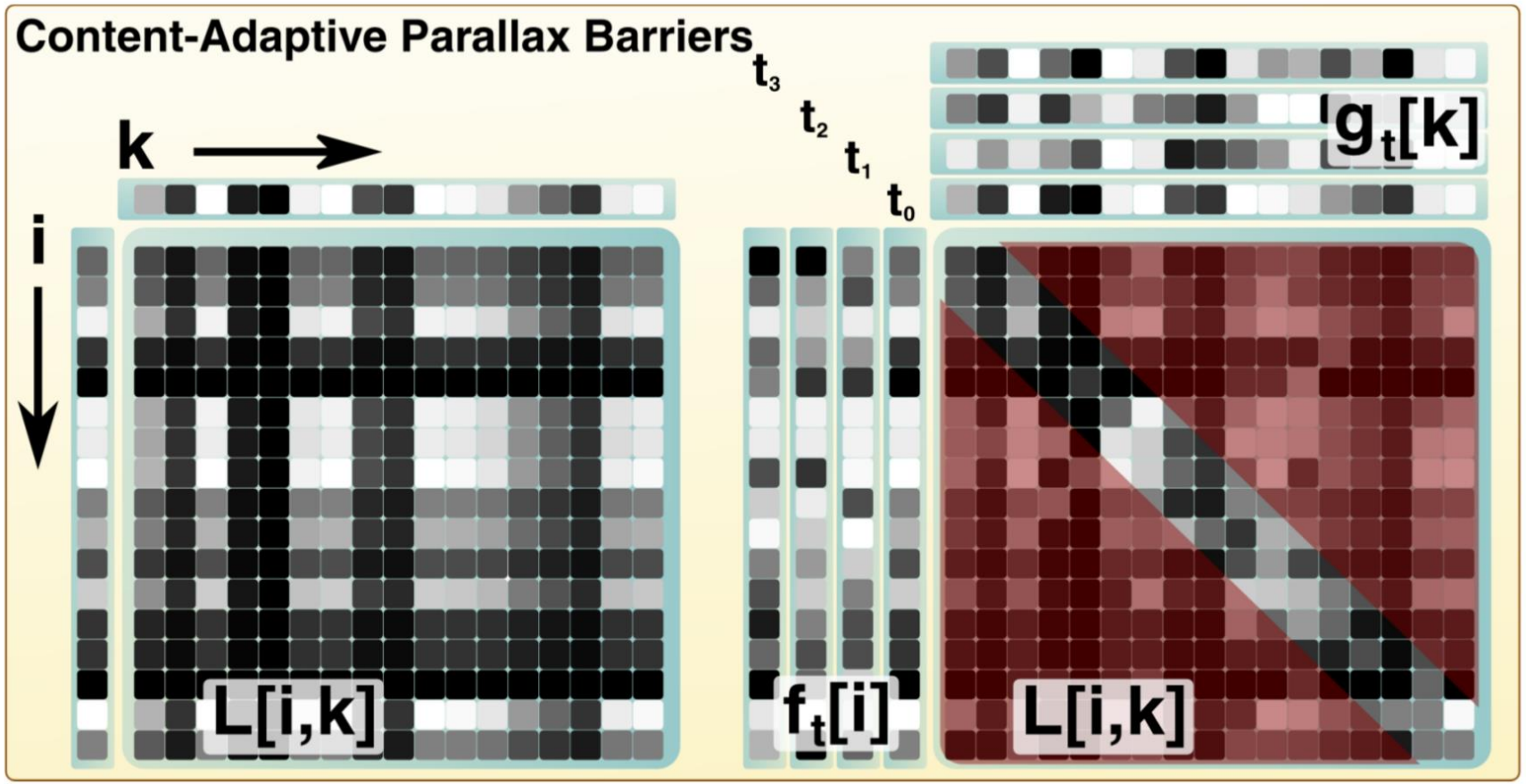
Pinhole mask creates directionally dependent light field

Simulation of Parallax Barrier Display

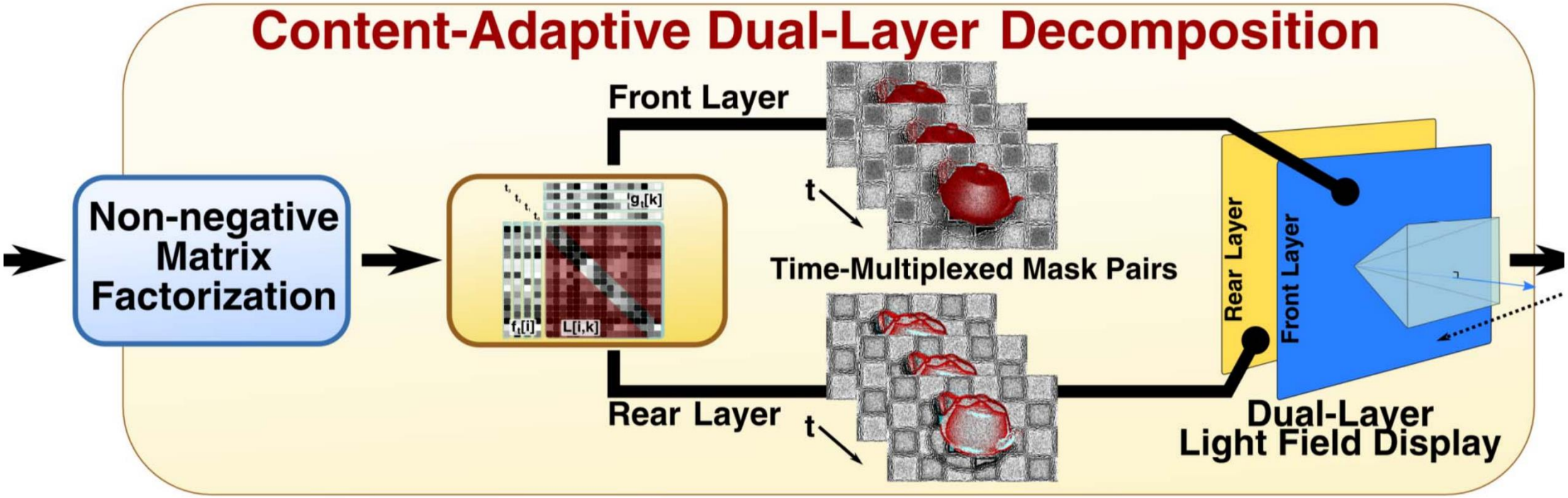
- Light field



Simulation of Parallax Barrier Display



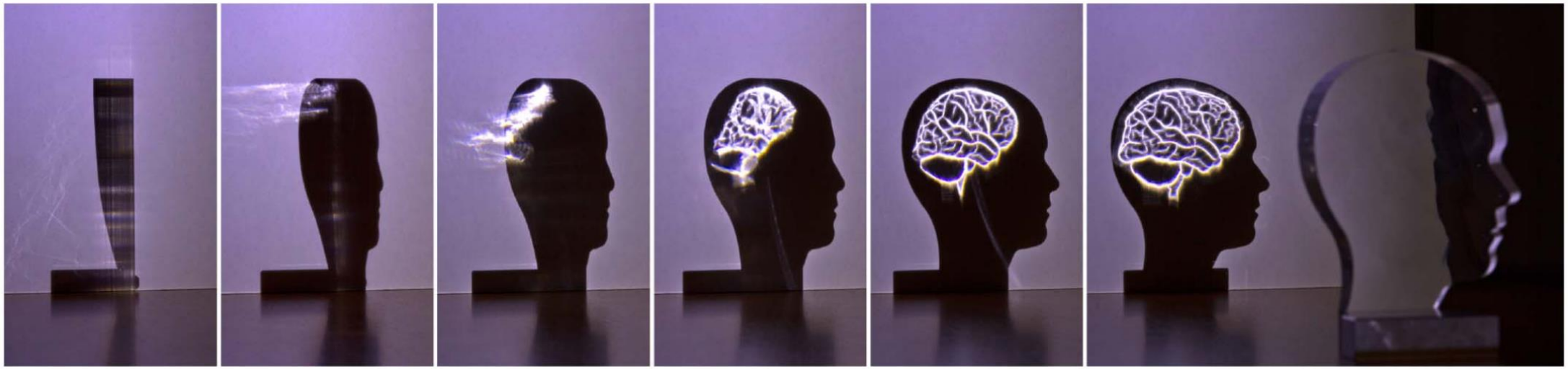
Simulation of Parallax Barrier Display



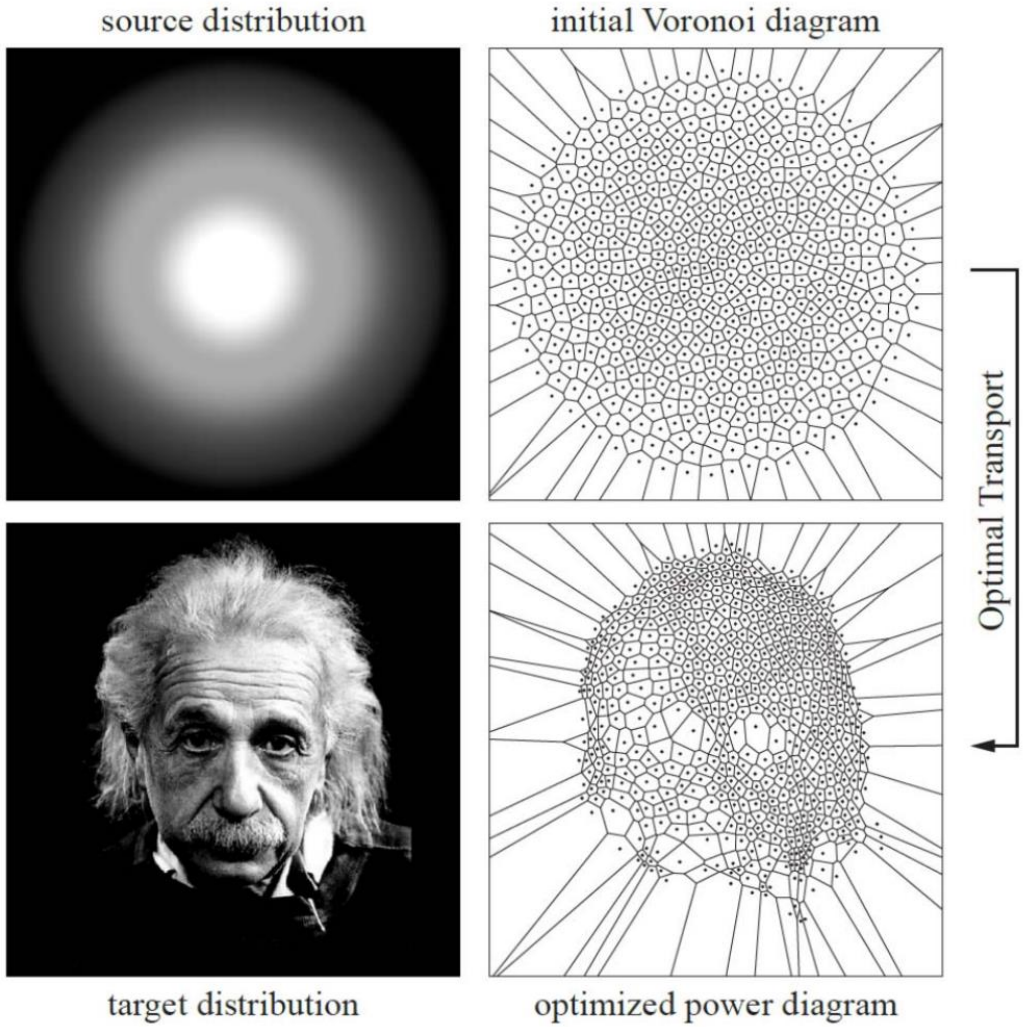
Simulation of Parallax Barrier Display

- Link
- Software only
- Lecture 8 and Lecture 9

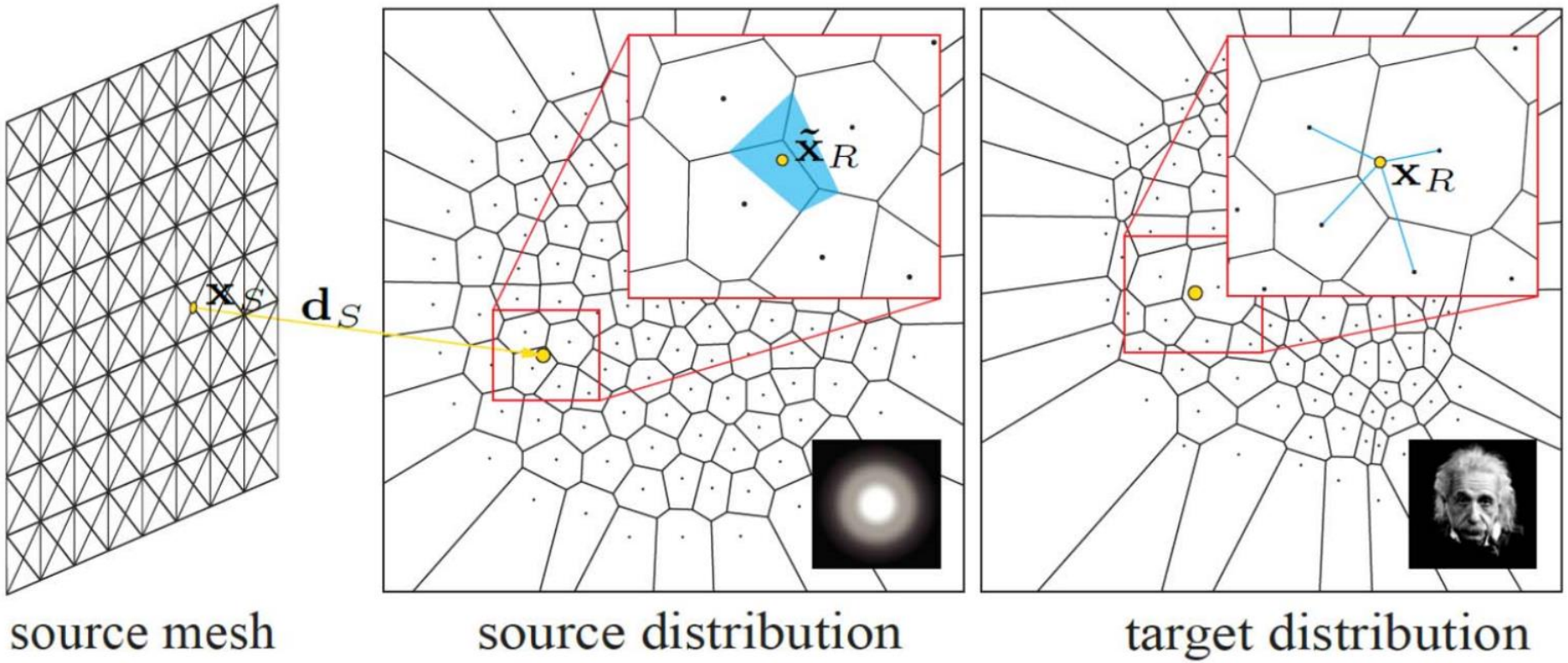
Simulating Computational Caustic Desig



Simulating Computational Caustic Desig

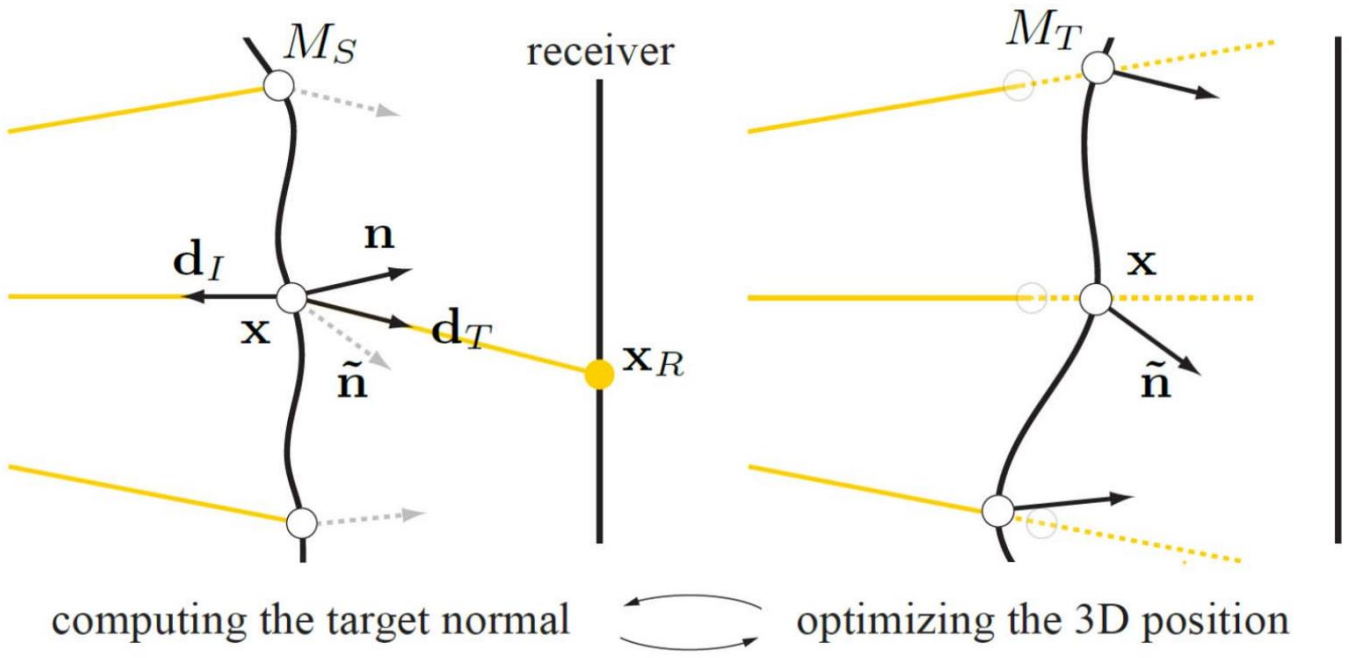


Simulating Computational Caustic Desig



Simulating Computational Caustic Desig

Integrate based on desired normals



Simulating Computational Caustic Desig

- Link
- Software only
- Lecture 13

Important dates

- Midterm presentation—Project ideas and progress
  - 11th. Jan. 2018
- Final presentation—Project demos and implementation
  - 25th. Jan. 2018