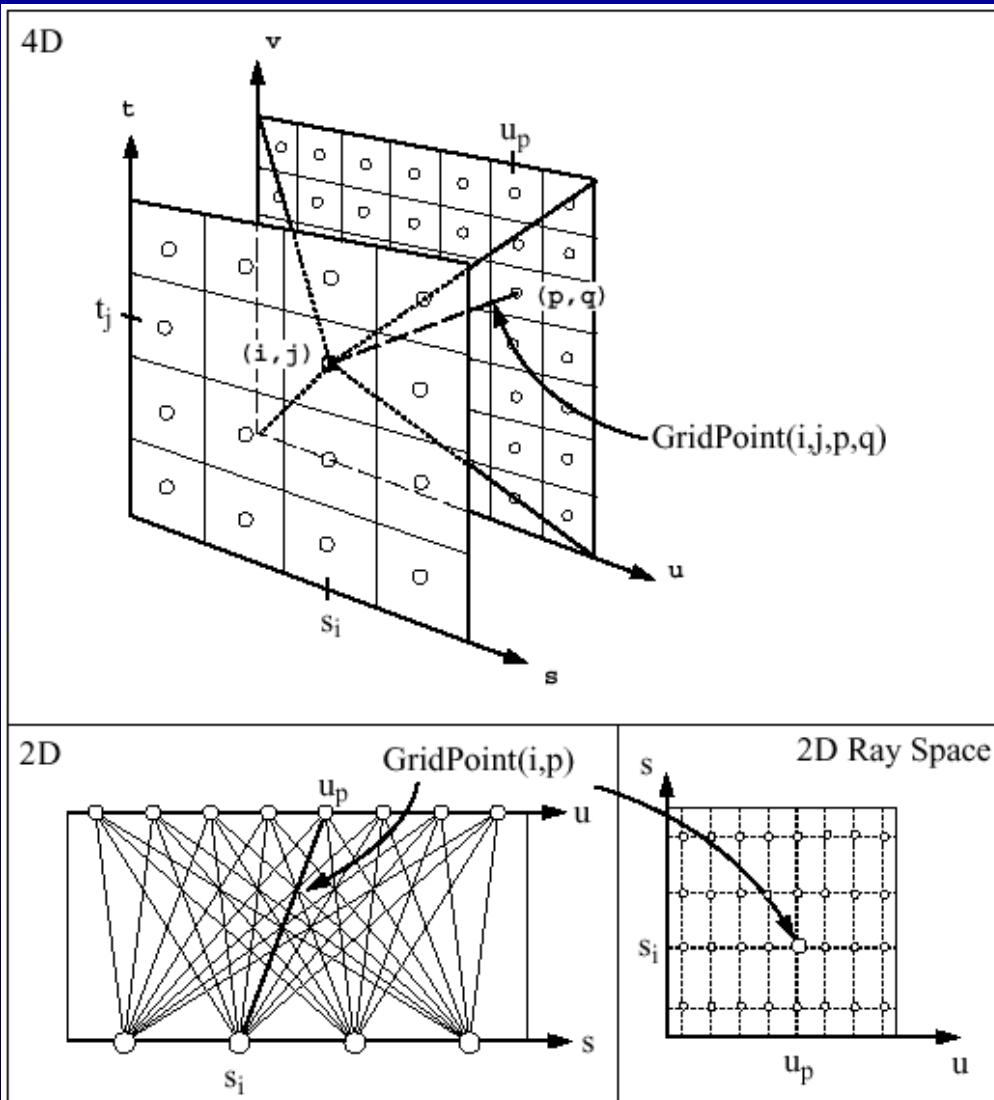# Dynamically Reparameterized Light Fields
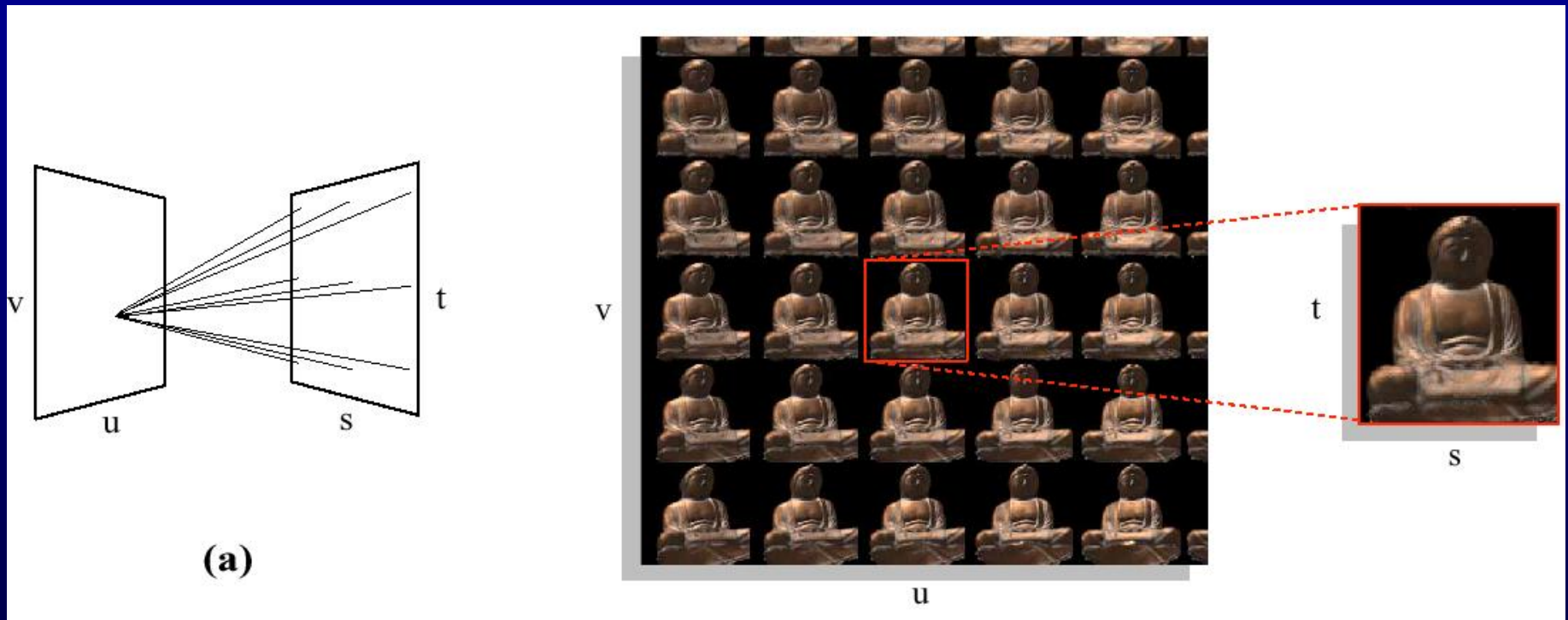
based on [Isaksen2000]

# Lightfield rendering
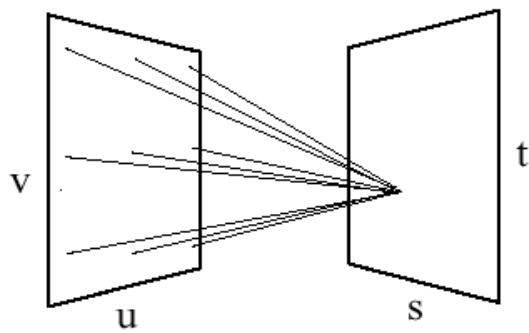


- a 4D sampling of the plenoptic function

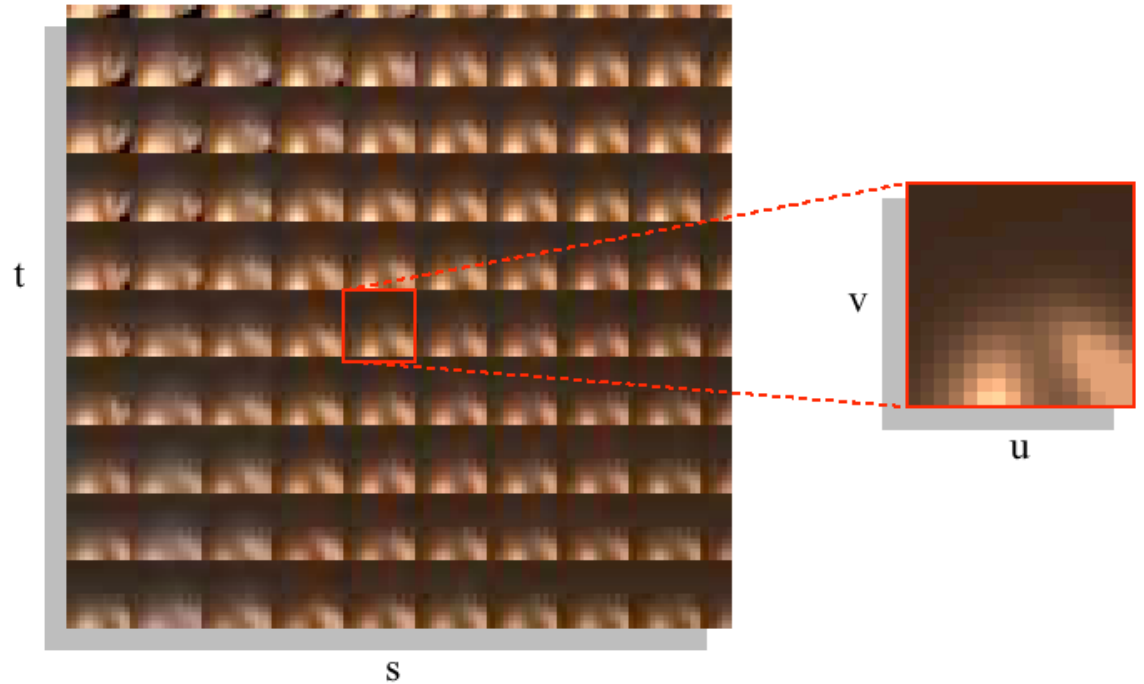- defines all rays between two planar grids
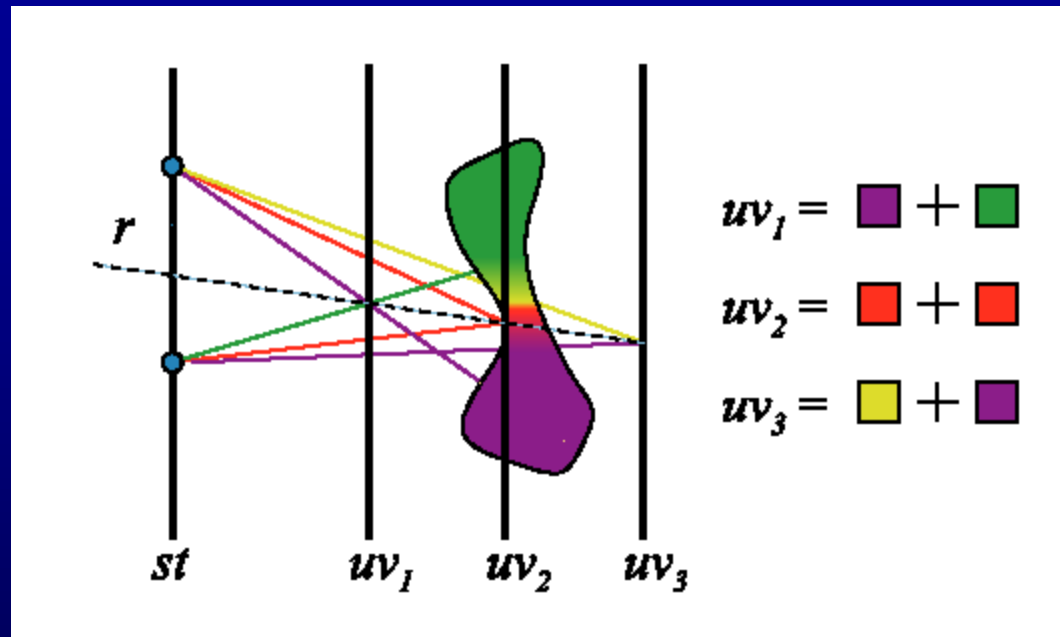
# Lightfield: set of images with COPs on regular grid



(a)

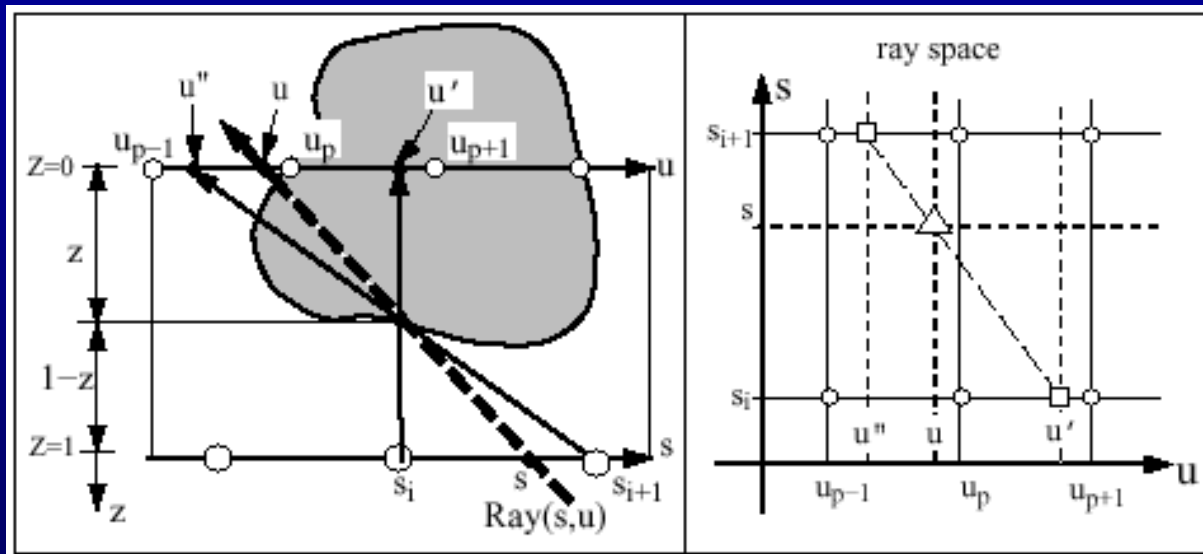# or Lightfield: set of images of a point seen at various angles



(b)

# Ray reconstruction ambiguity



- reconstruction of new ray is ambiguous

# Depth-corrected reconstruction



- reconstruction of new ray is ambiguous

- approximate depth can be used for correction

- for lightfields built from photographs depth is not available and difficult to approximate
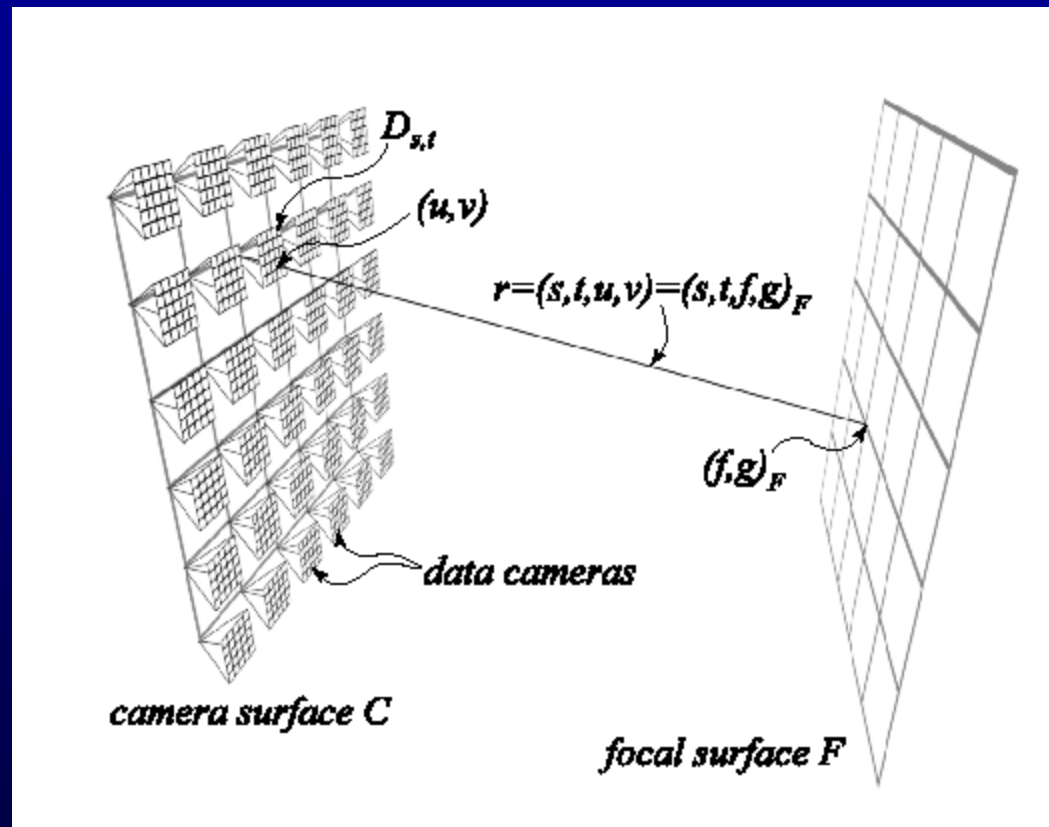
# Overview

- Challenges of lightfield rendering
- Dynamically reparameterized lightfields
  - definition
  - variable aperture and variable focus
  - autostereoscopic lightfields

# Overview

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# Focal surface parameterization

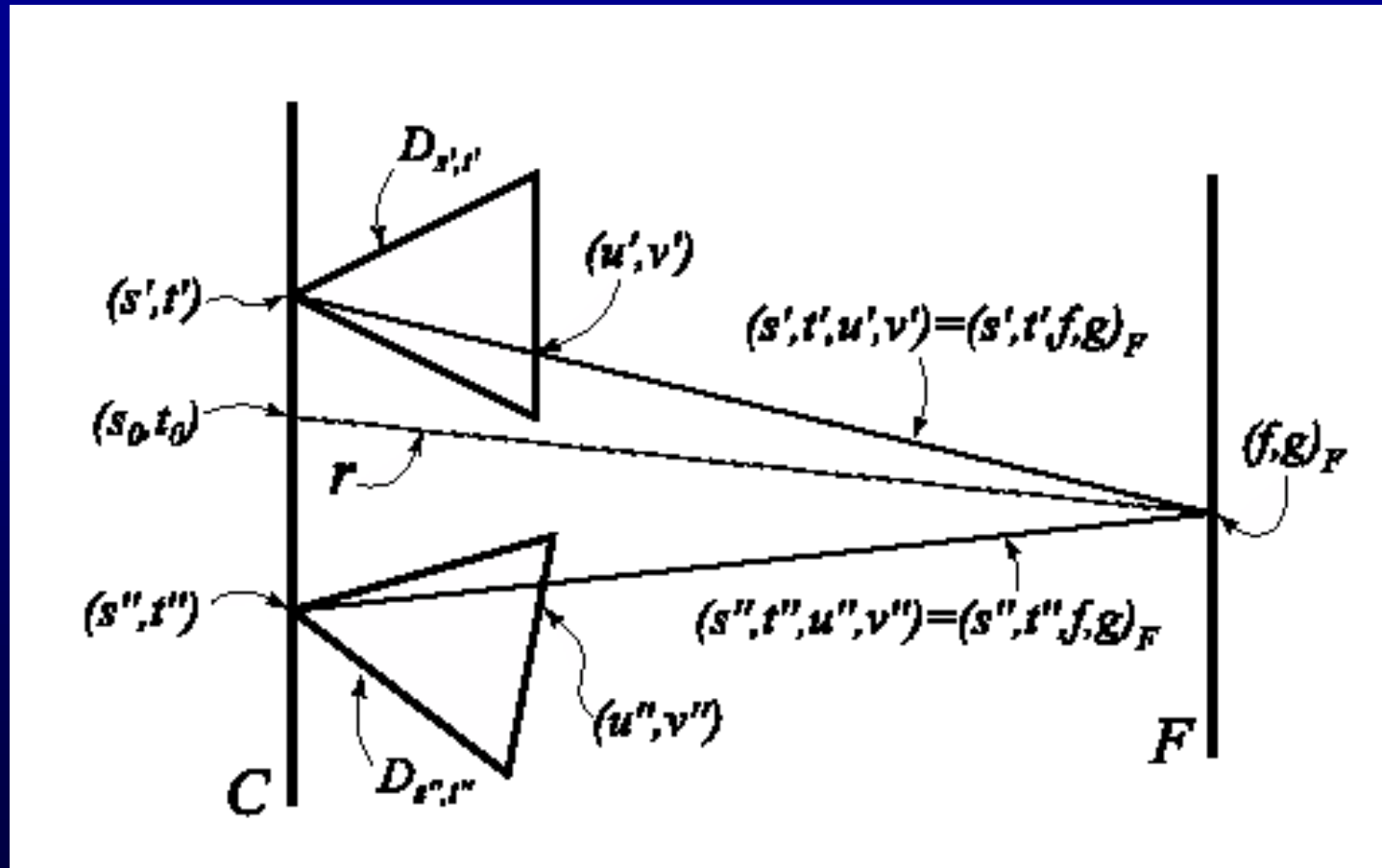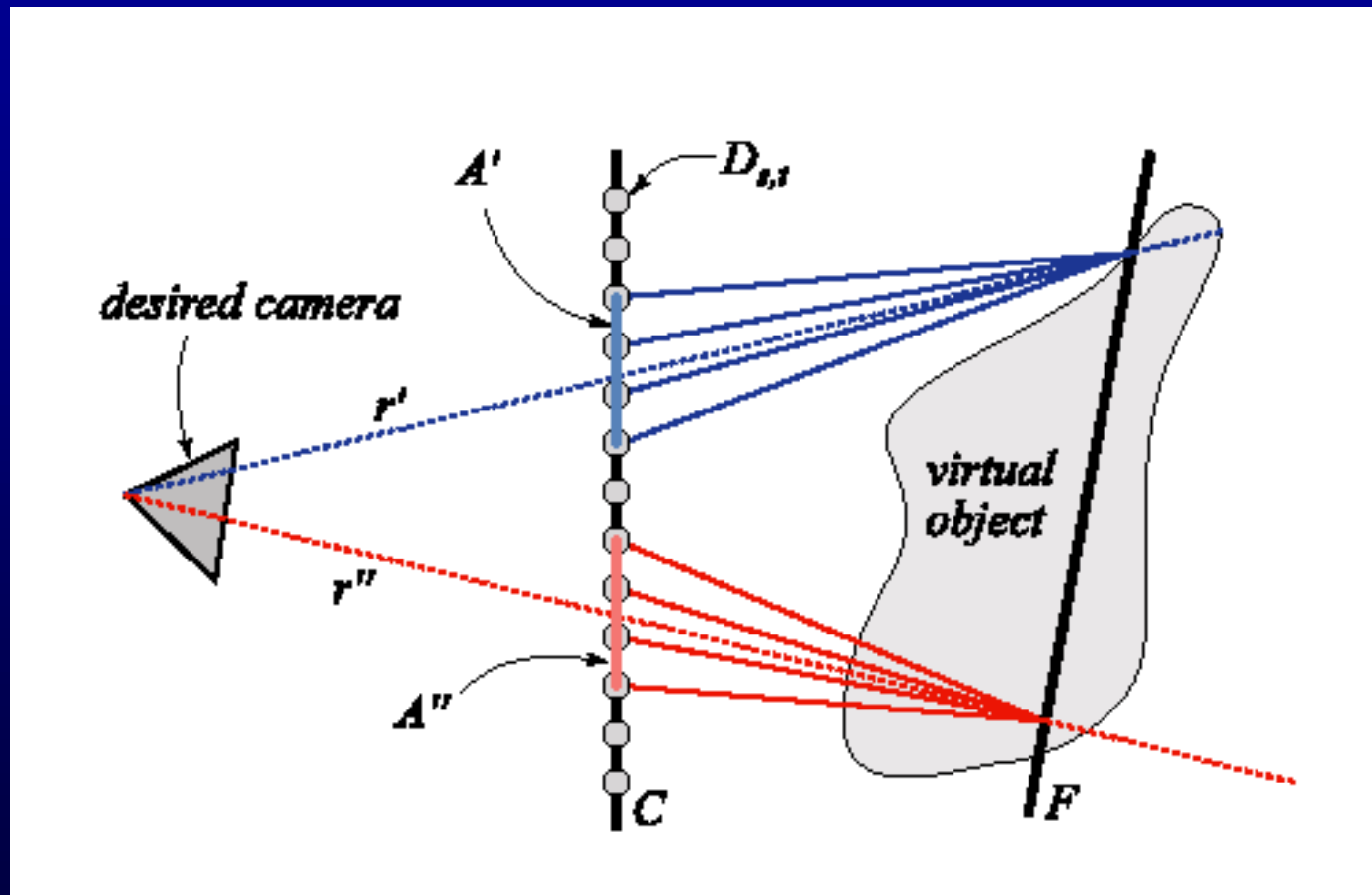# Mapping from focal surface to camera rays

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# Variable aperture

# Aperture filtering

# Changing depth of field example

# Changing depth of field example

# Very large aperture

# Variable focus

# Change of focus example
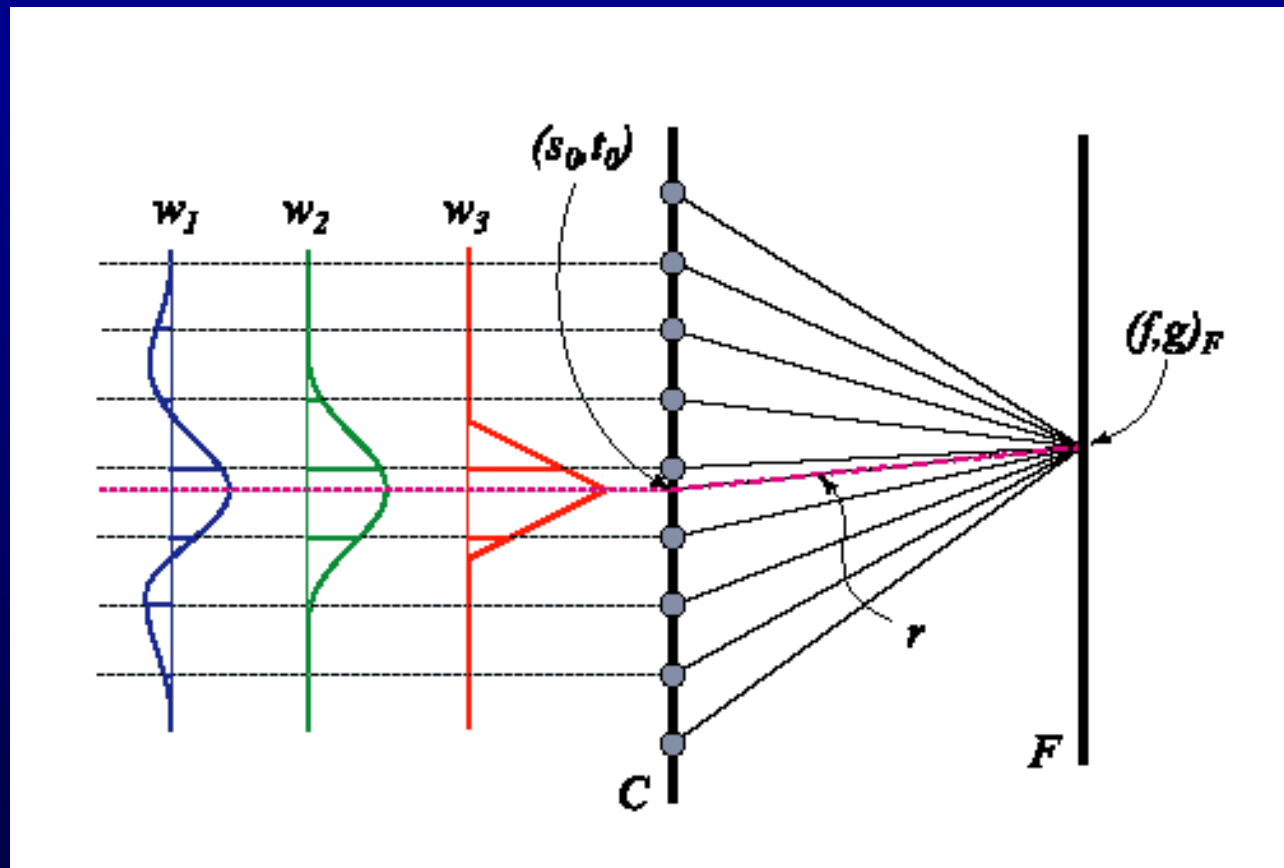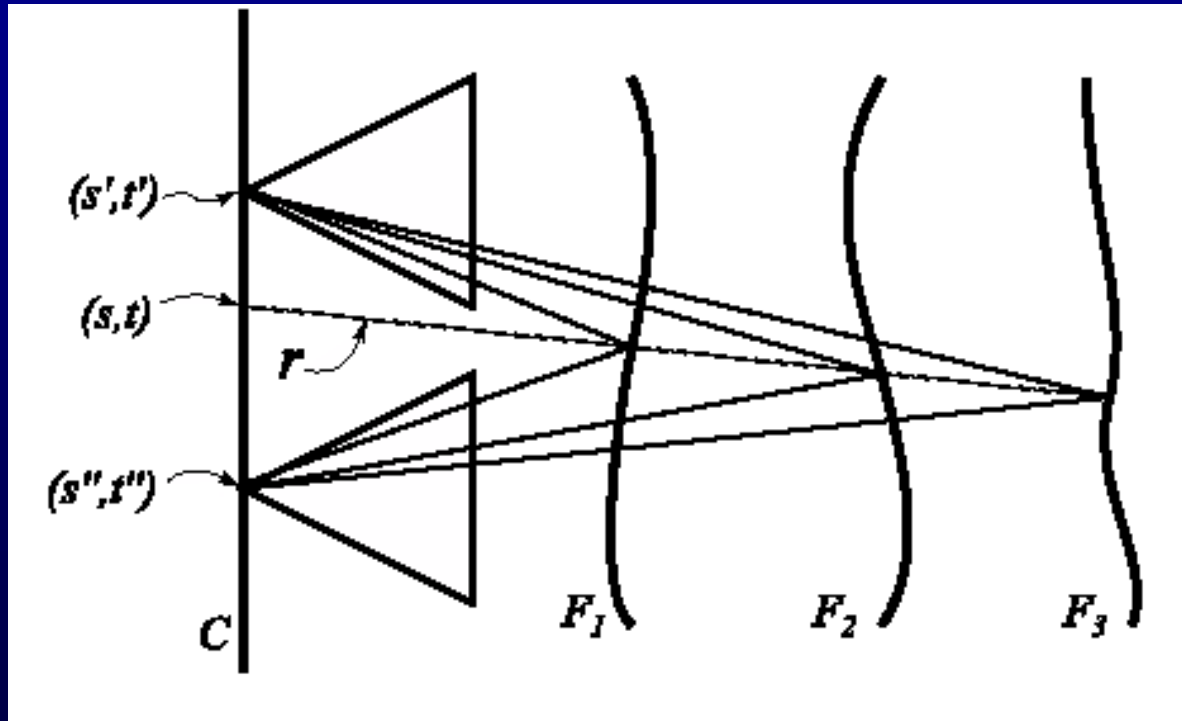
# Change of focus example

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# Overview

- Challenges of lightfield rendering
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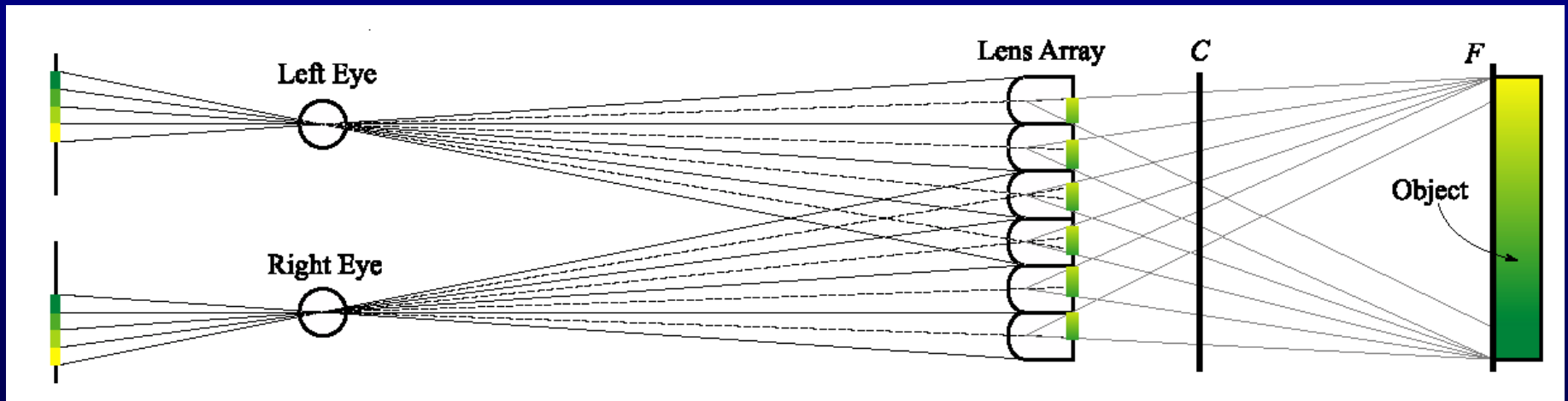  - **autostereoscopic lightfields**

# Integral photograph

- Special image covered with small lenses
- Image changes according to direction of view
- Simulates camera movement (object movement)
- Is essentially a lightfield viewed directly
- Easier to construct by reparameterizing a lightfield

# Lenslet as view dependent pixel
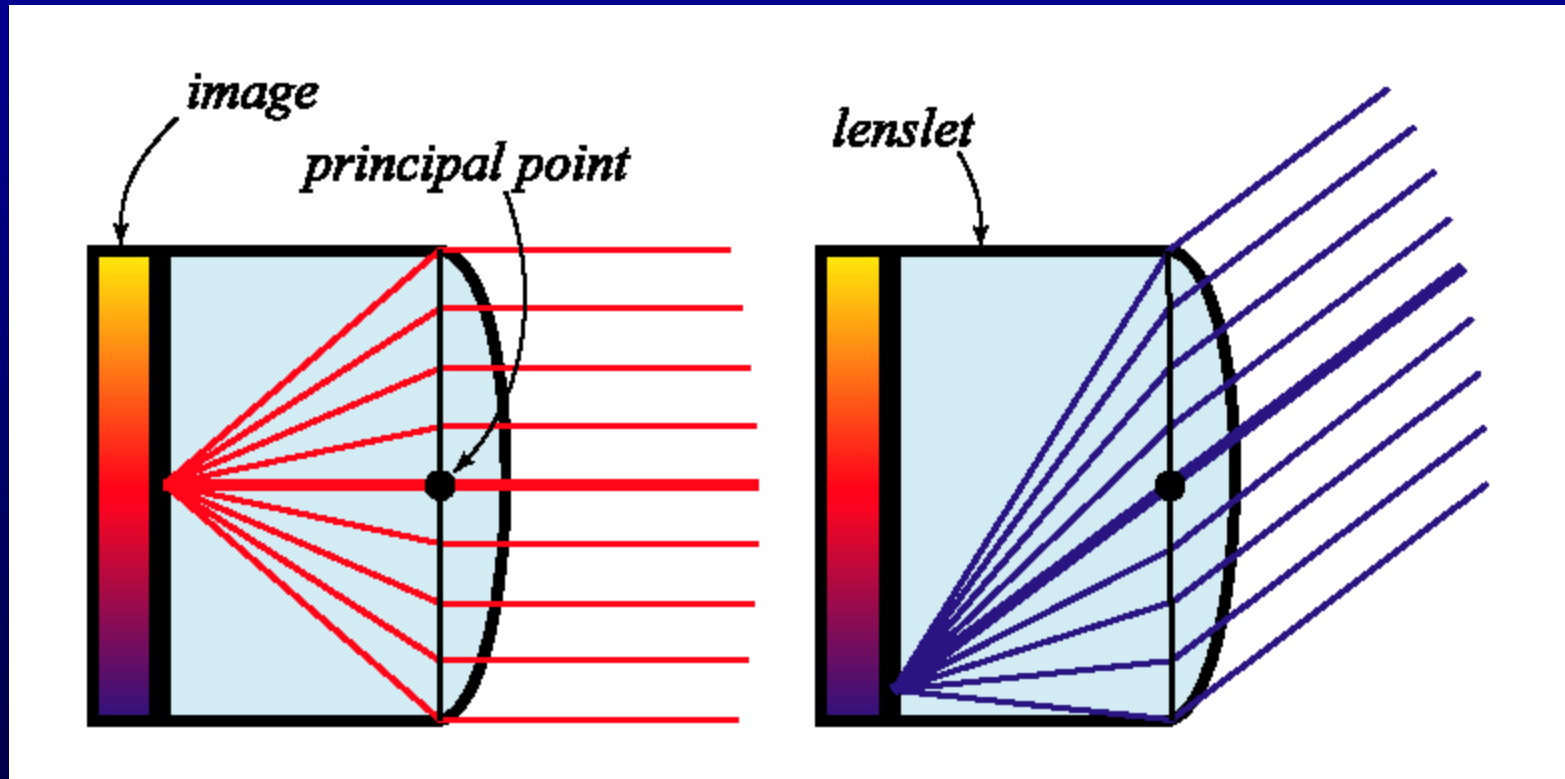
# Reparameterizing lightfield for direct viewing

# Directly viewable lightfield