

Sampling and Reconstruction of Visual Appearance

CSE 274 [Winter 2018], Lecture 11

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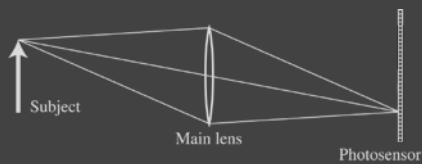
<http://www.cs.ucsd.edu/~ravir>



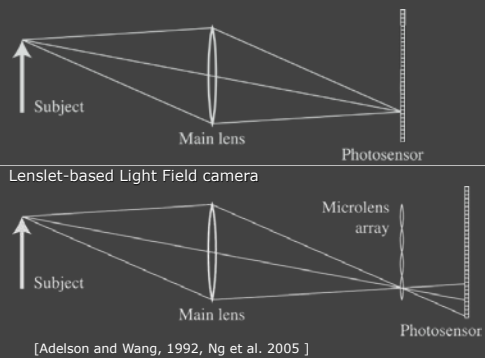
Applications

- Monte Carlo Rendering (biggest application)
- Light Transport Acquisition / Many Light Rendering
- *Light Fields and Computational Photography*
- Animation/Simulation (not covered in course)
- Compressive sensing for light field reconstruction
- Newer (deep) machine learning approaches

Light Field Inside a Camera



Light Field Inside a Camera



Stanford Plenoptic Camera [Ng et al 2005]



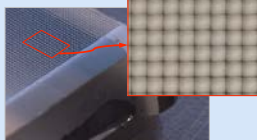
Contax medium format camera



Kodak 16-megapixel sensor



Adaptive Optics microlens array



125μ square-sided microlenses

$$4000 \times 4000 \text{ pixels} \div 292 \times 292 \text{ lenses} = 14 \times 14 \text{ pixels per lens}$$

Digital Refocusing



[Ng et al 2005]

Demo at: <https://people.cs.berkeley.edu/~ng>

