

## Sampling and Reconstruction of Visual Appearance: From Denoising to View Synthesis

CSE 274 [Fall 2022], Lecture 10

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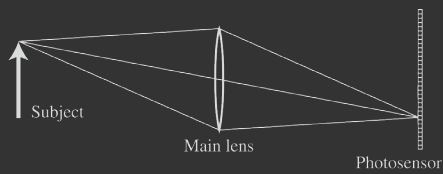
1

## Applications

- Monte Carlo Rendering
- Light Transport Acquisition / Many Light Rendering
- *Light Fields and Computational Photography*
- View Synthesis
- Animation/Simulation (not covered in course)

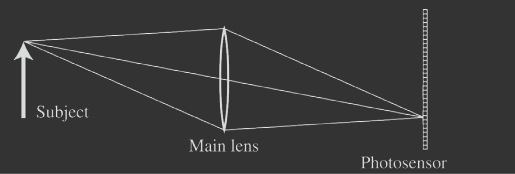
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## Light Field Inside a Camera

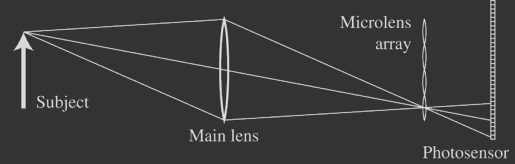


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## Light Field Inside a Camera



Lenslet-based Light Field camera



[Adelson and Wang, 1992, Ng et al. 2005]

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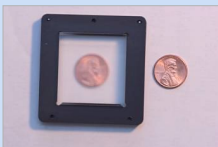
## Stanford Plenoptic Camera [Ng et al 2005]



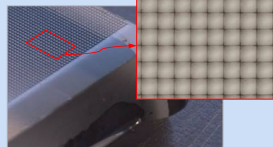
Contax medium format camera



Kodak 16-megapixel sensor



Adaptive Optics microlens array



125μ square-sided microlenses

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

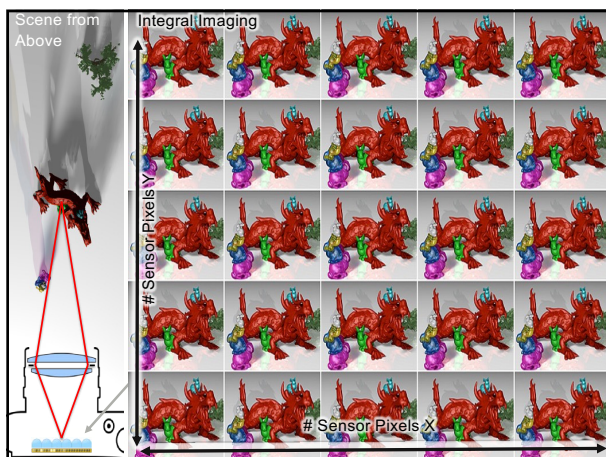
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## Digital Refocusing

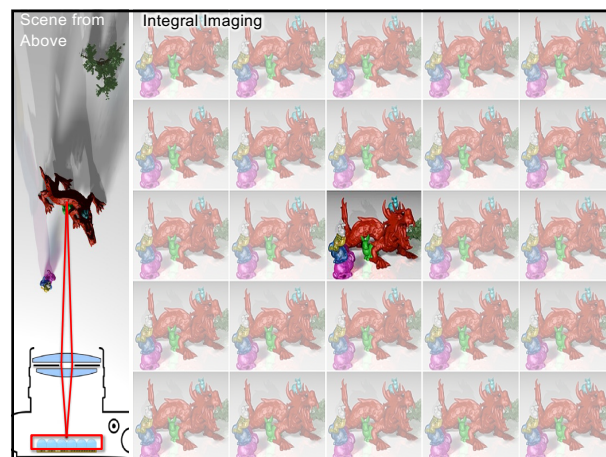


[Ng et al 2005]

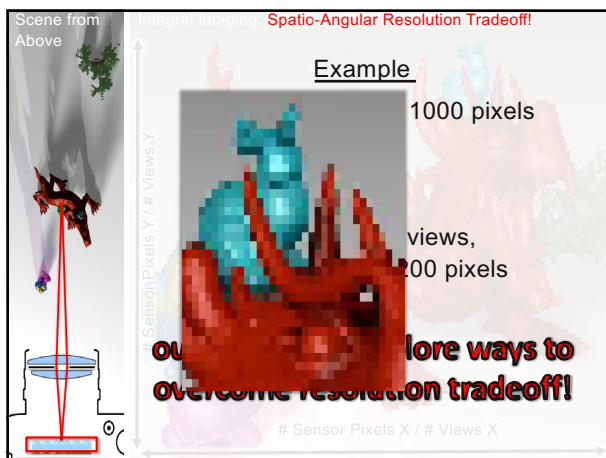
6



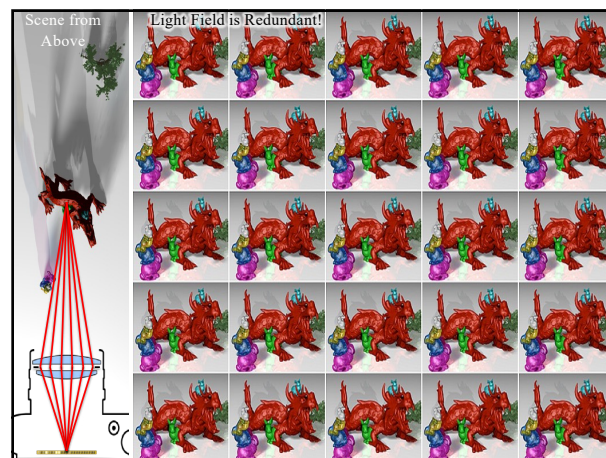
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