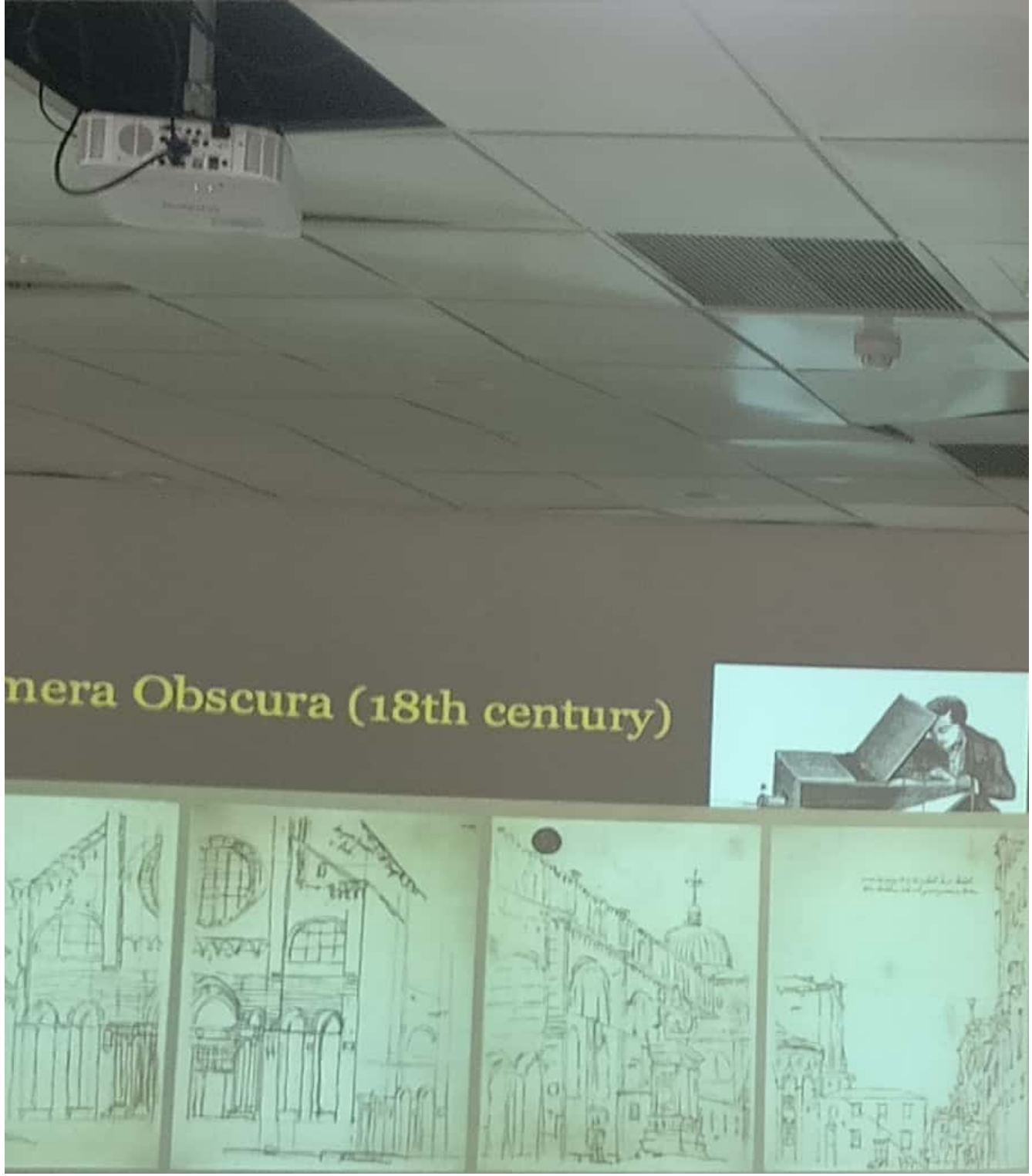
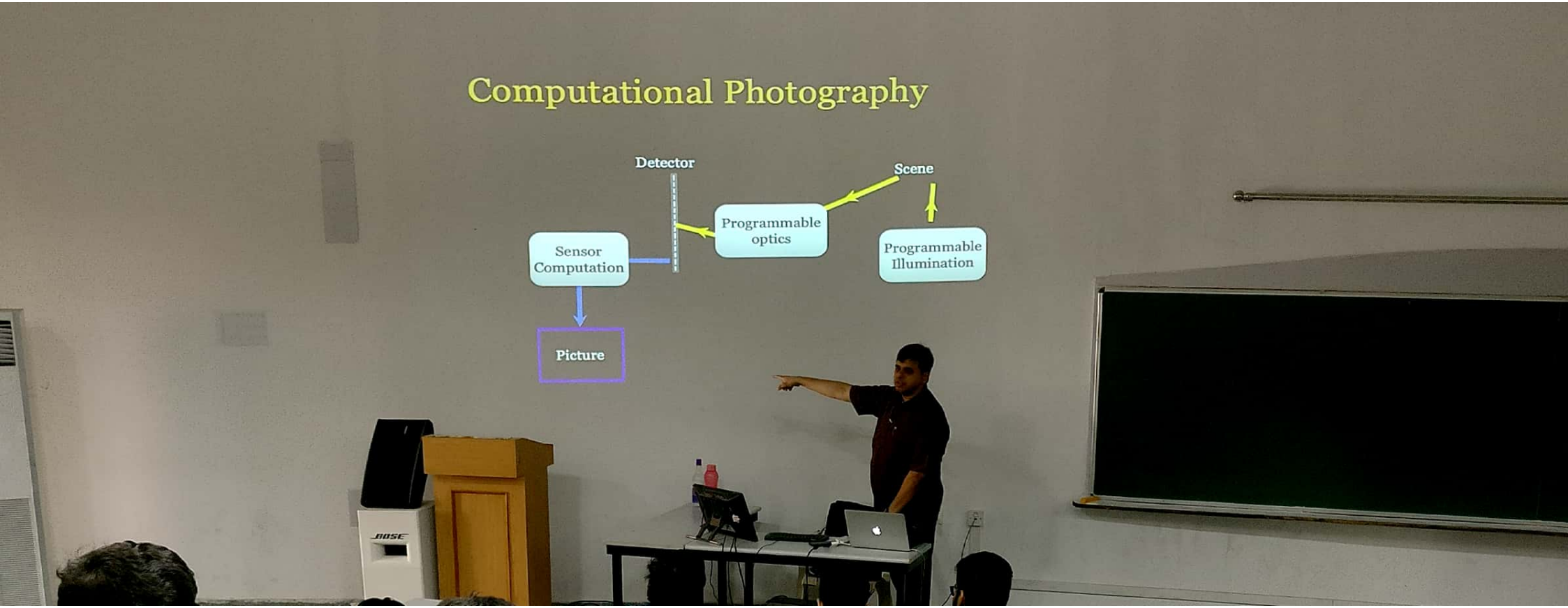
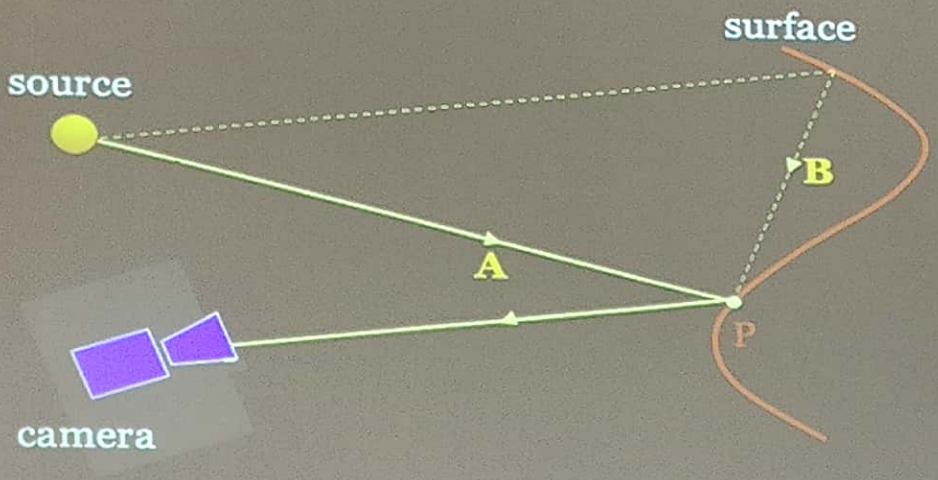
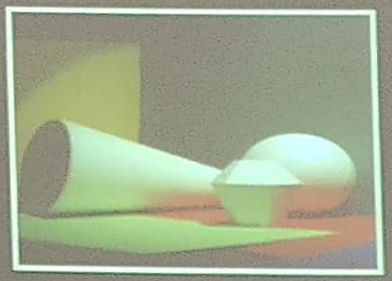


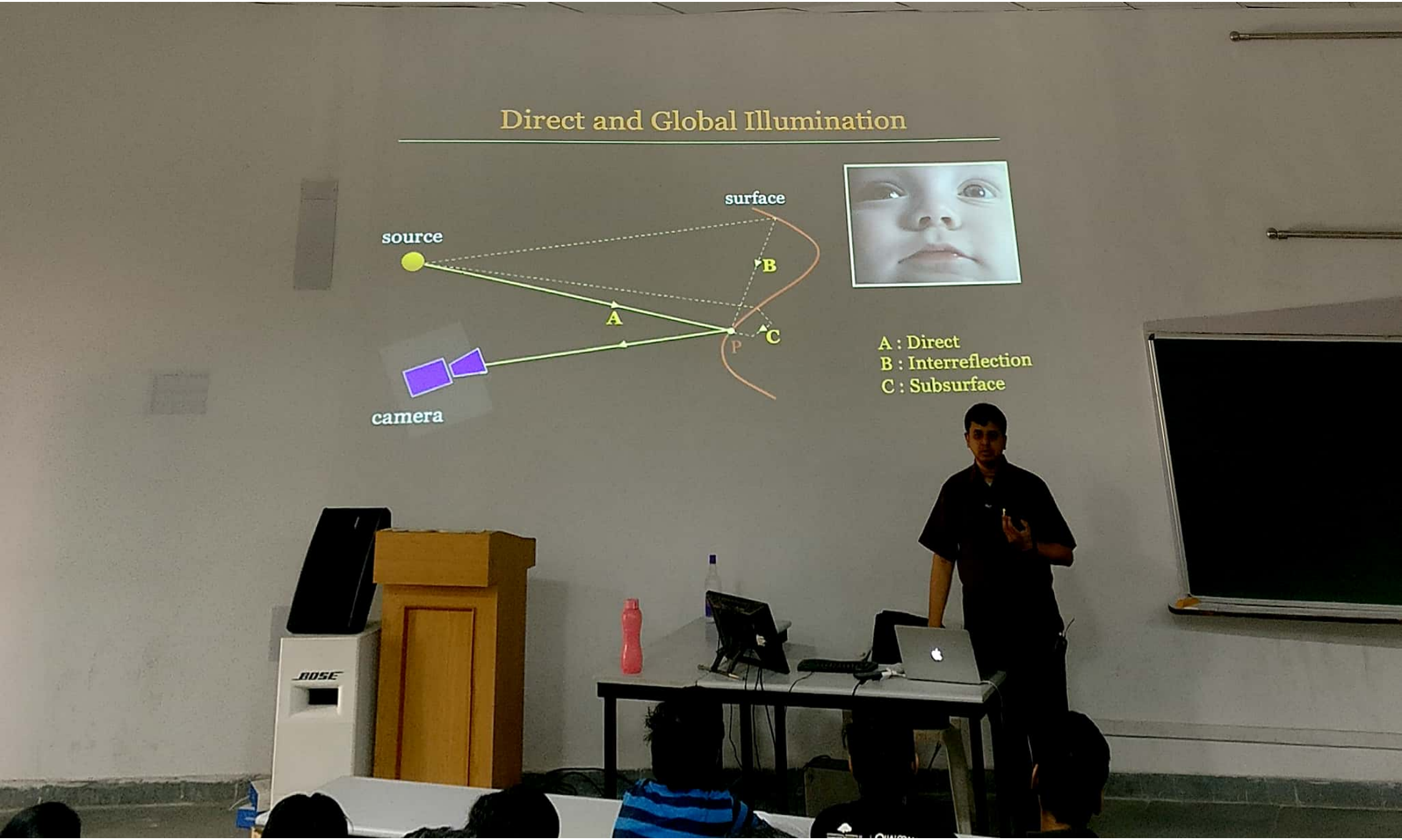


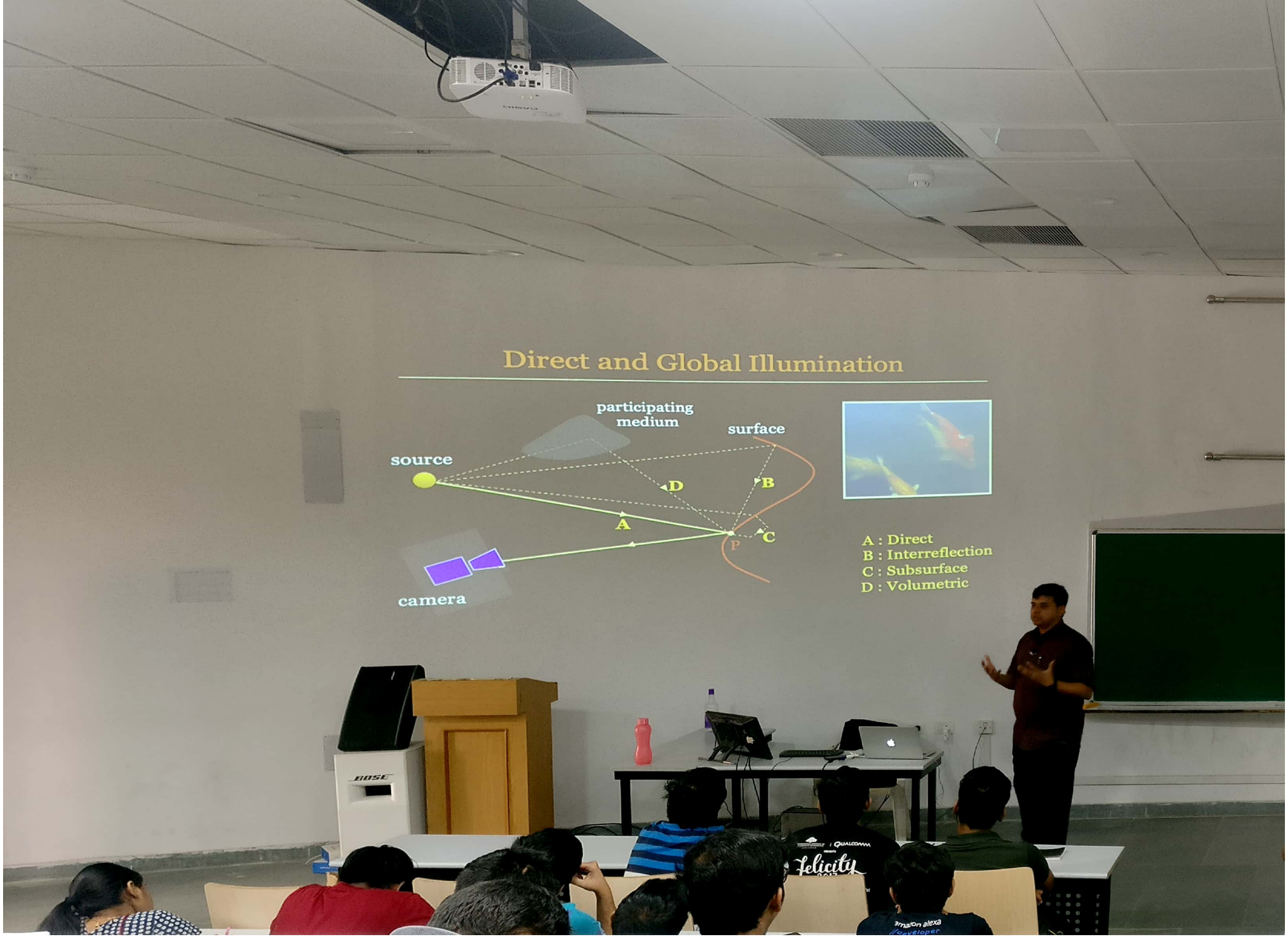
Direct and Global Illumination

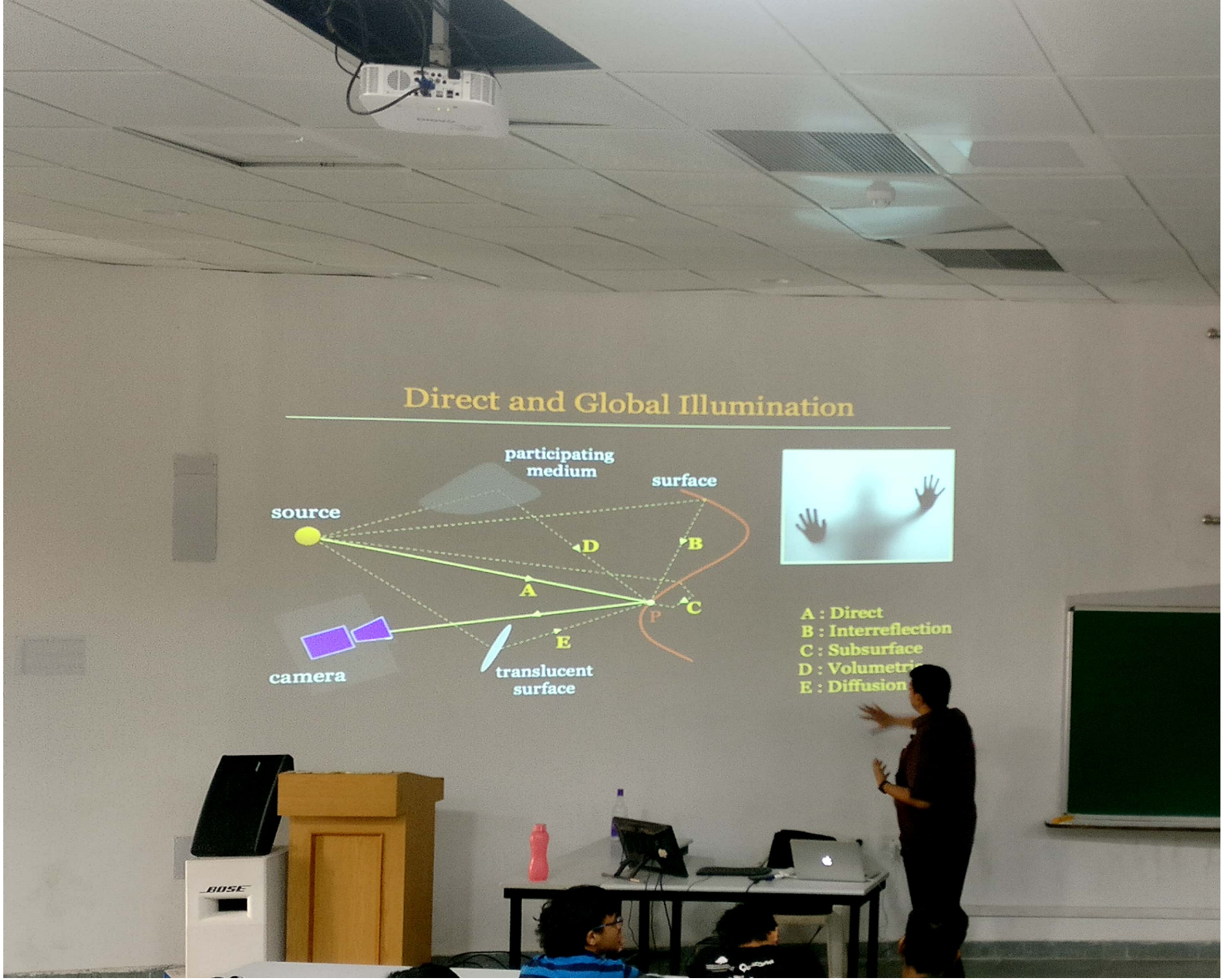




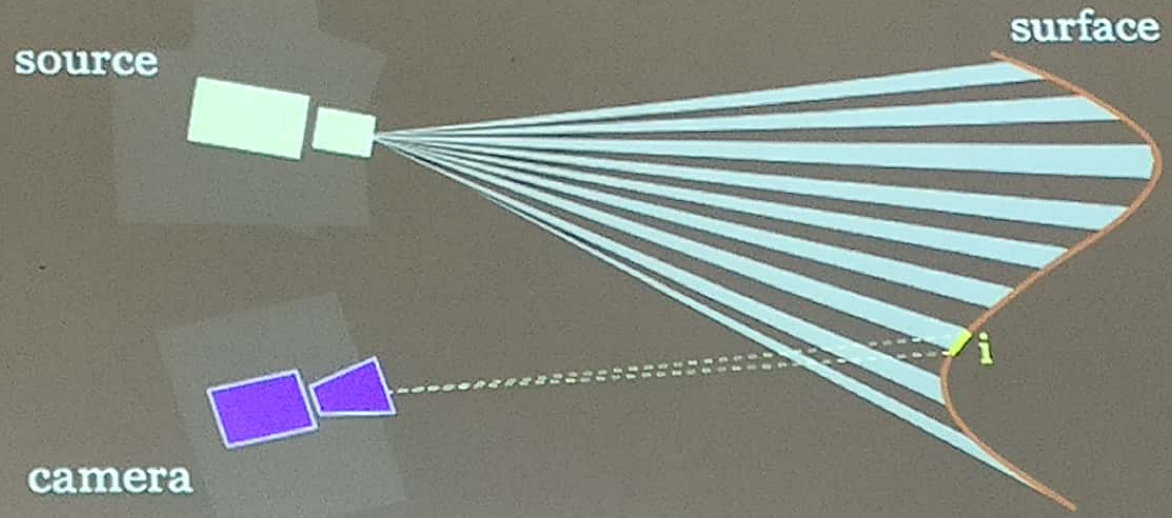
A : Direct
B : Interreflection







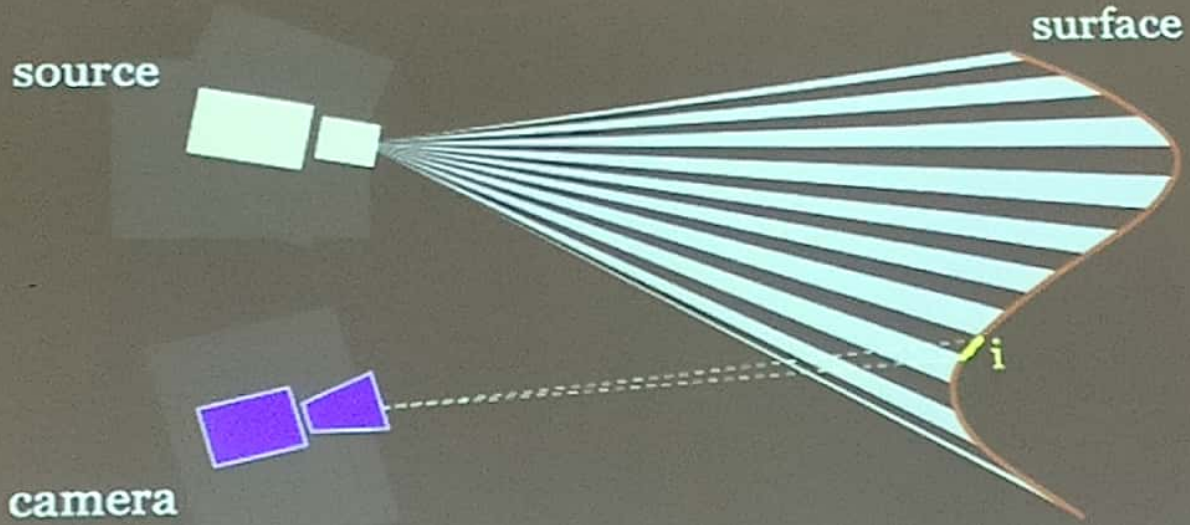
High Frequency Illumination Pattern



$$L^{+}[c,i] = L_d[c,i] + \alpha\, L_g[c,i]$$

fraction of activated source elements

High Frequency Illumination Pattern



$$L^{+}[c,i] = L_d[c,i] + \alpha\, L_g[c,i]$$

$$L^{-}[c,i] = (1-\alpha)\, L_g[c,i]$$

fraction of activated source elements

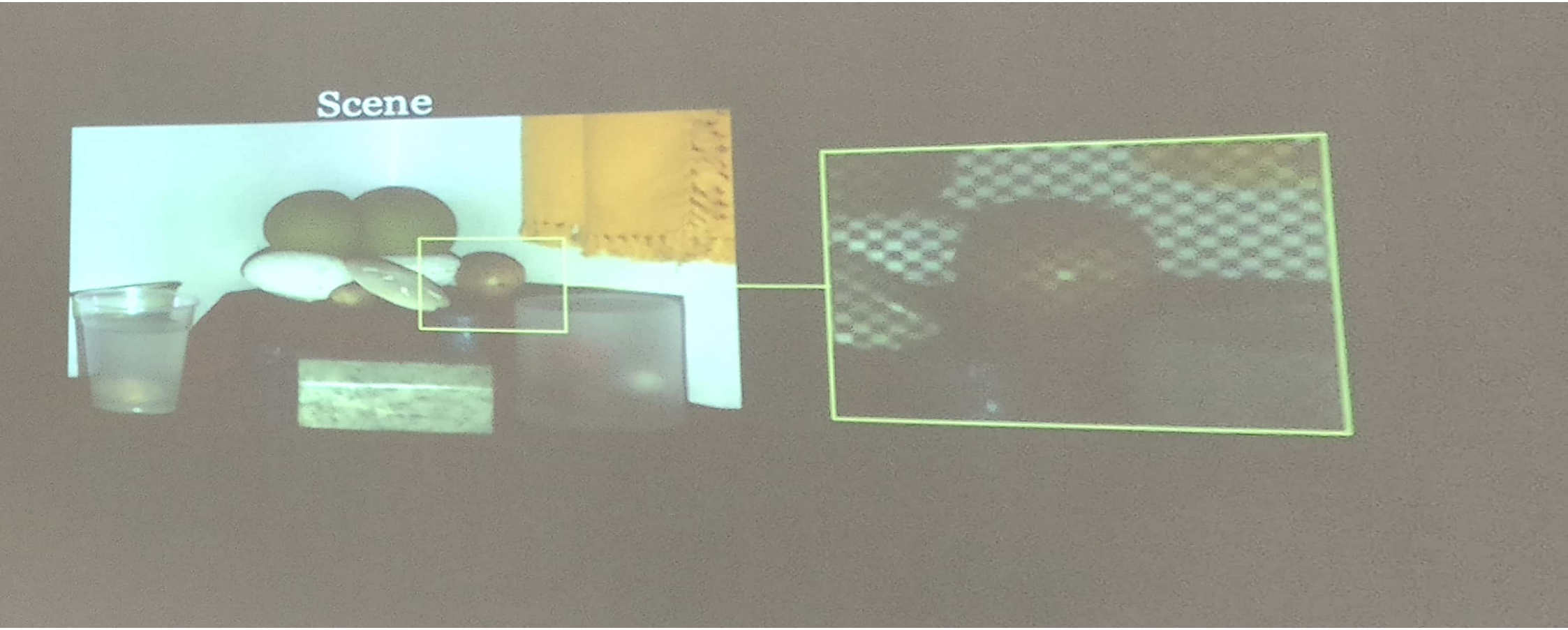
Separation from Two Images

$\alpha = \frac{1}{2}$:

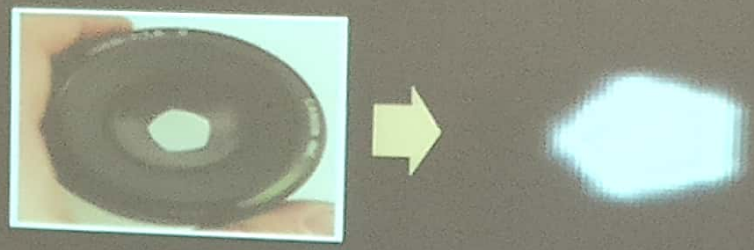
$$L_d = L_{\max} - L_{\min}, \quad L_g = 2L_{\min}$$

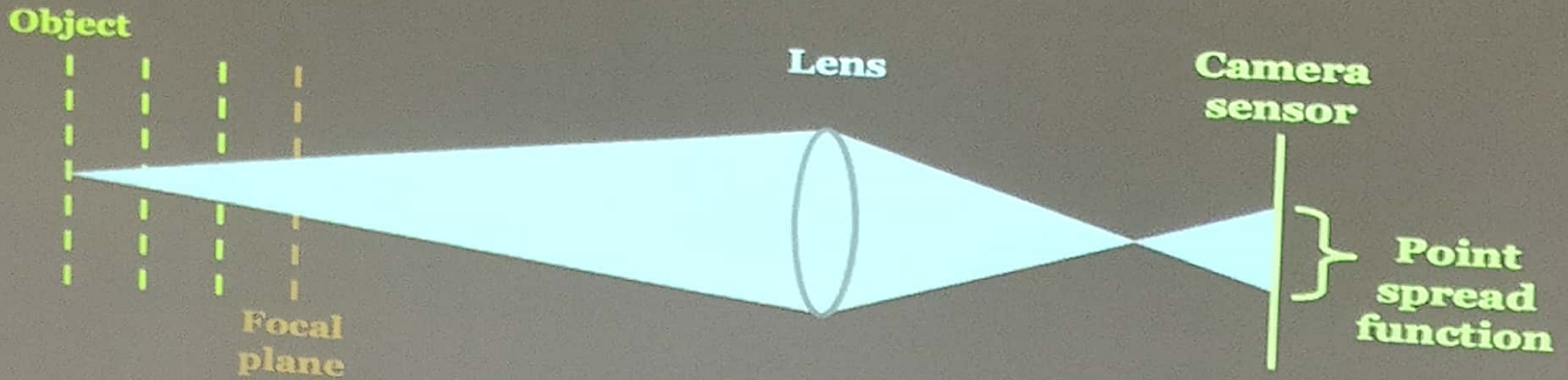
direct

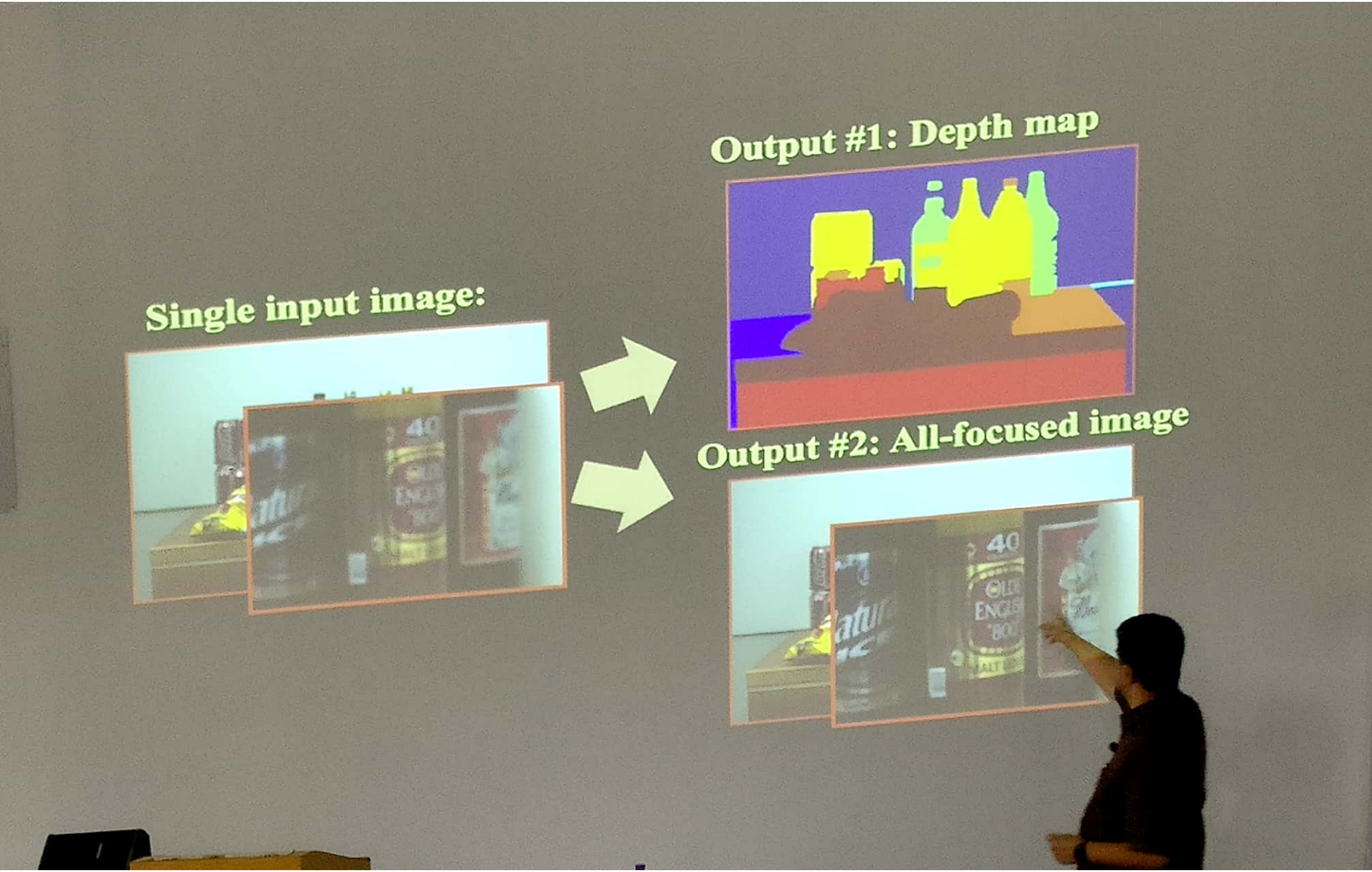
global



Lens and defocus

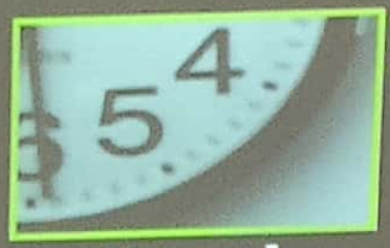






Key Ideas

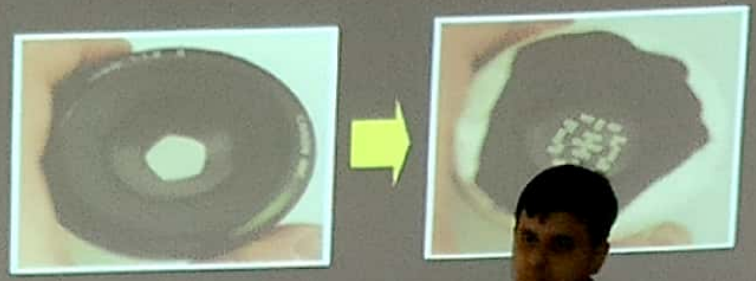
- **Exploit prior on natural images**
  - Improve deconvolution
  - Improve depth discrimination

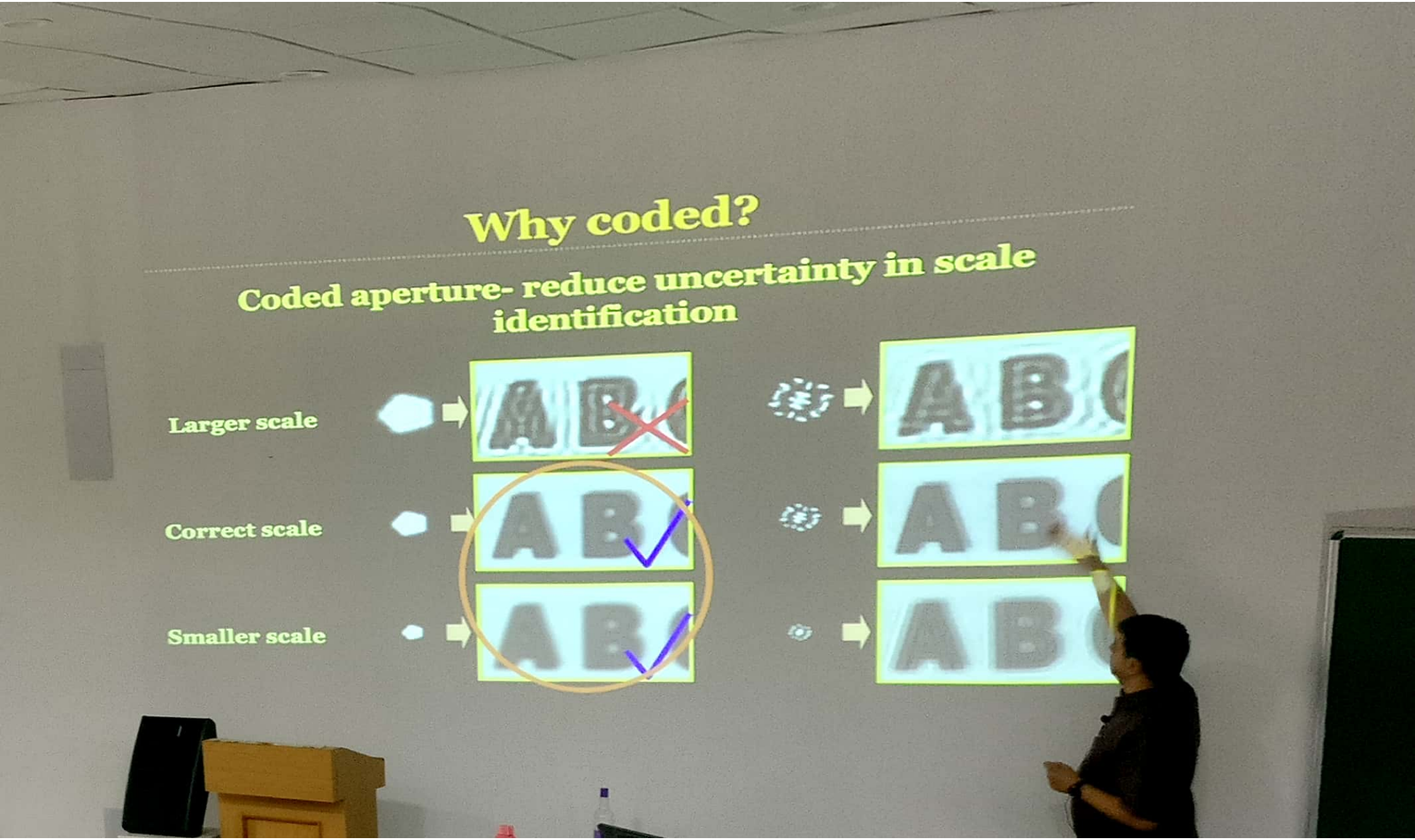


Natural

Unnatural

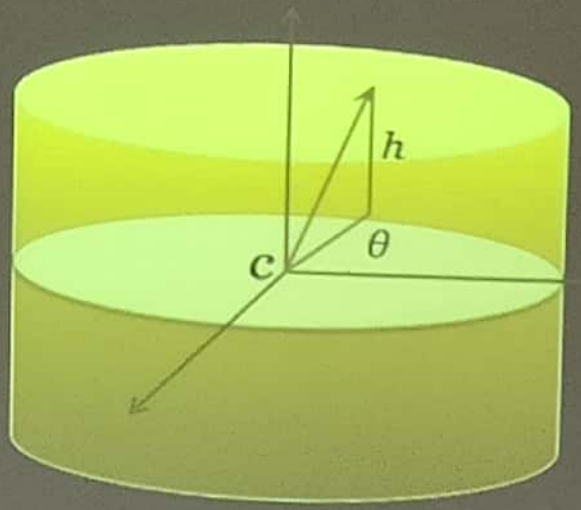
- **Coded aperture (mask inside lens)**
  - make defocus patterns different from natural images and easier to discriminate





Omnidirectional Image

- A 2-D function I(θ,φ) in terms of the polar and azimuthal angles
- Cylindrical projection is more common for panoramas



Omnidirectional Stereo

- For every pair of points: $((\theta_i,\varphi_i),(\theta_j,\varphi_j))$ on a sphere, we need to capture a light ray