



SNS COLLEGE OF ENGINEERING

(Autonomous)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

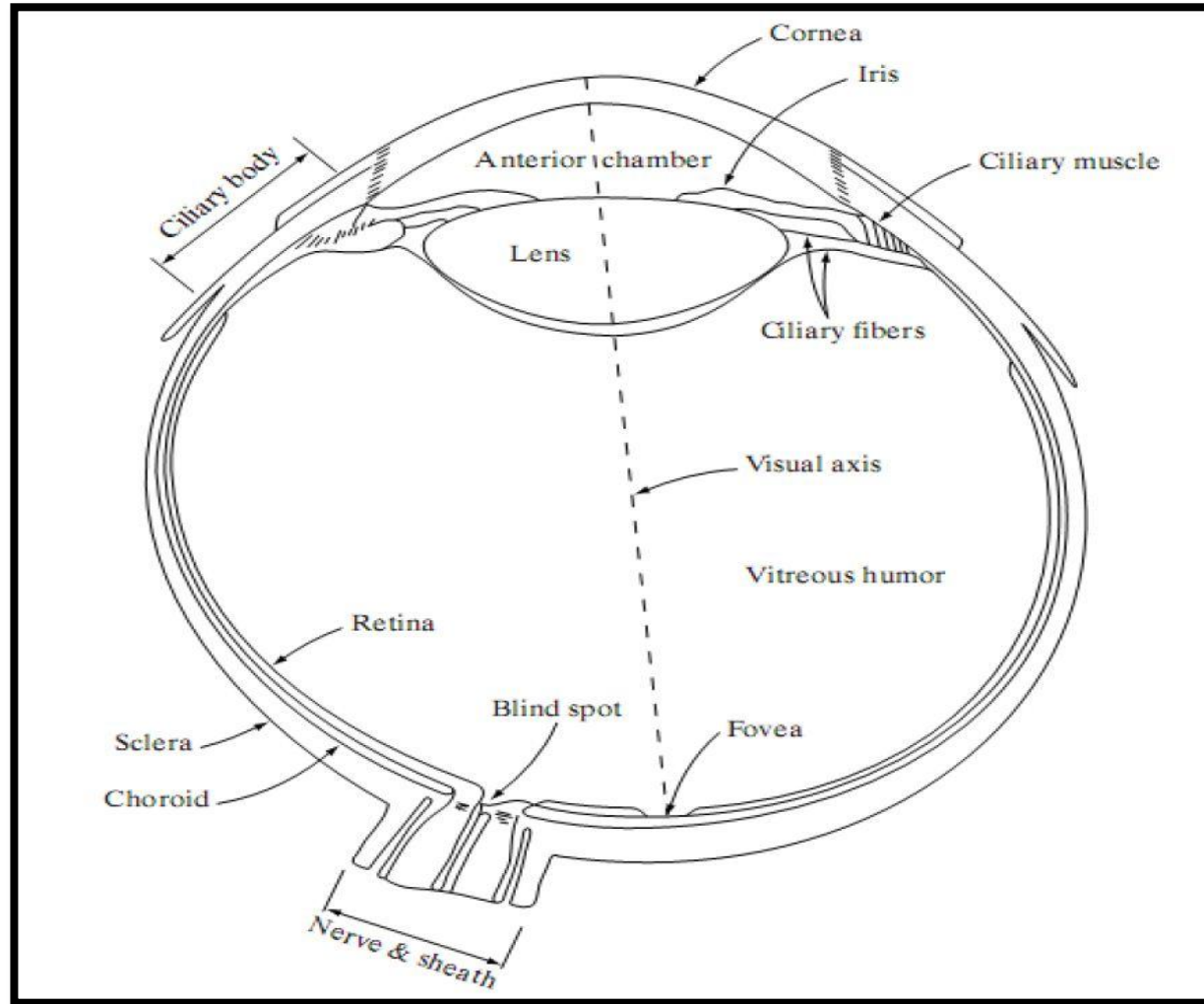


19EC351 – IMAGE PROCESSING AND COMPUTER VISION

Guess Today's Topic????



Structure of an Eye





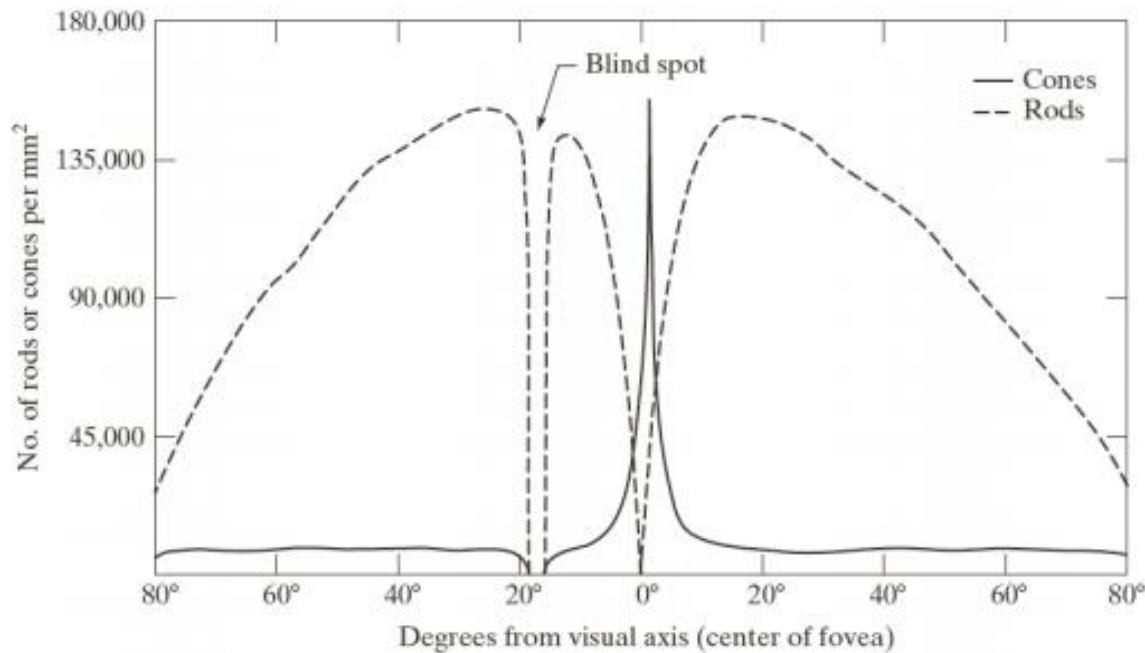
Structure of an Eye (cont.)



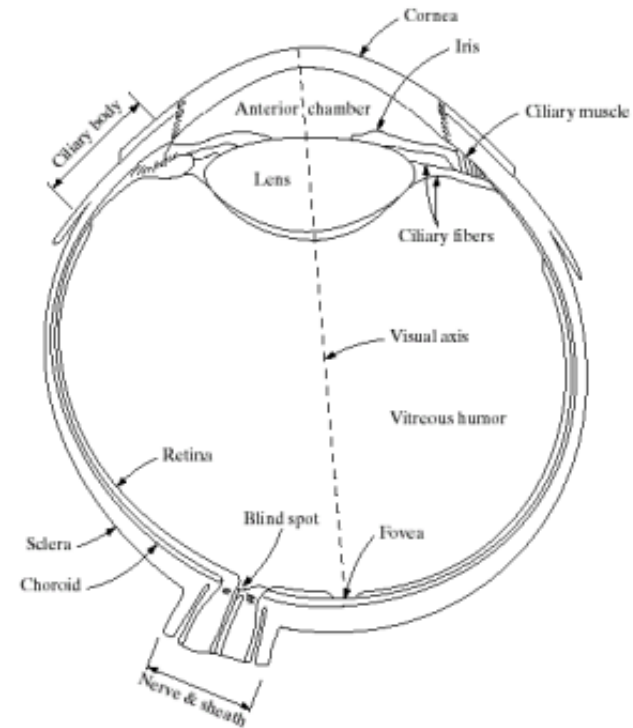
- The lens focuses light from objects onto the retina.
- The retina is covered with light receptors called cones (6-7 million) and rods (75-150 million)
 - Cones are concentrated around the fovea and are very sensitive to colour.
 - Rods are more spread out and are sensitive to low levels of illumination



Density of cones and rods across a section of the right eye



- Each cone is connected to each own nerve end.
 - They can resolve fine details.
 - Sensitive to color (*photopic* vision)
- Many rods are connected to a single nerve end
 - Limited resolution with respect to cones
 - Not sensitive to color
 - Sensitive to low level illumination (*scotopic* vision)



© Nikou, Digital Image Processing (E12)





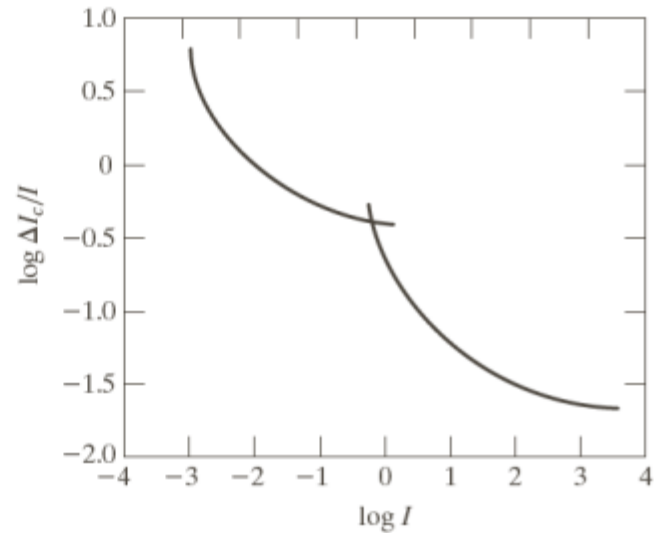
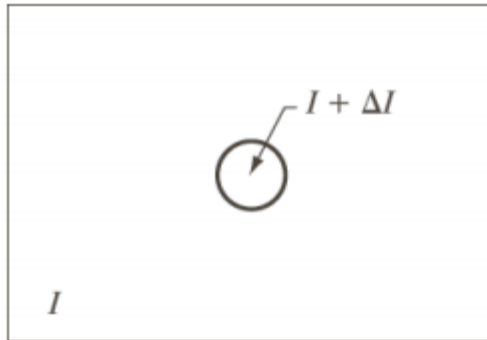
Brightness, Adaption and Discrimination



- The human visual system can perceive approximately 10^{10} different light intensity levels.
- At any time instance, we can only discriminate between a much smaller number – *brightness adaptation*.
- Similarly, the perceived intensity of a region is related to the light intensities of the regions surrounding it.



Weber ratio

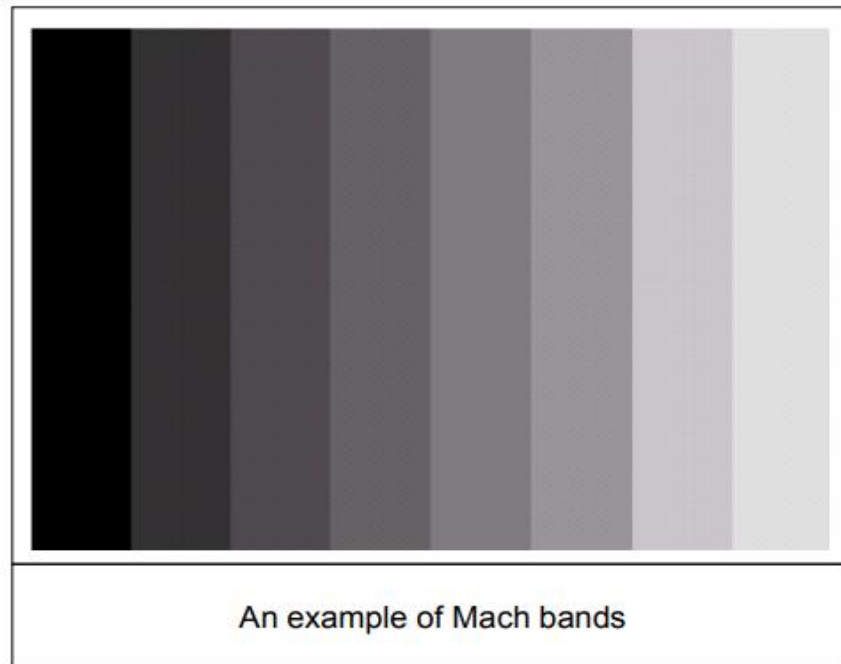




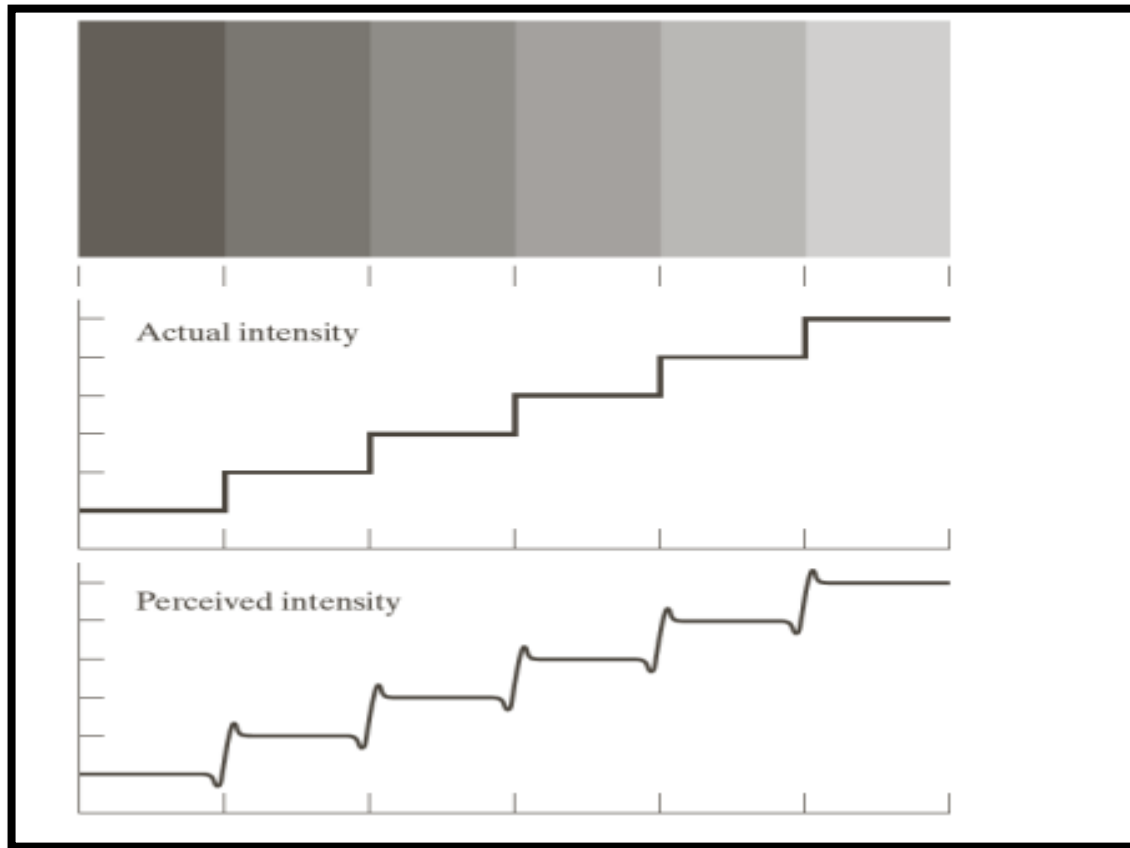
Brightness, Adaption and Discrimination (cont.)



The **Machband Effect** ... The what **effect**?
The **Machband** describes an **effect** where the human mind subconsciously increases the contrast between two surfaces with different luminance.



It shows that the human Visual system tends to undershoot or overshoot around the boundary regions of different intensities





THANK YOU

