CMPUT 428: 3D Modeling

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Contents

Final Lecture

Goal of computer vision

1 Eye

6 muscles that adjust

2 Retina

Light only detected at back of retina
Photons refract before it reaches back of retina, eyes need to recalibrate how it processes signals

3 Photoreceptors

Rods - night vision; no color

125 mill, none in fovea

20 rods : 1 cone

Cones - color sensitive; poor light sens

6.4 mill, peak density in fovea

4 How the eye works

large molecules, need large geometric changes to activate
cis retinal - low energy
trans retinal - slightly higher energy

$$\text{cis retinal} \xrightarrow{\text{energy from incoming light photon}} \text{trans retinal}$$

5 Interneurons and Ganglion cells

6 Visual system adjusts itself

Adjusts both in time and space.
Adjusts for:

light sensitivity / gain

neural fatigue

adjustient of priors (opposite dir.)

error correction

7 Color opponent ganglion cells

8 LGN

high motion and fast things
switchboard b/w retina and visual cortex

9 Simple Cells in V1

Direction sensitive "line finders"

10 Receptive field

11 Dorsal + Ventral

Dorsal - spatial vision
Ventral - object recognition

12 Boundary effect

13 Attention