



From Eye to AI: Digital Phantoms for Medical Imaging

Lecture 3 – Anatomy Meets 3D

Joe Xing, Ph.D
CTO and Co-founder of C. Light Tech
Visiting professor at Tsinghua University

Fall Season 2025

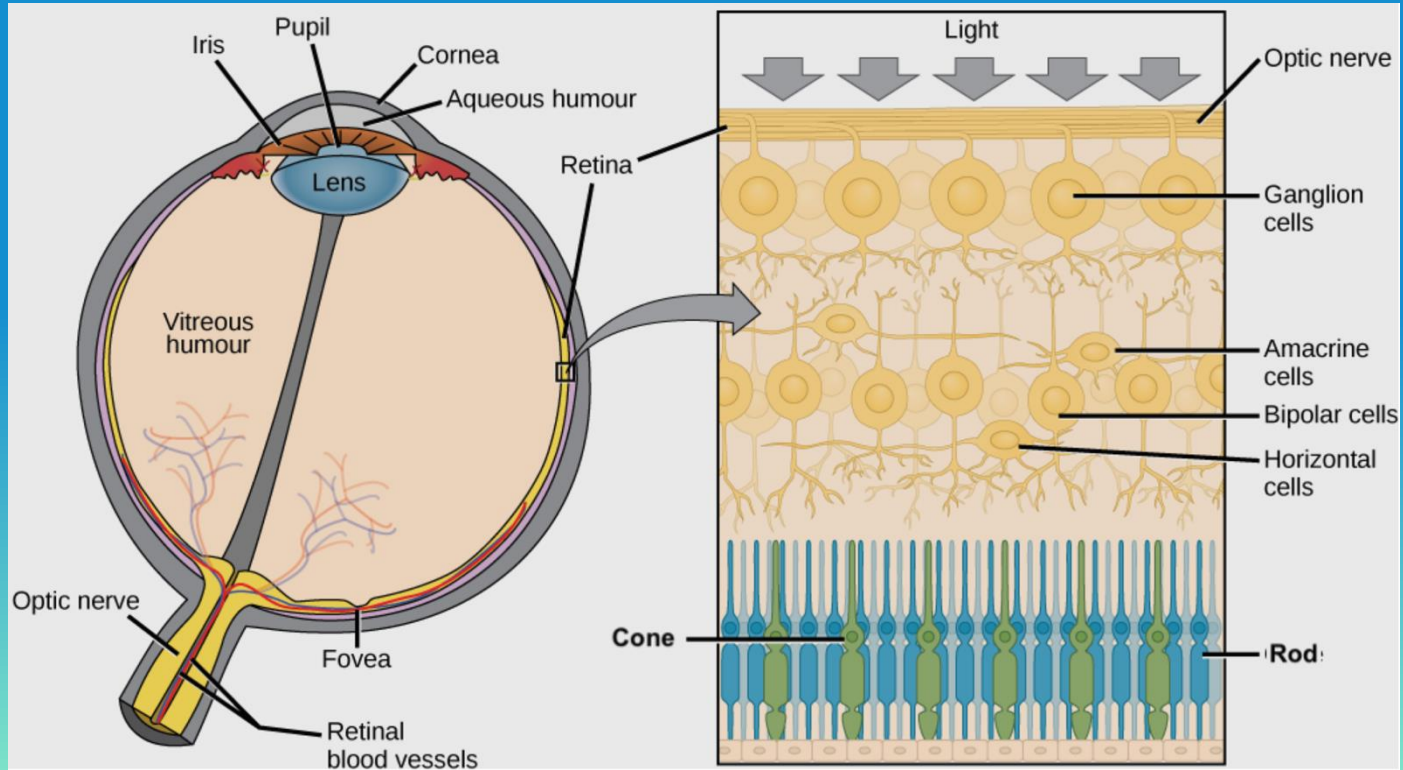


C. LIGHT
TECHNOLOGIES

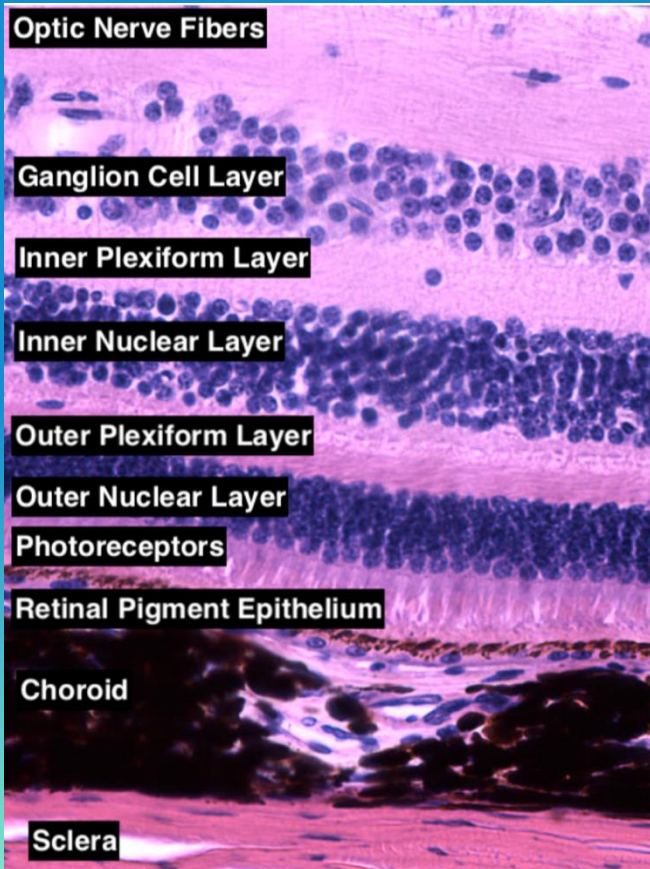


Retina Anatomy

- OphthoBasics — Eye Anatomy

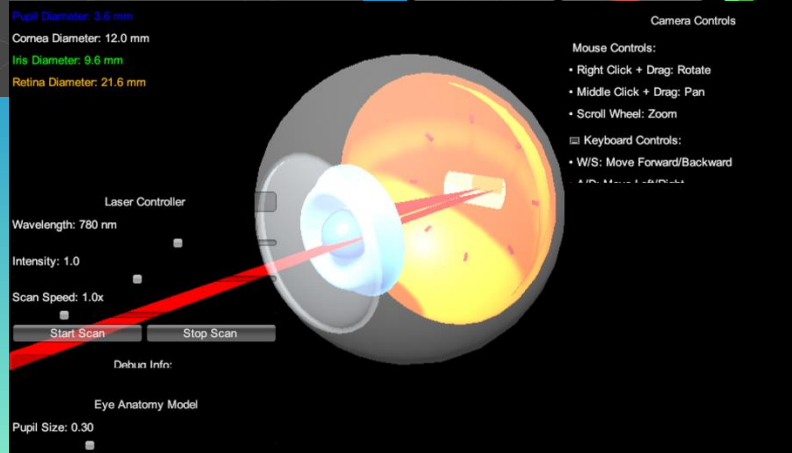
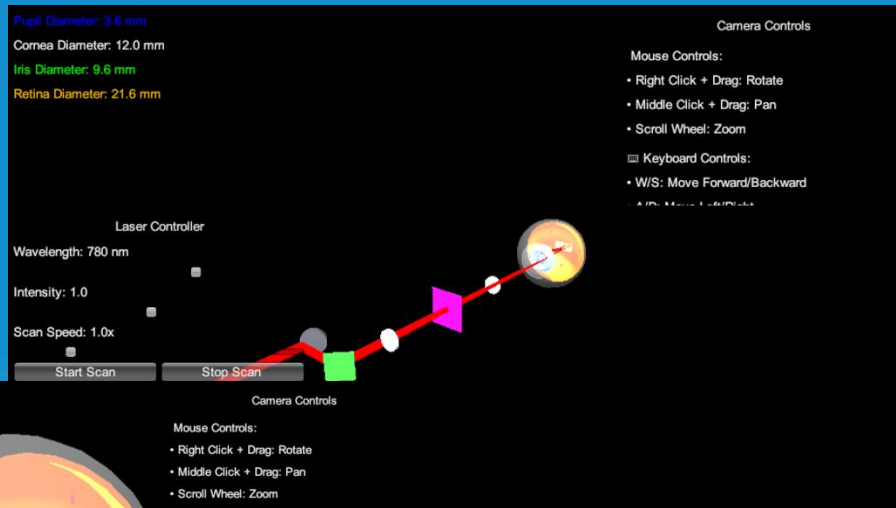
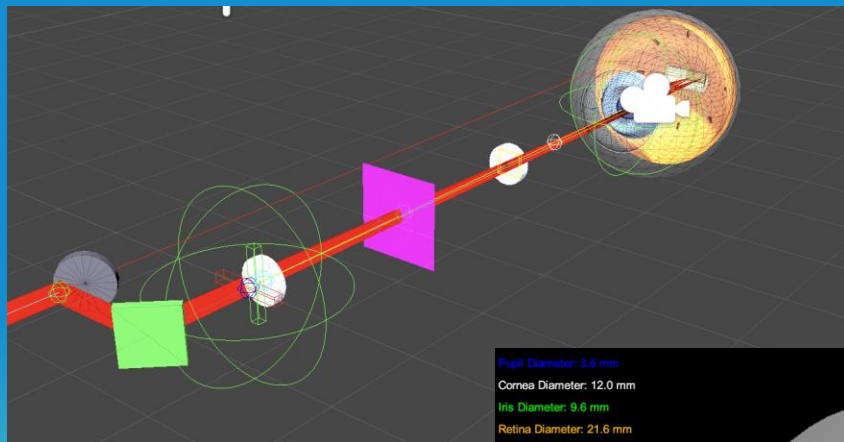


Retinal Structures



1. **Inner limiting membrane:** Is the structural interface between the vitreous and retina
2. **Retinal Nerve Fiber Layer:** Consists of axons of the optic nerve as they course across the retina
3. **Ganglion Cell Layer:** Contain cells that integrate information from intermediate cells in the retina that receive information from the photoreceptors and create action potentials to be propagated along the nerve fiber axons
4. **Inner Plexiform Layer:** Layer consisting of the dendrites of retinal ganglion cells and cells of the inner nuclear layer
5. **Inner Nuclear Layer:** Contains 3 types of cells (bipolar, amacrine, horizontal cells) that compute and integrate signals from photoreceptors
6. **Outer Plexiform Layer:** Consists of dendrites connecting photoreceptors and inner nuclear layer cells
7. **Outer Nuclear Layer:** Contain portions of the photoreceptors
8. **External Limiting Membrane:** Landmark separating the photoreceptor nucleus from the metabolic (inner) segment and light sensing (outer) segment of the cell ([see here for diagram](#))
9. **Photoreceptor layer:** Contains the inner and outer segments of the photoreceptor
10. **Retinal Pigment Epithelium:** Layer responsible for nourishing the retina, prevent reflection on the retina, and acts as a blood-eye barrier

Simple Model Eye



THANKS

DO YOU HAVE ANY QUESTIONS?

contact@joexing.me

