

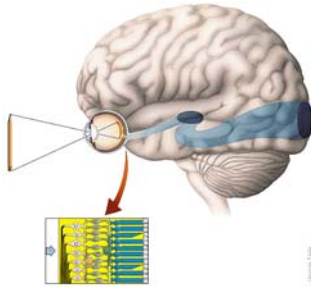
Human Visual System

Introduction to Computer Vision
CSE 152
Lecture 2

Announcements

- Assignment 0: “**Getting Started with Matlab**” is posted to the web page
- Discussion section: Monday 4:00 – 4:50p, Peterson Hall 104 – First one on Matlab

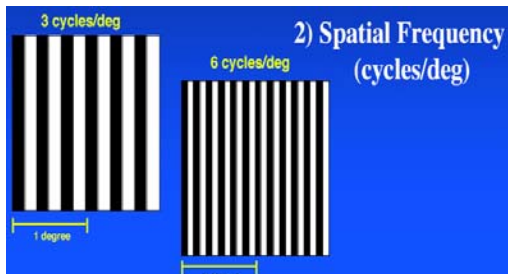
- Nearly all of this lecture was presented using overheads, not powerpoint.



Psychophysical Testing of Subjects



Example:
Show gratings w/ different spatial frequencies



Gradients/Motion



fMRI



Activation in the right fusiform gyrus.
[Tarr, Cheng 2003]

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Intro Computer Vision

Trilobite Visual System

- Most ancient known visual system.
- Compound eye with single crystal for each lens.

Electron Micrograph of
Holochoal eye



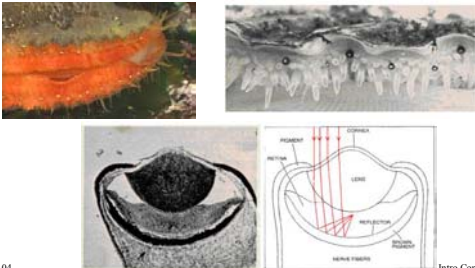
Good trilobite eye info at: <http://www.aloha.net/~smgon/eyes.htm>

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Scallop eyes

- Hundreds of primitive eyes, mirror in back
- Changes in light and motion and very rough images are registered on the retinas of the mollusc.
- Nice material at: <http://soma.npa.uiuc.edu/courses/bio303/Ch11b.html>



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Stomatopod eyes

- Dumb bell shaped, compound eyes
- Stereo vision with just one eye;
- Each eye is up on a stalk, with a wide range of motion;
- Stomatopods have up to 16 visual pigments stomatopods can also see ultra-violet and infra-red light, and some can even see polarized light.
- See <http://www.ucmp.berkeley.edu/aquarius/>



Larva Mantis Shrimp



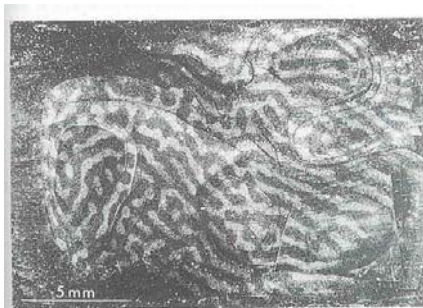
Adult Mantis Shrimp



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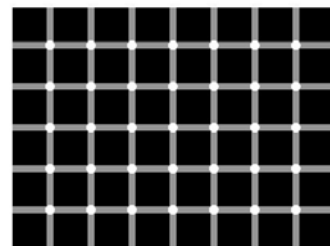
Ocular Dominance Columns



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What color are the dots Fixate at center



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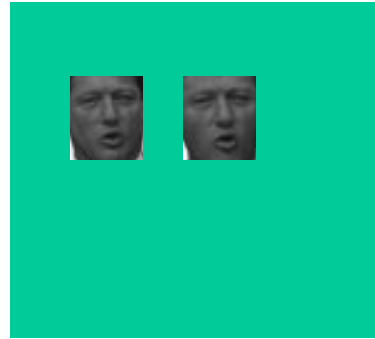
Context: Whose faces do you see?



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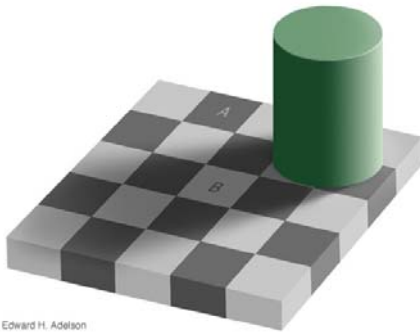
Context: Whose faces do you see?



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Which square is darker?



Edward H. Adelson

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