

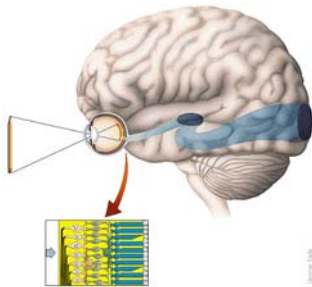
Human Visual System

Computer Vision I
CSE 252A
Lecture 2

Announcements

- Assignment 0: “**Getting Started with Matlab**” is posted to the web page
- Some excellent review slides on
 - Linear algebra
 - Random variables and vectorsby Tim Marks is posted to the web page
- Sign up on the mailing list

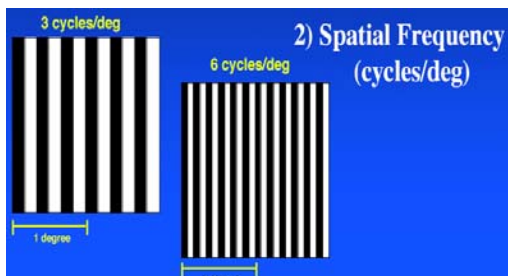
- Nearly all of this lecture was presented using overheads, not PowerPoint.



Psychophysical Testing of Subjects



Example:
Show gratings w/ different spatial frequencies



Gradients/Motion



fMRI



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

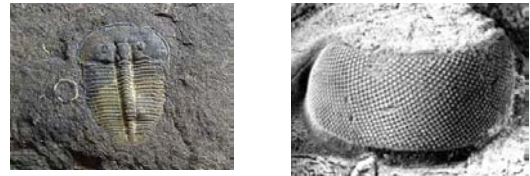
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Computer Vision I

Trilobite Visual System

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

Electron Micrograph of
Holochoiral eye



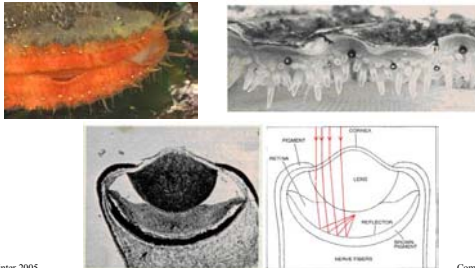
Good trilobite eye info at: <http://www.aloha.net/~smgon/eyes.htm>

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Computer Vision I

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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Computer Vision I

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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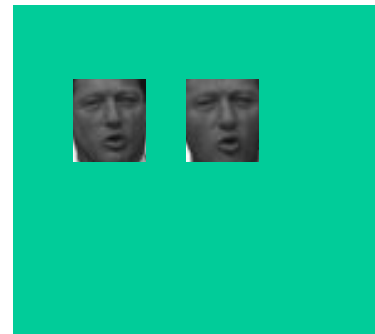
Context: Whose faces do you see?



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Computer Vision I

Context: Whose faces do you see?



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