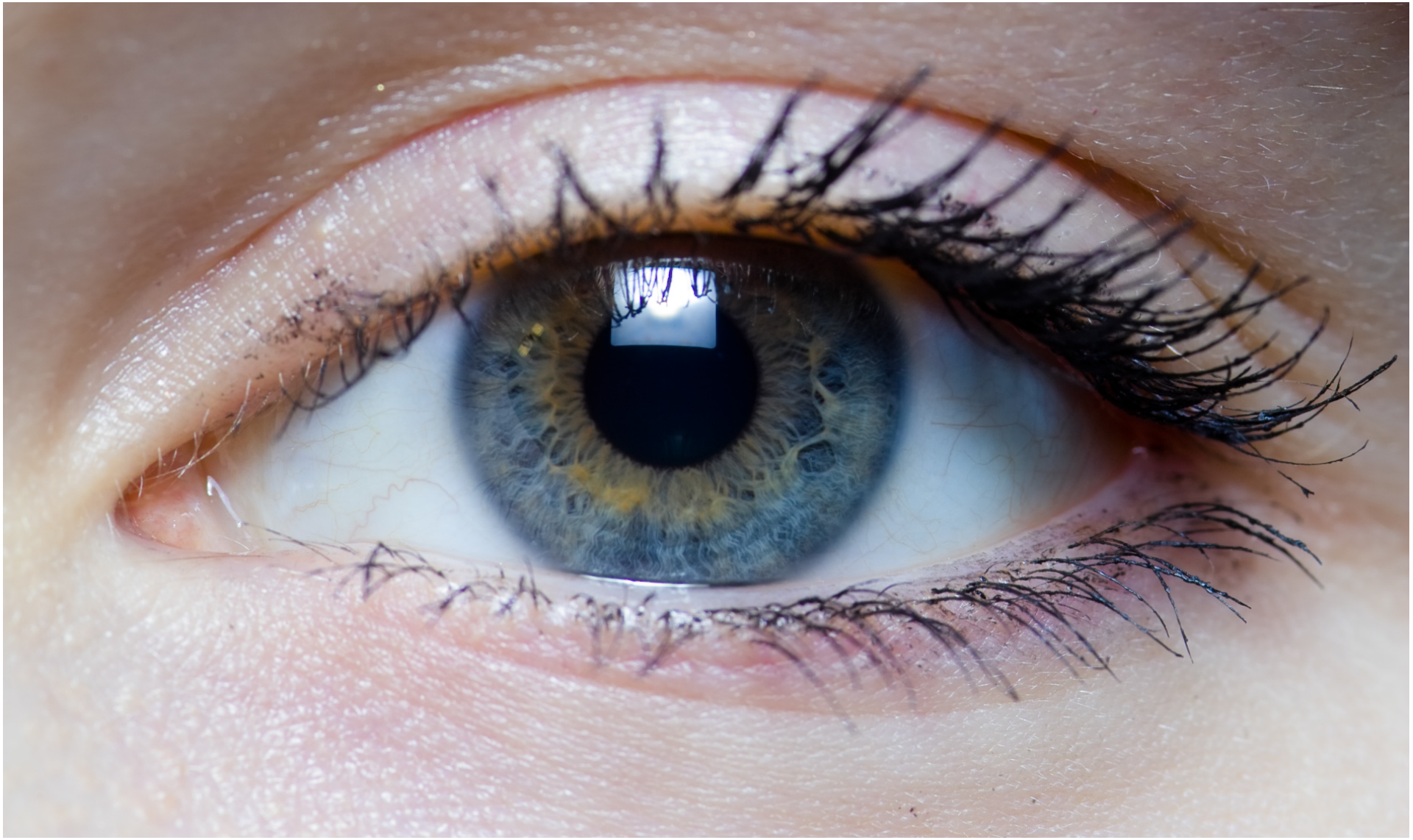
Visual Object Recognition
Computational Models and Neurophysiological Mechanisms
Neurobiology 130/230. Harvard College/GSAS 78454



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Please fill in this poll to get to know more about you:

https://docs.google.com/forms/d/e/1FAIpQLSeeAC6VRy0z7fGBlwR4aFTNOI3htfTfOwIA3L06Mgdj1pp7pw/viewform

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Recordings

We are planning to record the zoom lectures. If you have a problem with this, please communicate with us as soon as possible.

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Zoom Do's and Don'ts

https://matterhorn.dce.harvard.edu/engage/player/watch.html?id=6e5e7ddc-8740-4dcd-b353-4e65421d7a96

Do not:
Zoom from your phone
Use zoom while driving
Use aliases
Leave your mic on unless you are speaking

Do:
Find a quiet place without distractions
Turn on your camera
Dress appropriately
Use your full name
Use the chat to communicate about class-related matters during class
Participate in class, ask questions!
Unmute yourself, ask the question, mute yourself again when you are satisfied with the answer

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Web site: http://tinyurl.com/visionclass
→ Class notes, Class slides, Readings Assignments

Location: Zoom

Time: Mondays 03:00 – 05:00
(except first class on Wed Sep 2nd)

Lectures:

Faculty: Gabriel Kreiman (and invited guests)

TA: Will Xiao

Contact information:

Gabriel Kreiman
gabriel.kreiman@tch.harvard.edu
617-919-2530

Will Xiao
xiaow@fas.harvard.edu

Office Hours: Before class (Mondays 2pm), after class (Mondays 5pm). By appointment

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GRADING

Class participation	15%
Comments on lecture notes	15%
Homework	50%
Final paper	20%

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GRADING. Comments on lecture notes* 15%

Lecture notes available at:

http://klab.tch.harvard.edu/academia/classes/Neuro230/2020/Neuro_130_230_Notes_2020.html
and https://canvas.harvard.edu/courses/77079

Maximum grade per week = 10 points.

Spelling/grammar/wrong citation/wrong figure reference/etc:	1 point
Undefined word in text, undefined variable in equation:	2 points
Error in equation:	10 points
Erroneous statement:	5 points
Suggestion for figure improvement:	4 points
Specific clarification question:	3 points
Relevant work missing in notes:	3 points

Filename: <YOURNAME>_LECTURE<LECTURENUMBER>_COMMENTS

Format: PDF, Word, Text, Latex

Lecture number, line number, your comments/edits

Due date: Monday, day of the lecture at midnight.

By email: xiaow@fas.harvard.edu or upload to Canvas

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GRADING. Homework* **50%**

One reading assignment per class.

Original scientific literature

Total of 11 reading assignments

Write two paragraphs about the paper:

Paragraph 1: Discuss one missing control or one problem with the interpretation.

Paragraph 2: Discuss a logical follow-up question.

Note: Do NOT copy and paste the paper. We have already read it.

Filename: <YOURNAME>_Assignment<AssignmentNumber>

Format: PDF, Word, Text, Latex

Due date: One week after assignment discussion in class. Monday, midnight. See specific dates on website.

By email: xiaow@fas.harvard.edu or upload to Canvas

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Class 1 [09/02/2020]. Introduction to Vision
Class 2 [09/14/2020]. Natural image statistics and the retina
Class 3 [09/21/2020]. The Phenomenology of Vision
Class 4 [09/28/2020]. Learning from Lesions
Class 5 [10/05/2020]. Primary Visual Cortex
October 12th: University Holiday
Class 6 [10/19/2020]. Adventures into *terra incognita*
Class 7 [10/26/2020]. From the Highest Echelons of Visual Processing to Cognition
Class 8 [11/02/2020]. First Steps into in silico vision
Class 9 [11/09/2020]. Teaching Computers how to see
Class 10 [11/16/2020]. Computer Vision
Class 11 [11/23/2020]. Connecting Vision to the rest of Cognition
Class 12 [11/30/2020]. Visual Consciousness
FINAL EXAM, PAPER DUE 12/14/2020. No extensions.

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Recommended books

Kreiman G (to appear, 2020). Biological and Computer Vision. Cambridge University Press. (Lecture notes)

Other good books

Ullman S (1996) High-level vision. MIT Press.
Wandell BA (1995) Foundations of vision. Sunderland Sinauer Associates.
Chalupa LM and Werner JS (editors) (2003). The Visual Neurosciences. MIT Press.
Frisby and Stone (2010). Seeing. MIT Press.
Kriegeskorte and Kreiman (2011). Visual population codes. MIT Press.
Purves and Lotto. (2003). Why we see what we do. Sinauer Books.
Deco and Rolls (2004). Computational Neuroscience of Vision. Oxford University Press.
Ripley. Pattern recognition and neural networks (1996). Cambridge University Press.
Rao, Olshausen and Lewicki (eds) (2002). Probabilistic models of the brain. MIT Press.
Koch C (2005) The quest for consciousness. Roberts & Company Publishers.
Regan (2000) Human perception of objects. Sinauer Books.
Dayan and Abbott (2002). Theoretical Neuroscience. MIT Press.

Academic Integrity Policy

All reading assignments will be discussed in class. During class, collaboration and discussion is not only permitted but actually encouraged.

After class, each student must prepare the homework on his/her own. Students should be aware that in this course collaboration of any sort on any work submitted for formal evaluation is not permitted. This means that you may not discuss your problem sets, paper assignments, exams, or any other assignments with other students. All work should be entirely your own.

The use of textbooks, books and articles is encouraged. Students must use appropriate citation practices to acknowledge the use of books, articles, websites or lectures, that were consulted to complete your assignments.

Reading Assignment 1

Hecht, S., et al. (1942). "Energy, quanta and vision." Journal of General Physiology 25: 819-840

Discussion: Monday 09/14/2020

Reading assignment paper due: Monday 09/21/2020

Reading available at:

http://klab.tch.harvard.edu/academia/classes/Neuro230/2020/Neuro_130_230_Reading_Assignments_2020.html

and

https://canvas.harvard.edu/courses/77079