Psych 210B Introduction II: Cognition

Instructor Information

Mark Steyvers  
Office: SBSG 2316  
Office Hours: Tu 3-4pm and by appointment  
Phone: 949-824-7642  
Email: mark.steyvers@uci.edu

Jeff Krichmar  
Office: SBSG 2328  
Office Hours: Tu/Th 1:30-3 pm  
Phone: 949-824-5888  
Email: jkrichma@uci.edu

Class Meets: Wednesday, 2:00 – 4:50 pm, SBSG 2200

Class webpage: https://eee.uci.edu/17s/68730

In this course, we will be discussing evidence linking cognition and the brain. We will focus on higher-level cognition including theory, decision-making, memory, and learning. We will try to understand how the brain is organized and functions to support these cognitive abilities.

Course Assignments:

Readings
We will assign a selection of readings for each week highlighting interesting and current issues from within the domains. Everyone will be responsible for reading all of the material prior to the class period in which it is discussed.

Signup sheet:

https://docs.google.com/spreadsheets/d/1dX5cCDg9tLoG3iZLRluCLUVidiITu31xxFr9hTgSlw/edit?usp=sharing

Weekly comments
All students are required to submit comments and questions on each reading prior to class. The goal of this assignment is to promote critical thinking on the topic prior to class, so that our discussion in class is most fruitful. Comments should be posted via an EEE MessageBoard associated with the class. Comments must be posted by Monday evening (midnight) prior to class.

Presentations
Each week student presenters will present the readings for the week. In your presentations, you should discuss the rationale behind the work as well as to highlight the most interesting or controversial aspects of the research. Your goal is to generate discussion of the research, its contributions to the literature, as well as the major issues or questions it raises.
Discussants
Each week student discussants will guide the class discussion of that week’s readings. Discussants are expected to organize the comments submitted prior to class and moderate the discussion. Discussants are also responsible for posting a summary of the discussion and any follow-up comments by **Friday evening (midnight) following the class**. Discussant summaries should be uploaded to the EEE DropBox associated with the class.

Students not leading the discussion should come to class prepared to discuss the readings selected for that week. Class participation is expected from all students. Failure to participate in class discussion will adversely affect your course grade.

Papers
There will be a final paper. You will select one of the topics discussed in class and explore it further. You will write a paper reviewing the literature you have read. Papers should be about 10-15 pages in length (double spaced). Papers should include recent work in the area you’ve selected (i.e., publications within the last five years).

Final papers are due **Wednesday, June 14th** by midnight. All papers should be submitted using the DropBox on the EEE website. All papers should be in PDF format.

**GRADING:**
Grades will be determined as follows:
40% final paper
20% presentations
20% discussant
10% weekly comments
10% class participation

**SCHEDULE**

April 12 - Bayesian modeling & Deep Learning

April 19 – Brain and Behavior

April 26 – Human Cognition and Big Data (Brain Initiatives)

May 3 – Information Theory and Efficient Coding

May 10 – Exploration vs. Exploitation

May 17 – Memory Consolidation

May 24 – Decision-Making

May 31 – Cognitive Effort and Resource Rational Models
June 7 – Self-Directed Learning & Embodiment

June 14 – Final Papers due

**READING LIST (Subject to Change)**

**Bayesian modeling & Deep Learning**


**Further Reading:**


**Brain and Behavior**


**Human Cognition and Big Data (Brain Initiatives)**


**Information Theory and Efficient Coding**


**Exploration vs. Exploitation**


OR


Further Reading:


Memory Consolidation

• McClelland, J.L., McNaughton, B.L., and O'Reilly, R.C. (1995). Why there are complementary learning systems in the hippocampus and neocortex: insights from the successes and failures of connectionist models of learning and memory. Psychological review 102, 419-457.


Decision-Making


Further Reading:


Cognitive Effort and Resource Rational Models


Further Reading:


**Self-Directed Learning & Embodiment**


Pfeifer, R., Iida, F., and Lungarella, M. Cognition from the bottom up: on biological inspiration, body morphology, and soft materials. Trends in cognitive sciences 18, 404-413
