

APPL 595B (1 unit) - Theoretical Neuroscience Journal Club – Fall 2015

Instructors: Jean-Marc Fellous, O. Ozan Koyluoglu, and Kevin K. Lin

Mondays 1:00 -2:00pm in Math 102

(Organizational meeting: Monday, August 31, 2015)

Ever wondered how your brain computes? What are the basic principles that make each and everyone of us the most adaptive and flexible computers on earth? Why is it so easy for us to perceive faces, but so difficult for a computer? On the other hand, why is it so hard for us to play chess, but so easy for a computer? All these questions are actively debated, and we will try to understand the nature of the issues through the reading of published journal articles and book chapters.



Course goals: Exchange of scholarly information and discussion of current literature in Computational Neuroscience in a small group setting.

Who is this for? Anyone willing to learn by presenting! Especially:

Neuroscience students / postdocs / faculty interested in modeling & theory.

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Students / postdocs / faculty from quantitative disciplines (e.g., math, physics, engineering, computer science) curious about neuroscience.

Graduate students are encouraged to register for credit (see below).

Undergraduate students are welcome to participate.

When? We will meet weekly on Mondays 1:00 – 2:00pm in MATH 102.

What topics will we cover? We will begin with a brief introduction to neuroscience and classic computational models. The topics for the rest of the semester will be partly based on participant interests. Possibilities include:



- *Fundamentals:* Dynamics of single neurons, synapses, small and large networks.

- *Specific examples of neuronal computation:* Visual processing (both early pathway and higher-level processing), spatial navigation (place cells, grid cells, etc.), memory on different scales.

Topics will be chosen by the instructors, taking into account the interests of participants. For those interested, there will also be opportunities for hands-on experience using common neural simulators like NEURON or Matlab.

For information from past Journal Clubs, including examples of papers we read, see

<http://amygdala.psychdept.arizona.edu/jclub.html>.

More questions? E-mail fellous@email.arizona.edu, ozan@email.arizona.edu, klin@math.arizona.edu.

Grading: Students receiving credit should expect to present at least one paper during the term, and to lead a subsequent discussion. The rest of the grade will be based on class participation.

Note: It is the University's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let us know immediately so that we can discuss options. You are also welcome to contact Disability Resources (520-621-3268) to establish reasonable accommodations.