COGS 107B

TA: Alexander Johnson

abj009@ucsd.edu

Office Hours: Fridays Before Section 10am - 11:50
Mandeville Coffee Cart
Please fill out this survey on how I can do better next time I get to TA!

https://tinyurl.com/wi18-cogsci-evals
Week 9

LAST SECTION - Will hold OH next Friday

Midterm 3 Topics:

- Learning
- Memory
- Motor Control
- Prefrontal Cortex & Attention

Lots of these are dense topics.

study early

Midterm 3 is non-cumulative 3/15/18 @ 12:30 (This room)

OR 3/19/18 @ 11:30 am
Motor Control

Can you trace the connections from brain to muscle?

What are the 4 sources of motor neuron innervation?

What neurotransmitter do muscles respond to? Using what receptor type?
Motor Control

What 3 firing patterns do we see in Premotor Cortex (PMC) neurons?
What is *action mapping*?
What is *action planning*?
What do we mean by *sequence dependant*?

What types of things do mirror neurons in PMC respond to?
sequence-dependent action mapping: this neuron fires after the last turn if it’s a right turn.

action planning: this neuron fires during forward locomotion preceding right turns.

action mapping: this neuron fires during the execution of any right turn.
Motor Control

A neuron increases activity to stimulus that it *likes* -
There is still debate over what M1 neurons *like*

What are the three proposed functions of M1?

“Synergies”

Direction & Velocity

Pathlets
Population coding

How do we determine the **directional tuning** of a neuron? How do we represent it?

If we’re listening to a large population of M1 neurons how can we control a robotic arm?
Monkey video

https://www.youtube.com/watch?v=wxIgdOlT2cY
Prefrontal Cortex

Compared to M1 and PMC Prefrontal (PFC) neuron responses are more abstract:

What are the connections of PFC? Why does this set it up to be an ‘executive’?

How could the PFC inputs to Thalamus (Nucleus reuniens) inform the binding problem?
Prefrontal Cortex

Why did Prof. Nitz say PFC could be ‘chunking’ Hippocampus to create episodes?

How could working memory help this function?
Prefrontal Cortex

How does PFC respond to numerosity? Categories?

What happens when you disable PFC?