2017
Kavli Summer Institute in Cognitive Neuroscience

Week 2: Computational perspectives on the brain in psychiatric and neurological disorders

Course Directors

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The analysis of behavioral and neural data using computational models is of growing importance in neuroscience. Computational modeling provides a bridge between behavior and neural data and in so doing has the potential for providing a more fine-grained account of behavioral aberrations in psychiatric and neurological disorders. The second week of the course will focus on contemporary approaches to the computational analysis of behavioral and neural data with an emphasis on applications in neuropsychiatric disorders.

Monday (7/03): Computational perspectives on planning

8:00-8:30	Breakfast
8:30-8:45	Introductory Remarks – Ray Dolan / Robb Rutledge
8:45-10:15	Yael Niv – Task representations: why we need them and how we learn them
10:15-10:30	Break
10:30-11:45	Angela Yu – Learning and decision making in inhibitory control
11:45-1:45	Lunch
1:45-2:45	Lab Session: Ethics
2:45	Adjourn

Tuesday (7/04): Multiple systems for value learning

8:00-8:45	Breakfast
8:45-10:15	Nathaniel Daw – Computational accounts of habits, control, and compulsion
10:15-10:30	Break
10:30-11:45	John O'Doherty – Model-based vs model-free reinforcement-learning mechanisms and their arbitration in instrumental and Pavlovian conditioning
11:45-1:45	Lunch
1:45-5:00	Lab Session: Brain Imaging
5:00	Adjourn

Wednesday (7/05): Reinforcement learning in psychiatric and neurological disease

8:00-8:45	Breakfast
8:45-10:15	Anne Collins – Reinforcement learning: identifying the key players in computation, brain, and behavior
10:15-10:30	Break
10:30-11:45	Quentin Huys – Dopamine in alcohol addiction: a tale of an error
11:45-1:45	Lunch
1:45-5:00	Lab Session: EEG and TMS
5:00	Adjourn

Thursday (7/06): Computational analyses of subjective states

8:00-8:45	Breakfast
8:45-10:15	Robb Rutledge – A neural and computational model of subjective well-being
10:15-10:30	Break
10:30-11:45	Steve Fleming – Metacognitive neuroscience: psychophysical and computational approaches to quantifying self-awareness
11:45-1:45	Lunch
1:45-5:00	Debate Preparation (no lab)
6:30-8:00	**DEBATES**: **Teams 3 and 4** (fellows will be organized into teams during week 1)

Friday (7/07): Modeling complex behavior

8:00-8:45	Breakfast		
8:45-10:15	Mate Lengyel – Priors: of ferret and men (and women)		
10:15-10:30	Break		
10:30-11:45	Wei Song Ong – Modeling behavior and neuronal function in strategic interactions		
11:45-1:45	Lunch		
1:45-3:15	Laurence Hunt – A distributed, hierarchical and recurrent approach to reward-guided choice		
3:15	Adjourn		
5:00-6:00	Reception	**Banquet**	**Faculty Club**
6:00-8:00	Dinner	**Banquet**	**Faculty Club**

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