SHORT COURSE 2

Data Science and Data Skills for Neuroscientists

Organized by: Konrad Kording, PhD, and Alyson Fletcher, PhD
Friday, November 11, 2016
8:00 a.m. – 6:00 p.m.
Location: San Diego Convention Center
Room: 6C
San Diego, CA

Time	Topic	Speaker
7:30 – 8:00 a.m.	**Check-In**	
8:00 – 8:10 a.m.	Opening Remarks	Konrad Kording, PhD *Northwestern University* Alyson Fletcher, PhD *UCLA*
8:10 – 9:10 a.m.	Canonical data analysis cascade MATLAB for neuroscientists Peristimulus time histograms (PSTH)	Pascal Wallisch, PhD *New York University*
9:10 – 10:10 a.m.	Fundamentals of statistics: densities, mean-squared error, and regression Bootstrapping and confidence intervals Time of maximal firing rates	Robert Kass, PhD *Carnegie Mellon University*
10:10 – 10:30 a.m.	**Morning Break**	
10:30 – 11:10 a.m.	Fitting tuning curves Error bars and model selection with bootstrap	Konrad Kording, PhD *Northwestern University*
11:20 – 12:10 p.m.	Classification in neural systems Poisson point process models for spiking Model selection: cross validation and overfitting	Alyson Fletcher, PhD *UCLA*
12:10 – 1:10 p.m.	**Lunch**	
1:10 – 2:10 p.m.	Generalized linear models (GLMs) with spike history GLMs with neuron-neuron interactions Regularization, ridge regression	Jonathan Pillow, PhD *Princeton University*

SOCIETY *for* NEUROSCIENCE

	and smoothing	
2:20 – 2:40 p.m.	Sparsity in neural decoding	Alyson Fletcher, PhD *UCLA*
2:50 – 3:20 p.m.	Multilayer models and deep learning	Konrad Kording, PhD *Northwestern University*
3:20 – 3:40 p.m.	**Afternoon Break**	
3:40 – 4:40 p.m.	Neural population models Principal Component Analysis (PCA) Time series models and Gaussian process factor analysis (GPFA) State space dynamical systems	Maneesh Sahani, PhD *University College London*
4:50 – 5:50 p.m.	Local network structure of neural data Clustering and modularity in networks How networks change: the dynamics of graphs	Danielle Bassett, PhD *University of Pennsylvania*
5:50 – 6:00 p.m.	Closing Remarks	Konrad Kording, PhD *Northwestern University* Alyson Fletcher, PhD *UCLA*