

Brain Mapping Center SEMINAR SERIES

Sponsored by the UCLA Brain Mapping Center Faculty

The focus of these talks is on advancing the use of brain mapping methods in neuroscience with an emphasis on contemporary issues of neuroplasticity, neurodevelopment, and biomarker development in neuropsychiatric disease.

“Deep Learning for Brain Connectivity: From Network Discovery to Clinical Translation”



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[Click here to register if attending via Zoom](#)

Resting-state data has become ubiquitous in computational neuroscience by allowing us to parse the intrinsic organization of the brain, identify biomarkers of different neural processes, and discriminate between patient and control groups. While such methods have yielded novel and valuable insights into the brain, there remains a notable gap between the data and models we are analyzing and the patient care pathway. This talk will showcase recent work in my lab that attempts to bridge this translational gap. First, I will discuss our work to predict complex behavioral deficits from brain connectivity data. This framework combines dictionary learning for structure-function integration with recurrent neural networks to parse the evolving brain states. Next, I will describe our translational work that uses dynamic functional connectivity to localize the language and motor areas of the eloquent cortex for preoperative mapping. Our model leverages specialized convolutional filters that extract graph-based features from the dynamic connectivity matrices, an LSTM attention network to weigh the relevant time points for multitask classification. Finally, I will describe our recent efforts on seizure onset localization. Here, we develop a multimodal deep neural network that fuses resting-state fMRI and diffusion MRI connectivity. The graph-based interactions in this model can accurately localize the seizure onset zone across a heterogeneous cohort of temporal and extratemporal lobe epilepsy patients.

November 4, 2021 11:00am - 12:00pmPDT

**Zoom AND Neuroscience Research Building (NRB 132)
635 Charles E. Young Dr. South**

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