Please join us in attending Matthew Feigelis's Dissertation Defense on ***Friday, December 6th, 2024 from 10:00 AM - 12:00 PM***! Please mark your calendars and come support Matthew in this major milestone!

Please see details below for Matthew's Abstract:

Date & Time: Friday, December 6th, 2024 from 10 AM - 12 PM

Location: PEB 721

Zoom: https://ucsd.zoom.us/j/7587533682?omn=97353560075

Title: Precision Functional Mapping in Child Development and Tourette Syndrome

Abstract:
Our understanding of human neurodevelopment relies on group/population averages, but we know that individual differences in brain function are related to many life outcomes and the development of neuropsychiatric disorders. Precision functional mapping (PFM) is the precise and reliable characterization of functional brain organization at the individual level, made possible through the collection of large amounts of resting-state fMRI data from each individual. PFM shifts the focus from studying the group to studying the individual, characterizing individual differences in functional organization that have previously been blurred by heavy reliance on group-average techniques. In this thesis, I use a PFM approach to characterize individual brain function in children, adults, and people with Tourette syndrome. First, I present a study characterizing individual-specific brain organization in childhood, finding a core organization shared by all children, with inter-individual variability occurring in the bilateral frontal cortex and the temporo-occipito-parietal junction. Compared with PFM data from adults, children had less inter-individual variability in functional organization within their age group, suggesting a refinement in functional organization with age. Second, I present a study characterizing tic symptoms in Tourette syndrome at the individual participant level. By simultaneously collecting densely sampled resting-state fMRI data and naturally occurring tics in the scanner, activation maps corresponding to motor tics were referenced to each individual's functional brain networks. During the time period prior to the tic, which is associated with urge/discomfort building up to a tic, brain activation localized within the boundaries of each individual's cingulo-opercular and somato-cognitive action networks. Other regions and network involvement during tic symptoms differed across individuals, possibly related to different types of tics. By studying individuals, I identify previously blurred individual differences in brain function in development and in a neuropsychiatric disorder, which may ultimately increase the clinical utility of neuroimaging methods.

Committee members:
Professor Deanna Greene, Chair
Professor Mikio Aoi
Professor Gedeon Deák
Professor Anastasia Kiyonaga