Hackathon on Brain Connectomics  
Nov 4, Saturday, Purdue University

Location: TBA

8:30 am    Breakfast  
9:00 am    Hackathon  
3:00 pm    anticipated ending time (there will be a lunch break in between)

This event will be a hands-on day on Brain connectomics organized by the CONNplexity Lab (https://engineering.purdue.edu/ConnplexityLab). Professor Joaquín Goñi and post-doc Enrico Amico will lead the sessions.

Bringing structural and/or functional connectivity data (in the form of connectivity matrices) from your lab is highly encouraged. Otherwise, HCP connectivity testing data will be provided.

Participants are expected to bring their own laptops and working versions of Matlab (2015 or newer). We will provide access to matlab functions for assessing connectivity data.

The hackathon will cover four research lines of brain connectivity. Necessary concepts for each research line will be introduced. Participants can focus in one or in several of them, depending on their aims. The research lines are:

- **Shortest-paths and efficiency in structural connectivity.** We will cover the concepts of communicability in complex networks through shortest-paths and different properties of paths such as length, distance, and “hiddenness” (search information).


- **Modularity in connectivity-based networks.** We will cover concepts to identify communities and to assess modularity in connectivity data. This includes subject-level individual assessment and multi-layer cohort-assessment.


- **connICA.** We will cover the recent connICA approach, which allows to indentify independent connectivity traits in cohorts of functional connectivity data, and to link it with cognition and/or behavior.


- **Functional connectivity fingerprinting.** We will cover recent methods to measure and/or improve the capacity of individual fingerprinting, and the capacity of making network-level associations with cognitive and/or behavioral measurements.


At the end of the hackathon, participants will make brief presentations about their hands-on projects. Individual work and working in groups is equally encouraged.