

Mapping Thought to Action: Brain Machine Interface Workshop & Hackathon for Undergraduates

**Data Science &
Machine Learning for
Neurotechnology:
Getting Started as an
Undergraduate**

September 26-27, 2023

HDSI Building &
Franklin Antonio Hall,
UC San Diego

Full schedule and sign-up
application
(Space is limited)

Schedule (all meals provided!):
September 26: 8:30am - 10pm
(breakfast, lunch, & dinner)
September 27: 8:30am - 6pm
(breakfast & lunch)

Brain machine interfaces (BMIs) have enabled individuals with paralysis and profound speech deficits to control robotic limbs, use a computer mouse, and to type at rates faster than most of us can enter text on a smartphone!

How does this technology work?
It applies our understanding of the basic neuroscience of motor control and machine learning methods to map the activity of 10s to 100s of neurons into an estimate of movement and communication intent.

Learn more about brain machine interfaces and computational opportunities in this emerging field! Plan to participate in this workshop and hackathon!

Topics include: the neuroscience behind BMIs, neural decoding algorithms, career opportunities and development, peer review and research dissemination practices.

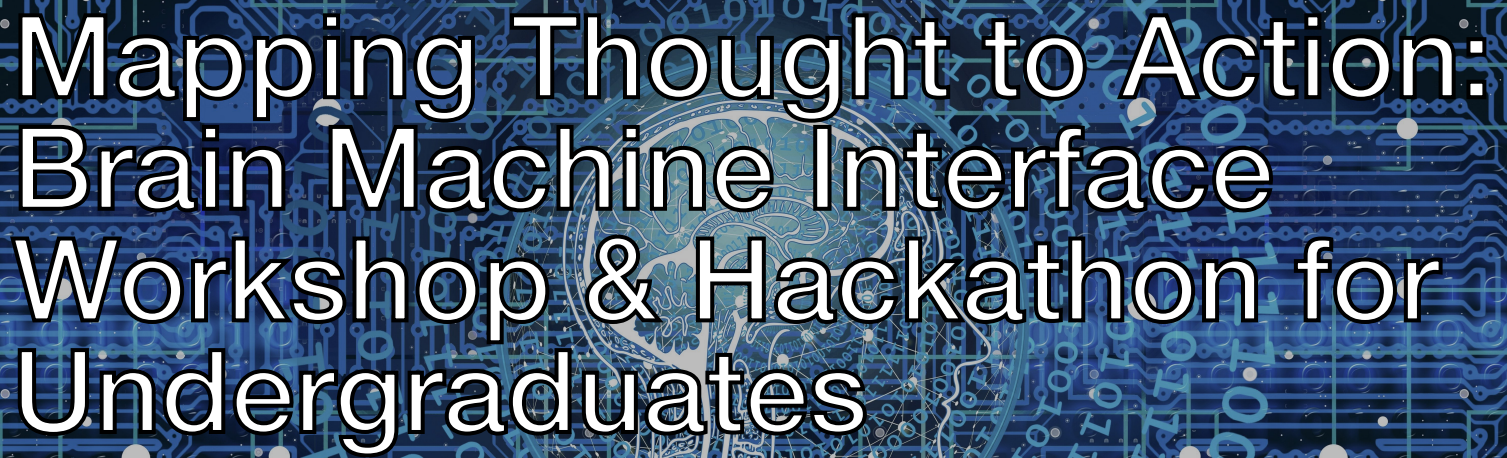
Undergraduate participants will form teams to work with neural datasets to ask computationally driven questions against the spiking activity of 100s of neurons.

The event will feature interactive talks, panels, and bootcamp coding sessions led by faculty and graduate students from UC San Diego and the University of Michigan. Attendees will apply data science and machine learning techniques to real neural data to prototype neural prosthesis designs.

Pre-requisites:

- Python basics
- Working knowledge of linear algebra & probability
- Experience playing with Jupyter notebooks or Google Colab
- Familiarity with numpy, scipy, and matplotlib libraries

Undergrads, including those who belong to groups underrepresented in STEM, are encouraged to apply, including but not limited to people of all racial, ethnic, geographic, and socioeconomic backgrounds, sexual orientations, genders, and persons with disabilities.



Mapping Thought to Action: Brain Machine Interface Workshop & Hackathon for Undergraduates

Tuesday, September 26, 2023

HDSI Multipurpose Room

8:30am - 9:10am: Breakfast & welcome by Vikash Gilja, ECE, UC San Diego

9:10am - 9:50am: Lecture by Cindy Chestek, Biomedical Engineering, University of Michigan

9:50am - 10:30am: Lecture by Gal Mishne, HDSI, UC San Diego

10:30am - 1pm: Interactive coding session & tutorial from neural activity to computer mouse control

HDSI Courtyard

1pm - 2:30pm: Lunch & team building

FAH Executive Conference Room

2:30pm - 5pm: Warm up neural decoding challenge & introduction to datasets

5pm - 6pm: Graduate student panel: collaboration and peer review

6pm - 8pm: Hackathon begins!

8pm - 9pm: Dinner & talk on science and career by Bradley Voytek, Cog Sci & HDSI, UC San Diego

9pm - ?: Hacking continues

Wednesday, September 27, 2023

FAH Executive Conference Room

8:30am: Breakfast and Grad student blitz talks

9:15am - 12pm: Hacking continues with graduate student and faculty office hours

12pm - 12:30pm: Hackathon team blitz talks

12:30pm - 1:30pm: Graduate student panel: communication and tools for dissemination

1:30pm - 4:30pm: Hacking continues!

4:30pm - 6pm: Hackathon team presentations