NCAN
National Center for Adaptive Neurotechnologies

NCAN SUMMER COURSE—JULY 2023

Translating Adaptive Neurotechnologies: Methodologies for real-time interactions with the nervous system

The National Center for Adaptive Neurotechnologies is pleased to announce its upcoming course on "Translating Adaptive Neurotechnologies: Methodologies for Real-Time Interactions with the Nervous System" to be held at the Stratton VA Medical Center in Albany, NY. This course will be a hybrid presentation of video lectures followed by an in-person workshop on July 10-14, 2023.

Adaptive Neurotechnologies

The rapidly growing field of adaptive neurotechnologies applies recent advances in neuroscience and engineering to establish real-time adaptive interactions with the nervous system that enable new scientific understanding and generate new therapeutic and diagnostic methods. Examples include brain-computer interfaces, deep brain stimulation, and operant conditioning of spinal reflexes. The realization of these technologies involves neuroscience, biomedical engineering, signal processing, mathematics, and computer science. Thus, their development and dissemination require leaders with knowledge and expertise that span all these disciplines.

Course Design and Organization

The course begins with a series of on-demand video lectures on a variety of neurotechnology topics. The workshop includes demonstrations and hands-on exercises with BCI2000, NCAN's general-purpose, open-source data acquisition software platform, and the Evoked Potential Operant Conditioning System (EPOCS), the clinical counterpart of BCI2000. It will include demonstrations of neurotechnologies for real-time multimodal interactions with the nervous system, including EEG-based brain-computer interfaces (BCIs) and EMG-based reflex operant conditioning protocols, with hands-on sessions in which the workshop participants learn how to apply BCI2000 and EPOCS, practice the methodologies used for adaptive neurotechnologies, and design and implement experiments.

Prior to the workshop, we will provide you with links to pre-recorded lectures that will provide you with the neuroscience and engineering background that you will need to fully benefit from the workshop. The workshop will begin on the evening of July 10, and then run 9:00 am-5:00 pm for the next four days. Topics to be covered include: signals, signal processing and feature extraction, hardware and software, and applications.

The workshop is limited to 24 participants. Modestly priced housing will be available in a nearby college dormitory. Workshop participants are responsible for their own transportation, housing, and food. Information about applying and registering for the Course can be found on our website. Email us at summercourse2023@neurotechcenter.org for additional information. A limited number of scholarships are available.

Who should apply?

Early to mid-career scientists, engineers, or clinicians, e.g., junior faculty, postdoctoral fellows, clinical residents or fellows, advanced graduate or medical students.

Washington University in St. Louis School of Medicine

U.S. Department of Veterans Affairs Stratton VA Medical Center

MUSC Medical University of South Carolina