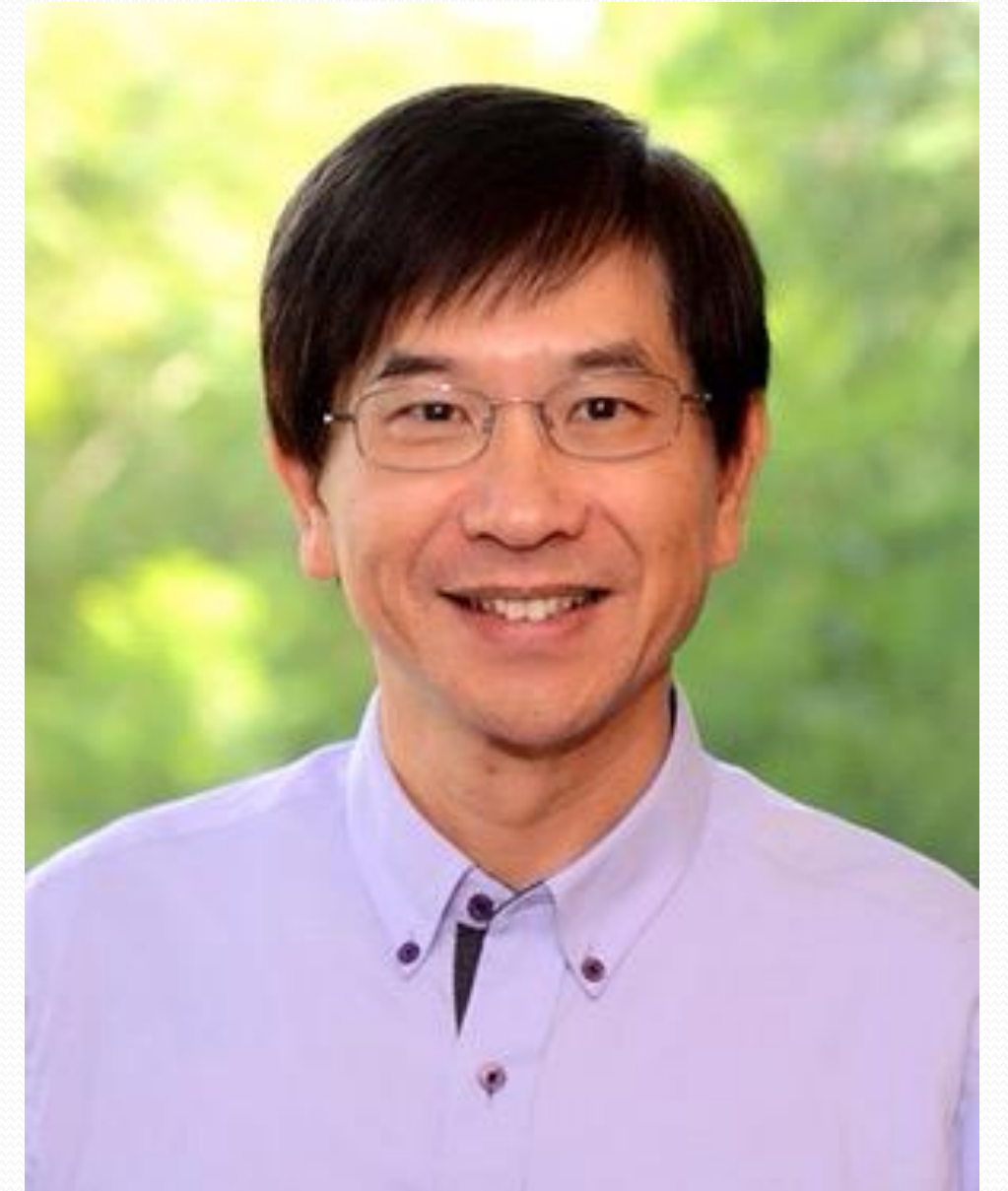# Machine Learning for Electrophysiological Data Analysis

Tzyy-Ping Jung, UC San Diego,

National Chiao Tung University

Date/Time: **2020/12/4 (FRI) 14:00-16:00 PM**
Conference Room: EC340
Host: 范倫達教授

Abstract：

Artificial intelligence (AI) including machine learning (ML) has made considerable contributions to our ability to attack problems with complex, unstructured and unlabeled data. While the human brain has long been regarded as a source of inspiration for AI, a contentious question is whether AI can advance the understanding of the human brain and behavior. My presentation will focus on (1) how DL/ML can help us to explore human brain dynamics and emotional responses; (2) how ML finds the associations between multimedia contents and the human brain; and (3) how transfer learning and Wasserstein Generative Adversarial Network can improve the performance of brain-computer interfaces (BCIs), and (4) the vulnerability of BCIs to adversarial attacks. Study results show that ML/DL may open a novel and revolutionary window into complex neural and physiological data, leading to a more detailed understanding of the strengths and limitations of the human mind, plus possible applications to medicine and cognitive testing/monitoring.

Speaker's Bio：

Tzyy-Ping Jung is the Co-Director of the Center for Advanced Neurological Engineering, an Associate Director of the Swartz Center for Computational Neuroscience, and an Adjunct Professor of the Department of Bioengineering at the University of California San Diego, CA, USA. He is also an Adjunct Professor of the Department of Electrical Engineering and Department of Computer Science at National Chiao Tung University, Hsinchu, Taiwan.

Dr. Jung established transformative techniques for applying blind source separation to decompose multichannel EEG/MEG/ERP and fMRI data and was elevated to an IEEE Fellow for his contributions to blind source separation for biomedical applications in 2015.

Dr. Jung's research emphasis has been placed on the integration of cognitive science, computer science and engineering, neuroscience, bioengineering, and electrical engineering. Dr. Jung's work is truly interdisciplinary and well cited by peers (over 30,000 total citations, h-index = 69 according to Google Scholar). He has published many well-cited articles in prestigious scientific journals such as Science, PNAS, PLoS Biology, and J. Neurosciences, engineering journals such as Proceedings of the IEEE, IEEE Trans Biomedical Engineering, and clinical journals such as Gerontology and JAMA Ophthalmology.