



THE CHINESE UNIVERSITY OF HONG KONG
Department of Electronic Engineering

SEMINAR

**An EEG study of steady-state brain responses to exogenous stimulation and
endogenous modulation**

By

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Time: 4:00 p.m.

Venue: Room 222 Ho Sin Hang Engineering Building

Abstract:

This talk addresses my recent neurophysiological studies of decoding of steady-state brain responses that are observed in electroencephalogram (EEG). The first part of the talk addresses brain—computer interfaces (BCI) that use steady-state visual evoked potentials (SSVEP). The SSVEP is a typical response to exogenous visual stimuli and a promising paradigm of high-speed BCI. I will talk about detection of patterns of visual stimulation from the observed EEG. The second part devote to endogenous modulation of imagined rhythms. Participants in the experiment were instructed to imagine either basic, binary, or ternary rhythm. The measured EEG was analyzed and it was found that the imagined rhythm could be decoded. Some demonstrations will be presented.

Biography:

Toshihisa Tanaka received the B.E., the M.E., and the Ph.D. degrees from the Tokyo Institute of Technology in 1997, 2000, and 2002, respectively. From 2000 to 2002, he was a JSPS Research Fellow. From October 2002 to March 2004, he was a Research Scientist at RIKEN Brain Science Institute. In April 2004, he joined Department of Electrical and Electronic Engineering, the Tokyo University of Agriculture and Technology, where he is currently an Associate Professor. In 2005, he was a Royal Society visiting fellow at the Communications and Signal Processing Group, Imperial College London, U.K. From June 2011 to October 2011, he was a visiting faculty member in Department of Electrical Engineering, the University of Hawaii at Manoa.

His research interests include a broad area of signal processing and machine learning including brain and biomedical signal processing, brain-machine interfaces and adaptive systems. He is a co-editor of *Signal Processing Techniques for Knowledge Extraction and Information Fusion* (with Mandic, Springer), 2008.

He served as an associate editor and a guest editor of special issues in journals including *Neurocomputing* and *IEICE Transactions on Fundamentals*. Currently he serves as an associate editor-in-chief of *Signals* (MDPI) and an associate editor of *IEEE Transactions on Neural Networks and Learning Systems*, *Computational Intelligence and Neuroscience* (Hindawi), and *Advances in Data Science and Adaptive Analysis* (World Scientific). Furthermore, he serves as a member-at-large, board of governors (BoG) of Asia-Pacific Signal and Information Processing Association (APSIPA). He was a chair of the Technical Committee on Biomedical Signal Processing, APSIPA. He is a senior member of IEEE, and a member of IEICE, APSIPA, and Society for Neuroscience.

ALL ARE WELCOME

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