The Chinese University of Hong Kong
Shun Hing Institute of Advanced Engineering
Distinguished Lecture Series 2011

Embracing Uncertainty and Sparsity for Speech Recognition

by

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Date: 8 June 2011 (Wednesday)
Time: 10:30 a.m. – 12:00 noon
Venue: Room 222, 2/F, Ho Sin Hang Engineering Building, CUHK

Abstract

In this talk, I will present our recent studies on machine learning and speech recognition, mainly focus on Bayesian and sparse learning of acoustic and language models. In general, speech recognition involves extensive knowledge of statistical models. Both acoustic and language models are important parts of modern speech recognition systems where the learned models from real-world data are full of complexity, ambiguity and uncertainty. The uncertainty and sparsity coding algorithms are crucial to tackle the model regularization for speech recognition. In acoustic modeling, I will introduce a sparse representation of acoustic features based on a set of state-dependent basis vectors. The Bayesian sensing hidden Markov models can be reliably estimated even from heterogeneous training data. The hybrid dictionary learning and sparse representation is performed. In language modeling, I will address the topic models and present a Dirichlet class language model, which projects the sequence of history words onto a latent class space and maximizes the marginal likelihood over the uncertainties of classes, which are expressed by Dirichlet priors. A Bayesian class-based language model is established.

In this presentation, I will report different evaluations on large vocabulary continuous speech recognition and briefly address a new work of embracing uncertainty and sparsity for blind source separation.

Biography of the Speaker

Jen-Tzung Chien received his Ph.D. degree in electrical engineering from the National Tsing Hua University, Hsinchu, Taiwan, ROC, in 1997. Since 1997, he has been with the Department of Computer Science and Information Engineering, National Cheng Kung University, Tainan, Taiwan, where he is currently a Distinguished Professor. He held the Visiting Professor positions at the Panasonic Technologies Inc., Santa Barbara, CA, the Tokyo Institute of Technology, Tokyo, Japan, the Georgia Institute of Technology, Atlanta, GA, the Microsoft Research Asia, Beijing, China, and the IBM T. J. Watson Research Center, Yorktown Heights, NY. His research interests include machine learning, speech recognition, face recognition, information retrieval and blind source separation.

Dr. Chien serves on the editorial board of the IEEE Signal Processing Letters. He received the Young Investigator Award (Ta-You Wu Memorial Award) from the National Science Council (NSC), Taiwan, in 2003, the Research Award for Junior Research Investigators from Academia Sinica, Taiwan, in 2004, and the NSC Distinguished Research Awards in 2006 and 2010.

* * * * *   ALL ARE WELCOME   * * * * *   For ENQUIRIES: (852) 3163-4351

* Light refreshment will be served at 10:15 a.m. before the lecture *