

Presents the Spring 2012 EECS Seminar Series

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**“Blind Wideband Beamforming Based on Frequency Invariant Transformation”**

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**ABSTRACT**

Beamforming is a technique to receive signals coming from some specific directions while suppressing interferences from other directions through an array of sensors. This can be achieved easily when some prior information about the desired signal is available, such as its direction of arrival (DOA). When such information is not available, we can employ some blind methods to solve the problem, leading to the class of blind beamformers. However, for wideband signals, this is not practical due to the extremely high computational complexity of the algorithms involved. In this talk we will introduce a blind wideband beamforming structure based on the frequency invariant transformation. With this structure, simple instantaneous blind source separation algorithms can be employed to extract the desired wideband signal from the received convolutive mixtures and it works effectively for both single-path and multi-path scenarios.

**BIOGRAPHY**

Dr Wei Liu received his B.Sc. in Space Physics (minor in Electronics) in 1996, L.L.B. in Intellectual Property Law in 1997, both from Peking University, China, M.Phil. from the Department of Electrical and Electronic Engineering, University of Hong Kong, in 2001, and Ph.D. in 2003 from the Communications Research Group, School of Electronics and Computer Science, University of Southampton, UK. He then worked as a postdoc in the same group and later in the Communications and Signal Processing Group, Department of Electrical and Electronic Engineering, Imperial College London. Since September 2005, he has been with the Communications Research Group, Department of Electronic and Electrical Engineering, University of Sheffield, UK, as a lecturer. His research interests are mainly in sensor (antenna, microphone, etc) array signal processing (beamforming, DOA estimation, tracking and localisation), blind signal processing (source separation and extraction), multirate signal processing (filter banks and wavelets), and their various applications, such as energy usage prediction, wind profile prediction, biomedical engineering, speech processing and wireless communications. He has published over 100 journal and conference papers and a research monograph about wideband beamforming ("Wideband Beamforming: Concepts and Techniques", John Wiley & Sons, March 2010, the first book focused on this area).