Abstract: The United Nations estimates that tens of millions of mines lie buried around the world, claiming 10,000 deaths annually and at least twice as many seriously injured. Clearing a mine infected area by humans is inefficient, costly and causes injury. Automatic techniques to detect and clear landmines have been an active research area in many countries over the past decade.

This talk begins with an overview of the landmine detection problem, and proceeds to introduce several signal processing methodologies to detect landmines using ground penetrating radar (GPR) sensor. Landmine detection using GPR is a very challenging problem, due to the ground bounce interaction and its sensitivity to soil conditions and clutter objects. Signal processing is indispensable in order to make GPR practical for this detection problem. In this talk, intelligent signal processing techniques for two GPR landmine detection platforms, the hand-held GPR and the vehicle mounted GPR, will be presented in details. The talk will conclude with some field test results in the United States and the challenges ahead.

Host: Dr. Arye Nehorai

Bio: (SM’00) received the B.Sc. and Ph.D. degrees in 1988 and 1991. He was a research associate in the Royal Military College of Canada from 1992 to 1994. He joined Nortel Networks, Canada in 1995 as a member of Scientific Staff. In 1996, he became a faculty in the Electrical and Computer Engineering Department at the Univ. of Saskatchewan, Canada. He has been with the Univ. of Missouri, Columbia since 1997, where he is currently Professor. His research interests are in detection and estimation, source localization, adaptive signal processing and wireless communications. He started his research on landmine detection in 1999 and has received continuous support from U.S. Army/ARO.

Dr. Ho has served as an Associate Editor of the IEEE Transactions on Signal Processing from 2003 to 2006, and the IEEE Signal Processing Letters from 2004 to 2008. He has been the Editor of the International Telecommunication Union (ITU) standard recommendation G.168: Digital Network Echo Cancellers since 2000, and the ITU standard recommendation G.160: Voice Enhancement Devices for Mobile Networks since 2006. He received the junior faculty research award from the College of Engineering at Univ. of Missouri in 2003. He is the inventor/co-inventor of three United States patents, three Canadian patents, two patents in Europe and four patents in Asia on mobile communications and signal processing.

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