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IEEE Signal Processing Society Distinguished Lecture

Defying Nyquist in Analog to Digital Conversion

By

Prof. Yonina Eldar

Technion - Israel Institute of Technology

Date: Tuesday, April 30, 2013

Time: Lecture: 06:00 pm – 07:00 pm

Place: Room 206/Ottawa Convention Centre, 55 Colonel By Drive, Ottawa, Ontario, Canada

Parking: OCC underground parking facility is available with fee

Admission: Free. Registration required. To ensure a seat, please register by e-mail contacting:

Dr. Yifeng Zhou (yifeng.zhou@crc.gc.ca) or

Dr. Jun Li (jun.li@crc.gc.ca) or

Dr. Sreeraman Rajan (sreeraman@ieee.org).

Abstract

The famous Shannon-Nyquist theorem has become a landmark in the development of digital signal processing. However, in many modern applications, the signal bandwidths have increased tremendously, while the acquisition capabilities have not scaled sufficiently fast. Consequently, conversion to digital has become a serious bottleneck.

In this talk a new framework for sampling wideband analog signals at rates far below that dictated by the Nyquist rate will be presented. The focus will be both on the theoretical developments, as well as on actual hardware implementations and considerations that allow realization of sub-Nyquist samplers in practice. Applications to a variety of different problems in communications, bioimaging, and signal processing will also be described.

Speaker's Bio

Yonina Eldar received the B.Sc. degree in physics and the B.Sc. degree in electrical engineering both from Tel-Aviv University (TAU), Tel-Aviv, Israel, in 1995 and 1996, respectively, and the Ph.D. degree in electrical engineering and computer science from the Massachusetts Institute of Technology (MIT), Cambridge, in 2002.

She is currently a Professor in the Department of Electrical Engineering at the Technion—Israel Institute of Technology, Haifa. She is also a Research Affiliate with the Research Laboratory of Electronics at MIT and a Visiting Professor at Stanford University, Stanford.

Dr. Eldar was a Horev Fellow of the Leaders in Science and Technology program at the Technion and an Alon Fellow. In 2004, she was awarded the Wolf Foundation Krill Prize for Excellence in Scientific Research, in 2005 the Andre and Bella Meyer Lectureship, in 2007 the Henry Taub Prize for Excellence in Research, in 2008 the Hershel Rich Innovation Award, the Award for Women with Distinguished Contributions, the Muriel & David Jacknow Award for Excellence in Teaching, and the Technion Outstanding Lecture Award, in 2009 the Technion's Award for Excellence in Teaching, in 2010 the Michael Bruno Memorial Award from the Rothschild Foundation, and in 2011 the Weizmann Prize for Exact Sciences. In 2012 she was elected to the Young Israel Academy of Science and to the Israel Committee for Higher Education, and elected an IEEE Fellow. She received several best paper awards together with her research students and colleagues. She is a Signal Processing Society Distinguished Lecturer, and an Editor-in-Chief of Foundations and Trends in Signal Processing.