



THE UNIVERSITY OF CHICAGO

Department of Statistics
STATISTICS COLLOQUIUM

ROBERT NOWAK

Department of Electrical and Computer Engineering
University of Wisconsin, Madison

Active Learning, One Bit at a Time

MONDAY, October 15, 2012, at 4:00 PM

133 Eckhart Hall, 5734 S. University Avenue

Refreshments following the seminar in Eckhart 110

ABSTRACT

Progress in science and engineering relies on building good models. Modern applications often involve huge systems of many variables, and researchers have turned to flexible nonparametric and high-dimensional statistical models to capture the complexity of such problems. Most of the work in this direction has focused on non-adaptive measurements. Alternatively, adaptive measurement procedures can improve the accuracy of statistical inference. These procedures automatically adapt the measurements in order to focus and optimize the gathering of new information. Sequential experimental design and testing are classic examples of adaptive approaches. Adaptive measurement procedures for high-dimensional and nonparametric inference are largely unexplored, but researchers in several communities have begun to develop promising new tools. In this talk, I will discuss three interrelated problems: Derivative Free Optimization, Binary Classification, and Ranking. The common theme is that the measurements available in each case will be “yes/no” questions. This simple sort of measurement is motivated by applications involving human subjects.

Bio: Robert Nowak received the B.S., M.S., and Ph.D. degrees in electrical engineering from the University of Wisconsin-Madison in 1990, 1992, and 1995, respectively. He was a Postdoctoral Fellow at Rice University in 1995-1996, an Assistant Professor at Michigan State University from 1996-1999, held Assistant and Associate Professor positions at Rice University from 1999-2003, and is now the McFarland-Bascom Professor of Engineering at the University of Wisconsin-Madison. Professor Nowak has held visiting positions at INRIA, Sophia-Antipolis (2001), and Trinity College, Cambridge (2010). He has served as an Associate Editor for the IEEE Transactions on Image Processing and the ACM Transactions on Sensor Networks, and as the Secretary of the SIAM Activity Group on Imaging Science. He was General Chair for the 2007 IEEE Statistical Signal Processing workshop and Technical Program Chair for the 2003 IEEE Statistical Signal Processing Workshop and the 2004 IEEE/ACM International Symposium on Information Processing in Sensor Networks. Professor Nowak received the General Electric Genius of Invention Award (1993), the National Science Foundation CAREER Award (1997), the Army Research Office Young Investigator Program Award (1999), the Office of Naval Research Young Investigator Program Award (2000), the IEEE Signal Processing Society Young Author Best Paper Award (2000), the IEEE Signal Processing Society Best Paper Award (2011), and the ASPRS Talbert Abrams Paper Award (2012). He is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE). His research interests include signal processing, machine learning, imaging and network science, and applications in communications, bioimaging, and systems biology.

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