UNIVERSITY OF TORONTO | DEPARTMENT OF MATHEMATICS

The 20th Annual R. A. Blyth Lectures in Mathematics

WHAT'S THE BIG DEAL ABOUT "BIG DATA"? EMERGENT PHENOMENA IN HIGH-DIMENSIONAL DATA ANALYSIS

Abstract:

In classical statistical analysis, one assumed that the number of variables of interest is mall but the number of observations is large. In the big-data era the number of variables is almost as large as, or even larger than the number of observations. In this new regime, several fascinating phenomena arise which both complicate life, but also render it more interesting.

I will illustrate the emergent new phenomena with vignettes showing how the big-data asymptotic overturns traditional statistics, such as covariance estimation, and its applications in signal processing and finance; from high-dimensional robust estimation of linear models, and its use for outlier detection. For example, traditional optimal procedures are no longer optimal. I will show how the emergent new high-dimensional phenomena offer exciting new opportunities in science and technology, for example in compressed sensing.

PROFESSOR DAVID DONOHO
STANFORD UNIVERSITY

PUBLIC LECTURE
Wednesday, February 25, 2015 – 4:30 p.m.
Room: BA1130

LECTURE 2
Thursday, February 26, 2015 – 4:10 p.m.
Room: Fields Institute, Room 230

LECTURE 3
Friday, February 27, 2015 – 3:10 p.m.
Room: Fields Institute, Room 230

The Blyth Lecture Reception will take place before the public lecture at 3:30 p.m. on Wednesday, February 25, 2015 in the Department of Mathematics lounge, 40 St. George St., 6th floor.