

4TH ANNUAL PROB / STAT DAY AT UMBC & SILVER JUBILEE CELEBRATION OF STATISTICS GRADUATE PROGRAM AT UMBC

FUNDED BY NATIONAL SECURITY AGENCY

Workshop on *Adversarial Risk Analysis*

Presented by Professor *David Banks*, Duke University

7th Floor, Library Building; 9: 00 am - 12:30 pm, Friday, April 23, 2010

Registration is Free but Required!

Registration deadline: Friday, April 2, 2010

Registration website:

<http://www.umbc.edu/circ/hosting/ProbStatDay2010>

Many modern applications, such as counterterrorism, corporate competition, and federal regulation, can be viewed as multiparty games in which the outcomes are uncertain. Such cases are not well-handled by classical statistical risk analysis (which ignores the adversarial aspect) nor by traditional game theory (which assumes that the payoffs to all parties for a given set of choices are known). This workshop addresses such problems, in which the solution requires that an actor "mirror" the thinking of the other actors in order to make their decisions.

The workshop approaches the problem broadly, including issues of elicitation and the problem of validating complex computer models---both of these are components in the risk analysis methodology used at the Department of Homeland Security. We also discuss auctions and the psychology of betting. But the main motivating example is counterterrorism, and much of the research pertains to work done as part of a recent National Academies panel review of DHS risk management methodology.

Lecture 1: Risk Analysis in Counterterrorism

1. Motivation
2. The National Research Council's 2008 report on DHS risk methodology
3. Combining statistical risk analysis with game theory: an example
4. The Bayesian strategy of Kadane and Larkey

Lecture 2: Applications in Auctions, Games, and Regulation

1. Multiplayer games of chance: Bellman and Blackwell
2. Auctions and Gambling: Bayesian methods
3. Regulation as a non-cooperative, non-zero-sum game

Lecture 3: Modeling Adversarial Risk

1. Battelle's model for bioterrorism risk assessment at DHS
2. Eliciting expert opinion---some new approaches to an old problem
3. Agent based models: uncertainty, parameterization, goodness-of-fit