UMBC AN HONORS UNIVERSITY IN MARYLAND

Department of MATHEMATICS & STATISTICS

DEPARTMENT OF MATH AND STATISTICS, UMBC

Probability and Statistics Day, 2009

Funded by National Security Agency

Workshop on Modern Multiple Testing

*Presented by Professor **Sanat Sarkar**, Temple University*

Friday, April 24, 2009
2:00 pm - 5:00 pm
Lecture Hall 8, ITE
Registration is Free but Required!
http://www.umbc.edu/circ/hosting/ProbStatDay2009/workshop_form.php
Registration deadline: Friday, March 27, 2009

In the past decade or so, there has been renewed interest in multiple testing due to its increased relevance as a statistical tool to analyze data from modern scientific investigations, such as genomics and brain imaging. As these experiments typically involve a large number of null hypotheses to test, making some of the more traditional multiple testing methods not as powerful as one would like, the research in modern multiple testing has been focused to a large extent on developing more meaningful and powerful notions of error rate and methods that control them. This course will present the developments of these newer methods.

Lecture 1: Introduction

1.1 The statistical problem
1.2 Different measures of false discoveries and false non-discoveries:
1.3 Single-step vs. stepwise multiple testing procedures
1.4 Useful formulas and inequalities

Lecture 2: Controlling the Familywise Error Rate (FWER) and the False Discovery Rate (FDR)

2.1 Procedures controlling the FWER: Bonferroni, Sidak, Holm, Hochberg, etc.
2.2 Approaches to controlling the FDR: Benjamini-Hochberg vs. Storey
2.3 Procedures controlling the FDR: The BH method, and adaptive BH methods.
2.4 Applications

Lecture 3: Generalizing the FWER and FDR

3.1 Procedures controlling generalized FWER
3.2 Procedures controlling generalized FDR
3.3 Applications

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