APPLIED MATHEMATICS COLLOQUIUM

Lifting the Curse of Dimensionality: Numerical Integration in Very High Dimensions

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Abstract:
Richard Bellman coined the phrase "the curse of dimensionality" to describe the extraordinarily rapid increase in the difficulty of most problems as the number of variables increases. A typical problem is numerical multiple integration, where the cost of any integration formula of product type obviously rises exponentially with the number of variables. Nevertheless, problems with hundreds or even thousands of variables do arise, and are now being tackled successfully. In this talk, I will tell the story of recent developments, in which within a decade the focus turned from existence theorems to concrete constructions that achieve the theoretically predicted results even for integrals in thousands of dimensions with many thousands of points. Suitable integration rules of this kind are now being applied to applications from mathematical finance and other fields.

Monday October 25th 2010
4:30 PM
Building 2, Room 105
Refreshments are available in Building 2, Room 290
(Math Common Room) between 3:30 – 4:30 PM

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