APPLIED MATHEMATICS COLLOQUIUM

MULTILINEAR ALGEBRA AND ITS APPLICATION TO HIGHER-ORDER WEB LINK ANALYSIS

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ABSTRACT:

Tensors (also known as multidimensional arrays or N-way arrays) are used in a variety of applications ranging from chemometrics to psychometrics. We present an overview of tensor decompositions and the software tools that are available for working with tensors. We then consider the application of the PARAFAC tensor decomposition to the problem of link analysis. We propose and test a new methodology that uses a higher-order representation of a web hyperlink graph. We label the edges in the link graph with the anchor text of the hyperlinks so that the associated linear algebra representation is a sparse, three-way tensor. The first two dimensions of the tensor represent the web pages while the third dimension adds the anchor text. We then use the rank-1 factors of the decomposition to automatically identify topics in the collection along with the associated authoritative web pages. This is joint work with Brett Bader, Sandia National Labs.

MONDAY, OCTOBER 31, 2005
4:30 PM
Building 2, Room 105

Reception at 4:00 PM in Building 4, Room 174.
(Math Majors Lounge)

Applied Math Colloquium: http://www-math.mit.edu/amc/fall05
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