Department of Mathematical Sciences

Colloquium

Petr Mayer

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Computing Mean First Passage Times Matrices in Markov Chains

The Mean First Passage Times matrix is one of the characteristic features of Markov Chains. The element (i, j) of the matrix represents mean time counted in amount of steps of a Markov chain needed for the first transition from state i to state j. As an example can serve mean time betwee failures in railway locking systems. The Mean First Passage Times matrix can also be used for estimating of stability of computed Stationary Probability Vector. The mean first passage matrix M is given by the equation $M = (I - Z + EZ_{diag})D$ where I is the identity matrix, Z is the fundamental matrix, E is a matrix whose all entries equal one, Z_{diag} is a diagonal matrix with the diagonal entries of Z on its diagonal, and D has on its diagonal the values $1/\alpha_i$, where α_i are the components of the limit matrix. We will present three methods for their computation: The original one due to C.D. Meyer, the "divide and conquer" approach by Kirkland, Neumann and Xu, and its columnwise computation. Some modifications of these procedures will be considered.

Friday, November 4, 2005 at 4 pm. in Bell Hall 143
The University of Texas at El Paso

Refreshments will be served in front of the colloquium room, 15 minutes before the start of the colloquium.

For further information, please contact Dr. Pavel Šolín, Bell Hall 220. Phone: (915) 747-6770, email: `solin@utep.edu`.