

APPLIED MATHEMATICS COLLOQUIUM

Efficient Solution of Differential Riccati Equations arising in Optimal Control for parabolic PDEs

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ABSTRACT:

The numerical treatment of linear quadratic regulator/gaussian design problems for parabolic partial differential equations requires solving large scale Riccati equations. In the finite time horizon case, the differential Riccati equation (DRE) arises. Typically the coefficient matrices of the resulting DRE have a given structure (e.g. sparse, symmetric or low rank). We derive efficient numerical methods for solving DREs capable of exploiting this structure, which are based on a matrix-valued implementation of the usual ODE methods. Their implementation in the Matlab toolbox M.E.S.S (Matrix Equation Sparse Solver) as well as suitable stepsize and order selection strategies will also be addressed.

MONDAY MARCH 30TH 2009

4:30 PM

Building 4, Room 237

*Refreshments at 4:00 PM in Building 2, Room 349
(Applied Math Common Room)*

Applied Math Colloquium: <http://www-math.mit.edu/amc/spring09>
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