



The University of Chicago  
Departments of Computer Science,  
Mathematics, and Statistics

## Scientific and Statistical Computing Seminar

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## Differential Variational Inequalities: A New Paradigm in the Mathematical Sciences

**FRIDAY, February 17, 2012, at 3:30 PM**

133 Eckhart Hall, 5734 S. University Avenue (unless announced otherwise).

### ABSTRACT

This lecture makes a foray into the new mathematical paradigm of differential variational inequalities (DVIs) and the closely related class of differential complementarity problems (DCPs). This paradigm serves as a bridge between the century-old subject of ordinary differential equations and the contemporary field of mathematical programming. On one hand, the former subject is significantly broadened in the DVI/DCP framework where discontinuities, nonsmoothness, and mode switches are modeled by disjunctive and variational conditions; on the other hand, a static mathematical program (optimization, equilibrium, and game problems) is extended to a continuous-time setting where the decision variables are functions of time. A touch of solution theory and methods is presented and some applications are sketched to illustrate the broad modeling reach of this paradigm.

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