



THE UNIVERSITY OF CHICAGO

Departments of Computer Science, Mathematics, and Statistics
SCIENTIFIC AND STATISTICAL COMPUTING SEMINAR

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Methods for Solving Large Dynamic Optimization Problems in Economics

THURSDAY, November 1, 2012, at 3:00 PM
112 Stevanovich Center, 5727 S. University Avenue

ABSTRACT

Economic systems have many dimensions due to differences in people, products, and geography. There is also much uncertainty in economic systems. Any optimality analysis of an economic problem must be able to incorporate this high dimensionality.

I will describe current efforts in solving such problems. The key idea is Value Function Iteration from the dynamic programming literature, but computational implementation of that approach faces challenges in approximating a value function, computing expectations, and solving huge numbers of relatively small optimization problems. Parallel computing is necessary to solve even modest size problems. A unique feature of economics problems is that the domain of the solution is not known a priori, making it desirable to adopt flexible methods that can solve for the domain of the solution as well as the solution.

The result is a combination of methods from approximation theory, quadrature theory, and simulation methods, all coordinated in a manner suitable for massively parallel environments.

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