



Special Colloquium

DR. RAYMOND CHOW
UCLA

"AN ALGORITHM FOR OVERCOMING THE CURSE OF DIMENSIONALITY IN HAMILTON-JACOBI EQUATIONS"

In this talk we discuss an algorithm to overcome the curse of dimensionality, in possibly non-convex/time/state-dependent Hamilton-Jacobi partial differential equations. They may arise from optimal control and differential game problems, and are generally difficult to solve numerically in high dimensions.

A major contribution of our works is to consider an optimization problem over a single vector of the same dimension as the dimension of the HJ PDE instead. To do so, we consider the new approach using Hopf-type formulas. The sub-problems are now independent and they can be implemented in an embarrassingly parallel fashion. That is ideal for perfect scaling in parallel computing.

The algorithm is proposed to overcome the curse of dimensionality when solving high dimensional HJ PDE. Our method is expected to have application in control theory, differential game problems, and elsewhere. This approach can be extended to the computational of a hamilton-Jacobi equation in the Wasserstein space, and is expected to have applications in mean field control problems, optimal transport and mean field games.

Friday, January 26th, 2018

Surge 284

Tea Time @ 4:00 p.m.

Talk Begins @ 4:10 p.m.

Ends @ 5:10 p.m.

UCR
Interdisciplinary
Applied
Mathematics

900 University Avenue
Surge Building
Riverside, CA
92521

