



THE UNIVERSITY OF
CHICAGO

Department of Statistics

STATISTICS COLLOQUIUM

DAVID KELLY

Courant Institute of Mathematical Sciences
New York University

Ergodicity and Accuracy in Optimal Particle Filters

MONDAY, January 30, 2017, at 4:00 PM

Eckhart 133, 5734 S. University Avenue

Refreshments following the seminar in Jones 111

ABSTRACT

The optimal particle filter is a sequential Monte Carlo method that has proved useful in (typically) low dimensional state tracking problems with partially observed states. In recent years, the method has been used in data assimilation communities, notably in geophysics, where the objective is to track very high dimensional geophysical states, which can have $O(10^9)$ dimensions. The success of the method is quite surprising, as statistical consistency theory would suggest that for such a high dimensional system, a Monte Carlo method would require an outrageously large ensemble size to accurately capture the evolving posterior. Nevertheless, the method has proved successful in several important data assimilation metrics when only very small ensemble sizes are used. In this talk, we discuss how this is possible and how one can build a theoretical framework for understanding particle filters with a fixed (and not large) number of particles.

This is based on joint work with Andrew Stuart (Caltech).

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