



THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS STUDENT SEMINAR

YIAN CHEN

Committee on Computational and Applied Mathematics
University of Chicago

Scalable Gaussian Process Regression for Physics-based Covariance Models

TUESDAY, March 3, 2020, at 2:00 PM
Jones 303, 5747 S. Ellis Avenue

ABSTRACT

The performance of Gaussian process analysis can be significantly affected by the choice of the covariance function. Physics-based covariance model provides an enlightening way to construct covariance models that are consistent with the underlying physical laws. We can also utilize low-rank approximations to perform scalable Gaussian process analysis for implicit models. The proposed approximations only interact with the physical model via a black-box forward solver and can achieve quasilinear complexity for Gaussian process regression, maximum likelihood parameter estimations, as well as approximating the expected Fisher information matrix when performing uncertainty quantifications.

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