THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS
STUDENT SEMINAR

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Variational Iterative Alternating Scheme

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Jones Laboratory, Room 303

ABSTRACT

Hierarchical models with gamma hyperpriors provide a flexible, sparsity-promoting framework to bridge L^1 and L^2 regularizations in Bayesian formulations to inverse problems. Despite the Bayesian motivation for these models, existing methodologies are limited to maximum a posteriori estimation. The potential to perform uncertainty quantification has not yet been realized. I will introduce a variational iterative alternating scheme for hierarchical inverse problems with gamma hyperpriors. The proposed variational inference approach yields accurate reconstruction, provides meaningful uncertainty quantification, and is easy to implement. In addition, it lends itself naturally to conduct model selection for the choice of hyperparameters. I will illustrate the performance of our methodology in several computed examples.