THE UNIVERSITY OF CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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Computationally Efficient Spatial Modeling Using Recursive Skeletonization Factorizations

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ABSTRACT

This research explores the application of recursive skeletonization factorization techniques to evaluate the log-likelihood of a parameterized spatial Gaussian process in $O(n^{3/2})$ time and $O(n \log(n))$ storage. We demonstrate these techniques by fitting a Matérn model to a dataset composed of around 87,000 observations of total column ozone measurements obtained from a single latitude band collected in November 2015. We then demonstrate that this fit can be improved by adding a nonstationarity function of latitude, and show how this can be done in a computationally efficient manner.