



THE UNIVERSITY OF
CHICAGO

DEPARTMENT OF STATISTICS

MASTER'S THESIS PRESENTATION

BINGXUE AN

Department of Statistics
The University of Chicago

Comparison of BML Methods with Traditional Methods for ENSO Prediction

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Jones 304, 5747 S. Ellis Avenue

ABSTRACT

The El Niño -Southern Oscillation (ENSO) is a climate pattern that occurs in the central and eastern equatorial Pacific Ocean. This phenomenon is cyclic, with the positive phase known as El Niño and the negative phase known as La Niña. It strongly influences ecosystems and human activities and people have been studying the prediction of El Niño events for decades. With sufficient observational data as the training set, many machine learning methods can predict the dynamics well but a major challenge in ENSO phenomenon prediction is the shortage of observational data dating far enough back due to limited technologies. In this masters' thesis, a Bayesian machine learning method (BML) introduced in the paper A Bayesian Machine Learning Algorithm for Predicting ENSO Using Short Observational Time Series [1] will be re-viewed and compared to two traditional methods. With RMSE and correlation as the evaluation criteria for prediction ability, the result shows that even with a basic neural network and one training parameter, the prediction ability of the BML method is at least two months extended compared to the other two methods. This result suggests that it may be possible to make predictions about the El Nino and the La Niña an event at least two months earlier than using traditional models.