



THE UNIVERSITY OF  
CHICAGO

Department of Statistics

## MASTER'S THESIS PRESENTATION

---

BO WEI OOI

Department of Statistics  
The University of Chicago

Statistical Inference and Clustering of Trend Functions in  
High-Dimensional Time Series

WEDNESDAY, JULY 17, 2019, at 3:00 PM  
Jones 304, 5747 S. Ellis Avenue

### ABSTRACT

High-dimensional time series can be modelled by a trend function and a stationary error process. In this paper, we will use this framework to discuss hypothesis testing based on a de-diagonalised quadratic form and clustering based on the parallelism of the trend functions, where the dimension can go to infinity with the sample size. The local linear estimate plays an important role in both hypothesis testing and clustering procedures and we propose an automatic direct plug-in approach that accounts for the correlated nature of our data. We evaluate these procedures with a simulation study and apply them to a data set of electricity load from different zones in the United States. In our data analysis, we cluster the zones and identify the trend functions and its associated parameters within each cluster.