



High Dimensional Nonstationary Time Series

# IRTG 1792

## Short Course

**Minh-Ngoc Tran**

### ***Bayesian Computation for Big Models Big Data***

Recent advances in technology have produced increasingly large volumes of data. The availability of big data also allows the data analyst to use increasingly complex and highdimensional statistical models. This leads to many research opportunities as well as challenges in statistical inference, in particular simulation-based Bayesian inference.

This lecture reviews some recent advances in Bayesian computation that enables Bayesian inference for Big Models Big Data. The lecture will start with estimation methods for models with an intractable likelihood, then show a close connection between intractable likelihood problems and Big Data problems. It then focuses on subsampling-based Markov chain Monte Carlo and Hamiltonian Monte Carlo for models with tall data, followed by Variational Bayes estimation methods for extremely high-dimensional models. The method is also extended to community detection for stochastic block models and stochastic networks.

11.-20.07.2018 | -  
IRTG 1792 Summer Camp



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