High Dimensional Nonstationary Time Series

IRTG 1792
Short Course

Matthew Harding

Applying Deep Learning and Machine Learning in Economics

The aim of this course is to introduce economists to new analytic methods, which lie at the intersection of traditional statistics, machine learning, and computer science, from the perspective of econometric analysis. The course will focus on the estimation of non-linear models by relaxing parametric assumptions with the use of neural network architectures. After introducing core concepts in machine learning and neural networks, the course will consider the semi-parametric estimation of hazard models with unobserved heterogeneity with applications to the large-scale modeling of individual credit. The course will the show how neural networks can be applied to the non-parametric estimation of random coefficients models by introducing quantile neural network estimation strategies. Lastly, the course will explore the connection between unsupervised learning and factor models by exploring different autoencoder deep learning models and explore their use in non-linear dimensionality reduction and clustering.

Matthew Harding is an Econometrician and Data Scientist. He is an Associate Professor of Economics and Statistics and UC Irvine. He holds a PhD in Economics from MIT and an MPhil in Economics from Oxford University. He directs the Deep Data Lab which conducts research into cutting edge econometric methods for the analysis of "deep data", large and information-rich data sets derived from many seemingly unrelated sources to provide novel economic insights. He works at the intersection of machine learning and statistics with a focus on deep learning and causal inference.

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