High Dimensional Nonstationary Time Series

IRTG 1792 Short Course

Jonas Peters

Causal Machine Learning

In the field of causality we want to understand how a system reacts under interventions (e.g. in gene knock-out experiments). These questions go beyond statistical dependences and can therefore not be answered by standard regression or classification techniques. In this short course you will learn about the interesting problem of causal inference and recent developments in the field. In particular, we introduce structural causal models and formalize interventional distributions. We define causal effects and show how to compute them if the causal structure is known. We present several ideas that can be used to infer causal structure from data. If time allows, we will show how causal concepts could be used in more classical statistical and machine learning problems. No prior knowledge about causality is required.

Jonas is professor in statistics at the Department of Mathematical Sciences at the University of Copenhagen. Previously, he has been at the MPI for Intelligent Systems in Tuebingen and was a Marie Curie fellow at the Seminar for Statistics, ETH Zurich. He studied Mathematics at the University of Heidelberg and the University of Cambridge. In his research, Jonas is interested in inferring causal relationships from different types of data and in building statistical methods that are robust with respect to distributional shifts. He seeks to combine theory, methodology, and

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