Invited Talk: Causal Learning and Machine Learning

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Abstract

Can we find the causal direction between two variables? How can we make optimal predictions in the presence of distribution shift? We are often faced with such causal modeling or prediction problems. Recently, with the rapid accumulation of huge volumes of data, both causal discovery, i.e., learning causal information from purely observational data, and machine learning are seeing exciting opportunities as well as great challenges. This talk will be focused on recent advances in causal discovery and how causal information facilitates understanding and solving certain problems of learning from heterogeneous data. In particular, I will talk about basic approaches to causal discovery and address practical issues in causal discovery, including nonstationarity or heterogeneity of the data and existence of measurement error. Finally, I will discuss why and how underlying causal knowledge helps in learning from heterogeneous data when the i.i.d. assumption is dropped, with transfer learning? as a particular example.

Biography

Kun Zhang is an assistant professor in the philosophy department and an affiliate faculty member in the machine learning department of Carnegie Mellon University (CMU), USA. Before joining CMU, he was a senior research scientist at Max Planck Institute for Intelligent Systems, Germany, and a lead scientist at Information Sciences Institute of University of Southern California. His research interests lie in machine learning and artificial intelligence, especially in causal discovery and causality-based learning. He has served as a senior program committee member or area chair for a number of conferences in machine learning or artificial intelligence, and organized various academic activities to foster interdisciplinary research in causality.