

Causal implications based on observations

Nihat Ay

Max Planck Institute for Mathematics in the Sciences

Leipzig, Germany

Abstract:

In the first part of my talk I shall review basic concepts of Pearl's causality theory. Within this theory, the notion of experimental intervention is essential and provides a formal basis for the definition and the study of causal effects. The identification of causal effects based on observational data represents a particularly important problem within this study. It is known that, given appropriate structural information, a causal effect can be identified based on solely observational data. I shall demonstrate this in the context of the sensori-motor loop. If structural information is not available, it is still possible to infer important properties of the underlying causal structure. The most basic version of this kind of inference is given by the well-known common cause principle for two variables. I shall present various recent extensions of this principle.