

FIM

Minicourse

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Causal Graphical Models and Counterfactuals

June 25 and 28, July 2 and 4, 2012

10:00 - 12:00, HG G 19.1, ETH Zürich, Rämistrasse 101

Abstract

In this series of lectures we will first introduce the potential outcome approach to causal models. We will then introduce multivariate statistical models based on Directed Acyclic Graphs (DAGs), reviewing their basic Markov properties. We will then provide a causal interpretation for DAGs in terms of potential outcomes, relating this to the back-door formula and more generally, the do-calculus of Pearl.

We will then consider two problems that arise in the context of a DAG model when we only observe a marginal distribution. First we consider the non-parametric identification of causal effects, and describe a simple complete algorithm for this problem. Second, we will describe a general class of non-parametric constraints that are implied to hold in the observed marginal distribution, which we call the nested Markov property. We will describe parameterizations of some of the related statistical models.

Finally, time permitting, we will describe approaches that have been proposed for dropping the assumption of acyclicity, describing some of the practical and theoretical obstacles.

Prerequisites: Some basic familiarity with statistical problems.

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