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Title: The Proximal ID Algorithm

Abstract: Unobserved confounding is a fundamental obstacle to establishing valid causal conclusions from observational data. Two complementary types of approaches have been developed to address this obstacle. An extensive line of work is based on taking advantage of fortuitous external aids (such as the presence of an instrumental variable or other proxy), along with additional assumptions to ensure identification.

On the other hand, a complete characterization of identifiability of a large class of causal parameters in arbitrary causal models with hidden variables has been developed using the language of graphical models, resulting in the ID algorithm and related extensions.

We aim to develop a synthesis of the proximal and graphical approaches to identification to yield the most general identification algorithm in multivariate systems currently known – the proximal ID algorithm. Our algorithm is able to both apply proximal causal methods in models not previously possible, and obtain identification in settings where the classical ID algorithm fails.

We outline a class of estimation strategies for causal parameters identified by our method. We illustrate our approach by simulation studies.

This is joint work with Eric J. Tchetgen Tchetgen and Zach Wood-Doughty

Bio: Dr. Ilya Shpitser is a John C. Malone Assistant Professor at the department of Computer Science at Johns Hopkins University. His primary area of interest is causal and probabilistic inference, graphical models, missing data, dependent data, and algorithmic fairness, with applications in healthcare and public health.

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