

Validating Causal Models

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Abstract

The goal of causal inference is to understand the outcome of alternative courses of action. However, all causal inference requires assumptions—more so than for standard tasks in probabilistic modeling—and testing those assumptions is important to assess the validity of a causal model. We develop Bayesian model criticism for causal inference, building on the idea of posterior predictive checks to assess model fit. Our approach involves decomposing the problem, separately criticizing the model of treatment assignments and the model of outcomes. Further we discuss how and when we can check the central assumption of unconfoundedness, which enables causal statements from observational data. Our approach provides a foundation for diagnosing causal inferences from observational data.

Keywords: Causal Inference; Probabilistic Models; Bayesian Analysis; Model Checking.

References