A Logic for Hypothetical Reasoning*

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Abstract

This paper shows that classical logic is inappropriate for hypothetical reasoning and develops an alternative logic for this purpose. The paper focuses on a form of hypothetical reasoning which appears computationally tractable. Specifically, Horn-clause logic is augmented with rules, called *embedded implications*, which can hypothetically add atomic formulas to a rulebase. By introducing the notion of *rulebase independence*, we show that these rules can express hypothetical queries which classical logic cannot; and by adopting methods from modal logic, we show these rules to be intuitionistic. In particular, they form a subset of intuitionistic logic having semantic properties similar to those of Horn-clause logic.

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