

Finite-valued Semantics for Canonical Labelled Calculi

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Abstract We define a general family of *canonical labelled calculi*, of which many previously studied sequent and labelled calculi are particular instances. We then provide a uniform and modular method to obtain finite-valued semantics for every canonical labelled calculus by introducing the notion of *partial non-deterministic matrices*. The semantics is applied to provide simple *decidable* semantic criteria for two crucial syntactic properties of these calculi: (strong) analyticity and cut-admissibility. Finally, we demonstrate an application of this framework for a large family of paraconsistent logics.

Keywords Sequent calculi · Labelled sequents · Canonical calculi · Cut-admissibility · Non-deterministic semantics · Finite-valued logics

1 Introduction

A useful semantics is an important property of formal calculi. In addition to providing real insights into their underlying logic, such semantics should also be *effective* in the sense of naturally inducing a decision procedure for its calculus. Another desirable property of such semantics is the possibility to apply it for characterizing important

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