

SUPPES–STYLE SEQUENT CALCULUS FOR PROBABILITY LOGIC

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Abstract. Deduction relation naturally connecting a set Γ of hypotheses with a conclusion A , usually denoted by $\Gamma \vdash A$, presents a basic notion of traditional logic. The framework of approximative and vague reasoning needs a new concept of such a connection enabling to express that 'A follows from Γ with probability p '. In this paper, following the Gentzen's approach to the formalization of the deduction relation, we introduce a system **LKprob**(ε) making it possible to work with the expressions of the form $\Gamma \vdash^n \Delta$, a generalization of Gentzen's sequents $\Gamma \vdash \Delta$ enriched by the Suppes–style formulae, meaning that 'the truthfulness probability of the sequent $\Gamma \vdash \Delta$ is greater than or equal to $1 - n\varepsilon$ ', for a given small real $\varepsilon > 0$ and any natural number n . We prove that our system is sound and complete with respect to the Carnap–Popper–type probability models.

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