

Proof terms for the existential quantifier

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In this talk I will discuss various proof terms that have been proposed for the existential quantifier. Standardly, and familiar from the Curry Howard Calculus, a proof term for $\exists x (x)$ (a, p) where a is a constant and p is a proof of (a) . This object has been developed in the intuitionistic calculus and straightforwardly extends to substructural Logics. An alternative family of proof terms has been suggested by Ruy de Queiroz and Dov Gabbay within the framework of Gabbay's Labelled Deductive Systems.

This framework allows for structurally very rich proof terms intended to supply terms also for classical predicate logic. A third class of terms is under development by me and derives from the treatment of existential quantification in the epsilon calculus. Standardly epsilon terms are interpreted by choice functions and these are typically geared towards classical logic. I will outline a theory of proof-objects for formulas with epsilon terms in which the "proof: proposition" pairs are extended with "construction:object" pairs where the interpretation 'proposition P is true if it has a proof' has the analogon 'object O' exists (in the domain) if it has a construction.