Parallel Session: Proof Theory

Organizer: José Espírito Santo (University of Minho)

May 18, 2021

Categorical models of Linear Logic with fixed points of formulas

Thomas Ehrhard[1],

[1] University of Paris

Propositional Linear Logic with least and greatest fixed points (muLL) is a very expressive system where Gödel's System T can be embedded and where many interesting inductive and co-inductive types can be defined. We introduce this system and present its categorical semantics based on Seely categories and on strong functors acting on them. We exhibit two simple instances of this setting. In the first one, which is based on the category of sets and relations, least and greatest fixed points are interpreted in the same way. In the second one, based on a category of sets equipped with a notion of totality (non-uniform totality spaces) and relations preserving it, least and greatest fixed points have distinct interpretations. This latter model shows that muLL enjoys a denotational form of normalization of proofs. Joint work with Farzad Jafarrahmani.