



**Mês de:           OUTUBRO 2012**

## **SEMINÁRIO DE LÓGICA MATEMÁTICA**

**Dia 4 de Outubro (quinta-feira), às 17h, na Sala B3-01**

Atomic Polymorphism.

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**Abstract:**

In the early seventies, Jean-Yves Girard and John Reynolds introduced, independently, quantification over types in the lambda-calculus, developing the well-known system F.

The primitive version of this system is very elegant, with only two generators of types (formulas): implication and second-order universal quantification. This shortage of generators does not limit the logic. Dag Prawitz showed how to introduce the remaining logical connectives being the full intuitionistic propositional calculus interpretable in F.

System F is impredicative since second-order quantifications may instantiate arbitrary types. Due to this impredicative feature of the system, Girard's proof of strong normalization of F is a somewhat delicate affair, making use of the reducibility candidates strategy.

In this talk we are interested in the restriction of F to atomic universal instantiations which we denote by system Fat.

Fat still interprets the full intuitionistic propositional calculus, via the very same definitions of Prawitz, relying crucially on the so-called phenomenon of instantiation overflow.

The predicativity of Fat greatly simplifies the normalization argument. We show how a strong normalization proof of Fat with respect to beta-eta- conversions results quite naturally from an adaptation of Tait's technique of reducibility ("convertibility", in Tait's original terminology).

From the above mentioned strong normalization of Fat, we present a novel and perspicuous proof of strong normalization of the full intuitionistic propositional calculus with the standard beta-conversions (using its embedding into Fat).

This is joint work with Fernando Ferreira.

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