Programme

18 January 2018

10.00 - 10.50 Gerhard Jäger, *Theories around $\Gamma_0$ – again*
10.50 - 11.20 Coffee
11.20 - 12.10 Michael Bärschi, *Uniform fixpoint variants in second order arithmetic*
12.10 - 13.00 Takako Nemoto, *Baire category theorem and nowhere differentiable continuous functions*
13.00 - 15.00 Lunch
15.00 - 15.50 Silvia Steila, *SCT through the reverse mathematical looking glasses*
15.50 - 16.40 Samuele Maschio, *Consistency of the intensional level of the Minimalist Foundation with Church’s Thesis and Axiom of Choice*
16.40 - 17.10 Coffee
17.10 - 18.00 Beatrice Donati, *Detecting Domain-Specific Ambiguities: An NLP Approach Based on Wikipedia Crawling and Word Embeddings*

19 January 2018

10.00 - 10.50 Hajime Ishihara, *Coequalisers in the category of basic pairs*
10.50 - 11.20 Coffee
11.20 - 12.10 Riccardo Bruni, *Computations Over Revision Graphs*
12.10 - 13.00 Franziskus Wiesnet, *Limit Values in the Signed Digit Representation*

Abstracts

Beatrice Donati

Ambiguity is at the same time a strength and a weakness when it comes to natural language processing. How can we keep intact the expressive power of our language and, at the same time, prevent misunderstandings related to ambiguous terms? We want to present a novel approach based on wikipedia crawling and word-embeddings designed to identify domain-specific ambiguities. This method (and the related software) is aimed primarily at those who deal with sensitive contexts, such as software requirements specifications, legal notes, medical documents. We implemented a first version of our tool and our preliminary experiments show promising results.

Hajime Ishihara

Ishihara and Kawai constructed coequalisers in the category BP of basic pairs in an extension of the constructive Zermelo-Fraenkel set theory (CZF), founded by Aczel, using the notion of a set-generated class and its characterisation by a generalised geometric theory introduced in Aczel et al. In this talk, we propose a kind of the non-deterministic inductive definition principle (NID) introduced by van den Berg, and show that it is in between NID for elementary rules and that for nullary rules introduced by Ishihara and Nemoto, and that it is equivalent to the existence of coequalisers in BP over a subsystem of CZF.

Samuele Maschio

Joint work with Hajime Ishihara, Maria Emilia Maietti and Thomas Streicher.

Consistency with the formal Church thesis (CT) and the axiom of choice (AC) was one of the requirements asked to the intensional level of a two-level foundation for constructive mathematics as proposed by M.E. Maietti and G. Sambin in 2005. Here we show that this is the case for the intensional level of the two-level Minimalist Foundation (MF) completed in 2009 by M.E. Maietti. The intensional level of MF consists of an intensional type theory à la Martin-Löf, called mTT. The consistency of mTT with CT and AC is obtained by showing the consistency with the formal Church thesis of a fragment of intensional Martin-Löf’s type theory, called MLtt1, where mTT can be easily interpreted. Then, in order to show the consistency of MLtt1 with CT, we interpret it within Feferman’s predicative theory of non-iterative fixpoints $\hat{ID}_1$ by extending the well known Kleene’s realizability semantics of intuitionistic arithmetics.
In constructive mathematics, Baire Category Theorem has at least following two forms:

A. Let \( \{U_n\} \) be a sequence of dense open sets in a complete metric space \( X \). Then the intersection \( U = \bigcap_{n \in \mathbb{N}} U_n \) is also dense in \( X \).

B. Let \( \{V_n\} \) be a sequence of nowhere dense closed sets in a complete metric space \( X \). Then the union \( V = \bigcup_{n \in \mathbb{N}} V_n \) is also nowhere dense in \( X \).

In [1], a constructive proof of A is given. In this talk, we will show that there exist nowhere differentiable continuous functions densely in \( C[0,1] \), using the above A.