

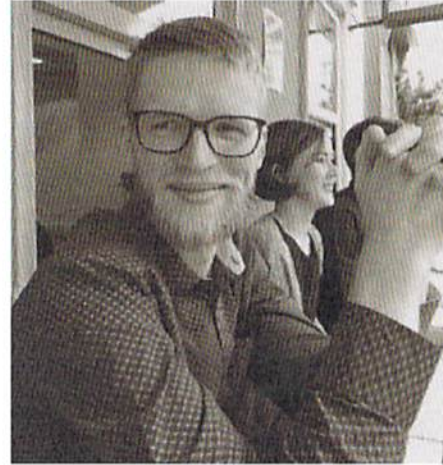
COMPUTABILITY SEMINAR

Guest Speaker: Dino Rossegger
Vienna University of Technology

Date: Thursday, October 5, 2017

Time: 2:00 PM

Location: 125 Hayes-Healy Hall



Lecture Title:

The complexity of embeddings between bi-embeddable structures

Abstract

In mathematics one usually considers structures up to isomorphism. However, if one wants to study computational properties of structures this classification is too coarse, and classifying structures up to computable isomorphism, probably relative to some oracle, is more robust. The most prominent notions in this line of research, which started over half a century ago, are Δ_α^0 categoricity, relative Δ_α^0 categoricity and degrees of categoricity.

In my talk I will give a quick overview over this line of research and present ideas and results obtained in joint work with Nikolay Bazhenov, Ekaterina Fokina, and Luca San Mauro on the complexity of embeddings between bi-embeddable computable structures. Instead of classifying structures up to effective isomorphism, we are interested in their classification up to effective bi-embeddability. We study notions similar to the above but for bi-embeddability: Δ_α^0 b.e. categoricity, relative Δ_α^0 b.e. categoricity, and degrees of b.e. categoricity. We focus on the class of equivalence structures and show that any structure in this class has degree of b.e. categoricity $\mathbf{0}$, $\mathbf{0}'$ or $\mathbf{0}''$. This mirrors unpublished results of Csimá and Ng on the degrees of categoricity of equivalence structures.

The notions of Δ_α^0 b.e. categoricity and relative Δ_α^0 b.e. categoricity behave differently than the classical notions. We give examples of equivalence structures which are (relatively) computably categorical but not (relatively) computably b.e. categorical and vice versa. In fact, the complexity may differ quite a bit; we construct a graph that is Δ_2^0 categorical but not Δ_α^0 b.e. categorical for any computable ordinal α .