

Informatik–Kolloquium SS 2023

Montag, 08.05.2023, 16.15 Uhr, Raum 02.152, Martensstr.3

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Univalent foundations for the formalization of (higher) category theory

Category theory is a mathematical theory of structures and their interactions. It was originally developed to axiomatize algebraic topology; in the meantime, it has proved useful as a language and infrastructure for organizing knowledge in many areas of mathematics, computer science, data science, biology, and more. The formulation of category theory in set-theoretic foundations has been seen as problematic: the notion of "sameness" between mathematical objects provided by set theory does not coincide with the fundamental notion of isomorphism in category theory. This divergence is exacerbated when considering higher-categorical structures, such as categories themselves.

In this talk, I explain how univalent foundations provides exactly the right setting in which to formalize category theory. In particular, equivalence of categories coincides with "sameness" of categories in the sense of univalent foundations. I am going to discuss two examples of the general theory developed in our paper/book "The Univalence Principle" (<https://arxiv.org/abs/2102.06275>), which will be published in Memoirs of the AMS.

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