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Categorification of Rule Algebras

lundi 28 novembre 2022 10:00 (45 minutes)

Reporting on joint work in progress with P.-A. Mellies and N. Zeilberger, I will present a novel approach to formalize operations in compositional rewriting systems wherein the number of ways to apply a rewrite is of interest. The approach is based upon defining a suitable double category to capture individual rewriting steps as its 2-cells, requiring in addition certain fibrational properties to hold for the functors of vertical source and target as well as of horizontal composition of cells. Counting numbers of realizations of individual rewriting steps or sequences rewrites is then implemented via a presheaf calculus over 2-cells. I will demonstrate how the notion of rule algebra representations is captured in this calculus and how the rule algebras themselves are categorified via a categorical construction involving coends.

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