

Univalent Models of a Non-Associative Composition

My master's thesis¹ at the University of Cambridge, supervised by [Jon Sterling](#).
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Abstract

Mixing call-by-name and call-by-value evaluation orders in a single programming language gives rise to a composition which is non-associative. To model such semantics, one may use [Munch-Maccagnoni's duploids](#), category-like structures that relax the associativity of composition. We study and formalize duploids in homotopy type theory/univalent foundations. Our work includes a definition of what it means for a duploid to be *univalent*: that isomorphisms of a suitable kind render the objects indistinguishable to the type theory. We show that the existing construction of a duploid from an adjunction fails to be univalent as a “single-sorted” duploid, and provide a novel construction which is. This work is formalized in the [UniMath](#) library for the [Rocq](#) proof assistant.

Bibtex

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¹Or rather, the report for my “Part III Project”.