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*A new model of type theory*

One question concerning the recently uncovered connections between intensional type theory, homotopy theory and higher category theory which has not yet been fully answered is the following: from a homotopy-theoretic point of view, how special are the higher categorical structures to which the type theory gives rise? More explicitly, are these structures general enough to encompass all homotopy types or do they have properties which prevent this?

I will discuss a model of type theory which, at least in low dimensions, offers an approach to this problem. Technically, the model is constructed through a form of gluing along the functor from the syntactic category of the type theory to the category of groupoids (which associates to a type its syntactic groupoid). The model allows us to establish proof-theoretic facts about the type theory, which in turn have useful homotopy-theoretic interpretations. The main application is then a characterization of the homotopy-theoretic behaviour in dimension one of the categorical structures arising from the type theory.

This is joint work with Michael Warren.