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The formal category theory of quasi-categories

Quasi-categories (aka ∞-categories) are convenient models of categories weakly enriched in spaces. Analogs of the standard categorical theorems involving limits and colimits, adjunctions, equivalences, and so forth have been proven by Joyal, Lurie, and others. The goal of this talk is to describe a new ground-level approach that allows for "formal" re-proofs of these facts that requires only very mild model categorical input and hence can be interpreted in other higher categorical contexts. The general strategy involves mediating between simplicially enriched universal properties and 2-categorical universal properties. A key technical observation is that there exist certain weak 2-limits in the strict 2-category of quasi-categories whose universal properties is robust enough to do formal category theory. We illustrate with as many sample proofs as time permits. This is a progress report on ongoing joint work with Dominic Verity.