Limit-sketchable infinity categories

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Abstract.

A presentable ∞-category is an accessible localization of an ∞-category of presheaves over some small ∞-category. Presentable ∞-categories play a key role in the study of higher topoi [2], stable ∞-categories and higher algebra. In ordinary category theory, a limit sketch is a categorical formalization of the notion of an essentially algebraic theory. The Representation Theorem of Adámek and Rosický [1] states that locally presentable categories are equivalent to categories of models of limit sketches.

In our research, we prove an analogous representation theorem in the context of ∞-categories, by showing that an ∞-category is presentable if and only if it is limit-sketchable. Moreover, we show that numerous ∞-categories, including complete Segal spaces, ∞-operads, E_∞-algebras, spectra, and infinite loop spaces, can be constructed as ∞-categories of models of limit sketches. Our representation theorem yields explicit presentable structures underlying each of the examples that we consider. This is joint work with Carles Casacuberta and Javier J. Gutiérrez.

References

[1] J. Adámek and J. Rosický. *Locally Presentable and Accessible Categories*. Vol. 189. Cambridge University Press, 1994

[2] J. Lurie. *Higher Topos Theory*. Annals of Mathematics Studies 170. Princeton University Press, 2009.