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Fixed Point Properties in Homotopy Type Theory

Homotopy type theory is a formal system for homotopy-coherent mathematics which can be interpreted in any $(\infty, 1)$ -topos. We investigate what it means for a space to have the property "every self-map has a fixed point" in this system, inspired by work of Szymik in the category of topological spaces. After constructing counterexamples, we show that classifying spaces of non-Abelian finite simple groups satisfy this property. Along the way, we compute the homotopy groups of the space of maps into a classifying space in homotopy type theory. Our results are formalised in the Rocq proof assistant.

This talk is based on joint work with Dan Christensen.