

Real-time Formalization of Mathematics

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Abstract

Formalization is the process of typing mathematical proofs into a computer, which checks that they're correct right down to the axioms of mathematics. So is it possible to formalize modern theorems in combinatorics, algebra or geometry, in "real time" (by which I mean months rather than decades)? For combinatorics the answer is "absolutely yes", for algebra it's "maybe" and for geometry we still have a long way to go. I will discuss various examples of formalizations, ranging from modern results in combinatorics to IMO geometry problems to work of Clausen and Scholze on liquid vector spaces, and raise some questions about where all this stuff might be going.

Keywords: formalization, axioms, computer proofs, International Mathematical Olympiad, liquid vector space.