




Machine-Checked Computational Mathematics

Assia Mahboubi   

Nantes Université, École Centrale Nantes, CNRS, INRIA, LS2N, UMR 6004, F-44000 Nantes, France

Vrije Universiteit Amsterdam, The Netherlands

Abstract

This talk shall discuss the potential impact of formal methods, and in particular, of interactive theorem proving, on computational mathematics.

Geared with increasingly fast computer algebra libraries and scientific computing software, computers have become amazing instruments for mathematical guesswork. In fact, computer calculations are even sometimes used to substantiate actual reasoning steps in proofs, later published in major venues of the mathematical literature. Yet surprisingly, little of the now standard techniques available today for verifying critical software (e.g., cryptographic components, airborne commands, etc.) have been applied to the programs used to produce mathematics. In this talk, we propose to discuss this state of affairs.

2012 ACM Subject Classification Computing methodologies → Theorem proving algorithms; Theory of computation → Type theory

Keywords and phrases Type theory, computer algebra, interactive theorem proving

Digital Object Identifier 10.4230/LIPIcs.CALCO.2023.5

Category Invited Talk

Funding This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No. 101001995).



© Assia Mahboubi;

licensed under Creative Commons License CC-BY 4.0

10th Conference on Algebra and Coalgebra in Computer Science (CALCO 2023).

Editors: Paolo Baldan and Valeria de Paiva; Article No. 5; pp. 5:1–5:1

Leibniz International Proceedings in Informatics



LIPICs Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany