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Formal Methods Online: Sequent Calculus Verifier (SeCaV)

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Abstract

We present the Sequent Calculus Verifier (SeCaV) and discuss its advantages and disadvantages as a tool for teaching logic, automated reasoning and formal methods. SeCaV is a formalization in the proof assistant Isabelle/HOL of classical first-order logic with constants and functions. The syntax, the semantics and the inductive definition of the sequent calculus proof system along with the soundness and completeness proofs are verified in Isabelle/HOL.

SeCaV is accompanied by the SeCaV Unshortener, which is a browser application for developing sequent calculus proofs that are automatically translated into the corresponding Isabelle-embedded proofs. A compact format for the one-sided sequent calculus is used. The system provides feedback on proof rule applications. Online help and examples are available. Hundreds of computer science students have used SeCaV for course exercises and exams.

Reference: <https://secav.compute.dtu.dk/>

Name: Sequent Calculus Verifier (SeCaV)

Link: <https://secav.compute.dtu.dk/>

Area: Proof systems in logic

Content:

Construction of formal proofs in sequent calculus with automatic translation to Isabelle/HOL and feedback on proof rule applications.

Usage:

Interactive web application with proofs written in a simple textual syntax. The tool is free to use for everyone, and help and examples are available as part of the tool.

Paper:

SeCaV: A Sequent Calculus Verifier in Isabelle/HOL

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