Extending Sledgehammer with SMT Solvers

**Jasmin Christian Blanchette · Sascha Böhme ·
Lawrence C. Paulson**

Abstract Sledgehammer is a component of Isabelle/HOL that employs resolution-based first-order automatic theorem provers (ATPs) to discharge goals arising in interactive proofs. It heuristically selects relevant facts and, if an ATP is successful, produces a snippet that replays the proof in Isabelle. We extended Sledgehammer to invoke satisfiability modulo theories (SMT) solvers as well, exploiting its relevance filter and parallel architecture. The ATPs and SMT solvers nicely complement each other, and Isabelle users are now pleasantly surprised by SMT proofs for problems beyond the ATPs' reach.

1 Introduction

It is widely recognized that combining automated reasoning systems of different types can deliver huge rewards. There have been several attempts to combine

---

J. C. Blanchette (✉) · S. Böhme
Institut für Informatik, Technische Universität München, Munich, Germany
e-mail: blanchette@in.tum.de

S. Böhme
e-mail: boehmes@in.tum.de

L. C. Paulson
Computer Laboratory, University of Cambridge, Cambridge, UK
e-mail: lp15@cam.ac.uk