Automated Deduction – A Basis for Applications

Volume III Applications

edited by

WOLFGANG BIBEL

Darmstadt University of Technology, Germany

and

PETER H. SCHMITT

University of Karlsruhe, Germany



KLUWER ACADEMIC PUBLISHERS

DORDRECHT / BOSTON / LONDON

TABLE OF CONTENTS

VOLUME III: APPLICATIONS

Affiliations of the Authors	xi
PART ONE / AUTOMATED THEOREM PROVING I MATHEMATICS	N
MICHAEL KOHLHASE / Introduction	3
CHAPTER 1. INGO DAHN / Lattice-ordered Groups in Deduction	9
CHAPTER 2. JÜRGEN STUBER / Superposition Theorem Proving for Commutative Rings	31
CHAPTER 3. HANS JÜRGEN OHLBACH AND JANA KÖHLER / How to Augment a Formal System with a Boolean Algebra Component	57
CHAPTER 4. MANFRED KERBER / Proof Planning: A Practical Approach to Mechanized Reasoning in Mathematics	77
PART TWO / AUTOMATED DEDUCTION IN SOFTWARE ENGINEERING AND HARDWARE DESIGN	ARE
JOHANN SCHUMANN / Introduction	99
CHAPTER 5. CHRISTOPH KREITZ / Program Synthesis	105
CHAPTER 6. JÜRGEN GIESL, CHRISTOPH WALTHER AND JÜRGEN BRAUBURGER / Termination Analysis	105
for Functional Programs	135

GANG AHRENDT / The WAM Case Study: Verifying Compiler Correctness for Prolog with KIV	165
CHAPTER 8. INGO DAHN AND JOHANN SCHUMANN / Using Automated Theorem Provers in Verification of Protocols	195
CHAPTER 9. WOLFGANG REIF AND GERHARD SCHELLHORN / Theorem Proving in Large Theories	225
CHAPTER 10. FRIEDER STOLZENBURG AND BERND THOMAS / Analyzing Rule Sets for the Calculation of Banking Fees by a Theorem Prover with Constraints	243
CHAPTER 11. BERND FISCHER, JOHANN SCHUMANN AND GREGOR SNELTING / Deduction-Based Software Component Retrieval	265
CHAPTER 12. REINHARD BÜNDGEN / Rewrite Based Hardware Verification with ReDuX	293
INDEX	317