Preface

SCSS 2024 is the 10th edition of the *10th International Symposium on Symbolic Computation in Software Science.* The symposium aims to promote research on the theoretical and practical aspects of symbolic computation in software science in the context of modern computational and artificial intelligence techniques. It will be held in Tokyo from August 28 to 30.

The symposium has three main types of presentations:

- the keynote and invited talks
- formal full papers
- works in progress.

This volume contains the record of the Work in Progress of SCSS 2024. The formal full papers and the abstracts of the keynote and invited talks appear in the Springer Lecture Notes series as LNAI 14991.

What is the meaning of the symposium name "symbolic computation in software science"? Symbolic computation is the science of computing with symbolic objects (terms, formulae, programs, representations of algebraic objects, and so on). Powerful algorithms have been developed during the past decades for the significant subareas of symbolic computation: computer algebra and computational logic. These include resolution proving, model checking, provers for various inductive domains, rewriting techniques, cylindrical algebraic decomposition, Gröbner bases, characteristic sets, and telescoping for recurrence relations. These algorithms and methods have been successfully applied in various fields. Software science has the goal of applying scientific principles in the development of software and covers a broad range of topics in software construction and analysis. One of the main objectives is to enhance software quality. The SCSS meetings bring these fields together, allowing the ideas from each to enhance the other.

Over the years, the scope of SCSS has evolved, incorporating new research themes that drive progress in symbolic computation in software science. Some of the recurring topics in the SCSS meetings have been:

- Theorem proving methods and techniques
- Algorithm synthesis and verification
- Formal methods, including for the analysis of network security
- Complexity analysis and termination analysis of algorithms
- Extraction of specifications from algorithms
- Generation of inductive assertions for algorithms
- Algorithm transformations
- Component-based programming
- Symbolic methods for semantic web and cloud computing.

The present instance of SCSS builds on these themes.

The abstracts and papers presented here emphasize symbolic computation, formal systems, and applications of formal methods. After fifteen years, the foundational framework stands firm, continually incorporating innovative developments in SCSS domains.

August 2024

Katsusuke Nabeshima
Stephen M. Watt

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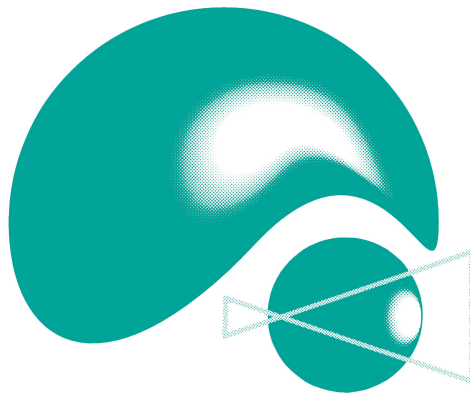
Table of Contents