

Preface

The articles contained in this volume were presented at the 9th International Workshop on Numerical Software Verification (NSV), held during July 17–18, 2016, in Toronto, Ontario, Canada. The NSV workshop is alternatively collocated with the International Conference on Computer Aided Verification (CAV) and the Cyber-Physical Systems Week (CPSWeek). In 2016, NSV was organized jointly with the 28th International Conference on Computer Aided Verification.

Numerical computations are ubiquitous in digital systems: supervision, prediction, simulation, and signal processing rely heavily on numerical calculus to achieve desired goals. The design and verification of numerical algorithms have a unique set of challenges, which set it apart from rest of software verification. To achieve the verification and validation of global properties, numerical techniques need to precisely represent the local behaviors of each component. The implementation of numerical techniques on modern hardware adds another layer of approximation because of the use of finite representations of infinite precision numbers that usually lack basic arithmetic properties such as commutativity and associativity. Finally, the development and analysis of cyber-physical systems that involve the interacting continuous and discrete components pose a further challenge. It is hence imperative to develop logical and mathematical techniques for reasoning about programmability and reliability. The NSV workshop is dedicated to the development of such techniques.

The papers of the edition were reviewed by the Program Committee, whose help is gratefully acknowledged. The invited speakers at NSV 2016 were Alessandro Abate (University of Oxford, UK), Thomas Heinz (Robert Bosch GmbH, Germany), Eric Feron (Georgia Institute of Technology, USA), Behzad Samadi (Maplesoft, Waterloo, Ontario, Canada), Yassamine Seladji (University of Tlemcen, Algeria), and Cesare Tinelli (University of Iowa, USA).

The first eight NSV meetings were held in Princeton, New Jersey, collocated with CAV (2008), San Francisco, California, collocated with CPSWeek (2009), Edinburgh, UK, collocated with FLoC (2010), Salt Lake City, Utah, collocated with CAV (2011), Berkeley, California, collocated with CAV (2012), Philadelphia, Pennsylvania, collocated with CPSWeek (2013), Vienna, Austria, collocated with CAV (2014), and Seattle, Washington, collocated with CPSWeek (2015).

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