

# Preface

This volume contains proceedings of the 4th International conference on Tools and Methods of Program Analysis (TMPA 2017).

The challenges of software quality are essential for the majority of high-tech industries including IT, finance, transportation, medicine, and many others. The purpose of the conference is to raise the awareness of progress in software development and to promote innovations in software testing, analysis, and verification.

The conference was held in Moscow during March 3–4, 2017, and gathered senior and postgraduate students, young and renowned scientists from academia, as well as industry researchers and practitioners from leading software development firms whose professional interests intersect with the topics of the conference.

The key topics of TMPA are software test automation; static program analysis; verification; dynamic methods of program analysis; testing and analysis of parallel and distributed systems; testing and analysis of high-load and high-availability systems; tools for software analysis, testing, and verification; analysis and verification of hardware and software systems; methods of building quality software.

The TMPA 2017 Program Committee included more than 70 researchers in the field of software testing, engineering and verification from 14 countries: Australia, Austria, Brazil, Canada, France, Germany, Italy, Japan, Russia, Spain, Sweden, The Netherlands, the UK, and the USA.

This year, the TMPA Program Committee received 51 submissions from Russia, Germany, France, Austria, Japan, Turkey, and the USA. After the independent reviewing process, 17 papers were accepted as regular papers. The acceptance rate of this volume is around 33%. Each paper was reviewed by at least three PC members.

The conference program included three keynote talks, two industry talks, as well as presentations of full and short papers that had been selected for publication in the proceedings during the independent reviewing process.

## *Keynote talks:*

1. “The Quest for Average Response Time” by Thomas A. Henzinger, President, IST Austria (Institute of Science and Technology Austria)
2. “Stemming Architectural Decay in Software Systems” by Nenad Medvidovic, Professor, University of Southern California and ACM SIGSOFT Executive Committee Chair
3. “Vellvm — Verifying the LLVM” by Steve Zdancewic, Professor, University of Pennsylvania

## *Industry talks:*

1. “Software Testing in Market Infrastructures” by Iosif Itkin, co-CEO and co-founder of Exactpro
2. “Live Testing Distributed System Fault Tolerance with Fault Injection Techniques” by Vadim Zherder of Moscow Exchange and Alexey Vasyukov of Inventa

The conference was co-organized by a number of Russian research universities and centers: National Research University Higher School of Economics, Institute for System Programming, Federal Research Center Computer Science & Control, Peter the Great St. Petersburg Polytechnic University and Exactpro, a fully owned subsidiary of the London Stock Exchange Group that specializes in quality assurance for exchanges, investment banks, brokers, and other financial sector organizations.

TMPA 2017 was marked by a series of “firsts”. For the first time, the TMPA conference was held in Moscow and in cooperation with ACM SIGSOFT and Springer. It was the first time that the submissions and the talks were in English.

We would like to express our gratitude to all the authors of submitted papers, and the members of the Program Committee, for their efforts in providing exhaustive reviews.

A separate thank you goes to the Moscow Exchange — the gold sponsor of TMPA — for their support. We deeply appreciate the participation of all the invited speakers and industry representatives.

We are grateful to all the staff of the companies that helped in all the stages of organizing TMPA 2017.

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