Message from the Workshop Chairs

SBST 2017

There is a growing realization that optimization can be applied to many aspects of the software development process - a research area known as Search Based Software Engineering (SBSE). Search Based Software Testing — one of the largest research areas within SBSE — is the process of using search-based optimization algorithms to specifically address problems in software testing. SBST has been applied to a wide variety of testing goals including structural, functional, non-functional and state-based properties. Many approaches to testing and a wide diverse range of development domains have been addressed, including exceptions, interactions, integration, mutation, regression, and web applications.

Work in SBST has developed to the point at which it is now ripe for combination with other areas of software engineering. The common “lingua franca” that makes these combinations possible is the definition of the fitness function that guides a search algorithm. A fitness function is merely a form of a metric, and metrics exist across the entire software engineering spectrum. Therefore, the central objective of this workshop is to bring together researchers and industrial practitioners from SBST and the wider software engineering community to share experience and provide directions for future research, and to encourage the use of search techniques to combine aspects of testing with other aspects of the software engineering lifecycle.

SBST is a two-day workshop aimed at bringing testing researchers together with the broader software engineering community to discuss state-of-the-art work and set new research directions. The workshop will consist of two keynote addresses, several technical paper sessions, a tutorial and a special session with invited papers on the Future of SBST.

Mark Harman (University College London) and Tanja Vos (Universitat Politècnica de València) will give keynote addresses. Following time for questions, we will ask the speakers to raise issues arising from their talk for participants to discuss. Lionel Briand (University of Luxembourg) will give a tutorial on Search-based Testing for Cyberphysical Systems. This tutorial focuses on the application of search-based testing to cyber-physical systems, identifying specific testing problems in the context of such systems. He will also address the advantages and limitations of metaheuristic search when automating test case generation and failure detection.

Three types of contributions were sought after, including:

- Full papers on original research - either empirical or theoretical - in SBST, practical experience of using SBST, or SBST tools.

- Short papers that describe novel techniques, ideas and positions that have yet to be fully developed; or are a discussion of the importance of a recently published SBST result by another author in setting a direction for the SBST community, and/or the potential applicability (or not) of the result in an industrial context.

- Position papers that analyze trends in SBST and raise issues of importance. Position papers are intended to seed discussion and debate at the workshop.

Each paper was reviewed by at least three PC members and evaluated according to the criteria of relevance, novelty, soundness, and ability to spark discussion. Additionally, we have organized a tool competition where we invited researchers, students, and tool developers to design innovative new
approaches to software test generation. The developers of these tools will present their techniques and results during the workshop.

As we have reached the 10th edition of the SBST workshop, we have invited distinguished researchers from the SBST community to present invited papers on Reflections and Future of the Search-Based Testing. The purpose of these contributions was to reflect on the most important achievements of the SBSE community in the last 10 years (i.e. since the workshop started), or identify the most challenging research topics.

The provisional program is as follows:

**Day 1:**
- 8:45 - 9:00am: Introduction
- 9:00 - 10:30am: Keynote: Tanja Vos
- 10:30 - 11:00am: Coffee Break
- 11:00 - 12:30pm: Paper Session:
  - "Inferring Automatic Test Oracles" - W. Langdon, Shin Yoo and Mark Harman
  - "Searching for Behavioural Bugs with Stateful Test Oracles in Web Crawlers" - Oussama Beroual, Francis Guérin and Sylvain Hallé
  - "An Analysis of the Suitability of Test-based Patch Acceptance Criteria" - Luciano Zemín, Simón Emmanuel Gutiérrez Brida, Ariel Godio, César Cornejo, Renzo Degiovanni, Germán Regis, Nazaren Aguirre and Marcelo Frias
- 12:30 - 2:00pm: Lunch
- 2:00 - 3:30pm: Tutorial: Lionel Briand
- 3:30 - 4:00 pm: Coffee Break
- 4:00 - 5:30pm: Competition Session:
  - "Java Unit Testing Tool Competition - Fifth Round" - Annibale Panichella and Urko Rueda
  - "EvoSuite at the SBST 2017 Tool Competition" - Gordon Fraser, Jose M. Rojas, Jose Campos and Andrea Arcuri
  - "JTeXpert at the SBST 2017 Tool Competition" - Abdelilah Sakti, Gilles Pesant, Yann-Gaël Guéhéneuc

**Day 2:**
- 9:00 - 10:30am: Keynote: Mark Harman
- 10:30 - 11:00am: Coffee Break
- 11:00 - 11:30am: Steering Committee Meeting
- 11:30 - 12:30pm: Paper Session:
  - "The Use of Automatic Test Data Generation for Genetic Improvement in a Live System" - Saemundur Oskar Haraldsson, John Woodward and Alexander Brownlee
- 12:30 - 2:00pm: Lunch
- 2:00 - 3:30 pm: Future of SBST:
  - "The Evolutionary Landscape of SBST: a 10 Year Perspective" - Myra Cohen
  - "Is Search-based Test Generation Research Stuck in a Local Optimum?" - Jose M. Rojas and Gordon Fraser
- 3:30 - 4:00pm: Coffee Break
- 4:00 - 5:30pm: Awards and Closing Remarks
We are grateful to all authors for their submissions to SBST 2017, and to the Program and Steering Committee members for their valuable time and effort in reviewing the submitted papers. Thank you, and we hope that you enjoy this year’s workshop.

Justyna Petke and Juan P. Galeotti
SBST 2017 Co-chairs