Università
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**Faculty
of Informatics**

ISSTA 2013

July 15-20, 2013 Lugano, Switzerland

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ISSTA 2013
July 15-20, 2013 Lugano, Switzerland

It is our great pleasure to welcome you to Lugano for ISSTA 2013, the 22nd International Symposium on Software Testing and Analysis. The ISSTA 2013 program includes keynotes, a doctoral symposium, technical papers and workshops.

Many people worked hard to bring ISSTA 2013 to fruition.
We thank the authors and the keynote speakers who provided such excellent work and the program committee for their excellent reviews and time and expertise in evaluating all submissions.
We thank the workshop organisers for their work in bringing their workshops to the ISSTA week and Paolo Tonella and the Doctoral Symposium committee for their work in helping to develop the next generation of researchers.

We would also like to thank

Leonardo Mariani, the workshop Chair,
Gordon Fraser, the Publicity Chair,
Mauro Prevostini, the Financial Chair,
Giacomo Toffetti Carughi, the Webmaster,
Elisa Larghi and Janine Caggiano, from the USI Dean's office
Rosario Maccarrone, for the promotion material, and
Tania Vanetti, the Graphic.

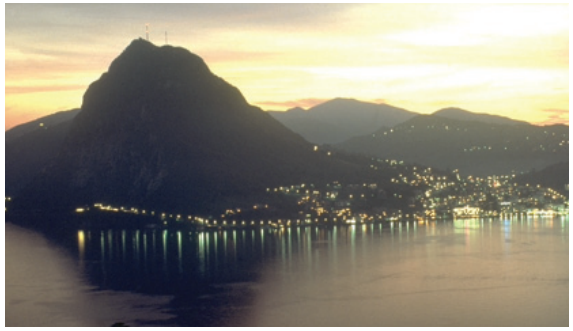
Without their valuable contributions ISSTA 2013 would have been greatly impoverished, both financially and intellectually.

We also gratefully acknowledge the ISSTA sponsor (ACM SIGSOFT) and the Università della Svizzera Italiana, Faculty of Informatics for their sponsorship and support.
We sincerely thank the ISSTA corporate supporters for their generous contributions:

UBS, Hasler Foundation (Gold donors)
Orange (Silver donors)
Città di Lugano, Gai & Partner, IBM, Google and UCL CREST center (Bronze donors).
We would also like to acknowledge Dirk Beyer and other anonymous employees at Conference Publishing, the proceedings-processing vendor for their timely support and contribution to the preparation of the conference proceedings.

Finally, we want to thank all of the conference attendees for contributing to making the conference a success.
We hope that you will find the ISSTA 2013 program intellectually stimulating and practically valuable, helping you to continue to improve the quality, safety and reliability of the `global software system skin', on which we all depend.

Mark Harman (PC) and Mauro Pezzè (GC)



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W#	ACRONYM	TITLE	ROOM (Red Building)
W1	QuoMBaT **merged with JAMAICA**	Quality of Model-Based Testing	A12
W2	QASBA	2nd International Workshop on Quality Assurance for Service-based Applications	A13
W3	JAMAICA	Joining AcadeMiA and Industry Contributions to testing Automation	A12
W4	TTC	Testing the Cloud	A14
W5	FutDeb	The Future of Debugging	A11

Quality of Model-Based Testing (QuoMBaT) - room A12 (Red Building)

The QuoMBaT workshop has been merged with the JAMAICA workshop. See the JAMAICA program for the exact schedule.

Organizers:
- Stephan Weißleder (Fraunhofer-Institute FOKUS)
- Barath Kumar (Institute of Industrial Information Technologies)
- Baris Güldali (University of Paderborn)
- David Faragó (Karlsruhe Institute of Technology)

Description:
Model-based testing (MBT) is an advanced testing technique that is becoming more and more popular in the software testing community. However, there is still a need for understanding and evaluating the capabilities & limitations of MBT approaches in order to adapt them in particular testing projects. The workshop on Quality of Model-Based Testing (QuoMBaT) addresses a crucial need for discussing the quality characteristics of MBT approaches: How can or should the quality of a newly proposed approach be measured? How can existing approaches be compared? What is the fault-detection capability of an automatically generated test suite compared to that of a manually produced one? Which kind of quality criteria are adequate? The objective of this second QuoMBaT workshop is to offer a forum for researchers and practitioners who are already working in this area or who are interested in exploring MBT.

Website:
The QuoMBaT website is available at
http://www.model-based-testing.de/quombat13

2nd International Workshop on Quality Assurance for Service-based Applications (QASBA) - room A13 (Red Building)

Organizers:
- Domenico Bianculli (University of Luxembourg)
- Sam Guinea (Politecnico di Milano)
- Sylvain Hallé (Université du Québec à Chicoutimi)
- Andrea Polini (ISTI CNR)

Description:
The service-oriented computing paradigm has been widely adopted in enterprises as a mean to implement distributed computing solutions. These solutions are realized as service-based applications (SBAs), by integrating heterogeneous software services, usually developed, controlled and owned by different organizations. Given the availability of mechanisms for run-time service discovery and binding, the service-oriented paradigm fosters a further level of dynamicity where service integration emerges at run time and evolves over time.

Nevertheless the run-time integration of services owned and controlled by different organizations, as well as the unprecedented degree of change allowed in such systems, affect the notion of correctness, dependability and quality of SBAs. This poses a challenge for the definition of new methodologies and techniques for the quality assurance process of this class of software. The consensus is that the quality assurance process has to span over the entire life cycle of a service-based application, integrating both design-time and run-time techniques; yet the approaches remain fragmented.

The QASBA 2013 workshop will be an opportunity for participants to discuss how the software testing and analysis research community can help address this and other relevant issues, to improve the quality assurance practice of the next generation SBAs.

Website:
The QASBA website is available at http://fmt.isti.cnr.it/qasba2013/

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QASBA Program

July 15	
8:00 - 9:00	Continental breakfast
9:00 - 9:15	Introduction to the workshop
9:15 - 10:15	Invited talk Tevfik Bultan: *Analyzing Interactions of Asynchronously Communicating Software Components*
10:15 - 10:30	Break-out session
10:30 - 11:00	Coffee Break
11:00 - 12:00	Paper Session - Quality Assurance at Design Time Abdulrahman Alreshidi, Steffen Zschaler and Peter Mcburney. *Towards a Refinement of Quality Modelling Language for Component-based Systems (QML/CS)* Selma Suloglu, Rıza Aktunc and Mustafa Yucefaydalı. *Verification of Variable Service Orchestrations using Model Checking*
12:00 - 12.30	Break-out session
12:30 - 14:00	Lunch
14:00 - 15:00	Invited talk Luciano Baresi: *Is runtime validation really needed?*
15:00 - 15:30	Break-out session
15:30 - 16:00	Coffee Break
16:00 - 17:30	Paper Session - Quality Assurance at Run Time Afef Jmal Maâlej, Zeineb Ben Makhlouf, Moez Krichen and Mohamed Jmaiel. *Conformance Testing for Quality Assurance of Clustering Architectures* Mariam Lahami, Moez Krichen and Mohamed Jmaiel. *Runtime Testing Framework for Improving Quality in Dynamic Service-based Systems* Shin Nakajima. *Safe Substitution for Service-based Applications*
17:30-17:45	Closing session

Joining AcadeMiA and Industry Contributions to testing Automation (JAMAICA) - room A12 (Red Building)

The QuoMBaT workshop has been merged with JAMAICA, which will host the presentation of the papers accepted at QuoMBaT.

Organizers:
- Gabriella Carrozza (Finmeccanica)
- Roberto Pietrantuono (Università degli Studi di Napoli Federico II)
- Vittorio Manetti (Finmeccanica)

Description:
In industrial software systems, testing activities account by now for more than 50% of total development effort. People strive to find solutions able to reduce such cost without compromising the final quality. A key role in this scenario is played by all those solutions pushing industry toward test automation. Although the importance of test automation is well-recognized, and the benefits it can bring to companies is a matter of fact, interactions between academia and industry are still very poor. On one hand, there are several theoretically sound solutions that however remain unapplied in real industrial settings; on the other hand, practitioners from industry do not take the risk of investing on new paradigms, methodologies, techniques and tools if they cannot feel immediate returns on business, time saving and company market advantage.

In such a vicious cycle, the JAMAICA workshop intends to foster the discussion on the current practices for automating testing activities in industry, so as to bring the attention of the community on the impact that such practices may have on the overall cost/quality trade-off and on the development cycle.

Methodological, technical, and practical solutions, tools and platforms for supporting automation, as well as concrete experiences and case-study in modern software systems will be presented and discussed, regarding all the type of test automation activities, including code-driven testing, model-based and model-driven testing, regression testing automation, prioritazation, oracle automation, and all practices, at several levels (unit, integration, system testing level, as well as at process level), oriented toward the minimization of manual error-prone activities in test cases generation and execution.

Website:
The JAMAICA website is available at http://www.jamaica-workshop.sesm.it

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QuoMBaT merged with JAMAICA Program

July 15	
9:00 - 9:10	Welcome from the Chairs
9:10 - 10:30	**Session 1 - "Testing Techniques"** Deepak Garg and Amitava Datta, *Early Detection of Faults related to Database Schematic Changes* Elisa Puoskari, Tanja Vos, Peter M. Kruse and Nelly Condori-Fernández, *Evaluating Applicability of Combinatorial Testing in an Industrial Environment: a case study* Johannes Weiss, *Introducing the QCEP-Testing System for Executable Acceptance Test Driven Development of Complex Event Processing Applications* Shadi Ghaith, *Automatic, Load-Independent Detection of Performance Regressions by Transaction Profiles*
10:30 - 11:00	Coffee Break
11:00 - 12:40	**Session 2 - "Model-based Testing"** Kazuki Munakata, Susumu Tokumoto and Tadahiro Uehara, *Model-based Test Case Generation using Symbolic Execution* Frank Elberzhager, Alla Rosbach and Thomas Bauer, *Analysis and Testing of Matlab Simulink Models: A Systematic Mapping Study* Marc-Florian Wendland, Marco Kranz, Christian Hein, Tom Ritter and Ana Garcia Flaquer, *Model-Based Testing in Legacy Software Modernization – An Experience Report* Michele Volpato and Jan Tretmans, *Towards Quality of Model-Based Testing in the ioco Framework* Atit Mishra, Manjunatha Rao and Yogananda Jeppu, *An Auto Review Tool for Model Based Testing of Safety Critical Systems*
12:40 - 14:00	Lunch Break
14:00 - 15:30	**Session 3 - "Test Automation Tools"** *Maurizio Leotta, Diego Clerissi, Filippo Ricca and Cristiano Spadaro, Comparing the Maintainability of Selenium WebDriver Test Suites Employing Different Locators: A Case Study* Vincenzo Ciriello, Gabriella Carrozza and Stefano Rosati, *Practical Experience and Evaluation of Continuous Code Static Analysis with CppTest* René Keimling, Christian Hansen and Attila Bilgic, *A system for automated testing in development of measuring devices for industrial process instrumentation* Vittorio Manetti and Luigi Martin Petrella, *FITNESS: a Framework for Automatic Testing of ASTERIX Based Software Systems*
15:30 - 16:00	Coffee Break
16:00 - 17:20	Invited Talk: Markus Schacher, *UML Testing Profile*
17:20 - 17:30	Closing Remarks

Testing The Cloud (TTC) - room A14 (Red Building)

Organizers:
- Eduardo Cunha de Almeida (Federal University of Paraná)
- Christina Thorpe (University College Dublin)
- Yves Le Traon (University of Luxembourg)
- Patrick O' Sullivan (IBM Dublin)
- Anthony Ventresque (University College Dublin)

Description:
Cloud computing is everywhere, inevitable: originally a layered abstraction of an heterogeneous environment, it has become the paradigm of a large-scale data-oriented system. And while it has some interesting features (easy deployment of applications, resiliency, security, performance, scalability, elasticity, etc.), testing its robustness and its reliability is a major challenge. The Cloud is an intricate collection of interconnected and virtualised computers, connected services, complex service-level agreements. From a testing perspective, the Cloud is then a complex composition of complex systems, and one can wonder whether anything like a global testing is possible? But if the answer is no, what can we conclude from partial tests? The question of testing this large, network-based, dynamic, composition of computers, virtual machines, servers, services, SLAs, seems particularly difficult. And critical for Cloud vendors: customers' trust is indeed crucial for companies implementing Clouds, and they have to ensure that the system has all the security and performance characteristics the marketing department highlights. This problem is a perfect example of cross concerns between academia and product companies, and it covers a broad range of topics, from software development to code analysis, performance monitoring to formal model for system testing, and so on.

In TTC we aim at bringing together researchers and practitioners interested in this difficult question of testing the cloud, ie. a complex distributed, dynamic and interconnected system. Hence we call for regular scientific submissions, but also for industrial experience feedbacks.

Website:
The TTC website is available at http://ttc2013.ucd.ie/

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TTC Program

July 15	
8:00 - 9:00	Breakfast and Registration
9:00 - 9:30	Introduction
9:30 - 10:30	Keynote: Ivona Brandic *Autonomic and SLA aware Cloud management*
10:30 - 11:00	Coffee Break
11:00 - 12:30	**Session 1: Academic Session** *On the Necessity of Model Checking NoSQL Database Schemas when building SaaS Applications* (Stefanie Scherzinger, Eduardo Cunha de Almeida, Felipe Ickert, Marcos Didonet Del Fabro) *Enabling large-scale testing of IaaS cloud platforms on the Grid'5000 testbed* (Sébastien Badia, Alexandra Carpen-Amarie, Adrien Lèbre, Lucas Nussbaum)
12:30 - 14:00	Lunch Break
14:00 - 15:30	**Session 2: Industrial Session I** *Testing a Cloud Application: IBM SmartCloud iNotes - Methodologies and Tools* (Michael Lynch, Thomas Cerqueus, Christina Thorpe) Keynote Speaker: Andreas Leitner, Google Zürich, Switzerland
15:30 - 16:00	Coffee Break
16:00 - 17:30	**Session 3: Industrial Session II** *Data Science in the Cloud Analysis of Data from Testing in Production* (Ross Smith, Robert Musson) Keynote Speaker: Ross Smith, Microsoft, Seattle, USA

The Future Of Debugging (FutDeb) - room A11 (Red Building)

Organizers:
- Satish Chandra (IBM Research India)
- Alessandro Orso (Georgia Institute of Technology)

Description:
The workshop on the future of debugging will bring together researchers and practitioners interested in the many challenges involved in debugging today's complex software systems. The focus of the workshop will be on computer-assisted techniques that can reduce the human skill and the effort required in diagnosing and fixing software defects. We will also explore synergies between debugging and closely related fields, such as specification discovery, verification, repository mining, and HCI.

The workshop will feature invited presentations from world leaders in the area of debugging, will examine current trends in automated software debugging, and will foster extensive discussions among the participants on these themes and trends.

Website:
The FutDeb website is available at https://sites.google.com/site/futdeb2013/

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The Future Of Debugging Program

July 15	
8:00 - 9:00	Opening remarks and overview
9:00 - 10:30	**Session 1** *How Symbolic Reasoning can help Program Repair* Abhik Roychoudhury (National University of Singapore) *Fault Localization with Error Invariants* Thomas Wies (New York University)
10:30 - 11:00	Break
11:00 - 12:30	**Session 2** *On the Necessity of Model Checking NoSQL Database Schemas when building SaaS Applications* (Stefanie Scherzinger, Eduardo Cunha de Almeida, Felipe Ickert, Marcos Didonet Del Fabro) *Enabling large-scale testing of IaaS cloud platforms on the Grid'5000 testbed* (Sébastien Badia, Alexandra Carpen-Amarie, Adrien Lèbre, Lucas Nussbaum)
12:30 - 14:00	Lunch Break
14:00 - 15:30	**Session 3** *Automatic runtime failure recovery* Mauro Pezzè (University of Lugano) *Scriptable, Time-travel Debugging with Expositor* Jeff Foster (University of Maryland)
15:30 - 16:00	Coffee Break
16:00 - 17:30	**Session 4** *Teaching a Debugging Class* Andreas Zeller (University of Saarland)
16:45 - 17:30	Round Table: Where Shall We Go Next?

The ISSTA Doctoral Symposium is a forum for PhD students working in the area of software testing and analysis to present their research goals, methods, and preliminary results, obtaining feedback from senior researchers of the software testing and analysis scientific community, in a constructive and friendly atmosphere.

Participants will obtain useful guidance for the completion of their dissertation research and initiation of a research career in software testing and analysis.

Prospective student participants should be at a stage in their research where they have already identified a research topic, but they are at least 6 months prior to dissertation completion.

The symposium will be closed-door, with participation restricted to the PhD students taking part in the symposium and the members of the ISSTA 2013 Doctoral Symposium committee.

PhD students taking part in the symposium will have a unique opportunity to describe their research ideas and receive comments and suggestions from experienced researchers in the field.

Doctoral Symposium Keynote speaker:

Tao Xie (University of Illinois at Urbana-Champaign, USA)

Title:

PhD-Program Preparation for Successful Post-PhD Career

Abstract:

It is valuable for PhD students to think ahead on what kinds of career paths the students intend to seek and what kinds of skills such career paths would require the students to have. This talk will discuss important skills that a PhD researcher is typically expected to attain: Assessment, Vision, Design, Execution, and Communication (in short as AVDEC) skills. This talk will also discuss lessons learned from experiences of the speaker along with other researchers, in terms of how to prepare for successful post-PhD career.

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Program - room A22 (Red Building)

Monday July 15th	
9:00	**Keynote:** Tao Xie (North Carolina State University, USA) *PhD-Program Preparation for Successful Post-PhD Career*
10:30	Break
11:00	**Session 1:** Temporal properties and concurrency Sangmin Park. *Debugging Non-deadlock Concurrency Bugs.* Simone Hanazumi and Ana de Melo. *Generation of Java Programs Properties from Test Purposes.*
12:30	Lunch
14:00	**Session 2:** Performance and databases Teodora Sandra Buda. *Generation of Test Databases Using Sampling Methods.* Shadi Ghaith. *Analysis of Performance Regression Testing Data by Transaction Profiles.*
15:30	Break
16:00	**Session 3:** Formal verification Thomas Thüm. *Product-Line Verification with Feature-Oriented Contracts.* Andrea Bonacchi. *Formal safety proof: a real case study in a Railway Interlocking System.*
17:30	

Doctoral Symposium Committee

Paolo Tonella (Chair), Fondazione Bruno Kessler, Italy
Benoit Baudry, INRIA, France
Antonia Bertolino, ISTI-CNR, Italy
Mary Jean Harrold, Georgia Institute of Technology, USA
Lori Pollock, University of Delaware, USA
Abhik Roychoudhury, National University of Singapore, Singapore

Wolfgang Emmerich
CEO (Zuhlke Engineering Limited)

Static Analysis of Systems
Tuesday, July 16th
9:00 - 10:30

Abstract
During the last decades, the programming language and software engineering research communities have made great advances on techniques for static program analysis. In industrial practice, however, engineers need to frequently answer questions that go beyond the scope of a single program and require end-to-end analyses of multiple distributed system components. Such systems often consist of multiple programs written in different programming languages, database schema and query languages, message formats, ETL scripts and proprietary business reporting languages. As an example I will discuss the calculation of data lineage in enterprise information systems, which is required by many financial services organisations. I will show how we have combined static program analysis techniques, such as dataflow analysis and program slicing with a meta data repository in order to calculate, visualize and report on data lineage in financial systems.

About the Speaker
Wolfgang Emmerich is Chairman and CEO of Zuhlke Engineering Ltd in London, UK. He is also a co-founder and Partner of the Zuhlke Technology Group in Schlieren (Zurich), Switzerland. Wolfgang and the business units that he leads have extensively consulted in the financial service industry in London and built a portfolio of static analysis tools for legacy systems analysis. Wolfgang holds a Doctor of Science degree from the University of Paderborn. He was Program Co-Chair of ICSE 2007 and Co-Chair of the Software Engineering in Practice Track of ICSE 2012. He has served on the editorial board of IEEE Transactions on Software Engineering and is a member of ACM SIGSOFT. Wolfgang is a Chartered Engineer and Member of the Institute of Engineering and Technology.

Carlo Ghezzi
Professor at Politecnico di Milano, Italy.

Towards agile verification and verification at run time
Wednesday, July 17th
9:00 - 10:30

Abstract
Formal verification, and in particular model checking, has made a lot of progress in the recent past. However, it is considered with skepticism by practitioners. It is viewed as a niche technique, somewhat confined to safety-critical systems, that failed to become standard practice in general. It is considered as a heavy-weight and very expensive technique that does not fit the requirements of the now prevalent incremental, iterative (i.e., agile) developments. On the other hand, recent work on rapidly evolving and self-adaptive software showed that formal verification can be brought effectively to run time to support reactive adaptation, by making model checking incremental. The talk discusses why and how that happened. It also argues that by making modeling and model checking incremental and iterative (i.e., agile) formal modeling and verification techniques potentially can be fully reconciled with the requirements of agile development, and this may pave the way for their adoption in the common practice.

About the Speaker
Carlo Ghezzi is an ACM Fellow, an IEEE Fellow, a member of the Italian Academy of Sciences, and a recipient of the ACM SIGSOFT Distinguished Service Award. He is the current President of Informatics Europe. He has been a member of the program committee of flagship conferences in the software engineering field, such as the ICSE and ESEC/FSE, for which he also served as Program and General Chair. He was also General Co-Chair of the International Conference on Service Oriented Computing. Ghezzi has been the Editor in Chief of the ACM Trans. on Software Engineering and Methodology and is currently an Associate Editor of the Communications of the ACM, IEEE Trans. on Software Engineering, Science of Computer Programming, Com-

puting, and Service Oriented Computing and Applications. Ghezzi's research has been mostly focusing on different aspects of software engineering. He co-authored over 200 papers and 8 books. He coordinated several national and international research projects. He is currently the PI of the ERC Advanced Grant SMScom.

	Tuesday July 16th	Wednesday July 17th	Thursday July 18th	
9.00	**Keynote** *Static Analysis of Systems* Wolfgang Emmerich CEO (Zuhlke Engineering Limited)	**Keynote** *Towards agile verification and verification at run time* Carlo Ghezzi Professor at Politecnico di Milano, Italy	**Mutating and Mocking** **(session chair: Lu Zhang)** *Selective Mutation Testing for Concurrent Code* Milos Gligoric, Lingming Zhang, Cristiano Pereira and Gilles Pokam	9.00
9.30			*Faster Mutation Testing Using Test Prioritization and Reduction* Lingming Zhang, Darko Marinov and Sarfraz Khurshid	9.30
10.00			Declarative Mocking Hesam Samimi, Rebecca Hicks, Ari Fogel and Todd Millstein.	10.00
10.30	Break			10.30
11.00	**Contracts, Invariants and Stability** **(session chair: Myra Cohen)** *Expressing and Checking Intended Changes via Software Change Contracts* Jooyong Yi, Dawei Qi, Shin Hwei Tan and Abhik Roychoudhury.	**Heap Analysis and Testing** **(session chair: Antonio Carzaniga)** *Dynamically Validating Static Memory Leak Warnings* Mengchen Li, Yuanjun Chen, Linzhang Wang and Guoqing Xu.	**Learning, Optimizing and Searching** **(session chair: Phil McMinn)** *Orthogonal Exploration of the Search Space in Evolutionary Test Case Generation* Fitsum Meshesha Kifetew, Annibale Panichella, Andrea De Lucia, Rocco Oliveto and Paolo Tonella.	11.00
11.30	*Finding Rare Numerical Stability Errors in Concurrent Computations* Hana Chockler, Karine Even and Eran Yahav.	*Collecting a Heap of Shapes* Earl Barr, Christian Bird and Mark Marron.	*Hybrid Learning: Interface Generation through Static, Dynamic, and Symbolic Analysis* Falk Howar, Dimitra Giannakopoulou and Zvonimir Rakamaric.	11.30
12.00	*Parallel Bounded Analysis in Code with Rich Invariants by Refinement of Field Bounds* Nicolas Rosner, Juan Galeotti, Santiago Bermúdez, Guido Marucci Blas, Santiago Perez De Rosso, Lucas Pizzagalli, Luciano Zemín and Marcelo Frias.	*Griffin: Grouping Suspicious Memory-access Patterns to Improve Understanding of Concurrency Bugs* Sangmin Park, Mary Jean Harrold and Richard Vuduc.	*Optimizing Monitoring of Finite State Properties through Monitor Compaction* Rahul Purandare, Matthew B. Dwyer and Sebastian Elbaum.	12.00
12.30	Lunch			12.30
14.00	**Fuzzing and GUI Testing** **(session chair: Andreas Zeller)** *Efficient and Flexible GUI Test Execution via Test Merging* Pranavadatta Devaki, Suresh Thummalapenta, Nimit Singhania and Saurabh Sinha.	**Races and Multithreaded Analysis and Testing** **(session chair: Darko Marinov)** **s***Variable and Thread Bounding for Systematic Testing of Multithreaded Programs* Sandeep Bindal, Sorav Bansal and Akash Lal.	**Whitebox Testing** **(session chair: Paolo Tonella)** *Does Automated White-Box Test Generation Really Help Software Testers?* Gordon Fraser, Matt Staats, Phil McMinn, Andrea Arcuri and Frank Padberg.	14.00

Program - Auditorium (Main Building)

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14.30	*Automatically Repairing Broken Workflows for Evolving GUI Applications* Sai Zhang, Hao Lu and Michael D. Ernst.	*EnforceMOP: A Runtime Property Enforcement System for Multithreaded Programs* Qingzhou Luo and Grigore Rosu.	*Comparing Non-Adequate Test Suites using Coverage Criteria* Milos Gligoric, Alex Groce, Chaoqiang Zhang, Rohan Sharma, Amin Alipour and Darko Marinov.	14.30
15.00	*Semi-valid Input Coverage for Fuzz-testing* Mohammad Torabi Dashti, David Basin and Petar Tsankov.	*SimRacer: A Scalable and Automated Framework to Support Testing for Process-Level Races* Tingting Yu, Witawas Srisa-An and Gregg Rothermel.	*Threats to the Validity and Value of Empirical Assessments of the Accuracy of Coverage-Based Fault Locators* Friedrich Steimann, Marcus Frenkel and Rui Abreu.	15.00
15.30	*Automated Testing with Targeted Event Sequence Generation* Casper S. Jensen, Mukul R. Prasad and Anders Møller.	*Practical Static Race Detection for Java Parallel Loops* Cosmin Radoi and Danny Dig.	Break	15.30
16.00	Break		**Web-Based Analysis and Testing** **(session chair: Alex Orso)** *An Empirical Study of PHP Feature Usage: A Static Analysis Perspective* Mark Hills, Paul Klint and Jurgen Vinju.	16.00
16.30	**Analysis and Testing of Non-functional Properties** **(session chair: Abhik Roychoudhury)** *Calculating Source Line Level Energy Information for Android Applications* Ding Li, Shuai Hao, William G.J. Halfond and Ramesh Govindan.	**Localisation, Patching and Repair** **(session chair: Shin Yoo)** *Using Automated Program Repair for Evaluating the Effectiveness of Fault Localization Techniques* Yuhua Qi, Xiaoguang Mao, Yan Lei and Chengsong Wang.	*Practical Blended Taint Analysis for JavaScript* Shiyi Wei and Barbara Ryder.	16.30
17.00	*Context-Sensitive Delta Inference for Identifying Workload-Dependent Performance Bottlenecks* Xusheng Xiao, Shi Han, Dongmei Zhang and Tao Xie.	*Data Model Property Inference and Repair* Jaideep Nijjar and Tevfik Bultan.	*Finding your Way in the Testing Jungle: A Learning Approach to Web Security Testing* Omer Tripp, Omri Weisman and Lotem Guy.	17.00
17.30	*Combining Model Checking and Testing with an Application to Reliability Prediction and Distribution* Lin Gui, Jun Sun, Yang Liu, Yuanjie Si, Jinsong Dong and Xinyu Wang.	*F3: Fault localization for Field Failures* Wei Jin and Alessandro Orso.		17.30
18.00				18.00
19.00		Conference Dinner Ristorante Vetta www.vetta.ch		19.00

Organizing Committee

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University of Milano Bicocca, Italy

Program chair
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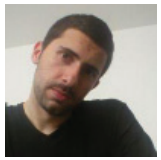
University College London, UK



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Shin Yoo, University College London, UK
Andreas Zeller, Saarland University, Germany
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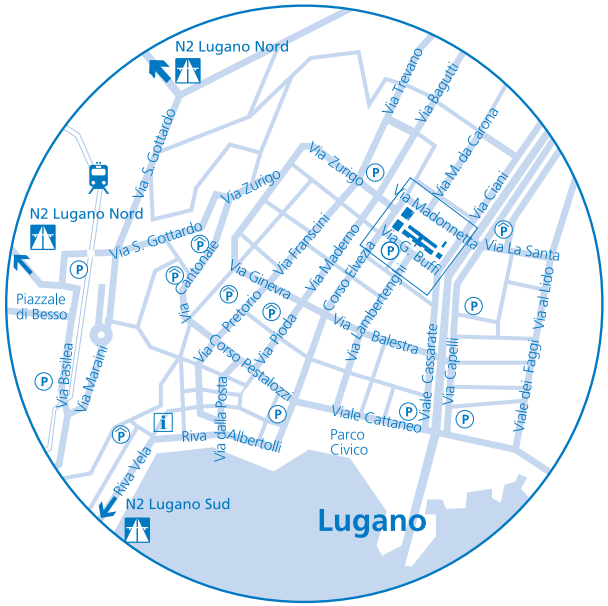
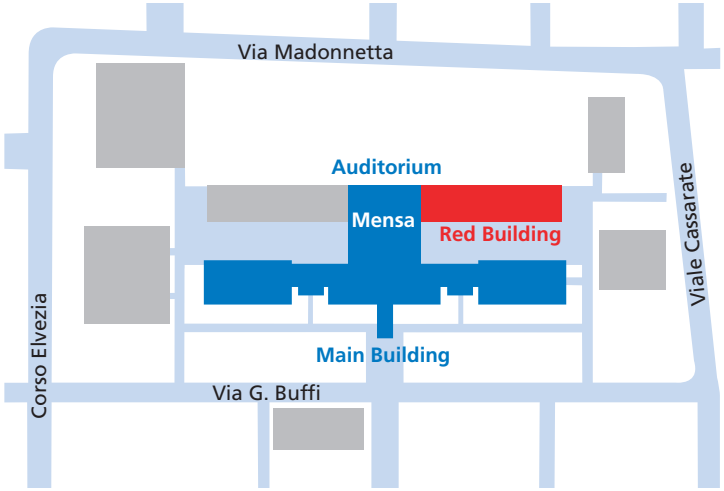
Andreas Zeller, Saarland University, Germany



The conference will be located in the USI **Auditorium**, the entrance is on the 3rd floor of the USI **Main Building**.
Workshops and Doctoral symposium will take place respectively in rooms of the 1st and 2nd floor of the **Red Building**.



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