

Javier Campos  
Boudewijn R. Haverkort (Eds.)

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# Quantitative Evaluation of Systems

12th International Conference, QEST 2015  
Madrid, Spain, September 1–3, 2015  
Proceedings



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12th International Conference, QEST 2015  
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# Preface

Welcome to the proceedings of QEST 2015, the 12th International Conference on Quantitative Evaluation of Systems. QEST is a leading forum on quantitative evaluation and verification of computer systems and networks, through stochastic models and measurements. QEST was first held in Enschede, The Netherlands (2004), followed by meetings in Turin, Italy (2005), Riverside, USA (2006), Edinburgh, UK (2007), St. Malo, France (2008), Budapest, Hungary (2009), Williamsburg, USA (2010), Aachen, Germany (2011), London, UK (2012), Buenos Aires, Argentina (2013), and, most recently, Florence, Italy (2014).

This year's QEST was held in Madrid, Spain, and collocated with the 26th Conference on Concurrency Theory (CONCUR 2015), the 13th International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS 2015), the 12th European Workshop on Performance Engineering (EPEW 2015), the 10th International Symposium on Trustworthy Global Computing (TGC 2015), the International Symposium on Web Services, Formal Methods and Behavioural Types (WS-FM/BEAT 2015), the Combined 22nd International Workshop on Expressiveness in Concurrency and 12th Workshop on Structured Operational Semantics (EXPRESS/SOS 2015), the Second International Workshop on Parameterized Verification (PV 2015), the 14th International Workshop on Foundations of Coordination Languages and Self-Adaptation (FOCLASA 2015), the 4th IFIP WG 1.8 Workshop on Trends in Concurrency Theory (TRENDS 2015), and the 4th International Workshop of Hybrid Systems and Biology (HSB 2015). Together these conferences and workshops formed MADRID MEET 2015, a one-week scientific event in the areas of formal and quantitative analysis of systems, performance engineering, computer safety, and industrial critical applications.

As one of the premier fora for research on quantitative system evaluation and verification of computer systems and networks, QEST covers topics including classic measures involving performance and reliability, as well as quantification of properties that are classically qualitative, such as safety, correctness, and security. QEST welcomes measurement-based studies as well as analytic studies, diversity in the model formalisms and methodologies employed, as well as development of new formalisms and methodologies. QEST also has a tradition in presenting case studies, highlighting the role of quantitative evaluation in the design of systems, where the notion of system is broad. Systems of interest include computer hardware and software architectures, communication systems, embedded systems, infrastructural systems, and biological systems. Moreover, tools for supporting the practical application of research results in all of the aforementioned areas are also of interest to QEST. In short, QEST aims to encourage all aspects of work centered around creating a sound methodological basis for assessing and designing systems using quantitative means.

The Program Committee (PC) consisted of 35 experts and we received a total of 42 submissions. Each submission was reviewed by four reviewers, either PC members or external reviewers. The review process included a rebuttal phase after the first notification

to authors and before the PC discussion. In the end, 17 full papers and two tool demonstration papers were selected for the conference program. The program was greatly enriched with the QEST keynote talk of Boris Köpf (IMDEA Software Institute, Spain) and the joint keynote talk with FORMATS 2015 of Jozef Hooman (RU Nijmegen and TNO-ESI, The Netherlands). We believe the overall result is a high-quality conference program of interest to QEST 2015 attendees and other researchers in the field.

We would like to thank a number of people. Firstly, all the authors who submitted papers, as without them there simply would not be a conference. In addition, we would like to thank the PC members and the additional reviewers for their hard work and for sharing their valued expertise with the rest of the community as well as EasyChair for supporting the electronic submission and reviewing process. We are also indebted to Alfred Hofmann and Anna Kramer for their help in the preparation of this volume. Also thanks to the MADRID MEET 2015 Web Manager Gustavo Santos, Local Organization Chair Ismael Rodríguez, and General Chair David de Frutos-Escrig for their dedication and excellent work. In addition, we thank the Facultad de Ciencias Matemáticas of the Universidad Complutense de Madrid for providing the venue location. Furthermore, we gratefully acknowledge the financial support of the Spanish Ministerio de Economía y Competitividad. Finally, we would like to thank Joost-Pieter Katoen, chair of the QEST Steering Committee, for his guidance throughout the past year.

We hope that you find the conference proceedings rewarding and will consider submitting papers to QEST 2016 in Quebec, Canada.

September 2015

Javier Campos  
Boudewijn R. Haverkort

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