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David Parker · Verena Wolf (Eds.)

# Quantitative Evaluation of Systems

16th International Conference, QEST 2019  
Glasgow, UK, September 10–12, 2019  
Proceedings

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# Preface

This volume contains the papers presented at QEST 2019: 16th International Conference on Quantitative Evaluation of Systems held during September 10–12, 2019, in Glasgow, UK. QEST is a leading forum on quantitative evaluation and verification of computer systems and networks, through stochastic models and measurements. It was held as a standalone event this year.

QEST covers a broad range of topics, including quantitative specification methods, stochastic and nondeterministic models, and metrics for performance, reliability, safety, correctness, and security. QEST welcomes a diversity of modeling formalisms, programming languages, and methodologies that incorporate quantitative aspects such as probabilities, temporal properties, and other forms of nondeterminism. Papers may advance empirical, simulation, and analytic methods. QEST also has a tradition of 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.

This year's edition of QEST featured three keynote speakers. Andrew Gordon (Microsoft Research) gave a talk on “End-User Probabilistic Programming,” Piet Van Mieghem (Delft University of Technology) spoke about “Epidemic Spread on Networks,” and Andre Platzer (Carnegie Mellon University) presented “The Logical Path to Autonomous Cyber-Physical Systems.” This year, QEST also included two invited tutorials, integrated within the main program. Barbara Fila (Kordy) from INSA Rennes gave a tutorial titled “Twenty Years of Quantitative Evaluation of Security with Attack Trees” and Jan Křetínský (Technical University of Munich) spoke about “Learning in Probabilistic Verification and Synthesis.”

The Program Committee (PC) consisted of 33 experts and we received a total of 40 submissions. Each submission was reviewed by either PC members or external reviewers (at least three) in a single-blind fashion. Based on the reviews and the PC discussion phase, 19 papers were selected for the conference program (17 full-length papers and 2 tool demonstration papers).

Our thanks go to the QEST community for making this an interesting and lively event; in particular, we acknowledge the hard work of the PC members and the additional reviewers for sharing their valued expertise with the rest of the community. The collection and selection of papers was organized through the EasyChair conference system and the proceedings volume was prepared and published with the help of Springer, in particular Alfred Hofmann, Aliaksandr Birukou, and Anna Kramer; we thank them all for their assistance. We would also like to thank Springer for kindly

sponsoring the conference and SICSA (The Scottish Informatics & Computer Science Alliance) for sponsoring PhD Studentships for Scotland-based students. Finally, we would also like to thank the local organization team, especially Gethin Norman, the general chair, for his dedication and excellent work, and the QEST Steering Committee for their support and guidance.

We hope that you find the conference proceedings rewarding and will consider submitting papers to QEST 2020.

July 2019

David Parker  
Verena Wolf

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# Contents

## Invited Talks

End-User Probabilistic Programming . . . . .	3
<i>Judith Borghouts, Andrew D. Gordon, Advait Sarkar, and Neil Toronto</i>	
The Logical Path to Autonomous Cyber-Physical Systems (Invited Paper) . . .	25
<i>André Platzer</i>	

## Probabilistic Verification

Model Checking Constrained Markov Reward Models with Uncertainties . . .	37
<i>Giovanni Bacci, Mikkel Hansen, and Kim Guldstrand Larsen</i>	
A Modest Approach to Modelling and Checking Markov Automata . . . . .	52
<i>Yuliya Butkova, Arnd Hartmanns, and Holger Hermanns</i>	
Finite Approximation of LMPs for Exact Verification of Reachability Properties . . . . .	70
<i>Gildas Kouko, Josée Desharnais, and François Laviolette</i>	

## Learning and Verification

Bayes-Adaptive Planning for Data-Efficient Verification of Uncertain Markov Decision Processes . . . . .	91
<i>Viraj Brian Wijesuriya and Alessandro Abate</i>	
Strategy Representation by Decision Trees with Linear Classifiers. . . . .	109
<i>Pranav Ashok, Tomáš Brázdil, Krishnendu Chatterjee, Jan Křetínský, Christoph H. Lampert, and Viktor Toman</i>	
Neural Network Precision Tuning . . . . .	129
<i>Arnault Ioualalen and Matthieu Martel</i>	

## Hybrid Systems

SOS: Safe, Optimal and Small Strategies for Hybrid Markov Decision Processes . . . . .	147
<i>Pranav Ashok, Jan Křetínský, Kim Guldstrand Larsen, Adrien Le Coënt, Jakob Haahr Taankvist, and Maximilian Weininger</i>	

Fast Falsification of Hybrid Systems Using Probabilistically Adaptive Input . . . . .	165
<i>Gidon Ernst, Sean Sedwards, Zhenya Zhang, and Ichiro Hasuo</i>	
State-Space Construction of Hybrid Petri Nets with Multiple Stochastic Firings . . . . .	182
<i>Jannik Hüls, Carina Pilch, Patricia Schinke, Joanna Delicaris, and Anne Remke</i>	
<b>Security</b>	
Expected Cost Analysis of Attack-Defense Trees . . . . .	203
<i>Julia Eisentraut and Jan Křetínský</i>	
A Process Algebra for (Delimited) Persistent Stochastic Non-Interference. . . . .	222
<i>Andrea Marin, Carla Piazza, and Sabina Rossi</i>	
Automated Game-Theoretic Verification of Security Systems . . . . .	239
<i>Chunyan Mu</i>	
<b>Probabilistic Modelling and Abstraction</b>	
Bayesian Abstraction of Markov Population Models . . . . .	259
<i>Luca Bortolussi and Francesca Cairolì</i>	
UTOPIC: Under-Approximation Through Optimal Control. . . . .	277
<i>Josu Doncel, Nicolas Gast, Mirco Tribastone, Max Tschaikowski, and Andrea Vandin</i>	
Reducing Spreading Processes on Networks to Markov Population Models . . . . .	292
<i>Gerrit Großmann and Luca Bortolussi</i>	
<b>Applications and Tools</b>	
Doping Tests for Cyber-Physical Systems . . . . .	313
<i>Sebastian Biewer, Pedro D’Argenio, and Holger Hermanns</i>	
Safety Guarantees for the Electricity Grid with Significant Renewables Generation . . . . .	332
<i>Andrea Peruffo, Emeline Guiu, Patrick Panciatici, and Alessandro Abate</i>	
WISEMOVE: A Framework to Investigate Safe Deep Reinforcement Learning for Autonomous Driving. . . . .	350
<i>Jaeyoung Lee, Aravind Balakrishnan, Ashish Gaurav, Krzysztof Czarnecki, and Sean Sedwards</i>	

*Great-Nsolve: A Tool Integration for (Markov Regenerative)*  
*Stochastic Petri Nets* . . . . . 355  
*Elvio Gilberto Amparore, Peter Buchholz, and Susanna Donatelli*

**Author Index** . . . . . 361