

Challenges in Automating Performance Tool Support

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Abstract

Research and development (R&D) of new tools for performance analysis faces many challenges from immaturity and lack of documentation of supporting tools and infrastructure, incompatibility of tools, lack of access to realistic case studies and performance parameters for them, validation of results, time required versus benefit of results, subsequent maintenance, and many, many others. Yet tool development is an essential part of practical R&D. The panelists relay experiences in developing tools, discuss what needs improvement, opportunities in developing R&D tools, and offer advice for researchers. After introductory remarks from each panelist, there will be a discussion session with the audience.

Keywords

Software Performance; Modeling Tools; Performance Evaluation Tools

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Vittorio Cortellessa (DISIM - Università dell'Aquila)

Vittorio has a background in analysis of non-functional properties of software/hardware systems, which span from simulation techniques to model-driven engineering applied to them. His interest in the last few years has been dedicated to introducing automation in the interpretation of analysis results, and in the software refactoring driven by quality attributes.

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Some tools may be found at <http://sealabtools.di.univaq.it/tools.php> More recent tools are on GitHub.

Abel Gómez (IN3 - Universitat Oberta de Catalunya)

Abel, with nearly 14 years of experience, is expert on Eclipse-based Model-driven Engineering (MDE) techniques and tools. During his career, Abel has heavily relied in several OMG standards (MOF, UML, OCL, QVT, MOFM2T, MARTE) to develop different model-based solutions. He is currently working as a postdoctoral researcher at the SOM Research Lab (Universitat Oberta de Catalunya), an Academic Member of the PolarSys Eclipse Working Group. PolarSys is the initiative under whose umbrella we find Model-based Engineering (MBE) solutions such as Papyrus or Capella. <https://www.polarsys.org/universitat-oberta-de-catalunya-uoc> <https://www.polarsys.org/papyrus-ic/about>

Samuel Kounev (University of Würzburg)

Samuel Kounev is a professor and chair of software engineering at the University of Würzburg. He received a PhD in computer science (2005) from TU Darmstadt. His research is in the area of software engineering with focus on methods, techniques and tools for the engineering of dependable and efficient computer-based systems, including both classical software systems and cyber-physical systems. His research interests span the areas of software design, modeling and architecture based analysis; performance engineering; systems benchmarking and experimental analysis; and autonomic and self-aware computing. Kounev's research is inspired by the vision of self-aware computing systems, to which he has been one of the major contributors shaping its development. He is founder and elected chair of the SPEC Research Group, a consortium within the Standard Performance Evaluation Corporation (SPEC), providing a platform for collaborative research efforts in the area of quantitative system evaluation and analysis. He serves as co-chair of the steering committee of the ACM/SPEC International Conference on Performance Engineering (ICPE) and the IEEE International Conference on Autonomic Computing (ICAC). He is a member of ACM, IEEE, and the German Computer Science Society.

Catalina Lladó (Universitat de les Illes Balears)

Catalina M. Lladó is a lecturer at the Departament de Ciències Matemàtiques i Informàtica of the Universitat de les Illes Balears (Palma de Mallorca, Spain). She received the Computer Engineering degree in 1998 from the Universitat de les Illes Balears and the Ph.D. in Computer Science from the Imperial College of London (UK) in 2002. She frequently works on conferences and program committees (for example, MASCOTS, EPEW, Valuetools, Sigmetrics) and serves as reviewer of international journals, as for instance Performance Evaluation. She has recently lead a research project funded by the Ministerio de Educacion y Ciencia of Spain called 'A General Performance Interoperability Framework'. In a broader view, her research interests are on performance modeling of computer and communications systems, and performance engineering.

Murray Woodside (Carleton University, Ottawa Canada)

The layered queueing toolset was developed as a way to embed performance modeling in software and system architecture, to couple the models to intuitions of designers and operators of systems and to provide scalable solutions of adequate accuracy. The toolset, which can be accessed at layeredqueues.org, includes analytic solution, simulation, experiment control, model extraction from operational traces and from software design models, random experiment generation, editing and some visualization tools. Our experience with these tools illustrates issues about tool usability and about the role of tools in system development.

Tool URLs: <http://www.layeredqueues.org> for full access and documentation; <https://github.com/layeredqueueing/V5> for the solver.