

Raffaella Mirandola: curriculum vitæ et studiorum

Name Raffaella Mirandola
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KEY DATA

Education

- Ph.D. in Computer Science, University of Roma Tor Vergata, Italy, 1994.
- M.Sc. in Computer Science University of Pisa, Italy, 1989.

Academic experience

I am Associate Professor at Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano. I am an active member of the scientific community and I regularly serve in international program committees and as a referee for top-ranked journals. I have been a *member of the editorial board* of the IEEE Transactions of Software Engineering and of the Journal of System and Software (Elsevier) and I'm Special Issue co-Editor Journal of System and Software. I have organized several international conferences as Program Chair (SEAMS 2021, ECSA20015, SATTa Track at ACM SAC 2013-2015, ICPE2011, MOCS Track at Euromicro SEAA 2010-2012, QoSA2009) and co-organized two Dagstuhl Seminars.

Research Areas

My main research interests are in: (i) Software quality requirements modeling, analysis and verification, (ii) Formal methods for (self-)adaptive dependable IT systems, (iii) Model-driven software engineering and the application of the theories, approaches and techniques specific to the above research areas to *service-oriented* and *component-based* systems, *adaptive systems*, *mobile systems*, and *cloud computing*. The research has been funded by several national and international projects, among which the FP7 European project Q-ImPRESS: "Quality Impact Prediction for Evolving Service-Oriented Software", for which I was Principal Investigator for Politecnico. More recently, I have been working on computing education research mainly focusing on observations and data analysis related to the innovative Distributed Software Development course.

Scientific Results

In the last 10 years, I have published three papers in the IEEE Trans. on Software Engineering, one paper on IEEE Trans. on Reliability, one paper on the ACM Trans. on Computing Education, one paper on the ACM Transactions on Adaptive and Autonomous Systems, and two papers on Future Generation Computer Systems. In total, I have published 180+ peer-reviewed papers in international journals and conferences/ symposia. Important research contributions widely cited in the literature are: the definition and generation of formal models at runtime and their usage in the area of service-oriented application (e.g., [IC.53],[JR.28],[JR.24],[JR.27]); the quality assurance of self-adaptive systems (e.g., [IB.3],[IB.7],[JR.13],[JR.21]); and the definition and generation of software quality models at design time (e.g., [IC.83], [JR.34],[JR.31]). Based on Google Scholar (20/01/2022), my h-index is 37 with 8216 as a total number of citations.

Teaching

Starting from 1997, 2+ courses taught per academic year, including: Computer Science Fundamentals (undergraduate course), Computer Infrastructure (graduate course), Software Engineering (graduate course), Distributed Software Development (graduate course). I have supervised several students for Master thesis.

Degrees

- Ph.D. in Computer Science, University of Roma Tor Vergata, Italy, 1994.
Title: *Hierarchical models for performance evaluation of computer and communication systems*
- M.Sc. in Computer Science University of Pisa, Italy, 1989.
(Thesis title: *Hybrid simulation and variance reduction methods for performance evaluation of queueing network models*)

Employment History

- Associate Professor at Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano (August 2011 – present)
- Assistant Professor at Dipartimento di Elettronica e Informazione, Politecnico di Milano (November 2005 – July 2011)
- Assistant Professor at the Computer Science Department, University of Rome Tor Vergata (November 1997 – October 2005)
- Post-Doc Fellow at the Computer Science Department, University of Rome Tor Vergata (November 1995 – October 1997)

PARENTAL LEAVE

September 1999 – February 2000

VISITING EXPERIENCE

International Visiting Full Professor, *Linneus University, Sweden*, (September 2018-August 2019), Swedish KK-Stiftelsens grant 20170232

NATIONAL HABILITATION

Italian national scientific qualification in the following scientific sectors:

Full Professor 09/H1 ING-INF/05

Full Professor 01/B1, INF/01

Collaborations

The following are the most active scientific collaborations:

- *Linneus University, Sweden*, collaboration with Prof. Jesper Andersson and Prof. Marco Caporuscio
- *York University, UK*, collaboration with Prof. Radu Calinescu
- *Katholieke Universiteit Leuven, Belgium* collaboration with Prof. Danny Weyns
- *KIT University, Germany* collaboration with Prof. Ralf Reussner
- *INRIA, France* collaboration with Prof. Jean-Marc Jezequel
- *Zagreb University, Croatia* collaboration with Prof. Igor Cavrak and Dott. Ivana Bosnic
- *CMU University, USA* collaboration with Prof. David Garlan
- *SEI, USA* collaboration with Dr. Grace Lewis
- *UCIrvine, USA* collaboration with Prof. Sam Malek
- *University of Milano, Italy* collaboration with Prof. Elvinia Riccobene
- *University of Bergamo, Italy* collaboration with Prof. Patrizia Scandurra

- *ISTI-CNR, Italy* collaboration with Prof. Antonia Bertolino
- *University of Roma Tor Vergata, Italy* collaboration with Prof. Vincenzo Grassi
- *Gran Sasso Science Institute, L'Aquila Italy* collaboration with Dott. Catia Trubiani

Academic Services

POLITECNICO DI MILANO

- President of the commission for the Evaluation Committee of the Bachelor and Master degree programs in Computer Engineering (Segretario di Laurea) (2013-present)
- Member of the PhD Advisory Board in Computer Engineering at Politecnico di Milano (2017-present)
- Delegate member of the Computer Engineering degrees at the Faculty Evaluation Committee (2013-present)
- Member of the PhD Admission Committee (2012)
- Member for the Evaluation Committee of State Exams for the Qualification to the Engineering Profession (2009)

INTERNATIONAL COMMUNITY

Participation in the selection committee

- Committee for the selection of the *Editor in Chief* for the IEEE Transaction on Software Engineering (2017)
- Committee for the selection of the *Editor in Chief* for the ACM Transaction on Adaptive and Autonomous Systems (2020)

Participation in the recruitment committee

- Chalmers University, Sweden, Committee for the recruitment of Lecturers and Senior Lecturers (2015)
- Malardalen University, Sweden, Committee for the recruitment of Senior Lecturers (2016)
- Chalmers University, Sweden, Committee for the recruitment of Senior lecturers (2018)
- LNU University, Sweden, Committee for the recruitment of Senior Lecturers (2020)
- KIT University, Germany, Committee for the recruitment of Junior Professor (2022)
- Several Italian Researcher, RTD-A, RTDB recruitment committee including: University of L'Aquila, GSS L'Aquila, University of Napoli, University of Verona and University of Padova (2005-present)

Participation in industry-relevant exploitation

- *Member of the Advisory Board* of the project AIDOaRT - AI-augmented automation for efficient DevOps, a model-based framework for continuous development At RunTime in cyber-physical systems, project n. 101007350-2 , under the call H2020-ECSEL-2020-2-RIA
- *Member of the DIA: The industry graduate school Data Intensive Applications, Linnaeus University, Sweden*

Description of Scientific Results

The main research interests are in:

- Software quality requirements modeling, analysis and verification
- Formal methods for (self-)adaptive dependable IT systems
- Model- driven software engineering

and the application of the theories, approaches and techniques specific to the above research areas to *service-oriented* and *component-based* systems, *adaptive systems*, *mobile systems*, and *cloud computing*. Her research has been funded by several national and international projects, among which the FP7 European project Q-ImPrESS: Quality Impact Prediction for Evolving Service-Oriented Software, for which she was Scientific Responsible and also local responsible for Politecnico.

An orthogonal research line concerns teaching and **computing education research** mainly focusing on observations and data analysis for the innovative Distributed Software Development (DSD) course. The results have been published in the **Information and Software Technology** journal [JR.7], the **ACM Transactions on Computing Education** [JR.8], and at the conferences [IC.15],[WS.11]. DSD is a project course held together with the University of Zagreb and Malarladen University, Vasteras, Sweden. The students learn how complex is working in distributed and geographically dispersed teams, using tools and technologies for distributed development environments and discovering how to cooperate with people of different cultures and how to manage in a predictable way the software development process. DSD teams participated and won various editions at the international project competitions in the **International Conference on Software Engineering** (2020/2021: teams in the finals, 2017/2018: winners, 2015/2017: team in semi-finals, 2012/2013: winners).

SOFTWARE QUALITY REQUIREMENTS MODELING, ANALYSIS AND VERIFICATION

A key requirement for software is becoming the capability to keep providing the required quality of service (QoS), in terms of performance, dependability and operating cost (e.g., energy consumption). To this end, quality goals must be carefully and continuously pursued throughout the lifecycle, and especially from its very beginning. Indeed, if unacceptable qualities are discovered late in the project, it is necessary to either abandon the system entirely or go back through redefinition, redesign and redevelopment phases until the system becomes acceptable. Both options are clearly much more expensive than meeting the quality goals since the initial stages. For these reasons the research has been directed to the (automatic) generation and use of software quality models in a continuous way starting from design time until runtime.

Scientific contributions A first research area has been the definition and generation of quality models at design time, with the definition of PRIMA-UML [IC.83], [IC.82], [JR.34] for example, which represents a seminal work in this area widely cited in the reading list of academic courses and in the literature, see for example the citations of Google Scholar for the **WOSP paper** [IC.83], and the **Science of Computer Programming** journal [JR.34]). These methods have been applied to the domain of mobile software architectures and the results presented in [IC.79] and in the **IEEE Transaction on Mobile Computing** [JR.32].

For component-based systems we have been working at a general framework for enabling the early validation of component-based systems on the basis of the architectural specification. We started with a survey on existing methods for the quality analysis of component-based systems presented in [IB.15]. Then, the definition of the Component-Based Software Performance Engineering (CB-SPE) [IC.73], [IC.75], [IC.74], [IC.64] [WS.23], [OJ.4] has been one of the result of this work, which is widely cited in the literature (see for example the citations of Google Scholar for the CBSE [IC.73]). In this context, a common component modeling example has been produced and presented in the widely cited **Springer Book** [BK.1], to provide a common case

study to be used as a basis for comparisons of different approaches. Different techniques based on optimization methods have been investigated and presented in [IC.49] and in two journal papers [JR.29], [JR.23] published on **Journal of Systems and Software**.

Another result concerns the definition and analysis of different kind of failures that can affect the overall system behavior [IC.46], [IC.43], [IC.28], in the **Transactions on Reliability** journal [JR.16] and in the **Software: Practice and Experience** journal [JR.12]. The paper [IC.46] received the **best paper award** at the CBSE conference. The paper [JR.2] presents a framework to better understand the resilience concept in software-intensive systems.

Different research contributions consist in the definition of models at runtime (presented at **ICSE Conference** [IC.53]) and their usage in the area of self-adaptive systems and service-oriented application, presented in [IC.61], [IC.52], [IC.51], [IC.55], [IB.8], [IC.31], [IC.30], [IC.20], [IC.17], [IB.4] and in the **IEEE Transactions on Software Engineering** journals [JR.28], [JR.27], [JR.14]. The obtained results are widely cited in the literature, see for example the citations of Google Scholar for the **ICSE paper** [IC.53], the **ESEC/FSE paper** [IC.51], and the **IEEE Transactions on Software Engineering** [JR.28] and [JR.27].

The adaptive composition of services based on reinforcement learning techniques has been the topic of research published in [IC.17] and **Future Generation Computer Systems, Elsevier** [JR.3]. In this context, a contribution with a special focus on energy has been presented in [IC.4] (Best paper award).

FORMAL METHODS FOR (SELF-)ADAPTIVE DEPENDABLE IT SYSTEMS

In modern software applications, two requirements are becoming common: software must adapt continuously to respond to changes in application objectives and in the environment in which it is embedded, and it is expected to fulfil its dependability. To this end the seamless use of *formal verification techniques* preventing errors from reaching the final implementation (or at least removing them when a new version of the software is deployed) has been proved to be a feasible way to reach these goals.

Scientific contributions In this area, the main contributions concern the definition of an overall framework promoting the use of quantitative formal techniques at runtime presented in [IB.8] and in the **Communication of ACM** [JR.24], as well as a set of specific techniques proposing the use of formal methods to deal with adaptable dependable systems. Specifically, Petri Nets and Queueing Networks have been applied to plan system adaptation while minimizing the energy consumption, in **Journal of Systems and Software** [JR.25], in **Sustainable Computing, Informatics and Systems** [JR.22] and in **International Journal of Performability Engineering** [OJ.1] respectively. Petri Nets have also been applied to devise the most suitable number of resources to be used when the workload of the application presents some burstiness [IC.34] and in the **Journal of Systems and Software** paper [JR.13]. More recently, formal models have also been applied for time-sensitive adaptation in Cyber Physical Systems through run-time configuration generation and verification and the results presented in the conference papers in the conference papers [IC.25] and [IC.23], [IC.18], [IC.13], [IC.12], [IC.11], and in the **Journal of Systems and Software** [JR.11] and in the **Journal of Software: Evolution and Process, Wiley**[JR.6].

The use of formal models for the definition of adaptation plans in cloud infrastructure has been discussed in [IC.24], [IC.19]. Based on that, we have also explored their combination with machine learning techniques in the **Journal of Network and Computer Applications** [JR.10], in **Future Generation Computer Systems, Elsevier** [JR.9], and in the **Computing Journal, Springer** [JR.5].

Another formalism, called Abstract State Machine (ASM), has been extended to deal with reliability analysis in [IC.32], [IB.5] and in the **Journal of System and Software** paper [JR.17] providing a unique component model, which is both the design oriented model of the component assembly and the formal analysis-oriented model and that leads the reliability analysis. The combined use of optimization techniques and design patterns and tactics have been exploited to explore the state space adaptation of service oriented applications in [IC.40] and in the **Science of Computer Programming** journal [JR.20].

Some of these topics, concerning the definition of metrics for system adaptability are presented in the journal paper [JR.21] (**Journal of Systems and Software**) and in the conference paper [IC.21].

The research challenges and possible research directions in the field of self-adaptive have been explored in [IB.11] and [IB.6] [IB.7], [IB.3].

The results of a new research line considering the identification and management of uncertainties in software-intensive adaptive systems have been presented in [IC.14], [IC.26], [IC.27] (Best paper candidate), in the book chapter [IC.3], in the conference papers [IC.3] (Best paper candidate), [IC.1], in the book chapter [IB.1] and in the **ACM Transactions on Adaptive and Autonomous Systems** [JR.1] paper.

MODEL- DRIVEN SOFTWARE ENGINEERING

Model-driven development (MDD) is a discipline that tries to systematize model-based software development. The goal of MDD is twofold. On the one side, it aims at deriving (automatically or semi-automatically) a software implementation, starting from high-level models of the system and applying model transformation rules which refine high-level descriptions into more concrete and specific models. On the other, it aims at supporting reasoning activities on the high-level models. Through an early analysis of quality properties, such as performance and reliability, the software engineer can evaluate the impact of the different design choices or candidate system architectures, before they are reified into runnable code.

Scientific contributions A first research contribution in this area is the definition of an UML profile for mobile software architectures and its usage for the analysis of quality requirements: [IC.81], [IC.72] and [IC.71]. Another result concerns the definition of a pivot language called KLAPER facilitating the definition and generation of analysis- oriented models (such as reliability models or performance models) starting from design-oriented models expressed in different formalisms, such as UML or BPMN, [IC.67],[IC.63],[JR.31],[IB.13], together with the possibility to deal with dynamic system environments [IC.62] and [IB.12]. A tool-suite has been built around this language and used in a set of academic and industrial case studies presented at the conferences [IC.42] (**TOOLS2011**, [IC.41] (**ICSE2011**)) and in the **Software and System Modeling** journal [JR.19]. The obtained results are widely cited in the literature, see for example the citations of Google Scholar for the WOSP paper [IC.67] and the **Journal of Systems and Software** paper [JR.31].

A different challenging problem we have considered in the MDE area is called "feedback provisioning": how to propose solutions to non-experienced engineers and guide them in the selection of an appropriate one when issues concerning quality attributes are detected. In this context we have presented a general discussion of challenges and open issues [IC.33] and their application to a specific domain [IC.22], we have proposed a multi-modeling solution that leverages and extends existing model transformation techniques with constructs to elicit the space of the alternative solutions and to bind quality properties to them, presented at **MODELS2011** conference [IC.39] and in the **Computer Science - Research and Development** journal [JR.26]. The model transformations themselves need to be verified and a testing technique has been proposed to this end in the **QUATIC2010** conference paper [IC.48] and in the **Innovations in Systems and Software Engineering** journal paper [JR.18].

Recently, we have started a research line exploring the definition of a DSL language for the specification of the managing part in self-adapting systems [IC.9]. Based on this language we are now defining a framework helping the development and verification of self-adapting systems, published in the conferences [IC.8], [IC.6], [IC.5], and in the **Journal of Systems and Software** [JR.4] .

DEVELOPMENT OF PRODUCTS

The research conducted during these years has been supported by the development of proof-of-concept tools that have been made available at the community. For example, we have developed *-PRIMA-UML-* for [JR.34], *-KLAPERSuite-* for [JR.31] and [JR.19], *-MOSES-* for [JR.27], *-MANTRA-* for [JR.18], *-SOLAR-* for [JR.21],

-SCOAP- [IC.24], -GoPrime- for [JR.14] - and more recently -The MSL language and framework- for [JR.4].

Some of them at present are not maintained but are still available on request (for example, PRIMA-UML, KLAPERsuite, SCOAP and MANTRA), while other framework are still in use for research purposes. For example,

SOLAR can be found at <http://webdiis.unizar.es/GISED/?q=tool/solar>

MOSES at <https://sourceforge.net/projects/uniroma2-moses/>

MSL framework at <https://github.com/fmselab/msl>

External research funding

EUROPEAN RESEARCH PROJECTS

Principal Investigator for Politecnico

- FP7 European project Q-ImPRESS: "Quality Impact Prediction for Evolving Service-Oriented Software"

I contributed actively in the following research projects:

- H2020 CSA Dossier Cloud: Devops-based Software engineering for the cloud (Coordinator Cyprus University of Technology, Local PI Luciano Baresi)
- FP7 ICT SeaClouds: Seamless adaptive multi-cloud management of service-based applications (Coordinator: ATOS, Spain, Local PI Elisabetta Di Nitto)
- FP7 ERC-SMSCom: Self-Managing Situated Computing (ERC grantee Carlo Ghezzi, Politecnico di Milano)
- FP7 NOE S-Cube: Software Services and Systems Network (Coordinator University of Duisburg-Essen, Local PI Carlo Ghezzi)
- FP6-ICT CASCADAS: Component-ware for Autonomic Situation-aware Communications, and Dynamically Adaptable Services (Coordinator Telecom Italia, Local PI Elisabetta Di Nitto)
- FP6 ICT PLASTIC: Providing Lightweight and Adaptable Service Technology for pervasive Information and Communication (Coordinator Inria, France, Local CNR PI Antonia Bertolino)
- European Project "GAAS": Design and development of distributed Client/server Architectures for air traffic control systems (local Rome PI, Giuseppe Iazeolla)
- EUROCONTROL Project "PAMPAS": A preliminary approach to performance modelling and analysis of air traffic control systems (local Rome PI, Giuseppe Iazeolla)
- EUROCONTROL Project "EVAS: EATMS Validation Strategy" (local Rome PI Giuseppe Iazeolla)

INDUSTRIAL-FUNDED RESEARCH PROJECTS

- Three years PhD Scholarship funded by Softeco Italy: 2009-2011
- Two stages, each of six months duration funded by HP Italia, 2015

NATIONAL RESEARCH PROJECTS

I contributed actively in the following Italian research projects:

- PRIN 2017 SISMA- Solutions for Engineering Microservice Architectures (Local PI Luciano Baresi)
- PRIN 2012 IDEAS - Integrated Design and Evolution of Adaptive Systems, (Local PI Carlo Ghezzi)
- PRIN 2008 DASAP: Architetture Software Adattabili e Affidabili per Sistemi Pervasivi, (Local PI Carlo Ghezzi)

- FIRB Programmi Strategici 2005: ART DECO (Adaptive InfRasTructures for DECentralized Organizations), (Local PI Carlo Ghezzi)
- FIRB - PERF (2002 - 2006) Performance Evaluation of Complex Systems: Techniques, Methodologies and Tools,(Local Rome PI Vincenzo Grassi)
- PRIN 2001 SAHARA Software Architectures for Heterogeneous Access Infrastructures, (Local Rome PI Vincenzo Grassi)
- PRIN 1999 SALADIN: Software Architectures and Languages to Coordinate Mobile Distributed Components, (Local Rome PI Vincenzo Grassi)
- Certia-CERC Project "Software Process Optimization and Collaborative Environments for Software V&V" (Rome PI, Giuseppe Iazeolla)
- CNR Project "Performance and Reliability Engineering of Distributed Databases"
- ITALIAN MURST Project "Performability V&V of Product and Processes in Software Engineering"

Other academic qualification

EDITORIAL BOARDS

- Special Issue co-Editor Journal of System and Software, Elsevier (2019-present)
- Past Editorial Board:
 - IEEE Transaction on Software Engineering (2014-2018),
 - Journal of System and Software, Elsevier (2008-2019).

JOURNAL SPECIAL ISSUE EDITOR

- "Theme issue on performance modeling" *Journal of Software and Systems Modeling, Springer* Volume 12, no. 4, (2013)
- "New Frontiers in Software Architecture" *Journal of Systems and Software, Elsevier*, 2017; Vol. 130

PROJECT REVIEWER

- Research projects for the "Netherlands Organisation for Scientific Research" in 2009 and 2012
- Research projects for the "Fundacao para a Ciencia e a Tecnologia", Portugal in 2012
- Research projects for the DFG priority program SPP 1593/1, Germany, in 2012
- Research projects for the DFG priority program SPP 1593/1, Germany, in 2015
- CLUSTER of EXCELLENCE projects, DFG, Germany, 2017, 2018

Conference Organization

Conference General (Co-)Chair

- ACM/IEEE International Symposium on Software Engineering for Adaptive and Self-Managing Systems-SEAMS 2023, co-located with ICSE 2023, Melbourne
- European Conference on Software Architecture- ECSA 2021,
- Comparch 2012, federated conference including CBSE (International ACM Sigsoft Symposium on Component Based Software Engineering), QoSA (International ACM Sigsoft Conference on the Quality of Software Architectures) and ISARCS (International ACM Sigsoft Symposium on Architecting Critical systems).

Conference Program (Co-)chair

- International Symposium on Software Engineering for Adaptive and Self-Managing Systems- SEAMS 2021
- European Software Architecture Conference - ECSA 2015
- ACM SAC Software Architecture: Theory, Technology, and Applications (SA-TTA) track (2013-2015)
- MOCS Model-based development, Components and Services Track at Euromicro SEAA Conference (2010-2012)
- ACM WOSP/SIPEW ICPE International Conference on Performance Engineering (2011)
- QoSA 2009: Fifth International Conference on the Quality of Software Architectures (2009)
- EUROMICRO Conference on Software Engineering and Advanced Applications (SEAA), 2008

Dagstuhl Seminars Co-organization

- GI-Dagstuhl-Seminar: "Model-Driven Quality Prediction", November 2009
- GI-Dagstuhl-Seminar: "Modelling Contest: Common Component Modelling Example", August 2007

Other events organization

- Workshop co-chair at The 20th International Conference on Service-Oriented Computing- ICSOC 2022
- Poster co-chair at IEEE International conference on Software Architecture- ICISA 2021
- Doctoral Symposium chair at European Conference on Software Architecture- ECSA 2019
- Poster co-chair at IEEE/ACM International Conference on Software Engineering, ICSE 2018
- Doctoral Project track chair at the International Symposium on Software Engineering for Adaptive and Self-Managing Systems- SEAMS 2018:
- Co-organizer of the first workshop on Gender Equality in Software Engineering, ICSE 2018
- Workshop co-chair at the European Conference on Software Engineering - European Conference on Software Architecture- ECSA 2018
- Co-organizer of the Woman in Software Architecture Track at the European Conference on Software Architecture-ECSA 2017
- Workshop co-chair at the IEEE/ACM International Conference on Software Engineering - ICSE 2015
- Co-organizer of QUOVADIS: First International workshop on Quantitative Stochastic Models in the Verification and Design of Software Systems, Workshop at ICSE 2010
- Workshop chair of IEEE ASE 2008: International Conference on Automated Software Engineering, 2008
- Panel organizer: "SOA and Quality Assurance" at SEAA 2008
- Workshop organizer NfC – Models for Non-functional Aspects of Component-Based Software, Models 2005

Steering Committees

I serve on the Steering Committee of the following conferences:

- ICPE: ACM International Conference on Performance Engineering
- ICISA: IEEE International Conference on Software Architecture
- ECSA, The European Conference on Software Architecture
- SEAMS: The International Symposium on Software Engineering for Adaptive and Self-Managing Systems (IEEE/ACM)

Program Committee Membership

Starting from 2002 until now I have been serving in the program committee of several conferences, among which:

- ICSE: the IEEE/ACM International Conference on Software Engineering
- ICPE: the ACM International Conference on Performance Engineering
- ICSA: the IEEE International Conference on Software Architecture
- ECSA: the European Conference on Software Architectures
- SEAMS: the International Symposium on Software Engineering for Adaptive and Self-Managing Systems
- MODELS: the ACM/IEEE International Conference on Model-Driven Engineering Language and Systems
- SEAA: the Euromicro Conference on Software Engineering and Advanced Applications

REFeree SERVICES

I regularly serve as a reviewer for several journals, among which: Performance Evaluation, Elsevier, Journal of System and Software, Elsevier, IEEE Transaction on Software Engineering, Software and System Modeling-Springer, ACM transactions on software engineering and methodology, IEEE Transactions on Dependable and Secure Systems, IEEE Transactions on Service Computing, Future Generation of Computer Systems, Elsevier, Journal of Software: Evolution and Process, Wiley, Computing Springer, Science of Computer Programming, Elsevier, Information and Software Technology, Elsevier

INVITED TALKS

- "Architecting self-adaptive systems under uncertainty" invited seminar, KIT University, Germany, July 2022
- "Software Performance Engineering in Complex Systems: Achievements and Challenges", invited seminar, Linnaeus University, Sweden, September 2018
- "Software QoS enhancement through self-adaptation and formal models" invited lectures at GSSI, L'Aquila, Italia, April 2015
- "Software Performance Engineering In and For Dynamic Environments", Keynote at ECSA 2011, Essen Germany, September 2011 (<http://www.ecsa2011.org/>)
- "A journey across three decades of software performance engineering approaches" Keynote at Palladio-Days 2011, Karlsruhe, Germany November 2011 (<http://www.palladio-days.org/2011/programme/>)
- "Software Performance Engineering In and For Dynamic Environments" Seminar at Milano Bicocca, PhD Course, 2 December 2011
- "Tecniche di valutazione di requisiti di performance e reliability per il software", Invited talk, Workshop CDE V&V Intecs, 25 November 2011
- "Some issues about modeling of mobile software architecture", Invited presentation at UML 2004 Workshop on "Software Architecture Description and UML", 12 October 2004

TUTORIALS

- "Software QoS enhancement through self-adaptation and formal models" at QoSA'14, the 10th International ACM SIGSOFT Conference on Quality of Software Architectures (part of CompArch 2014), June 30 - July 04, 2014, Lille, France (with Diego Perez-Palacin)
- "Performance Validation of mobile software architecture" at PERFORMANCE 2002 IFIP WG 7.3 International Symposium on Computer Performance Modeling, Measurement and Evaluation, Roma, Italy, September 2002 (with V. Cortellessa and V. Grassi)

- “Performance Validation of mobile software architecture” at the Fourth International Workshop on Software and Performance, WOSP 2004, ACM, January 14-16 2004, Redwood Shores, CA, USA (with V. Cortellessa and V. Grassi)

Teaching experience

For all the courses presented in the list, whenever not differently indicated, I have been both Lecturer and Examiner. I have also indicated the courses that are my institutional assignment (IA).

From 2013, I have been involved in an *innovative teaching methods* project: the Distributed Software Development (DSD) course. DSD is a project course held together with the University of Zagreb and Malarladen University, Vasteras, Sweden. The students learn how complex is working in distributed and geographically dispersed teams, using tools and technologies for distributed development environments and discovering how to cooperate with people of different cultures and how to manage in a predictable way the software development process. DSD teams participated and won various editions at the international project competitions in the International Conference on Software Engineering (2017/2018: winners, 2015/2017: team in semi-finals, 2012/2013: winners). Besides, interesting research results have been published from the observation and the analysis of data collected during the course [JR.7], [JR.8], [IC.15],[WS.11].

- **Distributed Software Development, 2013-2022** (5 credits) - Master of Science, Computer Engineering, Politecnico di Milano, Course offered together with the University of Zagreb and Malarladen University, Vasteras, Sweden.
- **Fundamental of Computer Science, (2017-2022)** (10 credits)- IA - Undergraduate Programme, ICT Engineering, Politecnico di Milano
- **Impianti e Servizi Informatici (2016-2020)** (10 credits)- Undergraduate Programme, Computer Engineering, Laurea On Line, Politecnico di Milano.
- **Computer Infrastructures, 2015-2017** (5 credits) - IA - Master of Science, Computer Engineering, Politecnico di Milano
- **Software Engineering II (2010-2016)** (5 credits)- IA - Master of Science, Computer Engineering, Politecnico di Milano
- **Impianti Informatici (2008-2015)** (5 credits)- Undergraduate Programme, Computer Engineering, Politecnico di Milano, Cremona Campus.
- **Fundamental of Computer Science, (2005-2010)** (10 credits)- IA - Undergraduate Programme, Management and Production Engineering, Politecnico di Milano
- **Fondamenti di Informatica II (2003-2005)**, (10 credits)- IA - Undergraduate Programme, Computer Engineering, University of Roma Tor Vergata
- **Early validation of non-functional requirements in software systems (2203-2004)**, - PhD Course at University of Roma Tor Vergata
- **Fondamenti di Informatica I, (1997-2004)**, (teaching assistant) (10 credits)- Undergraduate Programme, Computer Engineering, University of Roma Tor Vergata
- **Impianti Informatici (1997-2003)**,(5 credits) - IA - Undergraduate Programme, Computer Engineering, University of Roma Tor Vergata
- **Simulazione (1990-1996)**, (teaching assistant) (10 credits)- Undergraduate Programme, Computer Engineering, University of Pisa

Supervisor experience

- Advisors of several PhD and post-doc students in Computer Science and Engineering at Politecnico di Milano, 2007-Present
- Advisor of several undergraduate and Master students in Computer Engineering at Politecnico di Milano, 2006-Present
- Advisor of several Undergraduate and Master students in Computer Science at University of Roma Tor Vergata, 1997-2005

PHD EXTERNAL EXAMINER

- PhD Committee member in 2022 at KIT University, Germany, for the PhD defense of the candidate Stephan Seifermann discussing a thesis titled "Architectural Data Flow Analysis for Detecting Violations of Confidentiality Requirements", Advisor Prof. Ralf Reussner
- PhD Committee member in 2021 at Linneaus University, Sweden, for the PhD defense of the candidate Tobias Ohlsson discussing a thesis titled "Incremental Clustering of Source Code-a Machine Learning Approach", Advisor Prof. Morgan Ericsson and Prof. Anna Wingkvist
- PhD Committee member in 2020 at Malmo University, Sweden, for the PhD defense of the candidate Fahed Alkhabbas discussing a thesis titled "Realizing Emergent Configurations in the Internet of Things", Advisor Prof. Romina Spalazzese and Prof Paul Davidsson
- PhD Committee member in 2019 at Malardalen University, Sweden, for the PhD defense of the candidate Nesredin Mahmud discussing a thesis titled "Design of Assured and Efficient Safety-Critical Systems", Advisor Prof. Cristina Secoleanu, Sr. Lect. Guillermo Rodriguez-Navas
- PhD Committee member in 2018 at Malardalen University, Sweden, for the PhD defense of the candidate Gabriel Campeanu discussing a thesis titled "GPU Support for Component-based Development of Embedded Systems", Advisor Prof. Jan Carlson
- PhD Committee member in 2018 at University San Paolo, Brasil, for the PhD defense of the candidate Lina Mara Garces Rodriguez discussing a thesis titled "A reference architecture for healthcare supportive home systems from a systems-of-systems perspective", Advisors Elisa Yumi Nakagawa (ICMC-USP) and Professor Flavio Oquendo (UBS).
- PhD Committee member in 2016 at Malardalen University, Sweden, for the PhD defense of the candidate Gaetana Sapienza discussing a thesis titled "Multiple Criteria Decision Analysis-based HW/SW partitioning methodology for embedded applications", Advisor Prof. Ivica Crnkovic, co-advisors: Prof. Tiberiu Secoleanu, Dr. Antonio Cicchetti.
- PhD Committee member in 2013 at University of Zaragoza, Spain, for the PhD defense of the candidate Diego Perez-Palacin discussing a thesis titled "Extra Functional Properties Evaluation of Self-managed Software Systems with Formal Methods", Advisor Prof. Jose' Merseguer
- PhD Committee member in 2013 at University of Calgary, Canada, for the PhD defense of the candidate Anas Youssef discussing a thesis titled "Burstiness and Uncertainty Aware Service Level Planning for Enterprise Clouds", Advisor Dr Diwakar Krishnamurthy
- External reviewer in 2013 for the habilitation as Associate Professor of Tomas Bures, Charles University, Prague, Czeck Republic
- External reviewer 2012 for the PhD thesis of the candidate Indika Meedeniya titled "Architecture Optimisation of Embedded Systems under Uncertainty in Probabilistic Reliability Evaluation Model Parameters", Advisor Prof. Lars Grunske, Swburne University, Australia
- PhD Committee member in 2012 at University of Lisbona, Portugal, for the PhD defense of the candidate Liliana Rosa discussing a thesis titled "Self-management of Systems Built from Adaptable Components", Advisor Prof. Luis Rodrigues, co-advisors: Prof. Antonia Lopes
- PhD Committee member in 2012 at Malardalen University, Sweden, for the PhD defense of the candidate

Severine Santilles discussing a thesis titled "Managing Extra-Functional Properties in Component-Based Development of Embedded Systems", Advisor Prof. Ivica Crnkovic, co-advisors: Dr. Jan Carlsson, Prof. Hans Hansson

- PhD Committee member in 2010 at Malardalen University, Sweden, for the PhD defense of the candidate Kurt Wallnau discussing a thesis titled "Predictability By Construction: Working the Architecture/Program Seam", Advisor Prof. Ivica Crnkovic, co-advisors: Magnus Larsson, Hans Hansson

Selected Publications

The paper selection reflects the results obtained in the different research lines in the last 10 years. The contributions below are listed starting from the most recent ones. The authors are almost always listed in alphabetical order and they equally contributed to the development of the research and papers.

- M. D'Angelo, M. Caporuscio, V. Grassi, R. Mirandola "Decentralized Learning for Self-Adaptive QoS-Aware Service Assembly" *Future Generation Computer Systems, Elsevier*, 108: 210-227 (2020), Scimago ranking: Q1 [doi: <https://doi.org/10.1016/j.future.2020.02.027>]
- P. Arcaini, R. Mirandola, E. Riccobene, P. Scandurra "MSL: a pattern language for engineering self-adaptive systems" *Journal of Systems and Software, Elsevier*, 164: 110558 (2020), Scimago ranking: Q1 [doi: <https://doi.org/10.1016/j.jss.2020.110558>]
- I. Bosnic and F. Ciccozzi and I. Crnkovic and I. Cavrak and E. Di Nitto and R. Mirandola and M. Zagar "Managing Diversity in Distributed Software Development Education - A Longitudinal Case Study" *ACM Transactions on Computing Education*, Volume 19 (2), 10:1-10:23, (2019), Scimago ranking: Q1 [doi: <https://doi.org/10.1145/3218310>]
- M. García-Valls and D. Perez-Palacin and R. Mirandola "Pragmatic cyber physical systems design based on parametric models" *Journal of Systems and Software, Elsevier* Volume 144, pp. 559-572, (2018), Scimago ranking: Q1 [doi: <https://doi.org/10.1016/j.jss.2018.06.044>]
- M. Amiri, L. Mohammad-Khanlia, R. Mirandola "An online learning model based on episode mining for workload prediction in cloud" *Future Generation Computer Systems, Elsevier*, Volume 87: 83-101 (2018), Scimago ranking: Q1 [doi: <https://doi.org/10.1016/j.future.2018.04.044>]
- M. Amiri, L. Mohammad-Khanlia, R. Mirandola "A sequential pattern mining model for application workload prediction in cloud environment" *Journal of Network and Computer Applications, Elsevier*, Volume 105: 21-62 (2018), Scimago ranking: Q1 [doi: <https://doi.org/10.1016/j.jnca.2017.12.015>]
- M. Caporuscio, V. Grassi, M. Marzolla, R. Mirandola "GoPrime: a Fully Decentralized Middleware for Utility-Aware Service Assembly" *IEEE Transactions on Software Engineering* vol. 42, n.2, pp136-152, 2016, Scimago ranking: Q1 [doi: <http://dx.doi.org/10.1109/TSE.2015.2476797>]
- D. Perez Palacin, R. Mirandola, J. Meseguer "On the Relationships between QoS and Software Adaptability at the Architectural Level" *Journal of Systems and Software, Elsevier* Volume 87, no. 1 (2014), pp.1-17, Scimago ranking: Q1 [doi: <http://dx.doi.org/10.1016/j.jss.2013.07.053>]
- S. Distefano, C. Ghezzi, S. Guinea, R. Mirandola "Dependability Assessment of Web Service Orchestrations" *IEEE Transactions on Reliability* Volume 63, n.3, pp 689-705, 2014, Scimago ranking: Q1 [doi: <http://dx.doi.org/10.1109/TR.2014.2315939>]

- V. Cardellini, E. Casalicchio, V. Grassi, S. Iannucci, F. Lo Presti, R. Mirandola "MOSES: a Framework for QoS Driven Runtime Adaptation of Service-oriented Systems" *IEEE Transactions on Software Engineering* Volume 38, no.5 (2012) pp. 1138-1159, Scimago ranking: Q1 [doi: <http://dx.doi.org/10.1109/TSE.2011.68>]
- R. Calinescu, L. Grunske, M. Kwiatkowska, R. Mirandola, and G. Tamburrelli "Dynamic QoS Management and Optimisation in Service-Based Systems" *IEEE Transactions on Software Engineering* Volume 37, no.3 (2011) pp. 377-409, Scimago ranking: Q1 [doi: <http://dx.doi.org/10.1109/TSE.2010.92>]
- R. Calinescu, C. Ghezzi, M. Kwiatkowska, R. Mirandola "Self-adaptive software needs quantitative verification at runtime" *Communications of ACM* Volume 55, no. 9 (2012), pp. 69-77 , Scimago ranking: Q1 [doi: <http://dx.doi.org/10.1145/2330667.2330686>]

Complete publications list

PUBLICATIONS LIST

Refereed international journals	37
Refereed online international journals	4
Refereed international magazines	2
Editorial contributions	12
Refereed chapters in international books	17
Refereed international conferences	90
Refereed international workshops	24
Academic books	2

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- JR.1. F. Alongi, M. M. Bersani, N. Ghielmetti, R. Mirandola, D. A. Tamburri: "Event-sourced, observable software architectures: An experience report". *Software: Practice and Experience*, Wiley online first (2022)
[doi: <https://doi.org/10.1002/spe.3116>]
- JR.2. N. Alasmari, R. Calinescu, C. Paterson, R. Mirandola: "Quantitative verification with adaptive uncertainty reduction". *Journal of Systems and Software, Elsevier* 188: 111275 (2022)
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- JR.3. Andersson, J., Grassi, V., Mirandola, R., Perez-Palacin D. "A conceptual framework for resilience: fundamental definitions, strategies and metrics." *Computing* 103(4): 559-588 (2021)
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- JR.4. S. Mahdavi-Hezavehi, D. Weyns, P. Avgeriou, R. Calinescu, R. Mirandola, D. Perez-Palacin "Uncertainty in Self-Adaptive Systems: A Research Community Perspective." *ACM Transactions on Adaptive and Autonomous Systems*, 15(4): 10:1-10:36 (2020)
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- JR.5. M. D'Angelo, M. Caporuscio, V. Grassi, R. Mirandola "Decentralized Learning for Self-Adaptive QoS-Aware Service Assembly" *Future Generation Computer Systems, Elsevier*, 108: 210-227 (2020)
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- JR.6. P. Arcaini, R. Mirandola, E. Riccobene, P. Scandurra "MSL: a pattern language for engineering self-adaptive systems" *Journal of Systems and Software, Elsevier*, 164: 110558 (2020)
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- JR.8. L. Pagliari, R. Mirandola, C. Trubiani "Engineering Cyber-Physical Systems through Performance-based Modelling and Analysis: A Case Study Experience Report" *Journal of Software: Evolution and Process, Wiley*, 32(1) (2020)
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- JR.9. I. Cavrak and I. Bosnic and F. Ciccozzi and R. Mirandola "Resilience of distributed student teams to stress factors: A longitudinal case-study" *Information and Software Technology*, Available on line (May 2019)
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- JR.10. I. Bosnic and F. Ciccozzi and I. Crnkovic and I. Cavrak and E. Di Nitto and R. Mirandola and M. Zagar "Managing Diversity in Distributed Software Development Education - A Longitudinal Case Study" *ACM Transactions on Computing Education*, Volume 19 (2), 10:1-10:23, (2019)
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- JR.12. M. Amiri, L. Mohammad-Khanlia, R. Mirandola "A sequential pattern mining model for application workload prediction in cloud environment" *Journal of Network and Computer Applications, Elsevier*, Volume 105: 21-62 (2018)
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- JR.14. M.Caporuscio, C. Trubiani R. Mirandola "Building design-time and run-time knowledge for QoS-based component assembly" *Software: Practice and Experience, Wiley* Volume 47(12): 1905-1922 (2017)
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- JR.15. D. Perez Palacin, R. Mirandola, J. Meseguer "Accurate modeling and efficient QoS analysis of scalable adaptive systems under bursty workload" *Journal of Systems and Software, Elsevier* Volume 130, (August 2017), pp. 24-41
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- JR.19. R. Mirandola, P. Potena, E. Riccobene, P. Scandurra "A reliability model for Service Component Architectures" *Journal of Systems and Software, Elsevier* Volume 89, 2014, pp. 109-127
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- JR.20. A. Ciancone, A. Filieri, R. Mirandola "Testing operational transformations in model-driven engineering" *Innovations in Systems and Software Engineering, Springer* Volume 10, n.1, pp. 19-32, 2014
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- JR.21. A. Ciancone, A. Filieri, M. L. Drago, V. Grassi, H. Koziolk, R, Mirandola "The KlaperSuite Framework for Model-Driven Reliability Analysis of Component-Based Systems" *Software and System Modeling, Springer* Volume 13, n.4, pp. 1269-1290, 2014
[doi: <http://dx.doi.org/10.1007/s10270-013-0334-8>]
- JR.22. R. Mirandola, P. Potena, P. Scandurra "Adaptation Space Exploration for Service-oriented Applications" *Science of Computer Programming, Elsevier* Volume 80, Part B (2014) pp. 356-384
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- JR.24. M. Marzolla, R. Mirandola "Dynamic Power Management for QoS-Aware Applications" *Sustainable Computing, Informatics and Systems, Elsevier* Volume 3, no. 4, (December 2013) pp. 231-248
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- JR.25. A. Koziolk, D. Ardagna, R. Mirandola "Hybrid Multi-Attribute QoS Optimization in Component Based Software Systems" *Journal of Systems and Software, Elsevier* Volume 86, no. 10 (2013), pp.2542-2558
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- JR.27. D. Perez Palacin, R. Mirandola, J. Meseguer "QoS and energy management with Petri nets: a self-adaptive framework" *Journal of Systems and Software, Elsevier* Volume 85, no. 12 (2012), pp.2796-2811
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- JR.28. M. L. Drago, C. Ghezzi, R, Mirandola "A Quality Driven Extension to the QVT-Relations Transformation Language" *Computer Science - Research and Development, Springer* Volume 27, no. 2, (2012)
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- JR.30. R. Calinescu, L. Grunske, M. Kwiatkowska, R. Mirandola, and G. Tamburrelli "Dynamic QoS Management and Optimisation in Service-Based Systems" *IEEE Transactions on Software Engineering* Volume 37, no.3 (2011) pp. 377-409 [doi: <http://dx.doi.org/10.1109/TSE.2010.92>]
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- JR.32. A. Bertolino, E. Marchetti, R. Mirandola "Performance Measures for Supporting Project Manager Decision" *Software Process Improvement and Practice Journal, Wiley* Volume 12, no. 2 (2007), pp. 528-558 [doi: <http://dx.doi.org/10.1002/spip.312>]
- JR.33. V. Grassi, R. Mirandola, A. Sabetta "Filling the Gap Between Design and Performance/Reliability Models of Component-Based Systems: A Model-Driven Approach" *Journal of Systems and Software, Elsevier* Volume 80, no. 4 (2007), pp. 1512-1523 [doi: <http://dx.doi.org/10.1016/j.jss.2006.07.023>]
- JR.34. V. Grassi, R. Mirandola "Derivation of Markov Models for Effectiveness Analysis of Adaptable Software Architectures for Mobile Computing" *IEEE Transaction on Mobile Computing* Volume 2, no. 2 (2003), pp. 114-131 [doi: <http://dx.doi.org/10.1109/TMC.2003.1217232>]
- JR.35. Bertolino A., G.Lombardi, E.Marchetti, R. Mirandola, E. Peciola "A Reported Experience: Statistical Control of an Industrial Test Process" *IEE-Proceedings on Software* Volume 149, no. 4 (2002), pp. 98-101
- JR.36. Cortellessa V., Mirandola R. "PRIMA-UML: a Performance Validation Incremental Methodology on Early UML Diagrams" *Science of Computer Programming, Elsevier* Volume 44, no. 1 (2002), pp. 101-129 [doi: [http://dx.doi.org/10.1016/S0167-6423\(02\)00033-3](http://dx.doi.org/10.1016/S0167-6423(02)00033-3)]
- JR.37. Cortellessa V., Iazeolla G., Mirandola R. "Early Generation of Performance Models for Object-Oriented Systems" *IEE-Proceedings on Software* Volume 147, no. 3 (2000), pp. 61-72
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- OJ.2. R. Mirandola, P. Potena, "A QoS-based framework for the adaptation of service-based systems," *Scalable Computing: Practice and Experience* Volume 12, no. 1, (2011), ISSN 1895-1767
- OJ.3. Basanieri, F. Bertolino A., Marchetti E., Mirandola R. "UML-based Performance Analysis Techniques Applied to Software Multiprojects Management" *International Journal of Computer and Information Science (IJCIS)* Volume 4, no. 1 (2003), pp. 1-13
- OJ.4. A. Bertolino, R. Mirandola, "Modeling and Analysis of Non-functional Properties in Component-based Systems," *Electronic Notes in Theoretical Computer Science, Elsevier* Volume 82, no. 6, (2003), pp. 158-168, [doi: [http://dx.doi.org/10.1016/S1571-0661\(04\)81034-X](http://dx.doi.org/10.1016/S1571-0661(04)81034-X)]

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EDITORIAL CONTRIBUTIONS

- ED.1. S. Biffi and E. Navarro and W. Löwe and M. Sirjani and R. Mirandola and D. Weyns *ECSCA 2021 15th European Conference on Software Architecture*, Springer, LNCS 12857, 2021, ISBN 978-3-030-86043-1 [doi: <https://doi.org/10.1007/978-3-030-86044-8>]

- ED.2. R. Heinrich and R. Mirandola and D. Weyns *ECSA 2021 15th European Conference on Software Architecture: Companion Volume*, CEUR Proceedings, volume 2978,
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- ED.3. R. de Lemos and I. Nunes and R. Mirandola *SEAMS 2021: Proceedings of International Symposium on Software Engineering for Adaptive and Self-Managing Systems*, IEEE 2021
[doi: [10.1109/SEAMS51251.2021.00005](https://doi.org/10.1109/SEAMS51251.2021.00005)]
- ED.4. J. Pérez, R. Mirandola, H. Chen: *Proceedings of the 12th European Conference on Software Architecture: Companion Proceedings, ECSA 2018*, ACM, isbn 978-1-4503-6483-6
- ED.5. D. Weyns, R. Mirandola, I. Crnkovic "Introduction to the special issue on New frontiers in software architecture" *Journal of System and Software, Elsevier* Volume 130: 57-58 (2017)
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- ED.7. D. J. Lilja, R. Mirandola, "Introduction to the theme issue on performance modeling," *Journal of Software and Systems Modeling, Springer* Volume 12, no. 4, (2013), pp. 679-680
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- ED.8. V. Grassi, R. Mirandola, N. Medvidovic, M. Larsson "Proceedings of the 15th ACM SIGSOFT Symposium on Component Based Software Engineering, CBSE 2012" *Comparch '12 Federated Events on Component-Based Software Engineering and Software Architecture* ACM 2012, ISBN 978-1-4503-1345-2
- ED.9. V. Grassi, R. Mirandola, J. Cuellar, J. Lopez "Proceedings of the 3rd international ACM SIGSOFT symposium on Architecting Critical Systems, ISARCS 2012" *Comparch '12 Federated Events on Component-Based Software Engineering and Software Architecture* ACM 2012, ISBN 978-1-4503-1347-6
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- ED.11. S. Kounev, V. Cortellessa, R. Mirandola, D. J. Lilja " ICPE'11 - Second Joint WOSP/SIPEW International Conference on Performance Engineering" ACM 2011, ISBN 978-1-4503-0519-8
- ED.12. Geri Georg, Janyvind Agedal, Raffaella Mirandola, Ileana Ober, Dorina C. Petriu, Wolfgang Theilmann, Jon Whittle, Steffen Zschaler " Workshop on Models for Non-functional Properties of Component-Based Software - NfC, MoDELS Satellite Events 2005" LNCS 3844 Springer: 210-216
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