Matteo Camilli

Ph.D. in Computer Science

Personal Data

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Web page	`http://camilli.di.unimi.it`
Nationality	Italian
Date of birth	19 December 1986
Education	Ph.D. in Computer Science from Univesità degli Studi di Milano, March 2015. M.Sc. in Computer Science from Università degli Studi di Milano (cum laude), July 2011.

Languages

Italian	**Mother tongue**
English	**Professional working proficiency**

Current Occupation

2019–present **Research fellow (RTDA)**, *Faculty of Computer Science*, Free University of Bozen-Bolzano, Bolzano, (Italy).

I'm currently a research fellow at the Faculty of Computer Science of the Free University of Bozen-Bolzano. Previously I was a postdoc. research assistant at the Computer Science dept. of the University of Milan, Italy.

Subject area: Computer Science, Mathematics, Engineering.
OrcID: `http://orcid.org/0000-0003-2491-5267`.

Selected Computer and Programming Skills

Programming	Java, Java Reflection, RMI, AspectJ, C, C++, Python, PHP, Javascript, Smalltalk
Databases	SQL language, MySql, PostgreSQL, Oracle database
Cloud Computing	E2C: Amazon Elastic Compute Cloud infrastructure, Google App engine, Red Hat Openshift
Mobile	Google Android, Apple IOS
Unix	Shell scripting
VCS	Git, SVN

Short Bio

I'm currently a postdoctoral research fellow at the Computer Science department of the University of Milan (Italy), where I teach software engineering, and I work in the software engineering research group. In June 2018, I joined the computer science dept. board as delegate of postdoctoral researchers. During my Ph.D. program, I have been selected to participate at the ACM Student Research Competition and Doctoral Symposium of different editions of the ICSE conference. I received my PhD degree in Computer Science from the University of Milan in 2014. My dissertation focused on the combination of advanced abstraction techniques and big data approaches to tackle the state explosion problem in formal verification. My current research activity focuses on software engineering, formal methods, formal Verification, model-based testing. I'm especially interested in methods and tools to improve dependability of adaptable and evolvable time-dependent applications. I publish papers in international journals and in proceedings of international conferences. I serve as member of the program/organizing committee of international conferences.

Research Areas

My main research interests cover the macro-areas of formal methods and software engineering with particular focus on:

- Software requirements specification, analysis and verification;
- Model-based testing;
- Uncertainty quantification along the software lifecycle;
- Desing-time and runtime verification of software systems;
- Formal modeling using Markov models;

and the application of methodologies, theories, approaches and techniques specific to the above research areas to complex, advanced, distributed, time-dependent, service-oriented, component-based and self-adaptive systems.

Scientific Results

I'm co-author of a number of scientific publications on peer-reviewed international conferences/workshops and journals. During my Ph.D. program I have been selected by the ACM Student Research competition at the 39th International Conference on Software Engineering (ICSE 2012). I have been awarded twice by Amazon.com, Inc. AWS Research grant. According to Google Scholar (Oct 2019), my h-index is 8 with 140 citations. Currently, my major research contributions concern: the usage of massively parallel distributed architectures to verify efficiently correctness of complex software systems; the definition of a methodology to deal with the Inverse Uncertainty Quantification (IUQ) problem during the development lifecycle and its usage in the area of service-oriented applications; the definition of formal models to specify and verify distributed (time-dependent) self-adaptive systems having decentralized adaptation control. My major scientific contributions to this fields are briefly discussed in the following.

Distributed formal verification using cloud computing – Massively parallel Cloud computing platforms represent a great opportunity to run heavy time-consuming tasks dealing with the state explosion problem in many formal verification activities. The idea is that classical formal verification tools and techniques should undergo a deep technological transition to take advantage of the available powerful architectures. Namely, we developed distributed approaches to verification of Computation Tree Logic (CTL) requirements on very large state spaces. Our approach exploits and integrates a parametric state-space builder so called MARDIGRAS [IC12], [IC13], we designed to ease the adoption of "big data" platforms. The whole framework, composed by the state-space builder and the model-checker, leverages Hadoop Map-Reduce as its computational engine and can be easily specialized to deal with explicit model checking on huge state spaces generated from different formalisms. We successfully exploited it to perform verification of several benchmarking system examples, as shown in the following works [IC.11], [IC.12], [IC.13], [IC.14], [IC.15], accepted for presentation at different international conferences, such as the International Conference on Software Engineering (ICSE) 2012, 2014, and the International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC) 2012, 2015. Major results of this line of research have been published also in the invited special issue paper of "Concurrency and Computation: Practice and Experience" journal by Wiley [JR.3]. In 2015 and 2016 I've been awarder by the Amazon.com, Inc. AWS Research grant to perform proof of concept/benchmarking activities to evaluate the efficacy of leveraging Cloud computing facilities to create formal verification tasks as a service.

Uncertainty Quantification in Software Development – The problem of uncertainty quantification is recently gaining attention in the software engineering community since it has a significant impact on the ability of a software system to satisfy its objectives. The Inverse Uncertainty Quantification (IUQ) problem deals with estimation of the discrepancy between measured data at runtime and initial imperfect mathematical models (i.e., bias correction) to estimate values of unknown parameters (i.e., parameter calibration). We revisited the IUQ problem in software development and we proposed an approach for quantifying system uncertainty before the deployment, during integration testing activity. Namely, we propose a methodology to quantify and mitigate uncertainty combining Model-based testing (MBT) techniques and Bayesian inference. Major contributions in this field appeared in the proceedings of international conferences [IC.2], [IC.7], such as the international conference on Software Engineering and Formal Methods (SEFM), and the International Symposium on Software Reliability Engineering (ISSRE). We currently have an invited special issue paper submitted for possible publication in the journal of "Software Testing Verification and Reliability" by Wiley [UR.1].

Formal Verification of Distributed time-dependent Self-adaptive Systems – During our research activity in this area, we developed a formal framework to specify and verify the behavior of real-time self-adaptive systems. In particular, our main target systems are self-adaptive systems that exhibit a self-healing behavior. We define a specification formalism based on Petri nets extended with time. The proposed formalism provides enhancements to model self-adaptive systems with real-time constraints. In particular, we formalize and verify self-adaptation with temporal constraints. Major contributions has been published in the proceedings of international conferences, such as the International Symposium on Software Reliability Engineering (ISSRE) and as journal article in "Science of Computer Programming" by Elsevier [IC.10], [JR.2]. Other research directions in this field were conducted to deal with formal specification and verification of distributed self-adaptive systems having decentralized adaptation control. Namely, we developed a formalism that leverages the theoretical foundation of High-level Petri nets and takes inspiration from reflective systems to realize a two-layered modeling framework. The approach allows both concurrency and adaptation aspects to be easily represented. We also support formal verification activities through existing off-the-shelf state space builders and model checkers. Major contributions in this field appeared in the proceedings of international conferences and workshops [IC.1], [IC.2], [IC.3], [IC.4], such as International Conference on Application and Theory of Petri Nets and Concurrency (Petri Nets), the international Workshop on Discrete Event Systems (WODES), the International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC), and the European Conference on Software Architecture (ECSA). We currently have an invited special issue paper submitted for possible publication in the journal of "Discrete-event Dynamic Systems" by Springer [UR.3].

Education

2012–2015 **Ph.D. in Computer Science**, *Department of Computer Science*, Università degli Studi di Milano, Milan (Italy).

Thesis title: Coping with the State Explosion Problem in Formal Methods: Advanced Abstraction Techniques and Big Data Approaches.

2009–2011 **Computer Science M.Sc.**, *Università degli Studi di Milano*, Milan (Italy), *Master of Science*.

I got my M.Sc. degree in Computer Science on July 12th, 2011 at the University of Milan, with a final grade of 110/110 cum laude. The thesis is entitled "Parallel and distributed approaches to formal verification of Real-Time systems." (Italian version: "Confronto tra architetture per la realizzazione distribuita di tecniche di analisi per reti di Petri.")
Major achievements:
- Understand and improve analysis methods, design methods and development methods of complex/innovative IT systems.
- Take leadership roles in management/development of IT projects within companies or research institutes.
- Understand and use mathematical and physical means to support IT applications.

2005–2008 **Computer Science B.Sc.**, *Università degli Studi di Milano*, Milan (Italy), *Bachelor of Science*.

I got my B.Sc. degree in Computer Science on December 16th, 2008 at the University of Milan, with a final grade of 110/110 cum laude. The thesis is entitled "Design and implementation of a reachability analysis technique for Real-Time systems." (Italian version: "Progettazione e realizzazione di una tecnica di analisi di sistemi Real-time.")
Major achievements:
- Fundamentals of different computer science fields.
- Design and development of IT systems.
- Networks management.
- Understand and use mathematical techniques and tools.

Ph.D. Thesis

Title *Coping with the State Explosion Problem in Formal Methods: Advanced Abstraction Techniques and Big Data Approaches.*

Supervisors Carlo Bellettini, Mattia Monga

Description The thesis focuses on two complementary approaches to deal with the state explosion problem for dynamic, concurrent and real-time systems. Namely, we introduced advanced state space methods for real-time systems using different formal models of concurrency and time. In addition to that, we studied distributed approaches that exploit techniques typically used by the big data community to enable verification of very complex systems using big data approaches and cloud computing facilities.

Academic and Professional Experience

2019–present **Research fellow (RTDA)**, *Faculty of Computer Science*, Free University of Bozen-Bolzano, Bolzano, (Italy).

I currently hold a Research fellow (RTDa) position at the Computer Science faculty of the University of Bozen-Bilzano, Italy.

2016–2019 **Postdoctoral research assistant**, *Department of Computer Science*, Università degli Studi di Milano, Milan (Italy).

Postdoctoral research assistant at the Computer Science department of the University of Milan. I was in the computer science dept. board as delegate of postdoctoral researchers.

2014–2015 **Research grant holder**, *Università degli Studi di Bergamo*, Bergamo (Italy).

Software Engineering, formal methods, formal Verification, self-adaptive systems, real-time systems, parallel and distributed Systems.

Research and Development, *Collaboration with Bialetti Industrie S.p.A*, Brescia (Italy), on the Smart break project: `http://www.smartbreakproject.it`. Requirements and use case analysis. Definition of the interactions between roles and components to achieve goals.

2012–2015 **Phd student**, *Università degli Studi di Milano*, Milan (Italy).

The research activity focused on the connection between formal methods in software engineering and big data approaches. In particular, we developed distributed formal verification techniques leveraging high performance data processing software for extracting knowledge from the unprecedented amount of data coming from complex systems. We deployed our softwares on cloud based computing facilities to exploit the opportunity for verification techniques and tools to undergo a deep technological transition and use new available architectures.

2012–2013 **Research grant holder**, *Università degli Studi di Milano*, Milan (Italy).
Distributed analysis of internet traffic for protocol and structure independent botnet detection.

2011–2013 **Co-funder, technical director, developer**, *Failuresoftware*, Milan (Italy).
Failuresoftware is a team of creative and technology nerds building simple and sometimes useful mobile applications for the world.
Projects:
- BikeMi: mobile app of BikeMi Bike Sharing service.
- Photodump: a social network where users can collect and share bad photos.

2010–2011 **Research and development**, *Università degli Studi di Milano*, Milan (Italy).
Design, Development and Comparison between different parallel and distributed computational model for Real-time systems analysis techniques.

2008–2009 **Research and development**, *Università degli Studi di Milano*, Milan (Italy).
Design and Development of a Real-time systems analysis technique expressed by means of Time- Basic Petri nets.

Participation in Research Projects

2015 **Regional project – Simply**, *Supported by the Lombardy Region, Italy*, Design and development of a distributed service-based web-application for managing citizens' desk services.

2014 **Regional project – SmartBreak**, *Supported by the Lombardy Region, Italy*, Requirements analysis, use cases definition, and design of AI-powered home automation systems.

2012 **PRIN project – Botnet self-protection**, *Supported by the Italian Ministry of Research*, Distributed analysis of internet traffic for protocol and structure independent botnet detection.

Teaching Activity

2019-2020 **Teacher**, *Development of Data Products*, Compulsory course for master students in computational data science, Faculty of Computer Science - Free University of Bozen-Bolzano (Italy).
60 Hours, teaching in English

2019-2020 **Teaching assistant**, *Verification and Reliability for Dependable Systems*, Fundamental course for master students in software engineering for information systems, Faculty of Computer Science - Free University of Bozen-Bolzano (Italy).
20 hours, teaching in English

2018-2019 **Teacher**, *Software Engineering (Ingegneria del software)*, Compulsory course for undergraduate students, Dipartimento di Scienze e Innovazione Tecnologica (DiSIT), Università degli Studi del Piemonte Orientale.Vercelli (Italy).
48 hours, teaching in Italian

Tutor, *Computer Systems and Networks Security (Sicurezza dei Sistemi e delle Reti Informatiche)*, Compulsory course for graduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan (Italy).

2017-2018 **Teacher**, *Software Engineering (Ingegneria del software)*, Compulsory course for undergraduate students, Dipartimento di Scienze e Innovazione Tecnologica (DiSIT), Università degli Studi del Piemonte Orientale. Vercelli (Italy).
48 hours, teaching in Italian

Lab. teacher, *Software Engineering (Ingegneria del software)*, Compulsory course for undergraduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan (Italy).
48 hours, teaching in Italian

Tutor, *Computer Systems and Networks Security (Sicurezza dei Sistemi e delle Reti Informatiche)*, Compulsory course for graduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan (Italy).

2016-2017 **Teacher**, *Software Engineering (Ingegneria del software)*, Compulsory course for undergraduate students, Dipartimento di Scienze e Innovazione Tecnologica (DiSIT), Università degli Studi del Piemonte Orientale. Vercelli (Italy).
48 hours, teaching in Italian

Lab. teacher, *Software Engineering (Ingegneria del software)*, Compulsory course for undergraduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan (Italy).
48 hours, teaching in Italian

Tutor, *Computer Systems and Networks Security (Sicurezza dei Sistemi e delle Reti Informatiche)*, Compulsory course for graduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan (Italy).

2015-2016 **Lab. teacher**, *Software Engineering (Ingegneria del software)*, Compulsory course for undergraduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan (Italy).
48 hours, teaching in Italian

Lab. teacher, *Operating Systems (Sistemi Operativi)*, Compulsory course for undergraduate students, Dipartimento di Ingegneria gestionale, dell'informazione e della produzione (DIGIP), Università degli Studi di Bergamo. Bergamo (Italy).
48 hours, teaching in Italian

Tutor, *Computer Systems and Networks Security (Sicurezza dei Sistemi e delle Reti Informatiche)*, Compulsory course for graduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan (Italy).

2014-2015 **Lab. teacher**, *Software design (Progettazione del software)*, Compulsory course for undergraduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan (Italy).
48 hours, teaching in Italian

2013-2014 **Lab. teacher**, *Software design (Progettazione del software)*, Compulsory course for undergraduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan, Italy.
48 hours, teaching in Italian

2012-2013 **Lab. teacher**, *Software design (Progettazione del software)*, Compulsory course for undergraduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan, Italy.
48 hours, teaching in Italian

2011-2012 **Teaching assistant**, *Software design (Progettazione del software)*, Compulsory course for undergraduate students, Dipartimento di Informatica, Università degli Studi di Milano. Milan, Italy.
48 hours, teaching in Italian

Graduate and Undergraduate Students Supervision

2012-present Advisor of different undergraduate and master students in Computer Science at the dept. of Computer Science, University of Milan, Italy.

Honors and Awards

2015-2016 **Amazon.com, Inc. AWS Research grant**, *AWS Cloud Credits to perform proof of concept/benchmark tests evaluating the efficacy of moving formal verification activities to the cloud in order to tackle the state explosion problem*.

2014 **ICSE 2014 Doctoral Symposium**, *selected to participate at the Doctoral Symposium of ICSE (International Conference on Software Engineering) 2014 conference with the research paper "Formal verification problems in a big data world: Towards a mighty synergy"*.

2014 **ACM SIGSOFT CAPS**, *Travel grant recipient*.

2012 **ACM Student Research Competition at ICSE 2012**, *selected to participate at the main competition at the ICSE (International Conference on Software Engineering) 2012 conference with the research abstract "Petri Nets State Space Analysis in the Cloud"*.

2012 **ACM SIGSOFT CAPS**, *Travel grant recipient*.

Speaker at International Conferences

2019 **iFM 2019**, *The 15th International Conference on integrated Formal Methods. December 2-6 2019, Bergen, Norway*.

2019 **PETRI NETS 2019**, *The 40th International Conference on Application and Theory of Petri Nets and Concurrency. June 23-28, 2019. Aachen, Germany*.

2018 **ISSRE 2018**, *The 29th IEEE International Symposium on Software Reliability Engineering. October 15-18, 2018. Memphis, TN, USA*.

2018 **SYNASC 2018**, *20th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC). September 20 - 23 2018, Timisoara, Romania*, Logic and Programming track.

2018 **FAACS 2018**, *2nd International Workshop on Formal Approaches for Advanced Computing Systems @ ECSA 2018. Madrid, Spain. 24 September, 2018*.

2018 **WODES 2018**, *14th International Workshop on Discrete Event Systems. May 30 - June 1, 2018. Sorrento Coast, Italy*.

2017 **FAACS 2017**, *1st International Workshop on Formal Approaches for Advanced Computing Systems @ MSE 2017. Trento, Italy. September 4th, 2017.*

2017 **MSE 2017**, *2nd International Workshop on Microservices: Science and Engineering @ MSE 2017. Trento, Italy. September 4th, 2017.*

2017 **SEFM 2017**, *15th International Conference on Software Engineering and Formal Methods. September 4 - 8 2017. Trento, Italy.*

2017 **NFM 2017**, *9th NASA Formal Methods International Symposium. Moffett Field, CA, USA May 16 - 18, 2017.*

2016 **SYNASC 2016**, *18th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC). Timisoara, Romania, 24 - 27 September 2016*, Logic and Programming track.

2015 **ISSRE 2015**, *26th IEEE International Symposium on Software Reliability Engineering (ISSRE). November 2 - 5, 2015, Gaithersburg, MD, USA*, Formal methods track.

2014 **SYNASC 2014**, *16th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC). September 22 - 25 2014, Timisoara, Romania*, Distributed computing track.

2014 **ICSE 2014**, *36th International Conference on Software Engineering (ICSE). Hyderabad, India. May 31 - June 7, 2014*, Doctoral symposium.

2013 **RP 2013**, *7th International workshop on Reachability Problems (RP). 25 - 27 September 2013. Uppsala, Sweden.*

2012 **SYNASC 2012**, *14th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC). September 26 - 29 2012, Timisoara Romania*, Distributed computing track.

2012 **ICSE 2012**, *34th International Conference on Software Engineering (ICSE). June 2 - 9, 2012. Zurich, Switzerland*, ACM Student research competition.

Invited Seminars

Apr. 2019 **DEIB - Politecnico di Milano, Italy**, *I was invited by Prof. Pierluigi San Pietro to talk about my research activity carried out during my postdoctoral fellowship. The seminar was entitled "My past, present (and ulterior) research activity".*

Nov. 2015 **DIGIP - Università degli Studi di Bergamo, Italy**, *I was invited by the head of the FOSE Lab, Prof. Angelo Gargantini to talk about the application of formal methods leveraging modern parallel architectures. The seminar was entitled "Coping with the State Explosion Problem in Formal Methods: Advanced Abstraction Techniques and Big Data Approaches".*

Oct. 2014 **DEIB - Politecnico di Milano, Italy**, *I was invited by the head of the DEEPSE group, Prof. Carlo Ghezzi, to talk about my research activity carried out during my Ph.D. program. The seminar was entitled "Formal verification problems in a big data world: Towards a mighty synergy".*

Apr. 2014 **DEIB - Politecnico di Milano, Italy**, *I was invited by the head of the DEEPSE group, Prof. Carlo Ghezzi, to discuss and exchange ideas on common research interests and directions. The seminar was about "Distributed model checking on large clusters".*

External and International Collaborations

During my Ph.D. program and postdoctoral fellowship I built up and maintained strong collaborations with a number of external research groups working on common research directions and goals in Software Engineering and Formal Methods. Namely, major external/international collaborations follow below.

2019-present I've been involved in the maintenance and enhancement of the software tool NECO (`https://github.com/Lvyn/neco-net-compiler`), i.e., a LTL Model Checker supporting High-level Petri Net specifications. NECO is a research project by Prof. Franck Pommereau, head of the COSMO group at the University of Évry (France).

2018-present I currently have a collaboration with Catia Trubiani, Assistant Professor at the Gran Sasso Science Institute (GSSI), L'Aquila (Italy). We are currently have active research projects on uncertainty quantification in software development combining model-based testing techniques and Bayesian inference.

2018-present I'm an external collaborator of the ADAPT Lab, Dept. of Computer Science, University of Milan (Italy). I'm currently working along with Prof. Walter Cazzola on formal specification and verification of distributed evolvable systems.

2017-present I actively collaborate with Prof. Giuliana Franceschinis, University of Eastern Piedmont (Italy), on both didactics and research aspects. We are currently working on formal verification of distributed self-adaptive systems using High-level Petri Nets.

2015-present I have a longstanding collaboration with the FOSER research group at the University of Bergamo (Italy). Namely, we currently have a number of open research project along with Prof. Angelo Gargantini and Prof. Patrizia Scandurra on the application of formal methods to design and development of self-adaptive (time-dependent) systems and uncertainty quantification in software development.

Program and Organizing Committee Member

2020 **FAACS 2020**, *4th International Workshop on Formal Approaches for Advanced Computing Systems. Co-located with the 14th European Conference on Software Architecture (ECSA 2020)*, Program co-chair.

2020 **SA-TTA 2020**, *8th track on Software Architecture: Theory, Technology, and Applications (SA-TTA). Track of the The 34rd ACM/SIGAPP Symposium On Applied Computing (SAC 2020)*, Program co-chair.

2019 **FAACS 2019**, *3rd International Workshop on Formal Approaches for Advanced Computing Systems. Co-located with the 13th European Conference on Software Architecture (ECSA 2019)*, Program co-chair.

2019 **COP 2019**, *The 11th International Workshop on Context-Oriented Programming and Advanced Modularity (COP)*, External reviewer.

2019 **CLOSER 2019**, *9th International Conference on Cloud Computing and Services Science*, Program committee member.

2018 **FAACS 2018**, *2nd International Workshop on Formal Approaches for Advanced Computing Systems. Co-located with the 12th European Conference on Software Architecture (ECSA 2018)*, Program committee member.

2018 **MSE 2018**, *3rd International Workshop on Microservices: Science and Engineering. Co-located with STAF (Software Technologies: Applications and Foundations) 2018*, Program committee member.

2018 **SOCA 2018**, *The 11th IEEE International Conference on Service Oriented Computing and Applications*, External reviewer.

2017 **FAACS 2017**, *1st International Workshop on Formal Approaches for Advanced Computing Systems. Co-located with the 15th Int. conference on Software Engineering and Formal Methods (SEFM 2017)*, Program committee member.

2017 **MSE 2017**, *2nd International Workshop on Microservices: Science and Engineering. Co-located with the 15th Int. conference on Software Engineering and Formal Methods (SEFM 2017)*, Program committee member.

2016 **MSE 2017**, *2nd International Workshop on Microservices: Science and Engineering. Co-located with the 15th Int. conference on Software Engineering and Formal Methods (SEFM 2017)*, Program committee member.

2016 **MEDI 2016**, *6th International Conference on Model and Data Engineering*, External reviewer.

2015 **MEMOCODE 2015**, *13th ACM-IEEE International Conference on Formal Methods and Models for System Design*, External reviewer.

Referee Services for International Journals

I regularly serve as a reviewer for the following journals:

- IEEE SMC: IEEE Transactions on Systems, Man, and Cybernetics: Systems
- IEEE TSC: IEEE Transactions on Services Computing
- IEEE Access: IEEE Multidisciplinary Open Access Journal
- Elsevier SCP: Science of Computer Programming
- Elsevier RESS: Reliability Engineering & System Safety
- Wiley SPE: Software: Practice and Experience
- Wiley CPE: Concurrency and Computation: Practice and Experience

Refereed International Journal Articles

[JR.1] **2018**, *L. Capra, M. Camilli, Towards Evolving Petri Nets: a Symmetric Nets-based Framework, IFAC-PapersOnLine - Elsevier, Volume 51, Issue 7, 2018, Pages 480-485, ISSN 2405-8963, https://doi.org/10.1016/j.ifacol.2018.06.343*.

[JR.2] **2018**, *M. Camilli, A. Gargantini, and P. Scandurra. Zone-based formal specification and timing analysis of real-time self-adaptive systems. Science of Computer Programming - Elsevier, 159:28-57, 2018*.

[JR.3] **2016**, *C. Bellettini, M. Camilli, L. Capra, and M. Monga. Distributed CTL model checking using MapReduce: Theory and practice. Concurrency and Computation: Practice and Experience - Wiley, 28(11):3025-3041, August 2016.*

Refereed International Conference and Workshop Papers

[IC.0] **2019**, *M. Camilli, et.al. Hypothesis Testing Toolkit for Uncertain Service-based Web Applications. In proceedings of the 15th International conference on integrated Formal Methods, 2020. To appear..*

[IC.1] **2019**, *M. Camilli, and L. Capra. Formalizing Distributed Self-adaptive Systems using High-level Petri Nets. In Proceedings of the Summer Simulation Multi-Conference (SummerSim'19). Society for Computer Simulation International, San Diego, CA, USA. To appear.*

[IC.2] **2019**, *M. Camilli, C. Bellettini and L. Capra. PNemu: an Extensible Modeling Library for Adaptable Distributed Systems, in proc. of 40th International Conference, PETRI NETS 2019. To appear.*

[IC.3] **2018**, *M. Camilli, C. Bellettini, A. Gargantini and P. Scandurra, "Online Model-Based Testing under Uncertainty," 2018 IEEE 29th International Symposium on Software Reliability Engineering (ISSRE), Memphis, TN, USA, 2018, pp. 36-46. doi: 10.1109/ISSRE.2018.00015.*

[IC.4] **2018**, *M. Camilli, L. Capra. A Symmetric Nets Emulator for Adaptive P/T Nets. In 2018 20th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing*, To appear.

[IC.5] **2018**, *M. Camilli, C. Bellettini, and L. Capra. A high-level petri net-based formal model of distributed self-adaptive systems. In 12th European Conference on Software Architecture: Companion Proceedings (ECSA '18), volume ACM, New York, NY, USA, September 24-28 2018.*

[IC.6] **2018**, *M. Camilli, C. Bellettini, and L. Capra. Design-time to run-time verification of microservices based applications. In Antonio Cerone and Marco Roveri, editors, Software Engineering and Formal Methods, pages 168-173, Cham, 2018. Springer International Publishing.*

[IC.7] **2018**, *M. Camilli, C. Bellettini, L. Capra, and M. Monga. A formal framework for specifying and verifying microservices based process flows. In Antonio Cerone and Marco Roveri, editors, Software Engineering and Formal Methods, pages 187-202, Cham, 2018. Springer International Publishing.*

[IC.8] **2017**, *M. Camilli, A. Gargantini, P. Scandurra, and C. Bellettini. Towards inverse uncertainty quantification in software development (short paper). In Alessandro Cimatti and Marjan Sirjani, editors, Software Engineering and Formal Methods, pages 375-381, Cham, 2017. Springer International Publishing.*

[IC.9] **2017**, *M. Camilli, A. Gargantini, P. Scandurra, and C. Bellettini. Event-based runtime verification of temporal properties using time basic petri nets. In Clark Barrett, Misty Davies, and Temesghen Kahsai, editors, NASA Formal Methods, pages 115-130, Cham, 2017. Springer International Publishing.*

[IC.10] **2016**, *M. Camilli, C. Bellettini, L. Capra, and M. Monga. Coverability analysis of time basic petri nets with non-urgent behavior. In 2016 18th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC), pages 165-172, Sept 2016.*

[IC.11] **2015**, *M. Camilli, A. Gargantini, and P. Scandurra. Specifying and verifying real-time self-adaptive systems. In 2015 IEEE 26th International Symposium on Software Reliability Engineering (ISSRE), pages 303-313, Nov 2015.*

[IC.12] **2014**, *M. Camilli, C. Bellettini, L. Capra, and M. Monga. Ctl model checking in the cloud using mapreduce. In 2014 16th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, pages 333-340, Sept 2014.*

[IC.13] **2014**, *M. Camilli. Formal verification problems in a big data world: Towards a mighty synergy. In Companion Proceedings of the 36th International Conference on Software Engineering, ICSE Companion 2014, pages 638-641, New York, NY, USA, 2014. ACM.*

[IC.14] **2013**, *C. Bellettini, M. Camilli, L. Capra, and M. Monga. Mardigras: Simplified building of reachability graphs on large clusters. In Parosh Aziz Abdulla and Igor Potapov, editors, Reachability Problems, pages 83-95, Berlin, Heidelberg, 2013. Springer Berlin Heidelberg.*

[IC.15] **2012**, *C. Bellettini, M. Camilli, L. Capra, and M. Monga. Symbolic state space exploration of RT systems in the cloud. In 2012 14th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, pages 295-302, Sept 2012.*

[IC.16] **2012**, *M. Camilli. Petri nets state space analysis in the cloud. In 2012 34th International Conference on Software Engineering (ICSE), pages 1638-1640, June 2012.*

Submissions Under Review

[UR.1] **2019**, *M. Camilli, A. Gargantini and P. Scandurra. Uncertainty Quantification in Software Development Combining Model-based Testing and Bayesian Inference. Invited Special Issue Paper. Software Testing Verification and Reliability - Wiley. Submitted for publication.*

[UR.2] **2019**, *M. Camilli, L. Capra. Modeling and Verification of Self-adaptive Distributed Discrete-event Systems Using Symmetric Nets. Invited Special Issue Paper. Discrete-event Dynamic Systems - Springer. Submitted for publication.*

[UR.3] **2019**, *M. Camilli, A. Gargantini, P. Scandurra, C. Trubiani. Evaluating Uncertainty-aware Testing Methods by Delivered Confidence. ICSE 2020. Submitted for publication.*