Matteo Sammartino

Personal Information

Born: Catania, Italy, 10/11/1984
Citizenship: Italian
Email: matteo.sammartino@rhul.ac.uk
Job title: Lecturer
Affiliation: Royal Holloway University of London, University College London (Honorary)
Webpage: matteosammartino.com
Google Scholar Page DBLP page

Language

Italian native language
English fluent

Research Interests

- Formal semantics of programming languages
- Algebraic and coalgebraic specification
- Formal methods for concurrency
- Infinite-state models of computation
- Model learning and its applications in automated verification

Education

1/2010-12/2013 **PhD in Computer Science**, *University of Pisa*, Italy.
Thesis title: A Network-Aware Process Calculus for Global Computing and its Categorical Framework
Supervisor: Prof. Ugo Montanari

5/2009-12/2009 **Scholarship in the EU FP6 Project SENSORIA**, *University of Pisa*, Italy.
Topic: Semantics of systems with dynamic allocation and de-allocation of resources

1/2007-4/2009 **Master's degree in Computer Science**, *University of Pisa*, Italy.
Thesis title: Saturated Transition Systems for Presheaf Models
Supervisor: Prof. Ugo Montanari
Graduation mark: 110/110 cum laude

9/2003-12/2006 **Bachelor's degree in Computer Science**, *University of Pisa*, Italy.
Thesis Title: Un approccio innovativo ai problemi di flusso multicommodity basato sulla lagrangiana aumentata (An innovative approach to multicommodity flow problems based on augmented lagrangian)
Supervisor: Prof. Antonio Frangioni
Graduation mark: 110/110 cum laude

Employment History

01/2020 **Lecturer**, *Department of Computer Science, Royal Holloway University of London*, UK.

11/2018-12/2019 **Senior Research Associate and Teaching Fellow**, *Computer Science Department, UCL*, UK.

11/2017-10/2018 **Research Associate and Teaching Fellow**, *Computer Science Department, UCL*, UK.

1/2016-10/2017 **Research Associate**, *Computer Science Department, UCL*, UK.

1/2015-12/2015 **Postdoc researcher**, *Institute for Computing and Information Sciences, Radboud University*, Nijmegen, The Netherlands.
Funded by the NWO project *Practical Coinduction*

1/2013 - 12/2014 **Research fellow**, *Computer Science Department, University of Pisa*, Italy.
Funded by the EU FP7 Project *ASCENS*
Topic: Resource-based process calculi for global computing

Visiting positions

10/2016-11/2016 **Visiting researcher**, *Simons Institute for the Theory of Computing*, Berkeley, CA, USA.
Participant in the program *Logical Structures in Computation*

Teaching Experience

2020-present **Module Leader**, *Computer Science Department, RHUL*, London, UK.
Courses: Operating Systems (CS2850), Programming for Data Analysis (CS5810), Object Oriented Programming II (CS1812)

2017-2019 **Module Leader**, *Computer Science Department, UCL*, London, UK.
Course: Design and Professional Skills

2015 **Instructor**, *Institute for Computing and Information Sciences, Radboud University*, Nijmegen, The Netherlands.
Course: Algorithms and Data Structures

Supervision

Students

from October 2018 **Stefan Zetzsche**, *PhD Student*, Computer Science Department,UCL, UK.

Summers 2017/2018 **Tiago Ferreira**, *A-level student*, Internship at UCL.

2/2017-5/2017 **Maverick Chardet**, *Master's student*, ENS Lyon, M2 internship.

9/2016-7/2020 **Gerco van Heerdt**, *PhD student*, Computer Science Department, UCL, UK.

Postdocs

7/2020 - present **Thomas Neele**, CS Department, RHUL, UK.

Grants and Awards

2019 ∼ **£690k EPSRC Standard Grant**.
Project: Verification of Hardware Concurrency via Model Learning (CLeVer)

2018 ∼ **£98k grant for a PhD studentship**.
Funder: GCHQ, via the Research Institute in Verified Trustworthy Software Systems

2010 **Awarded PhD scholarship**.

Department Service

2018 **Served as Upgrade VIVA Chair and Final VIVA Examiner**.

2017 **Served as First Year VIVA Chair**.

Additional Education and Training

2019 **"Arena Two" course and "Enhancing Module Design" workshop**, *UCL*.

2017 **"Introduction to Research Student Supervision" course**, *UCL*.

Participation in Research Projects

- Verification of Hardware Concurrency via Model Learning (as Co-Investigator and lead author of the proposal)
- Automated Black-box Verification of Networking Systems (as Co-Investigator and lead author of the proposal)
- Dutch NWO project Practical Coinduction (as Researcher)
- EU FP7 Project ASCENS (as Researcher)
- EU FP6 Project SENSORIA (as Researcher)
- Italian MIUR Project CINA (PRIN 2010) (as Researcher)
- Italian MIUR Project IPODS (PRIN 2008) (as Researcher)

International Collaborations

- Loris D'Antoni, University of Wisconsin-Madison, USA
- Nathan Chong, ARM, UK
- Elvira Albert, Complutense University of Madrid, Spain
- Albert Rubio, Universitat Politécnica de Catalunya, Spain
- Byron Cook and Paul Subotic, Amazon UK
- Ugo Montanari, Fabio Gadducci, Roberto Bruni and Giacoma Valentina Monreale, University of Pisa, Italy
- Vincenzo Ciancia, ISTI-CNR Pisa, Italy
- Joshua Moerman, Radboud University, The Netherlands
- Bartek Klin and Michał Szynwelski, Warsaw University, Poland

Invitation to Conferences

3/2016 **Bellairs Workshop**, *McGill University*, Barbados.

Talks

Invited

2019 **Coalgebras for Causality**, *4th Workshop on Formal Reasoning about Causation, Responsibility, & Explanations in Science & Technology (CREST)*, ETAPS workshop, Prague, Czech Republic.

2017 **Learning Nominal Automata**, *RISE Seminar Cycle*, IST Austria, Vienna, Austria.

Conferences and Workshops

2018 **Automated Black-box Verification of Networking Systems**, *VeTSS PhD School and Sixth Workshop on Formal Methods and Tools for Security (FMATS)*, Microsoft Research, Cambridge, UK.

2017 **CALF: Categorical Automata Learning Framework.**, *LiVe (Learning in Verification)*, Uppsala, Sweden.

2017 **Learning Nominal Automata.**, *POPL (Principles of Programming Languages)*, Paris, France.

2015 **Dynamic Programming on Nominal Graphs.**, *GaM (Graph as Models)*, London, UK.

2014 **A Class of Automata for the Verification of Infinite, Resource-Allocating Behaviours.**, *TCG (Trustworthy Global Computing)*, Rome, Italy.

2012 **Network-Conscious π-calculus: a Concurrent Semantics.**, *MFPS (Mathematical Foundations of Programming Semantics)*, Bath, UK.

Seminars

2017 **CALF: Categorical Automata Learning Framework**, *6th South of England Regional Programming Language Seminar (S-REPLS)*, UCL, UK.

2016 **Learning Nominal Automata**, *Logic Lounge Cycle*, Simons Institute for the Theory of Computing, University of California, Berkeley, USA.

2015 **A Coalgebraic Semantics for Causality in Petri Nets**, *Brouwer Seminar Cycle*, Radboud University, Nijmegen, The Netherlands.

2014 **Presheaf Models for Nominal Calculi**.
Delivered at: ENS Lyon, France; Aarhus University, Denmark; Radboud University, Nijmegen, The Netherlands, in the *Brouwer Seminar Cycle*

2012-2014 **Seminars at meetings of research projects**.

- *Modeling PASTRY Distributed Hash Tables with Resource-Conscious Pi-Calculus*, University of Bologna (2014), PRIN CINA project;
- *Revisiting Causality* , Volkswagen, Braunschweig (2014), EU FP7 ASCENS project;
- *Operational models for resouce-aware calculi*, University of Pisa (2013), PRIN CINA project;
- *Resources in Cloud Computing*, Fraunhofer Institute, Berlin (2012), EU FP7 ASCENS project.

Professional Service

Organisation of events

2018-present **Co-organiser and co-chair of the Learning and Automata (LearnAut) Workshop**.
Affiliated with: FLoC 2018, LICS 2019

2010-2013 **Organiser of the *Mauriana Pesaresi* seminars for Computer Science PhD students**, *University of Pisa*, Italy.

Committee Memberships

ICGI 2020 PC, ICE 2018-2020 PC, CREST 2019 PC,RADICAL 2017 PC, POPL 2017 Artefact Evaluation Committee.

Reviews

Journals	Information and Computation, Journal of Logical and Algebraic Methods in Programming (Elsevier), Transactions on Modeling and Computer Simulation (ACM), Scientific Annals of Computer Science, Science of Computer Programming (Elsevier), Service Oriented Computing and Applications (Springer), Fundamenta Informaticæ.
Conferences & Workshops	MFCS 2020, TbiLLC 2019, LICS 2020, FOSSACS 2020, ESOP 2020, FSCD 2019, ESOP 2019, LPAR 2018, CSL 2018, FORTE 2018, FOSSACS 2018, MFCS 2017, CALCO 2017, FORTE 2017, FOSSACS 2017, FORTE 2016, CONCUR 2015, LICS 2015, FSEN 2015, COORDINATION 2014, ICALP 2014, PDP 2014, LATA 2014, WRLA 2014, APLAS 2014, FORTE 2012, TCS 2012.

Publications

Book chapters

[1] Roberto Bruni, Ugo Montanari, and Matteo Sammartino. "Reconfigurable and Software-Defined Networks of Connectors and Components". In: *Software Engineering for Collective Autonomic Systems - The ASCENS Approach*. 2015, pp. 73–106. DOI: 10.1007/978-3-319-16310-9_2.

[2] Nicklas Hoch, Giacoma Valentina Monreale, Ugo Montanari, Matteo Sammartino, and Alain Tcheukam Siwe. "From Local to Global Knowledge and Back". In: *Software Engineering for Collective Autonomic Systems - The ASCENS Approach*. 2015, pp. 185–220. DOI: 10.1007/978-3-319-16310-9_5.

Journal Articles

[3] Gerco van Heerdt, Joshua Moerman, Matteo Sammartino, and Alexandra Silva. "A (co)algebraic theory of succinct automata". In: *Journal of Logical and Algebraic Methods in Programming* 105 (2019), pp. 112–125. DOI: 10.1016/j.jlamp.2019.02.008.

[4] Roberto Bruni, Ugo Montanari, and Matteo Sammartino. "A coalgebraic semantics for causality in Petri nets". In: *Journal of Logical and Algebraic Methods in Programming* 84.6 (2015), pp. 853–883. DOI: 10.1016/j.jlamp.2015.07.003.

[5] Roberto Bruni, Ugo Montanari, and Matteo Sammartino. "Revisiting causality, coalgebraically". In: *Acta Informatica* 52.1 (2015), pp. 5–33. DOI: 10.1007/s00236-014-0207-9.

[6] Ugo Montanari and Matteo Sammartino. "A network-conscious π-calculus and its coalgebraic semantics". In: *Theoretical Computer Science* 546 (2014), pp. 188–224. DOI: 10.1016/j.tcs.2014.03.009.

Conference and Workshop Papers

[7] Fabio Gadducci, Hernan Melgratti, Christian Roldan, and Matteo Sammartino. "Implementation correctness for Replicated Data Types, categorically". In: *17th International Colloquium on Theoretical Aspects of Computing (ICTAC)*.

[8] Gerco van Heerdt, Matteo Sammartino, and Alexandra Silva. "Learning Automata with Side-Effects". In: *Coalgebraic Methods in Computer Science - 15th International Workshop (CMCS)*. URL: https://doi.org/10.1007/978-3-030-57201-3%5C_5.

[9] Joshua Moerman and Matteo Sammartino. "Residual Nominal Automata". In: *31st International Conference on Concurrency Theory (CONCUR)*.

[10] Roberto Bruni, Ugo Montanari, and Matteo Sammartino. "Algebras for Tree Decomposable Graphs". In: *Graph Transformation - 13th International Conference (ICGT)*. 2020.

[11] Loris D'Antoni, Tiago Ferreira, Matteo Sammartino, and Alexandra Silva. "Symbolic Register Automata". In: *31st International Conference on Computer-Aided Verification (CAV)*. 2019, pp. 3–21. DOI: 10.1007/978-3-030-25540-4_1.

[12] Fabio Gadducci, Hernan Melgratti, Christian Roldan, and Matteo Sammartino. "A Categorical Account of Replicated Data Types". In: *39th IARCS Annual Conference on. Foundations of Software Technology and Theoretical Computer Science (FST&TCS)*. 2019.

[13] Gerco van Heerdt, Tobias Kappe, Jurriaan Rot, Matteo Sammartino, and Alexandra Silva. “Tree Automata as Algebras: Minimisation and Determinisation”. In: *8th Conference on Algebra and Coalgebra in Computer Science (CALCO)*. 2019.

[14] Elvira Albert, Miguel Gomez-Zamalloa, Albert Rubio, Matteo Sammartino, and Alexandra Silva. “SDN-Actors: Modeling and Verification of SDN Programs”. In: *22nd International Symposium on Formal Methods (FM)*. 2018, pp. 550–567. DOI: 10.1007/978-3-319-95582-7_33.

[15] Ugo Montanari, Matteo Sammartino, and Alain Tcheukam Siwe. “Decomposition Structures for Soft Constraint Evaluation Problems: An Algebraic Approach”. In: *Graph Transformation, Specifications, and Nets - In Memory of Hartmut Ehrig*. 2018, pp. 179–200. DOI: 10.1007/978-3-319-75396-6_10.

[16] Gerco van Heerdt, Matteo Sammartino, and Alexandra Silva. “CALF: Categorical Automata Learning Framework”. In: *26th EACSL Annual Conference on Computer Science Logic (CSL)*. 2017, 29:1–29:24. DOI: 10.4230/LIPIcs.CSL.2017.29.

[17] Joshua Moerman, Matteo Sammartino, Alexandra Silva, Bartek Klin, and Michal Szynwelski. “Learning nominal automata”. In: *44th ACM SIGPLAN Symposium on Principles of Programming Languages (POPL)*. 2017, pp. 613–625. DOI: 10.1145/3009837.3009879.

[18] Roberto Bruni, Ugo Montanari, and Matteo Sammartino. “Causal Trees, Finally”. In: *Programming Languages with Applications to Biology and Security*. 2015, pp. 27–43. DOI: 10.1007/978-3-319-25527-9_4.

[19] Nicklas Hoch, Ugo Montanari, and Matteo Sammartino. “Dynamic Programming on Nominal Graphs”. In: *Graphs as Models*. Vol. 181. EPTCS. 2015, pp. 80–96. DOI: 10.4204/EPTCS.181.6.

[20] Ugo Montanari and Matteo Sammartino. “Network-Conscious π-calculus - A Model of Pastry”. In: *Logical and Semantic Frameworks, with Applications 2014*. Vol. 312. ENTCS. 2015, pp. 3–17.

[21] Vincenzo Ciancia and Matteo Sammartino. “A Class of Automata for the Verification of Infinite, Resource-Allocating Behaviours”. In: *Trustworthy Global Computing*. LNCS. Springer, 2014, pp. 97–111. DOI: 10.1007/978-3-662-45917-1_7.

[22] Ugo Montanari and Matteo Sammartino. “Network Conscious π-calculus: A Concurrent Semantics”. In: *Mathematical Foundations of Programming Semantics 2012*. Vol. 286. ENTCS. 2012, pp. 291–306. DOI: 10.1016/j.entcs.2012.08.019.

PhD Thesis

[23] Matteo Sammartino. “A Network-Aware Process Calculus for Global Computing and its Categorical Framework”. PhD thesis. University of Pisa, 2013.

arXiv

[24] Gerco van Heerdt, Matteo Sammartino, and Alexandra Silva. “Learning Automata with Side-Effects”. In: *CoRR* abs/1704.08055 (2017). URL: http://arxiv.org/abs/1704.08055.

[25] Vincenzo Ciancia and Matteo Sammartino. “A decidable class of (nominal) omega-regular languages over an infinite alphabet”. In: *CoRR* abs/1310.3945 (2013). URL: http://arxiv.org/abs/1310.3945.