

Cristian Mattarei, PhD

Postdoctoral Researcher - Stanford University

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Education

- Feb. 2016 **PhD in Information and Communication Technology**,
University of Trento & Fondazione Bruno Kessler, Trento (Italy).
Thesis: Scalable Safety and Reliability Analysis via Symbolic Model Checking: Theory and Applications. Supervisor: Alessandro Cimatti, Co-supervisor: Marco Bozzano.
Committee: David Jones (The Boeing Company), Luigi Portinale (Università del Piemonte Orientale), Roberto Sebastiani (Università di Trento), Christel Seguin (ONERA), and Joseph Sifakis (EPFL).
- Mar. 2011 **Master Degree in Computer Science (Data, Media, and Knowledge)**,
University of Trento, Trento (Italy).
- Sep. 2007 **Bachelor Degree in Computer Science**,
University of Trento, Trento (Italy).

Professional Experience

- Oct. 2016 - **Postdoctoral Researcher**,
present *Stanford University*, Stanford, California (USA).
Formal Verification of the Javascript Memory Model
- Nov. 2015 - **Researcher**,
Oct. 2016 *Fondazione Bruno Kessler*, Trento (Italy).
Symbolic Model Checking Based Safety and Reliability Analysis
- Feb. 2014 - **Visiting Researcher**,
Sep. 2014 *NASA Ames Research Center*, Moffett Field, California (USA).
Formal Verification, Validation, and Safety Analysis of the Functional Allocation project for the NextGen of the Automated Air Traffic Control System
- Nov. 2011 - **PhD Student/Candidate**,
Feb. 2016 *Fondazione Bruno Kessler*, Trento (Italy).
PhD Program in Formal Verification of Safety Critical Systems
- Jul. 2010 - **Software Engineer**,
Oct. 2011 *Fondazione Bruno Kessler*, Trento (Italy).
Design and implementation of the NuSMV integration into the Dassault Aviation OCAS toolset
- Jan. 2009 - **Software Engineer**,
Aug. 2010 *Fondazione Bruno Kessler*, Trento (Italy).
Design and implementation of MathSAT3D: an SMT-based solver for 3D spatial constraints

Mar. 2008 - **Formal Modeler**,

Mar. 2009 *Fondazione Bruno Kessler*, Trento (Italy).

Formalization and modeling of the European Train Control System (ETCS) interoperability requirements

Publications

Apr. 2018 **EMME: a formal tool for ECMAScript Memory Model Evaluation**

C. Mattarei, C. Barrett, S. Guo, B. Nelson, and B. Smith.

TACAS 2018, 24th International Conference on Tools and Algorithms for the Construction and Analysis of Systems. Thessaloniki (Greece)

Jul. 2016 **Model Checking at Scale: Automated Air Traffic Control Design Space Exploration**

M. Gario, A. Cimatti, C. Mattarei, S. Tonetta, and K. Y. Rozier.

CAV 2016, 28th International Conference on Computer Aided Verification. Toronto (Canada)

Apr. 2016 **The xSAP Safety Analysis Platform**

B. Bittner, M. Bozzano, R. Cavada, A. Cimatti, M. Gario, A. Griggio, C. Mattarei, A. Micheli and G. Zampedri*.

TACAS 2016, 22nd International Conference on Tools and Algorithms for the Construction and Analysis of Systems. Eindhoven (The Netherlands)

Sep. 2015 **Comparing Different Functional Allocations in Automated Air Traffic Control Design**

C. Mattarei, A. Cimatti, M. Gario, S. Tonetta, and K.Y. Rozier.

FMCAD 2015, 15th International Conference on Formal Methods in Computer-Aided Design. Austin, Texas (USA)

Jul. 2015 **Efficient Anytime Techniques for Model-Based Safety Analysis**

M. Bozzano, A. Cimatti, A. Griggio, and C. Mattarei*.

CAV 2015, 27th International Conference on Computer Aided Verification. San Francisco, California (USA)

Nov. 2014 **Formal Safety Assessment via Contract-Based Design**

M. Bozzano, A. Cimatti, C. Mattarei, and S. Tonetta*.

ATVA 2014, 12th International Symposium on Automated Technology for Verification and Analysis. Sydney (Australia)

Jan. 2015 **Safety Assessment of Altarica models via Symbolic Model Checking**

M. Bozzano, A. Cimatti, O. Lisagor, C. Mattarei, S. Mover, M. Roveri, and S. Tonetta*.

Science of Computer Programming Journal. Vol. 98.

Nov. 2013 **Efficient Analysis of Reliability Architectures via Predicate Abstraction**

M. Bozzano, A. Cimatti, and C. Mattarei*.

HVC 2013, 9th Haifa Verification Conference. Haifa (Israel)

Jul. 2013 **Automated Analysis of Reliability Architectures**

M. Bozzano, A. Cimatti, and C. Mattarei*.

ICECCS 2013, 18th International Conference on Engineering of Complex Computer Systems. Singapore

Sep. 2011 **Symbolic Model Checking and Safety Assessment of Altarica models**

M. Bozzano, A. Cimatti, O. Lisagor, C. Mattarei, S. Mover, M. Roveri, and S. Tonetta*.

AVoCS 2011, 11th International Workshop on Automated Verification of Critical Systems. Newcastle Upon Tyne (United Kingdom)

- Nov. 2009 **EuRailCheck: Tool Support for Requirements Validation**
R. Cavada, A. Cimatti, A. Mariotti, C. Mattarei, A. Micheli, A. Susi, S. Mover, M. Pensallorto, M. Roveri, and S. Tonetta*.
ASE 2009, 24th IEEE/ACM International Conference on Automated Software Engineering.
Auckland (New Zealand)

**authors in alphabetical order.*

Talks

- Nov. 30, **EMME: a formal tool for ECMAScript Memory Model Evaluation**,
2017 *Stanford University (USA)*, Stanford, California (USA).
- Feb. 10, **Scalable Safety and Reliability Analyses via Symbolic Model Checking**,
2017 *Stanford University (USA)*, Stanford, California (USA).
- Sep. 29, **Comparing Different Functional Allocations in Automated Air Traffic Control Design**,
2015 *FMCAD 2015, 15th International Conference on Formal Methods in Computer-Aided Design*, Austin, Texas (USA).
- Nov. 4, **Formal Safety Assessment via Contract-Based Design**,
2014 *ATVA 2014, 12th International Symposium on Automated Technology for Verification and Analysis*, Sydney (Australia).
- Aug. 22, **Formal Safety Assessment via SAT/SMT**,
2014 *Stanford Research International (SRI)*, Menlo Park, California (USA).
- Aug. 11, **Formal Analysis for Deciding Functional Allocation for AAC: Modeling Approach and Current Results**,
2014 *NASA ARC, Flight Trajectory Dynamics and Controls (AFT)*, Moffett Field, California (USA).
- Jun. 23, **Formal Analysis for Deciding Functional Allocation for AAC: an Overview of the Methodology**,
2014 *NASA ARC, Flight Trajectory Dynamics and Controls (AFT)*, Moffett Field, California (USA).
- Nov. 7, **Efficient Analysis of Reliability Architectures via Predicate Abstraction**,
2013 *HVC 2013, 9th Haifa Verification Conference*, Haifa (Israel).
- Jul. 19, **Automated Analysis of Reliability Architectures**,
2013 *ICECCS 2013, 18th International Conference on Engineering of Complex Computer Systems*, Singapore.
- May 28, **Automated Analysis of Reliability Architectures**,
2013 *AVM 2013, 8th Alpine Verification Meeting*, Trento (Italy).
- Sep. 12, **NuSMV3: a Framework for Model-Based Safety Assessment**,
2012 *MBSAW 2012, Model-Based Safety Assessment Workshop*, Bordeaux (France).
- May 22, **Library-Based Fault Injection for Formal Safety Assessment**,
2012 *AVM 2012, 7th Alpine Verification Meeting*, Passau (Germany).
- Sep. 12, **Symbolic Model Checking and Safety Assessment of Altarica models**,
2011 *AVoCS 2011, 11th International Workshop on Automated Verification of Critical Systems*, Newcastle Upon Tyne (United Kingdom).

Professional Activities

Program Committees

- AAAI: Association for the Advancement of Artificial Intelligence, 2018,
- AAAI: Association for the Advancement of Artificial Intelligence, 2017.

Peer-Reviews

- 9th NASA Formal Methods Symposium (NFM 2017),
- Transactions on Dependable and Secure Computing (TDSC 2016),
- 14th International Symposium on Automated Technology for Verification and Analysis (ATVA 2016),
- 21st International Symposium on Formal Methods (FM 2016),
- 25th International Joint Conference on Artificial Intelligence (IJCAI 2016),
- 18th Design and Testing in Europe Conference (DATE 2015),
- 21st International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2014),
- Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD 2015),
- 12th International Symposium on Automated Technology for Verification and Analysis (ATVA 2014),
- 14th International Conference on Formal Methods in Computer Aided Design (FMCAD 2014),
- 20th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2014),
- 16th Design and Testing in Europe Conference (DATE 2013),
- 3rd International Workshop on Model Based Safety Assessment (IWMBSA 2013),
- 7th International Symposium on Theoretical Aspects of Software Engineering (TASE 2013),
- Journal of Artificial Intelligence Research (JAIR 2012).

Summer Schools

Jun. 17 - 22, 2013 **13th International School on Formal Methods for the Design of Computer, Communication and Software Systems: Dynamical Systems**,
University Residential Center of Bertinoro, Bertinoro (Italy).

Jun. 12 - 15, 2012 **2nd International SAT/SMT Summer School**,
Fondazione Bruno Kessler, Trento (Italy).

Languages

Italian Native speaker

English Fluent

References

- **Alessandro Cimatti:** Head of Embedded Systems Unit (FBK) (cimatti@fbk.eu)
- **Clark Barrett:** Associate Professor Stanford University (barrett@cs.stanford.edu)
- **Kristin Yvonne Rozier:** Associate Professor Iowa State University (ky-rozier@iastate.edu)
- **David Jones:** Former Boeing Researcher (jonesdh821@gmail.com)
- **Marco Bozzano:** Senior Researcher at Embedded Systems Unit (FBK) (bozzano@fbk.eu)
- **Stefano Tonetta:** Researcher at Embedded Systems Unit (FBK) (tonettas@fbk.eu)