

# 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).

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## 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

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## Publications

- 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.*

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## Talks

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

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## Professional Activities

### Program Committees

- AAI: 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).

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## 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).*

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## Languages

Italian Native speaker  
English Fluent

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## 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 (k-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)