

Andrea Micheli

Resume



PhD in Computer Science with track record of publications in top-tier venues, proven ability of delivering solutions within research projects, and experience conceiving, designing, and implementing formal reasoning, planning and scheduling tools. Seeking to apply AI-based techniques for practical and industrial applications.

Education

- 2011 – 2016 **PhD in Computer Science**, *University of Trento and Fondazione Bruno Kessler, Italy.*
Planning and Scheduling in Temporally Uncertain Domains under the supervision of Alessandro Cimatti.
- 2009 – 2011 **Master Degree**, *University of Trento, Italy, Grade: 110/110 with honors.*
MSC in Computer Science, minor in Bioinformatics.
- 2010 – 2011 **Erasmus Scholarship**, *Vrije Universiteit Amsterdam, The Netherlands.*
- 2006 – 2009 **Bachelor Degree**, *University of Trento, Italy, Grade: 110/110 with honors.*
BSC in Computer Science.

Awards

- 2017 Honorable Mention for the ICAPS Best Dissertation Award, Pittsburgh, PA (USA).
- 2016 EurAI Best Dissertation Award, European Association for Artificial Intelligence (EurAI), The Hague (NL).
- 2016 Italian Association for Artificial Intelligence Best Dissertation Award 2016 “Premio Marco Cadoli”, Genova, (IT).
- 2006 Silver Medal at the Italian Olympiad in Informatics, Italian Association for Automated Computation (AICA), Milan.

Research Interests

My current research interests include Artificial Intelligence Planning in Continuous Domains and Temporal Reasoning Under Uncertainty. I worked on several research projects on this topic, in particular the ESA-IRONCAP project, aiming at the development of a mission planning system for future ESA missions, and the EIT iLAADR project, in which I developed the planning system for an industrial Automated Guided Vehicle with an on-board manipulator.

I am also interested in Satisfiability Modulo Theory, especially in Quantified Theories as an enabling technology for my planning research.

I am still involved in the development of NuSMV, hence I am interested in Formal Verification in general and Model Checking in particular.

Work Experience

- 2016 – Present **Post-Doctoral researcher**, *Fondazione Bruno Kessler, Trento, Italy.*
Research in Artificial Intelligence Planning and Scheduling.
- 2015 **Internship**, *NASA Ames Research Center, Mountain View, California, USA.*
Internship on the development of techniques for Strong Temporal Planning Under Uncertainty.

- 2010 – 2011 **Teaching Assistant**, *Free University of Bolzano*, Italy.
Functional and Logic Programming Languages course.
- 2008 – 2011 **Scientific Developer**, *Fondazione Bruno Kessler*, Trento, Italy.
Development of the EurailCheck software for the ERA-ETCS project. Development of the NuSMV and nuXmv model checkers. Development of the NuSMV API interface for the Kratos model checker.

Software Projects

- pySMT I am the co-creator of PYSMT (<http://www.pysmt.org>), an open-source python library that provides a solver agnostic interface to define, manipulate and solve first-order formulae in a decidable background theories.
- NuSMV I collaborated in the development of NUSMV (<http://nusmv.fbk.eu>), a state-of-the-art symbolic model checker for finite-state systems.
- nuXmv I collaborated in the development of NUXMV (<http://nuxmv.fbk.eu>), a symbolic model checker for the analysis of synchronous finite-state and infinite-state systems. NUXMV features SMT-based verification techniques, implemented through a tight integration with MATHSAT5.
- Kratos I collaborated in the development of KRATOS (<http://es.fbk.eu/tools/kratos/>), a software model checker for sequential and (cooperative) threaded C programs.

Publications

- 2017 Minh Do, Alessandro Cimatti, Andrea Micheli, Marco Roveri and David E. Smith. *Strong Temporal Planning with Uncontrollable Durations*. In *Artificial Intelligence*, 2017.
Andrea Micheli. *Disjunctive temporal networks with uncertainty via SMT: Recent results and directions*. In *Intelligenza Artificiale*, 2017.
Alessandro Cimatti, Andrea Micheli and Marco Roveri. *Validating Domains and Plans for Temporal Planning via Encoding into Infinite-State Linear Temporal Logic*. In *AAAI*, 2017.
- 2016 Alessandro Cimatti, Luke Hunsberger, Andrea Micheli, Roberto Posenato and Marco Roveri. *Dynamic Controllability via Timed Game Automata*. In *Acta Informatica*, 2016.
Alessandro Cimatti, Andrea Micheli and Marco Roveri. *Dynamic Controllability of Disjunctive Temporal Networks: Validation and Synthesis of Executable Strategies*. In *AAAI*, 2016.
- 2015 Marco Gario and Andrea Micheli. *pySMT: a Solver-Agnostic Library for Fast Prototyping of SMT-Based Algorithms*. In *SMT*, 2015.
Andrea Micheli, Minh Do and David E. Smith. *Compiling Away Uncertainty in Strong Temporal Planning with Uncontrollable Durations*. In *IJCAI*, 2015.
Alessandro Cimatti, Andrea Micheli and Marco Roveri. *An SMT-based approach to Weak Controllability for Disjunctive Temporal Problems with Uncertainty*. In *Artificial Intelligence*, 2015.
Marco Bozzano, Alessandro Cimatti, Marco Gario and Andrea Micheli. *SMT-based Validation of Timed Failure Propagation Graphs*. In *AAAI*, 2015.
Alessandro Cimatti, Andrea Micheli and Marco Roveri. *Strong Temporal Planning with Uncontrollable Durations: a State-Space Approach*. In *AAAI*, 2015.
Alessandro Cimatti, Andrea Micheli and Marco Roveri. *Solving strong controllability of temporal problems with uncertainty using SMT*. In *Constraints*, 2015.
- 2014 Roberto Cavada, Alessandro Cimatti, Michele Dorigatti, Alberto Griggio, Alessandro Mariotti, Andrea Micheli, Sergio Mover, Marco Roveri and Stefano Tonetta. *The nuXmv Symbolic Model Checker*. In *CAV*, 2014.
Alessandro Cimatti, Luke Hunsberger, Andrea Micheli, Roberto Posenato and Marco Roveri. *Sound and Complete Algorithms for Checking the Dynamic Controllability of Temporal Networks with Uncertainty, Disjunction and Observation*. In *TIME*, 2014.

- Alessandro Cimatti, Luke Hunsberger, Andrea Micheli and Marco Roveri. *Using Timed Game Automata to Synthesize Execution Strategies for Simple Temporal Networks with Uncertainty*. In AAI, 2014.
- 2013 Alessandro Cimatti, Andrea Micheli, and Marco Roveri. *Timelines with temporal uncertainty*. In AAI, 2013.
- 2012 Alessandro Cimatti, Andrea Micheli, and Marco Roveri. *Solving temporal problems using SMT: strong controllability*. In CP, 2012.
- Alessandro Cimatti, Andrea Micheli, and Marco Roveri. *Solving temporal problems using SMT: weak controllability*. In AAI, 2012.
- 2011 Alessandro Cimatti, Alberto Griggio, Andrea Micheli, Iman Narasamdya, and Marco Roveri. *Kratos - a software model checker for SystemC*. In CAV, 2011.
- 2010 Roberto Cavada, Alessandro Cimatti, Andrea Micheli, Marco Roveri, Angelo Susi, and Stefano Tonetta. *OthelloPlay: a plug-in based tool for requirement formalization and validation*. In TOPI, 2010.
- Alessandro Cimatti, Andrea Micheli, Iman Narasamdya, and Marco Roveri. *Verifying SystemC: A software model checking approach*. In FMCAD, 2010.
- 2009 Roberto Cavada, Alessandro Cimatti, Alessandro Mariotti, Cristian Mattarei, Andrea Micheli, Sergio Mover, Marco Pensallorto, Marco Roveri, Angelo Susi, and Stefano Tonetta. *Supporting requirements validation: The EurailCheck tool*. In ASE, 2009.

Languages

- Italian Mother tongue.
- English Proficient. I hold a Cambridge ESOL First Certificate in English (Mar 2006).

Relevant Experiences

Selected Talks

- 2017 *Validating Domains and Plans for Temporal Planning via Encoding into Infinite-State Linear Temporal Logic* at AAI 2017, San Francisco (CA), USA.
- 2016 *Planning and Scheduling in Temporally Uncertain Domains* at ECAI 2016, The Hague (NL).
- Dynamic Controllability of Disjunctive Temporal Networks: Validation and Synthesis of Executable Strategies* at AAI 2016, Phoenix (AZ), USA.
- 2015 *SMT-based techniques for planning and scheduling under uncertainty* at NASA Ames Research Center, Mountain View (CA), USA.
- 2014 *Using Timed Game Automata to Synthesize Execution Strategies for Simple Temporal Networks with Uncertainty* at the AAI 2014 conference, Quebec City, Canada.
- 2013 *Timelines with Temporal Uncertainty* at the IPS 2013 workshop, Turin, Italy.
- Timelines with Temporal Uncertainty* at the AAI 2013 conference, Bellevue (WA), USA.
- 2012 *Strong Controllability of Disjunctive Temporal Problems* at the Constraint Programming 2012 conference, Quebec City, Canada.
- Weak Controllability of Temporal Problems* at the AAI 2012 conference, Toronto, Canada.
- Strong Controllability of Disjunctive Temporal Problems* at the CSP-SAT 2012 workshop, Trento, Italy.
- Temporal Problems* at the Alpine Verification Meeting 2012, Passau, Germany.
- 2010 *OthelloPlay: a plug-in based tool for requirement formalization and validation* at the TOPI 2010 workshop, Honolulu (HI), USA.

Summer Schools

- 2013 ICAPS summer school on Planning and Scheduling, Perugia, Italy.
- 2012 SAT/SMT summer school in Trento, Italy.

Academic Services

I served in the program committee of the following conferences: ECAI'16, AAI'17, IJCAI'17, AAI'18.

I served as a Reviewer for the following journals: Constraints, Artificial Intelligence, IJITDM and Mathematical Reviews.

I served as a Reviewer for the following conferences: TACAS'08, FMCAD'12, LPAR'13, IJCAI'13, CP'13, IPS'13, DATE'14, TACAS'14, RCRA'14, TIME'14, FMCAD'14, VMCAI'15, AAI'15, ATVA'16, CAV'16, IJCAI'16, CPAIOR'17, TACAS'17, CAV'17.

I served as a sub-reviewer for the following journals: JLAP, STTT and Information Sciences.