hrico **Magnago**

Applied Scientist \cdot PhD

in enrico-magnago A enmag.github.io C EnMag 🖹 EnMag

Inquisitive, self-motivated and perseverant problem solver with outstanding academic results, strong background in formal verification and industrial experience in large-scale distributed systems. Dependable and proficient software developer with experience in design, implementation and evaluation of symbolic model checking algorithms. Love to combine formal verification expertise and coding skills to build scalable verification tools and create reliable software products.

Expertise: Symbolic Model Checking, Temporal Logics, SAT, SMT, Timed Systems, Hybrid Systems, Software Testing, Symbolic Execution, S3

Experience _____

APPLIED SCIENTIST II

Amazon Web Services

· Software verification and testing of large-scale distributed systems.

- RESEARCH AND DEVELOPMENT ENGINEER Synopsys Inc
 - · Design and development of tools for **static analysis** of interpreted programming languages.

• PHD STUDENT / CANDIDATE

University of Trento, Fondazione Bruno Kessler

- · Significantly enhanced the falsification capabilities of model checkers in infinite-state and timed systems.
- · Designed an effective **SMT-based symbolic algorithm** capable of finding counterexamples that other state-of-the-art procedures miss. · Developed a novel compositional semi-automated approach to falsify temporal properties. item Evaluated the viability of cloud platforms
- (AWS, Azure) for performance testing.
- · Published 5 research papers: 3 in highly rated international conferences and 2 in technical journals.

• TEACHING ASSISTANT: FORMAL METHODS COURSE, MASTER IN COMPUTER SCIENCE

University of Trento

- · Gave the laboratory lectures, defined the exam exercises and evaluated the students' solutions.
- · Topics: model checking using Spin, NuSMV and nuXmv; verification of timed systems using timed-nuXmv and HyCOMP.

SOFTWARE DEVELOPER

- Fondazione Bruno Kessler, Embedded Systems (ES) unit
- · Extended the symbolic model checker nuXmv to support verification of timed systems.
- · Designed and implemented techniques to verify expressive specifications: Metric Temporal Logic.
- · Defined and evaluated a novel and effective approach to identify infinite **non-lasso counterexamples** for timed systems.
- · Developed a **new compiler module** in nuXmv to meet software re-usability and extensibility requirements.
- · Testing, bug fixing, refactoring and documentation of large code base:
- >1M lines of C, >200K lines of Python, >150K lines of C++, >50k lines of LaTeX.

INTERN

- Fondazione Bruno Kessler, Data & Knowledge Management (DKM) unit
- · Implemented a Semantic Web application database interface using Elasticsearch Java API.

Education

- PHD, INFORMATION AND COMMUNICATION TECHNOLOGY Fondazione Bruno Kessler, University of Trento 2018/11/01 - 2022/11/18 · Cum Laude. · Advisor: Alessandro Cimatti, Co-advisor: Alberto Griggio. SUMMER / WINTER SCHOOLS ABOUT FORMAL VERIFICATION Marktoberdorf, Verona, Lisbon Technical University of Munich, University of Verona, University of Lisbon • MOD 2019: Summer School on Safety and Security of Software Systems: Logics, Proofs, Applications. · CPS 2019: Summer School on Formal Methods for Cyber-Physical Systems.
 - VMCAI 2019: Winter School on Verification, Model Checking, and Abstract Interpretation.

MASTER DEGREE IN COMPUTER SCIENCE

University of Trento

- · Final grade: 110L/110, Average grade: 29.24/30.
- · Notable project: distributed consensus protocol in Go.

Berlin, Germany 2022/12/01 - ongoing

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Dublin, Ireland 2022/05/09 - 2022/10/31

Trento, Italy 2018/11/01 - 2022/11/18

2019/03/15 - 2019/12/31

Trento, Italy

Trento, Italy 2017/03/27 - 2018/10/31

Trento, Italy 2015/07/20 - 2015/10/20

Trento, Italy

2019/07/31 - 2019/08/09 2019/06/03 - 2019/06/07 2019/01/09 - 2019/01/12

Trento, Italy 2016/08/08 - 2018/10/10

- POST-GRADUATE ERASMUS STUDENT
 - University of Edinburgh, School of Informatics
 - $\cdot\,$ Notable project: algorithms using Hadoop Map-Reduce.
- BACHELOR DEGREE IN COMPUTER SCIENCE

University of Trento

- · Final grade: 110L/110, Average grade: 28.11/30.
- $\cdot\,$ Notable project: multi-process question-answer game in C.

• HIGH SCHOOL DIPLOMA

Liceo Bertrand Russell

· Final grade: 93/100.

Programming Languages _____

С	NuSMV ¹ , nuXmv ¹ .
C++	nuXmv ¹ , msatic3 ¹ .
Python	F3 ² , pySMT ¹ , General Scripting.
Java	Academic Projects: web-based applications, J2EE, EJB.
LaTeX	Publications, Tools Documentation, BSc, MSc and PhD Theses.
Lex-Yacc	NuSMV ¹ , nuXmv ¹ , Academic Project.
Tcl	General Scripting.
Bash	General Scripting.

Skills_____

Languages:	eeeee Italian	eeee English
Hobbies:	Trumpet	eeee Skiing

Publications _____

INFOCOMP 2022	LTL falsification in infinite-state systems Alessandro Cimatti, Alberto Griggio, and Enrico Magnago. <i>Information and Computation Journal, Volume 289.</i>
ATVA 2021	Automatic Discovery of Fair Paths in Infinite-State Transition Systems Alessandro Cimatti, Alberto Griggio, and Enrico Magnago. 19 th International Symposium on Automated Technology for Verification and Analysis.
VMCAI 2021	Proving the Existence of Fair Paths in Infinite-State Systems Alessandro Cimatti, Alberto Griggio, and Enrico Magnago. 22 th International Conference on Verification, Model Checking, and Abstract Interpretation.
INFOCOMP 2020	SMT-based satisfiability of first-order LTL with event freezing functions and metric operators Alessandro Cimatti, Alberto Griggio, Enrico Magnago, Marco Roveri, and Stefano Tonetta. <i>Information and Computation Journal, Volume 272.</i>
CAV 2019	Extending nuXmv with Timed Transition Systems and Timed Temporal Properties Alessandro Cimatti, Alberto Griggio, Enrico Magnago, Marco Roveri, and Stefano Tonetta. 31 st International Conference on Computer Aided Verification.

Authors are in alphabetical order.

Professional Activities

CAV 2023	Artifact Evaluation Committee.		
	35^{th} International Conference on Computer Aided Verification.		
FORMATS 2022	Artifact Evaluation Committee.		
	20 th International Conference on Formal Modeling and Analysis of Timed Systems.		
CAV 2022	Artifact Evaluation Committee.		
	34^{th} International Conference on Computer Aided Verification.		
CAV 2020	Artifact Evaluation Committee.		
	32^{nd} International Conference on Computer Aided Verification.		
2019 - 2021	Peer-reviewer.		
	ATVA 2019, 2021; CAV 2020; CONCUR 2020; DAC 2020; FMCAD 2022; ICAPS 2020; ICCAD 2022; TACAS 2019, 2020, 2021; VMCAI 2020.		

Edinburgh, United Kingdom 2016/09/05 - 2016/12/24

> Trento, Italy 2013/08/08 - 2016/07/18

> Cles, Italy 2008/09/19 - 2013/07/04

1: Pre-existent tool or library 2: Standalone software