Laura Bozzelli

Curriculum of scientific activity

Personal Data

Surname Bozzelli
Name Laura
Birth date January 18, 1971
Nationality Italian
Email laura.bozzelli@unina.it

Present Academic Position

Role Researcher RTDA.
From: December 20, 2020.
Scientific area: Theoretical Computer Science.
Center: Department of Electrical Engineering and Information Technologies, University of Naples Federico II, Italy.

Research interests

Formal methods for the specification, analysis and synthesis of hardware and software systems. Formal languages, automata theory, temporal and strategy logics, model-checking of infinite state systems (Petri nets, Pushdown Systems, Process Rewrite Systems, Ground Rewriting Systems, Timed Automata), game theory in theoretical computer science and application to the control of timed systems.

Education

Ph.D In Computer Science.
Center: University of Naples Federico II, Italy.
Date of achievement: December 10, 2004.
Advisors: Prof. Adriano Peron (University of Naples Federico II).
Research Area: Formal verification of systems.
Thesis title: Model Checking Recursive and Parallel Systems.

Master In Information Technology.
Center: CEFRIEL of Polytechnic of Milan, Italy.
Date of achievement: June 2000.
Advisors: Prof. Luigi Lavazza (Polytechnic of Milan).
Research Area: Software Engineering.
Thesis title: Specification and analysis of object-oriented real-time software systems.

Laurea Degree
In Physics (summa cum laude).
Center: University of Naples Federico II, Italy.
Date of achievement: March 17, 1999.
Advisors: Prof. Giuseppe Trautteur (University of Naples Federico II) and Dr. Giuseppe De Pietro (CNR of Napoli).
Thesis title: Ambiente Distribuito Orientato ad Oggetti con Progetto e Sviluppo di un Video Client di un sistema Video on Demand.

Previous Academic Positions

2019-2020
Role: Research Fellow.
Center: Department of Electrical Engineering and Information Technologies, University of Naples Federico II, Italy.
Length: From March 2019 to December 2020.
Advisors: Prof. Adriano Peron (University of Naples Federico II).

2017-2018
Role: Research Fellow.
Center: CESMA, University of Naples Federico II, Italy.
Length: From September 2017 to September 2018.
Advisors: Prof. Aniello Murano (University of Naples Federico II).

2016
Role: Research Fellow.
Center: Department of Electrical Engineering and Information Technologies, University of Naples Federico II, Italy.
Length: From October 2016 to December 2016.
Advisors: Prof. Aniello Murano (University of Naples Federico II).

2010-2015
Role: Ramón y Cajal Researcher.
Center: Department of Programming Languages and Systems, Technical University of Madrid (UPM), Madrid, Spain.
Length: From May 2010 to May 2015.
Collaborations: team COSTA/CLIP of UPM coordinated by Prof. Germán Puebla, team coordinated by Prof. David Pearce, and collaborations with some researchers of IMDEA (Madrid Institute for Advanced Studies in Software Development Technologies).

2009-2010
Role: Post-doctoral Researcher.
Center: Institut de Recherche en Informatique et Systèmes Aléatoires (IRISA), INRIA, Rennes, France.
Length: From April 2009 to April 2010.
Advisors: Dr. Axel Legay (IRISA/INRIA) and Prof. Sophie Pinchinat (IRISA/INRIA & University of Rennes I).

2007-2009 Role: Research Fellow.
Center: Department of the Sciences of Culture, Politics and Information, University of Insubria, Como, Italy.
Length: From December 2007 to March 2009.
Advisors: Dr. Ruggero Lanotte (University of Insubria) and Prof. Simone Tini (University of Insubria).

2005-2006 Role: Post-doctoral Researcher.
Center: Laboratoire Spécification et Vérification (LSV) dell'École Normale Supérieure de Cachan, Paris, France.
Length: From October 2005 to June 2006.
Advisors: Dr. Patricia Bouyer (LSV – CNRS & ENS de Cachan) and Dr. Stéphane Demri (LSV – CNRS & ENS de Cachan).

Stays in internationally recognized centers

2024-Current Type: remote research collaboration.
Center: Bruno Kessler Foundation, Trento, Italy.
Length: 6 months.
Topic: Hyper temporal logics in an asynchronous framework.
Collaborators: Dr. Stefano Tonetta of Bruno Kessler Foundation.

2020-Presente Type: remote research collaboration.
Center: IMDEA (Madrid Institute for Advanced Studies in Software Development Technologies), Madrid, Spain.
Length: 4 years.
Topic: Hyper temporal logics in an asynchronous framework.
Collaborators: Dr. César Sánchez of IMDEA institute.

2016-2023 Type: remote research collaboration.
Center: Research Group on Automatic Verification of the University of Udine coordinated by Prof. Angelo Montanari, Italy.
Length: 6 years.
Topic: Model-checking in the context of interval temporal logics.
Collaborators: Prof. Angelo Montanari of University of Udine, Italy.

2019-2020 Type: Research Fellow.
Center: Department of Electrical Engineering and Information Technologies, University of Naples Federico II, Italy.
Length: 1 year.
Topic: Model Checking of infinite-state systems.
Advisors: Prof. Adriano Peron (University of Naples Federico II).

2016-2019 Type: research collaboration.
Center: ASTREA (Automated Strategic Reasoning) Research Laboratory of the Department of Electrical Engineering and Information Technologies, University of Naples Federico II, Italy.
Length: 3 years.
Topic: Logics for strategic reasoning.
Collaborators: Prof. Aniello Murano (University of Naples Federico II).

2017-2018 Type: Research Fellow.
Center: CESMA, University of Naples Federico II.
Length: 1 year.
Topic: Advanced methodologies for the control and analysis of complex reactive systems.
Advisors: Prof. Aniello Murano (University of Naples Federico II).

2016 Type: Research Fellow.
Center: Department of Electrical Engineering and Information Technologies, University of Naples Federico II, Italy.
Length: 3 months.
Topic: Implementation of measurement algorithms for synthetic aperture radar systems.
Advisors: Prof. Aniello Murano (University of Naples Federico II).

2015-2017 Type: Free research assignment.
Center: Department of Electrical Engineering and Information Technologies, University of Naples Federico II, Italy.
Length: 2 years.
Topic: Interval Temporal Logics and Verification of complex reactive systems.
Collaborators: Prof. Adriano Peron (University of Naples Federico II) and Prof. Angelo Montanari (University of Udine).

2010-2015 Type: Ramón y Cajal researcher.
Center: Faculty of Computer Science of the Polytechnic University of Madrid (UPM), Madrid, Spain.
Length: 5 years.
Topic: Automatic verification of infinite-state reactive systems.
Collaborations: team COSTA/CLIP of UPM coordinated by Prof. Germán Puebla, team coordinated by Prof. David Pearce, and collaborations with Dr. Pierre Ganty and Dr. César Sánchez of IMDEA (Madrid Institute for Advanced Studies in Software Development Technologies).

2014 Type: Invited Researcher.
Center: Institut de Recherche en Informatique et Systèmes Aléatoires (IRISA), INRIA, Rennes, France.
Length: 1 month.
Topic: Logics for information flow security requirements.
Collaborators: Prof. Sophie Pinchinat (IRISA/INRIA & University of Rennes I).

2013 Type: Visiting Researcher.
Center: Institut de Recherche en Informatique et Systèmes Aléatoires (IRISA), INRIA, Rennes, Francia.
Length: 1 week.
Topic: Logics for imperfect-information multi-agent games.
Collaborators: Prof. Sophie Pinchinat (IRISA/INRIA & University of Rennes I).

2012 Type: Visiting Researcher.
Center: Department of Logic, University of Seville, Spain.
Length: 1 week.
Topic: Refinement Modal Logic.
Collaborators: Dr. Hans van Ditmarsch (senior researcher at CNRS of LORIA in Nancy, France).

2011 Type: Visiting Researcher.
Center: Institut de Recherche en Informatique et Systèmes Aléatoires (IRISA), INRIA, Rennes, France.
Length: 2 weeks.
Topic: Analysis of abstractions of counter systems.
Collaborators: Prof. Sophie Pinchinat (IRISA/INRIA & University of Rennes I).

2011 Type: Visiting Researcher.
Center: Institut de Recherche en Informatique et Systèmes Aléatoires (IRISA), INRIA, Rennes, France.
Length: 1 week.
Topic: Opacity issues in games with imperfect information.
Collaborators: Prof. Sophie Pinchinat (IRISA/INRIA & University of Rennes I).

2009-2010 Type: Post-doc researcher.
Center: Institut de Recherche en Informatique et Systèmes Aléatoires (IRISA), INRIA, Rennes, France.
Length: 1 year.
Topic: Analysis of Component-based Open Real-time Systems.
Advisors: Dr. Axel Legay (IRISA/INRIA) and Prof. Sophie Pinchinat (IRISA/INRIA & University of Rennes I).

2007-2009 Type: Research Fellow.
Center: Department of the Sciences of Culture, Politics and Information - University of Insubria.
Length: 1 year and half.
Topic: Automatic Verification of infinite-state reactive systems.
Advisors: Dr. Ruggero Lanotte (University of Insubria) and Prof. Simone Tini (University of Insubria).

2006-2007 Type: Visiting Researcher.
Center: Department of Computer Science, University of Salerno, Fisciano, Salerno, Italy.
Length: 4 months.
Topic: Parametric Real-time Verification.
Collaborators: Prof. Salvatore La Torre (University of Salerno).

2005-2006 Type: Postdoctoral Researcher.
Center: Laboratory Specification and Verification (LSV) - Ecole Normale Supérieure de Cachan, Paris, France.
Length: 8 months.
Topic: Control and Observation of Real-Time Open Systems.
Advisors: Dr. Patricia Bouyer (LSV - CNRS & ENS de Cachan) and Dr. Stéphane Demri (LSV - CNRS & ENS de Cachan).

2002-2004 Type: PhD in Computer Science.
Center: Department of "Matematica e Applicazioni R. Caccioppoli", University of Napoli Federico II, Italy.
Length: 3 years.
Topic: Model Checking Recursive and Parallel Systems.
Advisors: Prof. Adriano Peron (University of Naples Federico II).

1999-2000 Type: Master in Information Technology (area of Software Engineering), supported by a grant from CEFRIEL.
Center: CEFRIEL of the Polytechnic of Milan, Italy.
Length: 1 year.
Topic: Specification and analysis of object-oriented real-time software systems.
Advisors: Prof. Luigi Lavazza (Polytechnic of Milan).

2000 Type: Participation in the CINECA summer school, supported by a scholarship.
Center: CINECA (Consortium of Italian Universities and Supercomputing Centre), Bologna, Italy.
Length: 2 weeks.
Topic: Advanced courses in parallel computing.

Participation in research projects

[1] Project Title: MAIA (Active infrastructure monitoring).
Goal: technological solutions for railway infrastructure safety.
Financial Entity: project PON Ricerca e Competitività funded by MIUR (cod. ARS01_00353).
Length: from January 2019 to June 2022.
Principal Investigator: Prof. Nicola Mazzocca (for University Federico II of Naples, Italy).
Role: Laura Bozzelli participates in the project in collaboration with Prof. Adriano Peron.
Topic: Asynchronous framework for hyper temporal logics.

[2] Project Title: OPL-APPS (IIoT OPEN Platform and Applications for Manufactoring).
Goal: framework per ICT manufactoring & Industry 4.0.
Financial Entity: project PON Ricerca e Competitività funded by MIUR (cod. ARS01_00615).
Length: from March 2018 to February 2020.
Principal Investigator: Prof. Stefano Avallone.
Role: Laura Bozzelli participates in the project in collaboration with Prof. Adriano Peron.
Topic: Model Checking of infinite-state system and multi-agent systems.

[3] Project Title: *Metodi formali per la verifica e la sintesi di sistemi discreti e ibridi*.
Goal: formal methods based on logics, automata and games for the verification and synthesis of reactive systems.
Financial Entity: Italian project funded by *Gruppo Nazionale per il Calcolo Scientifico* (GNCS).
Length: from July 2018 to February 2019.
Principal Investigator: Prof. Tiziano Villa (University of Verona, Italy).
Role: Laura Bozzelli participates in the project in collaboration with Prof. Aniello Murano and Prof. Adriano Peron.
Topic: Dense time timeline-based planning and pushdown real-time verification.

[4] Project Title: TELEMACO.
Goal: development of enabling technologies to the design of an innovative Synthetic Aperture Radar (SAR) system based on Forward Looking SAR technique.
Financial Entity: project PON Ricerca e Competitività funded by MIUR (cod. PON03PE_00112_1).
Length: from March 2014 to December 2016.
Principal Investigator: : Prof. Leopoldo Angrisani (for University Federico II of Naples, Italy).
Role: Laura Bozzelli participates in the project in collaboration with Prof. Aniello Murano from October 2016 to December 2016.

[5] Project Title: StrongSoft-CLIP.
Goal: formal methods for software of new generation, open and reliable.
Financial Entity: spanish project financed by Ministerio de Economía y Competitividad (cod. TIN2012-39391-C04-01).
Length: from January 2013 to december 2015.
Principal Investigator: Prof. Manuel Carro (UPM, Madrid, Spain & IMDEA institute of Madrid).
Role: Laura Bozzelli participates in the project at UPM of Madrid in collaboration with Dr. César Sánchez of IMDEA institute.
Topic: Stream runtime verification and temporal logics for visibly pushdown specifications.

[6] Project Title: VIVAC (Validación y Verificación de Aplicaciones Concurrentes).
Goal: formal methods for the specification, analysis, validation and verification of concurrent systems.
Financial Entity: spanish project financed by Ministerio de Economía y Competitividad (cod. TIN2012-38137-C02).
Length: from January 2013 to december 2015.
Principal Investigator: Prof. German Puebla (for UPM, Madrid, Spain).
Role: Laura Bozzelli participates as task leader in the project at UPM of Madrid in collaboration with the COSTA/CLIP team coordinated by Prof. German Puebla.
Topic: Decidability and complexity issues in verification of infinite-state abstract computational models.

[7] Project Title: SINTELNET (European Network for Social Intelligence).
Goal: build a shared perspective at the intersection between philosophy, social sciences and computer science around social intelligence.
Financial Entity: European Project supported by the 7th Framework Program of the EC within the FET (Future and Emerging Technologies) Coordination Action (FP7-ICT-2009-C Project No. 286380).
Length: from May 2011 to May 2014.
Principal Investigator: Prof. David Pearce (for UPM, Madrid, Spain).
Role: Laura Bozzelli participated in the project from 2013 to 2014 at UPM of Madrid in collaboration with Prof. David Pearce. Topic: Nonmonotonic temporal logics in the framework of answering set programing.

[8] Project Title: HATS (Highly Adaptable and Trustworthy Software using formal methods).
Goal: developing a formal method for the design, analysis, and implementation of highly adaptable software systems that are at the same time characterized by a high demand on trustworthiness.
Financial Entity: European Project supported by the 7th Framework Program of the EC within the FET (Future and Emerging Technologies) scheme.
Length: from March 2009 to February 2013.
Principal Investigator: Prof. German Puebla (for UPM, Madrid, Spain).
Role: Laura Bozzelli participated in the project since January 2011 at UPM of Madrid in collaboration with the COSTA/CLIP team coordinated by Prof. German Puebla.
Topic: Termination and performance analysis of infinite-state operational formalisms.

[9] Project Title: COMBEST (COMponent-Based Embedded Systems design Techniques).
Goal: providing a formal framework for component based design of complex embedded systems.
Financial Entity: European STREP-COMBEST Project, number 215543.
Length: from January 2008 to December 2010.
Principal Investigator: Prof. Albert Benveniste (for IRISA/INRIA, Rennes, France).
Role: Laura Bozzelli was involved as postdoctoral researcher at IRISA/INRIA of Rennes (France) under the supervision of Dr. Axel Legay and Prof. Sophie Pinchinat.
Topic: Modeling and verification issues in the refinement problem of real-time component-based systems.

[10] Project Title: VA@PSI (Automatic Verification of Internet Security Protocols).
Goal: developing a platform based on a variety of techniques that allow industry and standardization experts to automatically validate or detect errors on a large collection of practically relevant, Internet protocols.
Financial Entity: funded by the Italian Ministry of Education, University and Research (MIUR) under the FIRB (Fondo per gli Investimenti della Ricerca di Base) Programme.
Length: from January 2004 to December 2006.
Principal Investigator: Alessandro Armando (University of Genova, Italy).
Role: Laura Bozzelli participated in the project under the supervision of Prof. Adriano Peron (University of Napoli, Italy) and Prof. Salvatore La Torre (University of Salerno, Italy).
Topic: Modeling and verification aspects about the control flow of recursive and concurrent systems.

[11] Project Title: ACI-CORTOS (Control and Observation of Real-Time Open Systems).
Goal: increasing the knowledge about control problems for timed systems and provide new methods for controller synthesis.
Financial Entity: funded by the French Ministry of research.
Length: from October 2003 to October 2006.
Principal Investigator: Dr. Patricia Bouyer (for LSV of Cachan, Paris-France).
Role: Laura Bozzelli was involved as postdoctoral researcher at LSV of Cachan under the supervision of CNRS researcher Patricia Bouyer.
Topic: Decidability and complexity issues of the controller synthesis problem of timed automata against standard real-time linear temporal logics.

[12] Project Title: DESS (Development process for real-time Embedded Software Systems).
Goal: defining a sound methodology for enabling the European software industry to give better support to the development of embedded real-time software.
Financial Entity: MURST (Ministero dell'Università e della Ricerca Scientifica e Tecnologica) Italian project as part of the European EUREKA-ITEA program (ITEA 99012).
Length: From October 1999 to September 2001.
Principal Investigator: Prof. Luigi Lavazza (for CEFRIEL of Polytechnic of Milan).
Role: Laura Bozzelli was involved as master student (under the supervision of Prof. Luigi Lavazza) at CEFRIEL. In particular, the work for the master thesis was concentrated on the integration of UML aspects and formal methods for the specification and analysis of object-oriented real-time software systems.

Programme Committee roles

[1] Activity: PC member
Conference: 33rd EACSL Annual Conference on Computer Science Logic (CSL 2025), Amsterdam, Netherlands, February 10-14, 2025.

[2] Activity: PC member
Conference: 5th Workshop on Artificial Intelligence, Formal Verification, Logic, Automata, and Synthesis (OVERLAY 2023), Rome, Italy, November 7, 2023.

[3] Activity: PC member
Conference: 42nd International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2022), Madras, India, December 18-20, 2022.

[4] Activity: PC member
Conference: 13th International Symposium on Games, Automata, Logics, and Formal Verification (GANDALF 2022), Madrid, Spain, September 21-23, 2022.

[5] Activity: PC member
Conference: 9th International Symposium on Games, Automata, Logics and Formal Verification (GANDALF 2018), Saarbrücken, Germany, September 26-28, 2018.

[6] Activity: PC member
Conference: 11th International Workshop on Reachability Problems (RP 2017), September 7-9, London, United Kingdom.

[7] Activity: PC member
Conference: 26th International Conference on Automated Reasoning with Analytic Tableaux and Related Methods (TABLEAUX 2017), Brasilia, Brazil, September 25-28, 2017.

[8] Activity: PC member
Conference: 16th International Conference on Runtime Verification (RV 2016), September 23-30 2016, Madrid, Spain.

[9] Activity: PC member
Conference: 15th International Conference on Runtime Verification (RV 2015), September 22-25 2015, Vienna, Austria.

[10] Activity: PC member
Conference: 20th International Symposium on Temporal Representation and Reasoning (TIME 2013), September 26-28, Pensacola, FL (USA), 2013.

Presentations in Congresses

[1] Type of presentation: regular paper.
Title: A Quantitative Extension of Interval Temporal Logic over Infinite Words.
Authors: Laura Bozzelli, Adriano Peron.
Place: 29th International Symposium on Temporal Representation and Reasoning, TIME 2022, Virtual Conference, November 7-9, 2022.

[2] Type of presentation: regular paper.
Title: Complexity Analysis of a Unifying Algorithm for Model Checking Interval Temporal Logic.
Authors: Laura Bozzelli, Angelo Montanari, Adriano Peron.
Place: 26th International Symposium on Temporal Representation and Reasoning, TIME 2019, Malaga, Spain, October 16-19, 2019.

[3] Type of presentation: regular paper.
Title: On the Expressiveness of Temporal Equilibrium Logic.
Authors: Laura Bozzelli, David Pearce.
Place: 15th European Conference on Logics in Artificial Intelligence, JELIA 2016, Larnaca, Cyprus, November 9-11, 2016.

[4] Type of presentation: regular paper.
Title: On the Complexity of Temporal Equilibrium Logic.
Authors: Laura Bozzelli, David Pearce.
Place: 30th Annual ACM/IEEE Symposium on Logic in Computer Science, LICS 2015, Kyoto, Japan, July 6-10, 2015.

[5] Type of presentation: invited talker.
Title: On the Complexity of Temporal Equilibrium Logic.
Authors: Laura Bozzelli, David Pearce.
Place: 2nd Workshop on Logical Reasoning and Computation, LRC 2015, A Coruña, Spain, February 23-24, 2015.

[6] Type of presentation: regular paper.
Title: Visibly Linear Temporal Logic.
Authors: Laura Bozzelli, César Sánchez.
Place: 7th International Joint Conference on Automated Reasoning, IJCAR 2014, Vienna, Austria, July 19-22, 2014.

[7] Type of presentation: *best paper in sister conferences track*.
Title: The Complexity of One-Agent Refinement Modal Logic.
Authors: Laura Bozzelli, Hans P. van Ditmarsch, Sophie Pinchinat.
Place: 23rd International Joint Conference on Artificial Intelligence, IJCAI 2013, Beijing, China, August 3-9, 2013.

[8] Type of presentation: regular paper.
Title: Strong termination of gap-order constraint abstractions of counter systems.
Authors: Laura Bozzelli.
Place: 6th International Conference on Language and Automata Theory and Applications, LATA 2012, Coruña, Spain, March 5-9, 2012.

[9] Type of presentation: regular paper.
Title: Verification of gap-order constraint abstractions of counter systems.
Authors: Laura Bozzelli, Sophie Pinchinat.
Place: 13th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2019, Philadelphia, Pennsylvania, January 22-24, 2012.

[10] Type of presentation: regular paper.
Title: Hybrid and first-order complete extensions of CaRet.
Authors: Laura Bozzelli, Ruggero Lanotte.
Place: 20th International Conference on Automated Reasoning with Analytic Tableaux and Related Methods, TABLEAUX 2011, Bern, Switzerland, July 4-8, 2011.

[11] Type of presentation: regular paper.
Title: New results on pushdown module checking with imperfect information.
Authors: Laura Bozzelli.
Place: 2nd International Symposium on Games, Automata, Logics and Formal Verification, GANDALF 2011, Minori, (Amalfi coast), Italy, 15-17 June 2011.

[12] Type of presentation: regular paper.
Title: Hardness of preorder checking for basic formalisms.
Authors: Laura Bozzelli, Axel Legay, Sophie Pinchinat.
Place: 16th International Conference on Logic for Programming, Artificial Intelligence, and Reasoning, LPAR-16, Dakar, Senegal, April 25 – May 1, 2010.

[13] Type of presentation: regular paper.
Title: Complexity and Succinctness Issues for Linear-Time Hybrid Logics.
Authors: Laura Bozzelli, Ruggero Lanotte.
Place: 11th European Conference on Logics in Artificial Intelligence, JELIA 2008, Dresda, Germany, September 28 – October 1, 2008.

[14] Type of presentation: regular paper.
Title: The Complexity of CaRet + Chop.
Authors: Laura Bozzelli.
Place: 15th International Symposium on Temporal Representation and Reasoning, TIME 2008, Montreal, Canada, June 16 - 18, 2008.

[15] Type of presentation: regular paper.
Title: The Complexity of CTL* + Linear Past.
Authors: Laura Bozzelli.
Place: 11th International Conference on Foundations of Software Science and Computational Structures, FOSSACS 2008, Budapest, Hungary, March 29 - April 6, 2008.

[16] Type of presentation: regular paper.
Title: CaRet with Forgettable Past.
Authors: Laura Bozzelli.
Place: 4th Workshop on Methods for Modalities, M4M-5, Cachan, France, November 2007.

[17] Type of presentation: regular paper.
Title: Alternating automata and a temporal fixpoint calculus for visibly pushdown languages.
Authors: Laura Bozzelli.
Place: 18th International Conference on Concurrency Theory, CONCUR 2007, Lisbon, Portugal, September 4-7, 2007.

[18] Type of presentation: regular paper.
Title: Decision Problems for lower/upper bound Parametric Timed Automata.
Authors: Laura Bozzelli, Salvatore La Torre.
Place: 34th International Colloquium on Automata, Languages and Programming, ICALP 2007, Wroclaw, Poland, 9-13 July, 2007.

[19] Type of presentation: regular paper.
Title: Controller Synthesis for MTL Specifications.
Authors: Patricia Bouyer, Laura Bozzelli, Fabrice Chevalier.
Place: 17th International Conference on Concurrency Theory, CONCUR 2006, Bonn, Germany, August 27-30, 2006.

[20] Type of presentation: regular paper.
Title: Verification of well-formed communicating recursive state machines.
Authors: Laura Bozzelli, Salvatore La Torre, Adriano Peron.
Place: 7th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2006, Charleston, SC, USA, January 8-10, 2006.

[21] Type of presentation: regular paper.
Title: Complexity Results on Branching-Time Pushdown Model Checking.
Authors: Laura Bozzelli.
Place: 7th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2006, Charleston, SC, USA, January 8-10, 2006.

[22] Type of presentation: regular paper.
Title: Model checking for Process Rewrite Systems and a class of action-based regular properties.
Authors: Laura Bozzelli.
Place: 6th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2005, Paris, France, January 17-20, 2005.

Publications - Articles In Journals

[1] Laura Bozzelli, Angelo Montanari, Adriano Peron, and Pietro Sala.
The addition of temporal neighborhood makes the logic of prefixes and sub-intervals EXPSPACE-complete.
Logical Methods in Computer Science 20(1), 2024. ISSN 1860-5974.

[2] Laura Bozzelli, Bastien Maubert, and Aniello Murano.
On the Complexity of Model Checking Knowledge and Time.
ACM Transactions on Computational Logic 25(1), pages 8:1-8:42, 2024. ISSN 1529-3785.

[3] Laura Bozzelli, Angelo Montanari, Adriano Peron, and Pietro Sala.
Pspace-completeness of the temporal logic of sub-intervals and suffixes.
Information and Computation 294, pages 1-20, 2023. ISSN 0890-5401.

[4] Laura Bozzelli, Angelo Montanari, and Adriano Peron.
Interval temporal logic for visibly pushdown systems.
ACM Transactions on Computational Logic 24, pages 1-32, 2023. ISSN 1529-3785.

[5] Laura Bozzelli, Aniello Murano, and Adriano Peron.
Context-free timed formalisms: Robust automata and linear temporal logics.
Information and Computation 283, 2022. Elsevier, ISSN 0890-5401.

[6] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Pietro Sala.
Satisfiability and Model Checking for the Logic of Sub-Intervals under the Homogeneity Assumption.
Logical Methods in Computer Science 18(1): 2022. ISSN 1860-5974.

[7] Laura Bozzelli, Angelo Montanari, and Adriano Peron.
Complexity issues for timeline-based planning over dense time under future and minimal semantics.
Theoretical Computer Science 901: pages 87–113, 2022. Elsevier, ISSN 0304-3975.

[8] Laura Bozzelli, Angelo Montanari, and Adriano Peron.
Complexity analysis of a unifying algorithm for model checking interval temporal logic.
Information and Computation 280, 2021. Elsevier, ISSN 0890-5401.

[9] Laura Bozzelli, Aniello Murano, Giuseppe Perelli, and Loredana Sorrentino.
Hierarchical cost-parity games.
Theoretical Computer Science 847: pages 147-174, 2020. Elsevier, ISSN 0304-3975.

[10] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Gerhard J. Woeginger.
Timeline-based planning over dense temporal domains.
Theoretical Computer Science 813: pages 305-326, 2020. Elsevier, ISSN 0304-3975.

[11] Laura Bozzelli, Aniello Murano, and Loredana Sorrentino.
Alternating-time temporal logics with linear past.
Theoretical Computer Science 813: pages 199-217, 2020. Elsevier, ISSN 0304-3975.

[12] Laura Bozzelli, Alberto Molinari, Angelo Montanari, and Adriano Peron.
Model checking interval temporal logics with regular expressions.
Information and Computation 272: pages 305-326, 2020. Elsevier, ISSN 0890-5401.

[13] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Pietro Sala.
Which fragments of the interval temporal logic HS are tractable in model checking?
Theoretical Computer Science 764: pages 125-144, 2019. Elsevier, ISSN 0304-3975.

[14] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Pietro Sala.
Interval vs. Point Temporal Logic Model Checking: An Expressiveness Comparison.
ACM Transactions on Computational Logic 20(1): pages 4:1-4:31, 2019. ISSN 1529-3785.

[15] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Pietro Sala.
Model checking for fragments of the interval temporal logic HS at the low levels of the polynomial time hierarchy.
Information and Computation 262: pages 241–264, 2018. Elsevier, ISSN 0890-5401.

[16] Laura Bozzelli and César Sánchez.
Visibly Linear Temporal Logic.
Journal of Automated Reasoning, 60(2): pages 177–220, 2018. Springer, ISSN 1573-0670.

[17] Laura Bozzelli and César Sánchez.
Foundations of Boolean stream runtime verification.
Theoretical Computer Science 631: pages 118–138, 2016. Elsevier, ISSN 0304-3975.

[18] Laura Bozzelli, Bastien Maubert, and Sophie Pinchinat.
Uniform strategies, rational relations and jumping automata.
Information and Computation 242: pages 80–107, 2015. Elsevier, ISSN 0890-5401.

[19] Laura Bozzelli, Hans van Ditmarsch, and Sophie Pinchinat.
The complexity of one-agent refinement modal logic.
Theoretical Computer Science 603: pages 58-83, 2015. Elsevier, ISSN 0304-3975.

[20] Laura Bozzelli and César Sánchez.
Visibly rational expressions.
Acta Informatica 51(1): pages 25-49, 2014. Springer, ISSN 0001-5903.

[21] Laura Bozzelli, Hans van Ditmarsch, Tim French, James Hales, and Sophie Pinchinat.
Refinement modal logic.
Information and Computation 239: pages 303–339, 2014. Elsevier, ISSN 0890-5401.

[22] Laura Bozzelli and Sophie Pinchinat.
Verification of gap-order constraint abstractions of counter systems.
Theoretical Computer Science 523: pages 1–36, 2014. Elsevier, ISSN 0304-3975.

[23] Laura Bozzelli, Axel Legay, and Sophie Pinchinat.
On timed alternating simulation for concurrent timed games.
Acta Informatica 49(4): pages 249-279, 2012. Springer, ISSN 0001-5903.

[24] Laura Bozzelli, Axel Legay, and Sophie Pinchinat.
Hardness of preorder checking for basic formalisms.
Theoretical Computer Science 412(49): pages 6795-6808, 2011. Elsevier, ISSN 0304-3975.

[25] Laura Bozzelli, Aniello Murano, and Adriano Peron.
Pushdown Module Checking.
Formal Methods in System Design 36(1): pages 65-95, 2010. Springer, ISSN 0925-9856.

[26] Laura Bozzelli and Ruggero Lanotte.
Complexity and Succinctness issues for linear-time hybrid logics.
Theoretical Computer Science 411(2): pages 454-469, 2010. Elsevier, ISSN 0304-3975.

[27] Laura Bozzelli and Salvatore La Torre.
Decision problems for lower/upper bound parametric timed automata.
Formal Methods in System Design 35(2): pages 121-151, 2009. Springer, ISSN 0925-9856.

[28] Laura Bozzelli, Mojmír Kretínský, Vojtech Rehák, and Jan Strejcek.
On decidability of LTL model checking for process rewrite systems.
Acta Informatica 46(1): pages 1-28, 2009. Springer, ISSN 0001-5903.

[29] Laura Bozzelli, Salvatore La Torre, and Adriano Peron.
Verification of well-formed communicating recursive state machines.
Theoretical Computer Science 403(2-3): pages 382-405, 2008. Elsevier, ISSN 0304-3975.

[30] Laura Bozzelli.
Complexity Results on Branching-Time Pushdown Model Checking.
Theoretical Computer Science 379(1-2), pages 286-297, 2007. Elsevier, ISSN 0304-3975.

[31] Laura Bozzelli.
Model checking for Process Rewrite Systems and a class of action-based regular properties.
Theoretical Computer Science 360(1-3), pages 352-372, 2006. Elsevier, ISSN 0304-3975.

Publications - Articles in Conference Proceedings

[1] Alberto Bombardelli, Laura Bozzelli, César Sánchez, and Stefano Tonetta.
Unifying Asynchronous Logics for Hyperproperties.
In *Proceedings of the 44th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS'24)*, Gandhinagar, Gujarat, India, December 16-18, 2024. Leibniz International Proceedings in Informatics (LIPIcs), Volume 323, pages 14:1–14:18. ISSN 1868-8969.

[2] Massimo Benerecetti, Laura Bozzelli, Fabio Mogavero, and Adriano Peron.
Full Characterisation of Extended CTL*.
In *Proceedings of the 31st International Symposium on Temporal Representation and Reasoning (TIME'24)*, Montpellier, France, October 28-30, 2024. Leibniz International Proceedings in Informatics (LIPIcs), Volume 318, pages 18:1–18:18. ISSN 1868-8969.

[3] Massimo Benerecetti, Laura Bozzelli, Fabio Mogavero, and Adriano Peron.
Automata-Theoretic Characterisations of Branching-Time Temporal Logics.
In *Proceedings of the 51st International Colloquium on Automata, Languages, and Programming (ICALP'24)*, Tallinn, Estonia, July 8-12, 2024. Leibniz International Proceedings in Informatics (LIPIcs), Volume 297, pages 128:1-128:20. ISSN 1868-8969.

[4] Massimo Benerecetti, Laura Bozzelli, Fabio Mogavero, and Adriano Peron.
Quantifying over Trees in Monadic Second-Order Logic.
In *Proceedings of the 38th Annual ACM/IEEE Symposium on Logic in Computer Science (LICS'23)*, Boston, USA, 26 – 29 June 2023. IEEE.

[5] Laura Bozzelli, Adriano Peron, and César Sánchez.
Expressiveness and Decidability of Temporal Logics for Asynchronous Hyperproperties.
In *Proceedings of the 33rd International Conference on Concurrency Theory (CONCUR'22)*, September 12-16, 2022, Warsaw, Poland. Leibniz International Proceedings in Informatics (LIPIcs), Volume 243, pages 27:1–27:16. ISSN 1868-8969.

[6] Laura Bozzelli and Adriano Peron.
A Quantitative Extension of Interval Temporal Logic over Infinite Words.
In *Proceedings of the 29th International Symposium on Temporal Representation and Reasoning (TIME'22)*, November 7-9, 2022, Virtual Conference. Leibniz International Proceedings in Informatics (LIPIcs), Volume 247, pages 11:1–11:16. ISSN 1868-8969.

[7] Laura Bozzelli and Adriano Peron.
Parametric Interval Temporal Logic over Infinite Words.
In *Proceedings of the 13th International Symposium on Games, Automata, Logics, and Formal Verification (GandALF'22)*, Madrid, Spain, September 21-23, 2022. Electronic Proceedings in Theoretical Computer Science (EPTCS), Volume 370, pages 97–113. ISSN 2075-2180.

[8] Laura Bozzelli, Adriano Peron, and César Sánchez.
Asynchronous Extensions of HyperLTL.
In *Proceedings of the 36th Annual ACM/IEEE Symposium on Logic in Computer Science (LICS'21)*, Rome, Italy, June 29 - July 2, 2021. IEEE, pages 1–13.

[9] Laura Bozzelli, Angelo Montanari, Adriano Peron, and Pietro Sala.
Pspace-Completeness of the Temporal Logic of Sub-Intervals and Suffixes.
In *Proceedings of the 28th International Symposium on Temporal Representation and Reasoning (TIME'21)*, September 27-29, 2021, Klagenfurt, Austria. Leibniz International Proceedings in Informatics (LIPIcs), Volume 206, pages 9:1–9:19. ISSN 1868-8969.

[10] Laura Bozzelli, Angelo Montanari, Adriano Peron, and Pietro Sala.
Adding the Relation Meets to the Temporal Logic of Prefixes and Infixes makes it EXPSPACE-Complete.
In *Proceedings of the 12th International Symposium on Games, Automata, Logics, and Formal Verification (GandALF'21)*, Padua, Italy, 20-22 September 2021. Electronic Proceedings in Theoretical Computer Science (EPTCS), Volume 346, pages 179–19. ISSN 2075-2180.

[11] Laura Bozzelli, Alberto Molinari, Angelo Montanari, and Adriano Peron.
Undecidability of future timeline-based planning over dense temporal domains.
In *Proceedings of the 21st Italian Conference on Theoretical Computer Science (ICTCS'20)*, Ischia, Italy, September 14-16, 2020. CEUR Workshop Proceedings, Volume 2756, pages 155–166. CEUR-WS.org. ISSN 1613-0073.

[12] Laura Bozzelli, Aniello Murano, and Adriano Peron.
Module Checking of Pushdown Multi-agent Systems.
In *Proceedings of the 17th International Conference on Principles of Knowledge Representation and Reasoning, (KR'20)*, Rhodes, Greece, September 12-18, 2020. AAAI Press, pages 162–171.

[13] Laura Bozzelli, Angelo Montanari, Adriano Peron, and Pietro Sala.
On a temporal logic of prefixes and infixes.
In *Proceedings of the 45th International Symposium on Mathematical Foundations of Computer Science (MFCS'20)*, Prague, Czech Republic, August 24-28, 2020. Leibniz International Proceedings in Informatics (LIPIcs), Volume 170, pages 21:1–21:14. ISSN 1868-8969.

[14] Laura Bozzelli, Angelo Montanari, and Adriano Peron.
Interval Temporal Logic for Visibly Pushdown Systems.
In *Proceedings of the 39th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS'19)*, Bombay, India, 11-13 December, 2019. Leibniz International Proceedings in Informatics (LIPIcs), Volume 150, pages 33:1–33:14. ISSN 1868-8969.

[15] Laura Bozzelli, Angelo Montanari, and Adriano Peron.
Taming the Complexity of Timeline-Based Planning over Dense Temporal Domains.
In *Proceedings of the 39th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS'19)*, Bombay, India, 11-13 December, 2019. Leibniz International Proceedings in Informatics (LIPIcs), Volume 150, pages 34:1-34:14. ISSN 1868-8969.

[16] Laura Bozzelli, Alberto Molinari, Angelo Montanari, and Adriano Peron.
Model Checking Timeline-Based Systems over Dense Temporal Domains.
In *Proceedings of the 20th Italian Conference on Theoretical Computer Science (ICTCS'19)*, Como, Italy, September 9-11, 2019. CEUR Workshop Proceedings, Volume 2504, pages 235–247. CEUR-WS.org. ISSN 1613-0073.

[17] Laura Bozzelli, Bastien Maubert, and Aniello Murano.
The Complexity of Model Checking Knowledge and Time.
In *Proceedings of the 28th International Joint Conference on Artificial Intelligence, (IJCAI'19)*, Saarbrücken, Macao, China, August 10-16. Pages 1595–1601. ISSN 1045-0823.

[18] Laura Bozzelli, Angelo Montanari, and Adriano Peron
Complexity Analysis of a Unifying Algorithm for Model Checking Interval Temporal Logic.
In *Proceedings of the 26th International Symposium on Temporal Representation and Reasoning (TIME'19)*, Málaga, Spain, October 16-19, 2019. Leibniz International Proceedings in Informatics (LIPIcs), Volume 147, pages 18:1–18:17. ISSN 1868-8969.

[19] Laura Bozzelli, Aniello Murano, and Adriano Peron.
Timed Context-Free Temporal Logics.
In *Proceedings of the 9th International Symposium on Games, Automata, Logics and Formal Verification (GANDALF'18)*, Saarbrücken, Germany, 26-28 September 2018. Electronic Proceedings in Theoretical Computer Science (EPTCS), Volume 277, pages 235–249. ISSN 2075-2180.

[20] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Gerhard J. Woeginger.
Timeline-Based Planning over Dense Temporal Domains with Trigger-less Rules is NP-Complete.
In *Proceedings of the 19th Italian Conference on Theoretical Computer Science (ICTCS'18)*, Urbino, Italy, September 18-20, 2018. CEUR Workshop Proceedings, Volume 2243, pages 116–127. CEUR-WS.org, 20016. ISSN 1613-0073.

[21] Laura Bozzelli, Alberto Molinari, Angelo Montanari, and Adriano Peron.
Decidability and Complexity of Timeline-Based Planning over Dense Temporal Domains.
In *Proceedings of the 16th International Conference on Principles of Knowledge Representation and Reasoning (KR'18)*, Tempe, Arizona, 30 October - 2 November 2018. AAAI Press, pages 627–628.

[22] Laura Bozzelli, Aniello Murano, and Adriano Peron.
Event-Clock Nested Automata.
In *Proceedings of the 12th International Conference on Language and Automata Theory and Applications (LATA'18)*, Ramat Gan, Israel, April 9-11, 2018. Lecture Notes in Computer Science, Volume 10792, pages 80–92. Springer, 2018. ISSN 0302-9743.

[23] Laura Bozzelli, Aniello Murano, and Loredana Sorrentino
Results on Alternating-Time Temporal Logics with Linear Past.
In *Proceedings of the 25th International Symposium on Temporal Representation and Reasoning (TIME'18)*, Warsaw, Poland, October 15-17, 2018. Leibniz International Proceedings in Informatics (LIPIcs), Volume 120, pages 6:1–6:22. ISSN 1868-8969.

[24] Laura Bozzelli, Alberto Molinari, Angelo Montanari, and Adriano Peron.
Complexity of Timeline-Based Planning over Dense Temporal Domains: Exploring the Middle Ground.
In *Proceedings of the 9th International Symposium on Games, Automata, Logics and Formal Verification (GANDALF'18)*, Saarbrücken, Germany, 26-28 September 2018. Electronic Proceedings in Theoretical Computer Science (EPTCS), Volume 277, pages 191–205. ISSN 2075-2180.

[25] Laura Bozzelli, Alberto Molinari, Angelo Montanari, and Adriano Peron.
On the Complexity of Model Checking for Syntactically Maximal Fragments of the Interval Temporal Logic HS with Regular Expressions.
In *Proceedings of the 8th International Symposium on Games, Automata, Logics and Formal Verification (GANDALF'17)*, Rome, Italy, September 20-22, 2017. Electronic Proceedings in Theoretical Computer Science (EPTCS), Volume 256, pages 31–45. ISSN 2075-2180.

[26] Laura Bozzelli and Aniello Murano.
On the Complexity of ATL and ATL* Module Checking.
In *Proceedings of the 8th International Symposium on Games, Automata, Logics and Formal Verification (GANDALF'17)*, Rome, Italy, September 20-22, 2017. Electronic Proceedings in Theoretical Computer Science (EPTCS), Volume 256, pages 268–282. ISSN 2075-2180.

[27] Laura Bozzelli, Aniello Murano, Giuseppe Perelli, and Loredana Sorrentino
Hierarchical Cost-Parity Games.
In *Proceedings of the 24th International Symposium on Temporal Representation and Reasoning (TIME'17)*, Mons, Belgium, October 16-18, 2017. Leibniz International Proceedings in Informatics (LIPIcs), Volume 90, pages 6:1–6:17. ISSN 1868-8969.

[28] Laura Bozzelli, Alberto Molinari, Angelo Montanari, and Adriano Peron.
An in-Depth Investigation of Interval Temporal Logic Model Checking with Regular Expressions.
In *Proceedings of the 5th International Conference on Software Engineering and Formal Methods (SEFM'17)*, Trento, Italy, September 4-8, 2017. Lecture Notes in Computer Science, Volume 10469, pages 104–119. Springer, 2017. ISSN 0302-9743.

[29] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Pietro Sala.
Satisfiability and Model Checking for the Logic of Sub-Intervals under the Homogeneity Assumption.
In *Proceedings of the 44th International Colloquium on Automata, Languages, and Programming (ICALP'17)*, Warsaw, Poland, July 10-14, 2017. Leibniz International Proceedings in Informatics (LIPIcs), Volume 80, pages 120:1–120:14. ISSN 1868-8969.

[30] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Pietro Sala.
Interval vs. Point Temporal Logic Model Checking: an Expressiveness Comparison.
In *Proceedings of the 36th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS'16)*, Chennai, India, December 13-15, 2016. Leibniz International Proceedings in Informatics (LIPIcs), Volume 65, pages 26:1–26:14. ISSN 1868-8969.

[31] Laura Bozzelli and David Pearce.
On the Expressiveness of Temporal Equilibrium Logic.
In *Proceedings of the 15th European Conference on Logics in Artificial Intelligence (JELIA'16)*, Larnaca, Cyprus, November 9-11, 2016. Lecture Notes in Computer Science, Volume 10021, pages 159–173. Springer, 2016. ISSN 0302-9743.

[32] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Pietro Sala.
Model Checking the Logic of Allen's Relations Meets and Started-by is P^{NP}-Complete.
In *Proceedings of the 7th International Symposium on Games, Automata, Logics and Formal Verification (GANDALF'16)*, Catania, Italy, September 14-16th 2016. Electronic Proceedings in Theoretical Computer Science (EPTCS), Volume 226, pages 76–90. ISSN 2075-2180.

[33] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Pietro Sala.
Interval Temporal Logic Model Checking Based on Track Bisimilarity and Prefix Sampling.
In *Proceedings of the 17th Italian Conference on Theoretical Computer Science (ICTCS'16)*, Lecce, Italy, September 7-9th 2016. CEUR Workshop Proceedings, Volume 1720, pages 49–61. CEUR-WS.org, 20016. ISSN 1613-0073.

[34] Laura Bozzelli, Alberto Molinari, Angelo Montanari, Adriano Peron, and Pietro Sala.
Interval Temporal Logic Model Checking: The Border Between Good and Bad HS Fragments.
In *Proceedings of the 8th International Joint Conference on Automated Reasoning (IJCAR'16)*, Coimbra, Portugal, June 27 - July 2, 2016. Lecture Notes in Computer Science, Volume 9706, pages 389–405. Springer, 2016. ISSN 0302-9743.

[35] Laura Bozzelli and David Pearce.
On the Complexity of Temporal Equilibrium Logic.
In *Proceedings of the 30th Annual ACM/IEEE Symposium on Logic in Computer Science (LICS'15)*, Kyoto, Japan, July 6-10, 2015, pages 645-656. IEEE Computer Society Press, 2015.

[36] Laura Bozzelli, Bastien Maubert, and Sophie Pinchinat.
Unifying Hyper and Epistemic Temporal Logics.
In *Proceedings of the 18th International Conference on Foundations of Software Science and Computation Structures (FoSSaCS'15)*, London, UK, April 11-18, 2015. Lecture Notes in Computer Science, Volume 9034, pages 167–182. Springer, 2015. ISSN 0302-9743.

[37] Laura Bozzelli and César Sánchez.
Visibly Linear Temporal Logic.
In *Proceedings of the 7th International Joint Conference on Automated Reasoning (IJCAR'14)*, Vienna, Austria, July 19-22, 2014. Lecture Notes in Computer Science, Volume 8562, pages 418–433. Springer, 2014. ISSN 0302-9743.

[38] Laura Bozzelli and César Sánchez.
Foundations of Boolean Stream Runtime Verification.
In *Proceedings of the 5th International Conference on Runtime Verification (RV'14)*, Toronto, Canada, September 22-25, 2014.Lecture Notes in Computer Science, Volume 8734, pages 64–79. Springer, 2014. ISSN 0302-9743.

[39] Laura Bozzelli, Hans P. van Ditmarsch, and Sophie Pinchinat.
The Complexity of One-Agent Refinement Modal Logic.
In *Proceedings of the 23rd International Joint Conference on Artificial Intelligence (IJCAI'13)*, Beijing, China, August 3-9, 2013, pages 2977-2981. IJCAI/AAAI Press, 2013. ISSN 0738-4602.

[40] Bastien Maubert, Sophie Pinchinat, and Laura Bozzelli.
The complexity of synthesizing uniform strategies.
In *Proceedings of the first International Workshop on Strategic Reasoning (SR'13)*, Rome, Italy, March 16-17, 2013. Electronic Proceedings in Theoretical Computer Science, Volume 112, pages 115–122.

[41] Laura Bozzelli and César Sánchez.
Visibly Rational Expressions.
In *Proceedings of the IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS'12)*, Hyderabad, India, December 15-17, 2012. Leibniz International Proceedings in Informatics (LIPIcs), Volume 18, pages 211-223. ISSN 1868-8969.

[42] Laura Bozzelli, Hans P. van Ditmarsch, and Sophie Pinchinat.
The Complexity of One-Agent Refinement Modal Logic.
In *Proceedings of the 13th European Conference on Logics in Artificial Intelligence (JELIA'12)*, Toulouse, France, September 26-28, 2012. Lecture Notes in Computer Science, Volume 7519, pages 120-133. Springer, 2008. ISSN 0302-9743.

[43] Laura Bozzelli.
Strong termination of gap-order constraint abstractions of counter systems.
In *Proceedings of the 6th International Conference on Language and Automata Theory and Applications (LATA'12)*, A Coruña, Spain, March 5-9, 2012. Lecture Notes in Computer Science, Volume 7183, pages 155-168. Springer, 2012. ISSN 0302-9743.

[44] Laura Bozzelli and Sophie Pinchinat.
Verification of gap-order constraint abstractions of counter systems.
In *Proceedings of the 13th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI'12)*, Philadelphia, Pennsylvania, January 22-24, 2012. Lecture Notes in Computer Science, Volume 7148, pages 88-103. Springer, 2012. ISSN 0302-9743.

[45] Laura Bozzelli and Pierre Ganty.
Complexity Analysis of the Backward Coverability Algorithm for VASS.
In *Proceedings of the 5th International Workshop on Reachability Problems (RP'11)*, Genoa, Italy, September 28-30, 2011. Lecture Notes in Computer Science, Volume 6945, pages 96-109. Springer, 2011. ISSN 0302-9743.

[46] Laura Bozzelli and Ruggero Lanotte.
Hybrid and first-order complete extensions of CaRet.
In *Proceedings of the 20th International Conference on Automated Reasoning with Analytic Tableaux and Related Methods (TABLEAUX'11)*, Bern, Switzerland, July 4-8, 2011. Lecture Notes in Computer Science, Volume 6793, pages 58-72. Springer, 2011. ISSN 0302-9743.

[47] Bastien Maubert, Sophie Pinchinat, and Laura Bozzelli.
Opacity Issues in Games with Imperfect Information.
In *Proceedings of the 2nd International Symposium on Games, Automata, Logics and Formal Verification (GANDALF'11)*, Minori, (Amalfi coast), Italy, 15-17 June 2011. Electronic Proceedings in Theoretical Computer Science, Volume 54, pages 87-101.

[48] Laura Bozzelli.
New results on pushdown module checking with imperfect information.
In *Proceedings of the 2nd International Symposium on Games, Automata, Logics and Formal Verification (GANDALF'11)*, Minori, (Amalfi coast), Italy, 15-17 June 2011. Electronic Proceedings in Theoretical Computer Science, Volume 54, pages 162-177.

[49] Laura Bozzelli, Axel Legay, and Sophie Pinchinat.
Hardness of preorder checking for basic formalisms.
In *Proceedings of the 16th International Conference on Logic for Programming, Artificial Intelligence, and Reasoning (LPAR-16)*, Dakar, Senegal, April 25 – May 1, 2010. Lecture Notes in Computer Science, Volume 6355, pages 119 - 135. Springer, 2010. ISSN 0302-9743.

[50] Laura Bozzelli, Axel Legay, and Sophie Pinchinat.
On Timed Alternating Simulation for Concurrent Timed Games.
In *Proceedings of the 29th International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS'09)*, Kolkata, IIT Kanpur, India, December 15-17, 2009. Leibniz International Proceedings in Informatics (LIPIcs), Volume 4, pages 85-96. ISSN 1868-8969.

[51] Laura Bozzelli and Ruggero Lanotte.
Complexity and Succinctness Issues for Linear-Time Hybrid Logics.
In *Proceedings of the 11th European Conference on Logics in Artificial Intelligence (JELIA'08)*, Dresden, Germany, September 28 - October 1, 2008. Lecture Notes in Computer Science, Volume 5293, pages 48-61. Springer, 2008. ISSN 0302-9743.

[52] Laura Bozzelli.
The Complexity of CaRet + Chop.
In *Proceedings of the 15th International Symposium on Temporal Representation and Reasoning (TIME'08)*, Montréal, Canada, 16 - 18 June 2008. IEEE Computer Society 2008, pages 23 - 31. ISBN 978-0-7695-3181-6.

[53] Laura Bozzelli.
The Complexity of CTL* + Linear Past.
In *Proceedings of the 11th International Conference on Foundations of Software Science and Computational Structures (FOSSACS'08)*, Budapest, Hungary, March 29 - April 6, 2008. Lecture Notes in Computer Science, Volume 4962, pages 186 - 200. Springer, 2008. ISSN 0302-9743.

[54] Laura Bozzelli.
CaRet with Forgettable Past.
In *Proceedings of the 4th Workshop on Methods for Modalities (M4M-5)* Cachan, France, November 2007. Electronic Notes in Theoretical Computer Science, Volume 231, pages 343-361. Elsevier Science Publishers, 2009. ISSN 1571-0661.

[55] Laura Bozzelli.
Alternating automata and a temporal fixpoint calculus for visibly pushdown languages.
In *Proceedings of the 18th International Conference on Concurrency Theory (CONCUR'07)*, Lisbon, Portugal, September 2007. Lecture Notes in Computer Science, Volume 4703, pages 476 - 491. Springer, 2007. ISSN 0302-9743.

[56] Laura Bozzelli and Salvatore La Torre.
Decision Problems for lower/upper bound Parametric Timed Automata.
In *Proceedings of the 34th International Colloquium on Automata, Languages and Programming (ICALP'07)*, Wroclaw, Poland, 9-13 July 2007. Lecture Notes in Computer Science, Volume 4596, pages 925 - 936. Springer, 2007. ISSN 0302-9743.

[57] Laura Bozzelli, Mojmír Kretínský, Vojtech Rehák, and Jan Strejcek.
On decidability of LTL model checking for process rewrite systems.
In *Proceedings of the 26th International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS'06)*, Kolkata, India, December 2006. Lecture Notes in Computer Science, Volume 4337, pages 248 -259. Springer, 2006. ISSN 0302-9743.

[58] Laura Bozzelli and Regis Gascon.
Branching Time Temporal Logic Extended with Presburger Constraints.
In *Proceedings of the 13th International Conference on Logic for Programming, Artificial Intelligence, and Reasoning (LPAR'06)*, Phnom Penh, Cambodia, November 2006. Lecture Notes in Computer Science, Volume 4246, pages 197 - 211. Springer, 2006. ISSN 0302-9743.

[59] Patricia Bouyer, Laura Bozzelli, and Fabrice Chevalier.
Controller Synthesis for MTL Specifications.
In *Proceedings of the 17th International Conference on Concurrency Theory (CONCUR'06)*, Bonn, Germany, August 27-30, 2006. Lecture Notes in Computer Science, Volume 4137, pages 450 - 464. Springer, 2006. ISSN 0302-9743.

[60] Laura Bozzelli, Salvatore La Torre, and Adriano Peron.
Verification of well-formed communicating recursive state machines.
In *Proceedings of the 7th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI'06)*, Charleston, SC, USA, January 8-10, 2006. Lecture Notes in Computer Science, Volume 3855, pages 412 - 426. Springer, 2006. ISSN 0302-9743.

[61] Laura Bozzelli.
Complexity Results on Branching-Time Pushdown Model Checking.
In *Proceedings of the 7th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI'06)*, Charleston, SC, USA, January 8-10, 2006. Lecture Notes in Computer Science, Volume 3855, pages 65 - 79. Springer, 2006. ISSN 0302-9743.

[62] Laura Bozzelli, Aniello Murano, and Adriano Peron.
Pushdown Module Checking.
In *Proceedings of the 12th International Conference on Logic for Programming, Artificial Intelligence, and Reasoning (LPAR'05)*, Montego Bay, Jamaica, December 2005. Lecture Notes in Computer Science, Volume 3835, pages 504 - 518. Springer, 2005. ISSN 0302-9743.

[63] Laura Bozzelli.
Model checking for Process Rewrite Systems and a class of action-based regular properties.
In *Proceedings of the Sixth International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI'05)*, Paris, France, 17-20 January 2005. Lecture Notes in Computer Science, Volume 3385, pages 282–297. Springer, 2005. ISSN 0302-9743.

Summary of research activity in the last five years

2021-2024 Bozzelli's research activity is concentrated on decision, complexity, expressiveness, and succinctness issues related to the formal analysis of infinite-state reactive systems in the framework of automata theory, game theory, and temporal and modal logics. In particular, the focus is on algorithmic methods developed in the context of model-checking, one of the most successful technologies for system verification and also one of the most effective applications of formal methods. Model-checking is mainly used for automatic verification in design phase of software and hardware *reactive* systems, i.e. systems which need to interact with their environment frequently, and often (potentially) do not terminate. Typical examples are concurrent and/or distributed systems. Practical examples include telephone switching networks and safety-critical systems such as nuclear power plants and air traffic control systems.

In the last five years from 2021 to 2024, Laura Bozzelli has worked in collaboration with national and international colleagues on the following topics.

- Timeline-based planning (TP) is a promising approach to real-time temporal planning and reasoning about executions under uncertainty which has been successfully exploited in a number of application domains, including space missions, constraint solving, and activity scheduling. Compared to classical action-based temporal planning, TP adopts a more declarative paradigm which focuses on the constraints that sequences of actions have to fulfil to reach a given goal. We have done a systematic study on expressiveness and complexity of TP in the dense-time settings. While in the discrete-time setting the TP problem is decidable (and precisely EXPSPACE-complete), the shift to a dense-time domain dramatically increases expressiveness and complexity, depicting a scenario which resembles that of the well-known timed linear temporal logics under a pointwise semantics. In particular, we have shown that the TP problem in its full generality is indeed undecidable, and undecidability is caused by the high expressiveness of trigger rules. Decidability can be recovered by imposing suitable syntactic/semantic restrictions on the trigger rules (for details, see [7]).

- Investigation of the complexity of the model-checking problem of finite-state system against epistemic temporal logics which are useful for the analysis and verification of multi-agent systems. In particular, we have established the precise complexity of the model-checking problem for the main logics of knowledge and time. While this problem was known to be non-elementary for agents with perfect recall, with a number of exponentials that increases with the alternation of knowledge operators, the precise complexity of the problem when the maximum alternation is fixed has been an open problem for 20 years. We have closed it by establishing improved upper bounds for CTL with knowledge and providing matching lower bounds that also apply for epistemic extensions of LTL and CTL (see [2]).

- Expressiveness and computational complexity of decision problems related to the analysis and automatic verification of finite-state and pushdown systems in the context of interval temporal logics. In the model-checking methodology, the properties of interest are typically formalized in point-based temporal logics. The latter allow to describe how a system evolves state by state. On the other hand, the formalization of the problem in terms of temporal points makes it difficult, if not impossible, to express properties involving duration or temporal aggregation or more generally properties allowing to specify temporal relations between non-singular events involving entire fragments of computation. Among the recent proposals aiming to overcome these (intrinsic) limitations of the model-checking problem and its formalization, a prominent position is essentially based on the use of the interval temporal logic initially proposed by Halpern and Shoham (and known as HS) and the reformulation of its semantics in the context of reactive systems verification. In this context, in the four-year period 2021-2024, the undersigned has given the following contributions.
  - Determining the precise computational complexity of satisfiability and model-checking problems of finite-state systems for linear-time fragments of HS under the homogeneity assumption. The latter ties the propositional labeling of intervals to that of the states of the transition graph of the system, and is crucial to ensure the decidability of basic decision problems (see the conference proceedings papers [9] and [10], and the journal papers [1], [3], [6], [8]).
  - Pushdown systems represent a classical infinite-state operational formalism suitable for modeling the control flow of typical sequential imperative languages with recursive procedure calls (making the call/return paradigm of procedural programs explicit). We have addressed the problem of extending the interval temporal logic of Halpern and Shoham (HS) for the specification and automatic verification of context-free requirements, in both the linear-time and branching-time settings, of pushdown systems under the following restrictions: the homogeneity assumption for propositional labeling and the visibility requirement on the operations performed on the system stack (see the work in the journal paper [4]).
  - Classical timed temporal logics allow one to express timing constraints by specifying constant bounds on the delays between events. Typical examples are lower and upper bounds on computation times, delays between sending and receiving a message, and timeouts. In the early stages of system design, when not much is known about the system under development, it is still useful for designers to use parameters instead of specific constants. We have investigated a parametric extension of interval temporal logic HS under the homogeneity assumption that allows one to specify parametric bounds on the duration (length) of the interval selected by a temporal operator (see the work in conference proceedings [7]).
  - Study and localization of the decidability border of satisfiability and model-checking problems of finite-state systems for a quantitative extension of interval logic HS (under the homogeneity assumption) that allows to specify timing constraints on the sum/difference of the durations (lengths) of the current interval and of the one selected by the temporal operator (see the work in conference proceedings [8]).

- Introduction and study of the expressivity of significant fragments of second-order monadic logic (MSO) useful for strategic reasoning and their relation to fragments of the modal μ-calculus. The logic MSO interpreted on infinite trees is a fundamental framework in the context of the formal analysis of finite-state systems. All standard temporal logics such as CTL* logic and modal μ-calculus can be translated into MSO. In particular, modal μ-calculus characterizes the properties expressible in MSO that are invariant under bisimulation, while CTL* logic characterizes the properties invariant under bisimulation expressible in the MPL (*Monadic Path Logic*) fragment of MSO where the second-order quantification is restricted to paths of the given tree structure. In this context, the undersigned, together with others, has introduced a new significant fragment (Monadic Tree Logic or MTL) of MSO where the second-order quantification is restricted to subtrees of the given structure. The relevance of this formalism comes from the fact that it subsumes several temporal logics for strategic reasoning. As main contributions, the expressiveness of the new logic has been studied in comparison with MSO and MPL logics and their variants, and the connections of MTL with significant fragments of the extended modal μ-calculus with counting constraints on modal operators (see the work in conference proceedings [3]).

- Characterization of standard branching-time temporal logics by subclasses of finite-state alternating automata. Characterization theorems are an important tool for comparing the expressive power of temporal logics used for the formal specification and verification of reactive systems. While complete connections have been found for the linear-time case between temporal logics, predicate logics, algebraic models, and automata, the situation for the branching-time case is more fragmentary. In this context, we have provided characterizations of two important branching-time temporal logics, CTL* and ECTL* (the latter an extension of CTL*), interpreted on trees with arbitrary branching degree, in terms of two variants of hesitant alternating automata on trees. These characterizations also apply to two well-known fragments of second-order monadic logic (MSO), namely, *Monadic Path Logic* and *Monadic Chain Logic*. Indeed, the results achieved solve a forty-year-old open question (see the works in conference proceedings [1] and [2]).

- Introduction and study of expressivity, decidability, and computational complexity issues of asynchronous extensions of hyper temporal logics suitable for the specification and analysis of security policies of digital information flows. Hyper temporal logics allow to specify properties of sets of traces (computations) and, therefore, can relate distinct execution paths in the transition graph of a reactive system. These abilities are useful for specifying security policies that compare observations made by an external agent along computations resulting from different values of non-directly observable inputs. Such security requirements are not expressible in classical regular temporal logics that allow to specify only properties of single execution traces. We have introduced and investigated two possible asynchronous extensions of Hyper LTL. In an asynchronous framework, an observer cannot distinguish time points along an execution that have the same observation. The semantics of Hyper LTL is instead synchronous and, in particular, it is possible to compare execution traces only at coincident time points, or in general, at time points at a distance from each other that is bounded by a fixed constant. As main contributions, we have investigated the expressiveness of the new logics together with other well-known hyper logics with asynchronous semantics recently introduced. Furthermore, while the model-checking problem for the new logics is highly undecidable, two significant fragments have been identified that are more expressive than Hyper LTL and are able to express relevant security requirements in an asynchronous setting, and for which, the model-checking problem is decidable and not more computationally expensive than that related to Hyper LTL (see the works in conference proceedings [4] and [7]).

Other Professional Activities

2014-2020 Consultant partner of Digitalcomoedia s.r.l. of Naples, a company for the creation of digital content, startup and innovative PMI in the ICT sector (see http://startup.registroimprese.it/) which includes as services the creation of advanced tools in virtual reality and interactive mixed reality for industry 4.0. In this context, the following design, research and development activities have been carried out:

- 2015/2016: design, research, and development of the EDOC-V4F application, a framework for editing training and education scenarios and their immersive and interactive fruition in an AR environment in optical see-through marker-based mode. Application commissioned by Lattanzio Group s.r.l. and the CETMA consortium for the VIS4Factory and EDOC@work projects (PON R&C projects for smart manufacturing funded by MIUR, cod. PON04a2_8 e cod. PON02_00634_3551288).

- 2015/2016: design, research, and development of the ISTME (Interactive Stereoscopic 3D Models Explorer) application for the management of training and education in the advanced industry and defense electronics sector commissioned by Selex ES s.p.a. The application allows the immersive and interactive use of virtual replicas of complex systems and the interactive editing and execution of maintenance procedures compliant with the ISO S1000D standard.

- Partner of the general purpose iEngine platform. Brand and international IPR of Digitalcomoedia, the framework can be used in various application areas: industry 4.0, support for training, simulation and maintenance, support for advanced digital marketing, digital transformation processes. The undersigned has contributed since 2015 to the design and development of the general architecture of the platform and some of its fundamental modules.

- 2016/2017: design, research and development of the VRXperience application commissioned by Leonardo s.p.a. which allows the immersive and interactive use in virtual reality of 3D catalogues to represent company products to be used as virtual stands for marketing operations.

- 2017/2018: project, research, and development manager in the creation of the Morpheus application, an evolution of ISTME commissioned by Leonardo s.p.a. which allows immersive, interactive and collaborative use in a real-time 3D environment of training and education scenarios in the context of industry 4.0. Morpheus VR, which integrates the latest virtual and mixed reality and communication technologies, received the Smau innovation award 2018 edition (see https://www.smau.it/news/premio-innovazione-smau-tutti-i-vincitori).

- 2019/2020: project, research and development manager in the implementation of the Morpheus HLA application, an extension of Morpheus commissioned by Leonardo s.p.a. which supports the HLA protocol for the integration of simulation aspects for the functioning of complex devices in an immersive virtual environment.

- 2018/2020: project owner of the Leonardo 4.0 platform, created for the Leonardo 4.0 project, a PON Research and Innovation project in the Intelligent Factory area funded by MIUR, code ARS01_00615, of which Digitalcomoedia s.r.l. is one of the beneficiaries. The Leonardo 4.0 platform is an evolution of Morpheus capable of providing assistance support (guidance) in an interactive AR environment in optical see-through mode for the optimization of manual assembly processes, verification and testing along production lines, and evolutionary training of complex devices.

2003-2005 Adviser in the area of Research and Development at Digitalcomoedia s.r.l. of Napoli, Italy, a company for the creation of digital content, startup and innovative PMI in the ICT sector (see http://startup.registroimprese.it/). During this period, Laura Bozzelli was the co-tutor of two degree thesis in Computer Science (University of Napoli "Federico II", Italy) which were developed in cooperation with DigitalComoedia.

2000-2001 Software designer at Techno-System Development s.r.l. of Napoli, Italy (web site: http://www.tsdev.it), a company of software and hardware development for Aerospatial Engineering, which cooperates with important research centers among them: European Space Agency (ESA), Italian Space Agency, CIRA, and Swedish Space Corporation. During this period, Laura Bozzelli was involved in the development of real-time software for the on-line data acquisition in the ESA robotic spacecraft mission ROSETTA.

Napoli, January 28, 2025

In witness whereof
Dott. Laura Bozzelli