CATERINA URBAN

DATE AND PLACE OF BIRTH	March 9th, 1987, Udine, Italy
NATIONALITY	Italian
ADDRESS	École Normale Supérieure, 45 rue d'Ulm, 75005 Paris, France
EMAIL	caterina.urban@inria.fr
WEBPAGE	https://caterinaurban.github.io
DBLP	http://dblp.org/pers/hd/u/Urban:Caterina
GOOGLE SCHOLAR	http://scholar.google.it/citations?user=4-u1_HIAAAAJ

CURRENT POSITION

- INRIA, Paris, France — **Research Scientist (Chargé de Recherche)**, Feb 2019 - Now

EDUCATION

- École Normale Supérieure, Paris, France — **Ph.D. in Computer Science**, Dec 2011 - July 2015
  Subject: Static Analysis by Abstract Interpretation of Functional Temporal Properties of Programs
  Advisors: Radhia Cousot (Emeritus Research Director, CNRS, Paris, France) and Antoine Miné (Research Scientist, CRNS, Paris, France)
  Final mark: summa cum laude
- Menlo College, Atherton, USA — Fifth **Summer School** on Formal Techniques, May 2015
- Università degli Studi di Udine, Italy — **Master's degree in Computer Science**, Fall 2009 - Fall 2011
  Final mark: summa cum laude
- Università degli Studi di Udine, Italy — **Bachelor's degree in Computer Science**, Fall 2006 - Fall 2009
  Final mark: summa cum laude

GRANTS

- **Principal Investigator**, **ETH Career Seed Grant**: "Static Analysis for Data Science Applications", 30KCHF, Jan 2017 - Dec 2017

AWARDS AND HONORS

- **Invited Paper** at IJCAI 2016 - Sister Conference Best Paper Track
- **Honorable Mention Award** for the Prix de Thèse Gilles Kahn 2015
- Selected Paper for JAR Journal Special Issue on the Best Papers at CADE 2015
- **Best Paper Award** at CADE 2015
- Selected Paper for COMLAN Journal Special Issue on the Best Papers at VMCAI 2015
- **Best Poster Award** at SOFSEM 2011

RESEARCH EXPERIENCE

- ETH Zürich, Zurich, Switzerland — **Postdoctoral Researcher**, Sep 2015 - Jan 2019
  Supervisor: Peter Müller (Full Professor, ETH Zürich, Zürich, Switzerland)
- Carnegie Mellon Silicon Valley - NASA Ames Research Center, Mountain View, USA — **Ph.D. Student Intern**, Mar 2015 - July 2015
  Mentor: Temesghen Kahsai (Research Scientist, NASA Ames Research Center, Moffett Field, USA)

CAREER BREAKS

- **Maternity Leave**, Sep 2018 - Dec 2018

PROFESSIONAL EXPERIENCE

- **Coordinator**: Dagstuhl Seminar 16471 - Concurrency with Weak Memory Models: Semantics, Languages, Compilation, Verification, Static Analysis, and Synthesis
- **Executive Board Member**: ETAPS Executive Board
- **Committee Chair**: ETAPS Doctoral Dissertation Award 2020
- **Program Committee Member**: SAS 2020, VSTTE 2020, SOAP 2020, CAV 2020, ESOP 2020, VMCAI 2020, iFM 2019, EMSOFT 2019, TAPAS 2019, LOPSTR 2019, AVoCS 2019, NSV 2019, PLDI 2019 Artifact Evaluation, CAV 2019, POPL 2019 Artifact Evaluation, VMCAI 2019, EMSOFT 2018, iFM 2018, SAS 2018, PLDI 2018 SRC, WST 2018, AVoCS 2018, CAV 2018, HCVS 2018, SAS 2017, SAS 2016, VMCAI 2016, SPLAH 2015 Demos, CAV 2015 Artifact Evaluation, SV-COMP 2015
- **Reviewer for International Journals**: Transactions on Software Engineering (2018), Transactions on Software Engineering (2017), Transactions on Programming Languages and Systems (2017), Formal

Methods in System Design (2017), Transactions on Programming Languages and Systems (2016), Acta Informatica (2016), Transactions on Programming Languages and Systems (2015)
- **Reviewer for International Conferences**: POPL 2020, NFM 2019, POPL 2018, ESOP 2017, VMCAI 2017, LOPSTR 2016, FM 2016, NFM 2016, TACAS 2016, ASE 2015, SAS 2015, CAV 2015, CAV 2014, TCS-B 2014
- **Reviewer of Book Manuscripts**: MIT Press (2020)
- **Reviewer of Book Chapters**: "Automatic Software Verification: An Overview of the State of the Art" (TBA)
- **Publicity Chair for International Conferences**: SAS 2018, SAS 2017
- **PhD Defense Committee Member**: Emilio Incerto (Gran Sasso Science Institute, Italy, April 2019)

TEACHING EXPERIENCE

- **Head Teaching Assistant** in Bachelor Program "Bachelor in Computer Science", **ETH Zürich**, Zurich, Switzerland — Spring 2018
  Course: Formal Methods and Functional Programming (Exercise Sessions: 12 hours)
- **Teaching Assistant** in Master Program "Master in Computer Science", **ETH Zürich**, Zurich, Switzerland — Fall 2017
  Course: Concepts of Object Oriented Programming (Exercise Sessions: 18 hours)
- **Teaching Assistant** in Bachelor Program "Bachelor in Computer Science", **ETH Zürich**, Zurich, Switzerland — Spring 2017
  Course: Formal Methods and Functional Programming (Exercise Sessions: 12 hours)
- **Head Teaching Assistant** in Master Program "Master in Computer Science", **ETH Zürich**, Zurich, Switzerland — Fall 2016
  Course: Concepts of Object Oriented Programming (Exercise Sessions: 14 hours)
- **Teaching Assistant** in Bachelor Program "Bachelor in Computer Science", **ETH Zürich**, Zurich, Switzerland — Spring 2016
  Course: Formal Methods and Functional Programming (Exercise Sessions: 12 hours)
- **Teaching Assistant** in Doctoral Program "Doctorate in Computer Science" and Master Program "Master in Computer Science", **ETH Zürich**, Zurich, Switzerland — Fall 2015
  Seminar: Research Topics in Software Engineering
- **Teaching Assistant** in Master Program "Master in Computer Science", **ETH Zürich**, Zurich, Switzerland — Fall 2015
  Course: Concepts of Object Oriented Programming (Exercise Sessions: 10,5 hours)
- **Lecturer** in Bachelor Program "Frontières du Vivant" (FdV), **Université Paris Descartes** (Paris 5), Paris, France — Spring 2015
  Course: Mathematics (Lectures: 10 hours, Exercise Sessions: 2 hours)
- **Invited Lecturer** in Master Program "Master Parisien de Recherche en Informatique" (MPRI), **Université Paris Diderot** (Paris 7), Paris, France — Fall 2014
  Course: Abstract Interpretation (Lectures: 1,5 hours)
- **Lecturer** in Bachelor Program "Frontières du Vivant" (FdV), **Université Paris Descartes** (Paris 5), Paris, France — Fall 2014
  Course: Mathematics (Lectures: 7,5 hours, Exercise Sessions: 3 hours)
- **Lecturer** in Bachelor Program "Frontières du Vivant" (FdV), **Université Paris Descartes** (Paris 5), Paris, France — Spring 2014
  Course: Mathematics (Lectures: 6 hours, Exercise Sessions: 4 hours)
- **Lecturer** in Bachelor Program "Frontières du Vivant" (FdV), **Université Paris Descartes** (Paris 5), Paris, France — Fall 2013
  Course: Mathematics (Lectures: 4 hours, Exercise Sessions: 10 hours)

MENTORING EXPERIENCE

- Serge Durand - "Static Analysis by Abstract Interpretation of the ACAS Xu Neural Networks"
  M1 Research Internship, École Normale Supérieure, France, Jun 2020 - Aug 2020
- Marco Zanella - TBA
  PhD Research Internship, École Normale Supérieure, France, May 2020 - Aug 2020
- Radwa Sherif Ahmed Kamel Abdelbar - "Automated Checking of Implicit Assumptions on Textual Data"
  Bachelor's Thesis, ETH Zürich, Switzerland, Mar 2018 - Aug 2018

- Lowis Engel - “Usage Analysis of Data Stored in Map Data Structures”
  Master’s Thesis, ETH Zürich, Switzerland, Feb 2018 - Aug 2018
- Madelin Schumacher - “Automated Generation of Data Quality Tests”
  Master’s Thesis, ETH Zürich, Switzerland, Sep 2017 - Mar 2018
- Samuel Ueltschi - “Proving Temporal Properties by Abstract Interpretation”
  Master’s Thesis, ETH Zürich, Switzerland, Mar 2017 - Sep 2017
- Mostafa Abdullah Ahmed Hassan - “A Static Type Inference for Python”
  Bachelor’s Thesis, ETH Zürich, Switzerland, Mar 2017 - Aug 2017
- Simon Wehrli - “Static Program Analysis of Data Usage Properties”
  Master’s Thesis, ETH Zürich, Switzerland, Feb 2017 - Aug 2017
- Flurin Rindisbacher - “Interprocedural Analysis in Sample”
  Master’s Thesis, ETH Zürich, Switzerland, Mar 2017 - Aug 2017
- Severin Münger - “Inference of Pointwise Specifications for Heap-Manipulating Programs”
  Master’s Thesis, ETH Zürich, Switzerland, Sep 2016 - Mar 2017
- Nathanaël Courant - “Precise Widenings for Proving Termination by Abstract Interpretation”
  Internship, ETH Zürich, Switzerland, Jun 2016 - Jul 2016
- Lukas Neukom - “Termination Analysis of Heap-Manipulating Programs by Abstract Interpretation”
  Master’s Thesis, ETH Zürich, Switzerland, Mar 2016 - Sep 2016
- Seraiah Walter - “Automatic Inference of Quantified Permissions by Abstract Interpretation”
  Master’s Thesis, ETH Zürich, Switzerland, Feb 2016 - Aug 2016

PUBLICATIONS - INTERNATIONAL JOURNALS

- Vijay D’Silva and **Caterina Urban**, **Abstract Interpretation as Automated Deduction**
  In Journal of Automated Reasoning (JAR), 2017.
- **Caterina Urban** and Antoine Miné, **Inference of Ranking Functions for Proving Temporal Properties by Abstract Interpretation**
  In Computer Languages Systems and Structures (COMLAN), 2017.

PUBLICATIONS - INTERNATIONAL CONFERENCES

- **Caterina Urban**, Maria Christakis, Valentin Wüstholz, Fuyuan Zhang, **Perfectly Parallel Fairness Certification of Neural Networks**
  Under Submission
- **Caterina Urban**, **Shape Analysis for Input Data**
  Under Submission
- **Caterina Urban**, **Static Analysis of Data Science Software**
  In Proc. 26th Static Analysis Symposium (SAS 2018) - **Invited Paper**
- **Caterina Urban**, Samuel Ueltschi, and Peter Müller, **Abstract Interpretation of CTL Properties**
  In Proc. 25th Static Analysis Symposium (SAS 2018)
- Mostafa Hassan, **Caterina Urban**, Marco Eilers, and Peter Müller, **MaxSMT-Based Type Inference for Python 3**
  In Proc. 30th International Conference on Computer Aided Verification (CAV 2018).
- Jérôme Dohrau, Alexander J. Summers, **Caterina Urban**, Severin Münger, and Peter Müller, **Permission Inference for Array Programs**
  In Proc. 30th International Conference on Computer Aided Verification (CAV 2018)
- **Caterina Urban** and Peter Müller, **An Abstract Interpretation Framework for Input Data Usage**
  In Proc. 27th European Symposium on Programming (ESOP 2018)
- Nathanaël Courant and **Caterina Urban**, **Precise Widening Operators for Proving Termination by Abstract Interpretation**
  In Proc. 23rd International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2017)
- Vijay D’Silva and **Caterina Urban**, **Büchi, Lindenbaum, Tarski: A Program Analysis Appetizer**
  In Proc. 25th International Joint Conference on Artificial Intelligence (IJCAI 2016) - **Invited Paper**
- **Caterina Urban** and Arie Gurfinkel and Temesghen Kahsai, **Synthesizing Ranking Functions from Bits and Pieces**
  In Proc. 22nd International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2016)

- Vijay D'Silva and **Caterina Urban**, **Abstract Interpretation as Automated Deduction**
  In Proc. 25th International Conference on Automated Deduction (CADE 2015) - **Best Paper Award**
- Vijay D'Silva and **Caterina Urban**, **Conflict-Driven Abstract Interpretation for Conditional Termination**
  In Proc. 27th International Conference on Computer Aided Verification (CAV 2015)
- **Caterina Urban**, **FuncTion: An Abstract Domain Functor for Termination**
  In Proc. 21st International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2015)
- **Caterina Urban** and Antoine Miné, **Proving Guarantee and Recurrence Temporal Properties by Abstract Interpretation**
  In Proc. 16th International Conference on Verification, Model Checking and Abstract Interpretation (VMCAI 2015)
- **Caterina Urban** and Antoine Miné, **A Decision Tree Abstract Domain for Proving Conditional Termination**
  In Proc. 21st International Static Analysis Symposium (SAS 2014)
- **Caterina Urban** and Antoine Miné, **An Abstract Domain to Infer Ordinal-Valued Ranking Functions**
  In Proc. 23rd European Symposium on Programming (ESOP 2014)
- **Caterina Urban**, **The Abstract Domain of Segmented Ranking Functions**
  In Proc. 20th International Static Analysis Symposium (SAS 2013)
- Marino Miculan and **Caterina Urban**, **Formal Analysis of Facebook Connect Single Sign-On Authentication Protocol**
  In Proc. Student Research Forum of 37th International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM 2011) - **Best Poster Award**

PUBLICATIONS - INTERNATIONAL WORKSHOPS

- **Caterina Urban** and Antoine Miné, **To Infinity… and Beyond!**
  In Proc. 14th International Workshop on Termination (WST 2014)
- **Caterina Urban**, **Piecewise-Defined Ranking Functions**
  In Proc. 13th International Workshop on Termination (WST 2013)

OTHER PUBLICATIONS

- **Caterina Urban**, **Analyse Statique par Interprétation Abstraite de Propriétés Temporelles des Programmes**
  In 1024 - Bulletin de la Société Informatique de France, April 2016.
  http://www.societe-informatique-de-france.fr/wp-content/uploads/2016/04/1024-no8-Urban.pdf
- **Caterina Urban**, **Ce Qu'Achille a Fait Calculer à la Tortue**
  In Blog Binaire, March 2016.
  http://binaire.blog.lemonde.fr/2016/03/25/ce-quachille-a-fait-calculer-a-la-tortue/

INVITED TALKS

- **TBA**: TBA
  Dagstuhl Seminar 20251 "Theoretical Advances and Emerging Applications in Abstract Interpretation", Schloss Dagstuhl, Germany.
- **Jun 2020**: "Perfectly Parallel Fairness Certification of Neural Networks"
  https://webconf.gricad.cloud.math.cnrs.fr/b/kha-fem-gu3
  INRIA Rennes, Rennes, France - remote
- **Jun 2020**: "Perfectly Parallel Fairness Certification of Neural Networks"
  https://bbb2.math.univ-paris-diderot.fr/b/sid-3jt-7ak
  IRIF, Paris, France - remote
- **May 2020**: "Perfectly Parallel Fairness Certification of Neural Networks"
  Tel Aviv University, Tel Aviv, Israel - remote
- **May 2020**: "Perfectly Parallel Fairness Certification of Neural Networks"
  Thales Research & Technology, Palaiseau, France - remote
- **October 2019**: Static Analysis of Data Science Software
  https://youtu.be/DX_wOrq9J18
  SAS 2019, Porto, Portugal - **Keynote Speaker**

- **April 2019**: “What Programs Want: Automatic Inference of Input Data Specifications”
  Gran Sasso Science Institute (GSSI), L’Aquila, Italy.
- **May 2018**: “Static Program Analysis for a Software-Driven Society”
  INRIA Paris, Paris, France.
- **May 2018**: “Static Program Analysis for a Software-Driven Society”
  TU Wien, Vienna, Austria.
- **March 2018**: “Static Program Analysis for a Software-Driven Society”
  https://memento.epfl.ch/event/ic-colloquium-static-program-analysis-for-a-softwa/
  École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland.
- **March 2018**: “Static Program Analysis for a Software-Driven Society”
  https://www.stevens.edu/events/static-program-analysis-software-driven-society
  Stevens Institute of Technology, Hoboken, New Jersey, USA.
- **March 2018**: “Static Program Analysis for a Software-Driven Society”
  Max Planck Institute for Software Systems, Kaiserslautern, Germany.
- **October 2017**: “An Abstract Interpretation Framework for Input Data Usage”
  Shonan Meeting 100 “Analysis and Verification of Pointer Programs”, Shonan Village Center, Japan
- **September 2017**: “An Abstract Interpretation Framework for Input Data Usage”
  Shonan Meeting 108 “Memory Abstraction, Emerging Techniques and Applications”, Shonan Village Center, Japan
- **January 2017**: “Synthesizing Ranking Functions from Bits and Pieces”
  Université Pierre et Marie Curie (Paris 6), Paris, France.
- **May 2016**: “Bringing Abstract Interpretation to Termination and Beyond"
  Dagstuhl Seminar 16201 “Synergies among Testing, Verification, and Repair for Concurrent Programs”, Schloss Dagstuhl, Germany.
- **January 2016**: “Analyse Statique par Interprétation Abstraite de Propriétés Temporelles des Programmes”
  Congrès SIF 2016, Strasbourg, France.
- **August 2015**: “Abstract Interpretation as Automated Deduction”
  TU Wien, Vienna, Austria.
- **July 2015**: “Counterexample-Guided Inference of Ranking Functions”
  SRI International, Menlo Park, USA.
- **December 2014**: “Proving Guarantee and Recurrence Temporal Properties by Abstract Interpretation”
  University of Udine, Udine, Italy.
- **November 2014**: “Proving Guarantee and Recurrence Temporal Properties by Abstract Interpretation”
  ETH Zurich, Zurich, Switzerland.
- **October 2014**: “Automatic Inference of Ranking Functions by Abstract Interpretation”
  Queen Mary University of London, London, UK.
- **August 2014**: “Automatic Inference of Ranking Functions by Abstract Interpretation”
  Dagstuhl Seminar 14352 “Next Generation Static Software Analysis Tools”, Schloss Dagstuhl, Germany.
- **June 2014**: “Automatic Inference of Ranking Functions by Abstract Interpretation”
  University College London, London, UK.
- **May 2014**: “An Abstract Domain to Infer Ordinal-Valued Ranking Functions”
  INRIA Rennes, Rennes, France.
- **March 2014**: “Automatic Inference of Ranking Functions by Abstract Interpretation”
  INRIA Paris-Rocquencourt, France.
- **January 2014**: “Automatic Inference of Ranking Functions by Abstract Interpretation”
  IBM Thomas J. Watson Research Center, Yorktown Heights, USA.
- **November 2013**: “The Abstract Domain of Piecewise-Defined Ranking Functions”
  East China Normal University, Shanghai, China.
- **November 2013**: “The Abstract Domain of Piecewise-Defined Ranking Functions”
  AVDCPS 2013, Changsha, China.
- **March 2013**: “The Abstract Domain of Segmented Ranking Functions”
  University of Udine, Udine, Italy.

LANGUAGES

- **Italian**: mother tongue
- **English**: very good, spoken and written

- **French**: good spoken, basic written
- **German**: basic, spoken and written

WORK EXPERIENCE

- Onoranze Funebri Decor Pacis, Udine, Italy — **Contractor**, August 2013
  I developed an iOS application to ease the inventory and the client management of the funeral home, and to provide a nice visual catalog.
- Università degli Studi di Udine, Udine, Italy — **System Administrator**, Fall 2008 - Fall 2011
  I worked as system administrator on UNIX/Linux systems and on Microsoft Windows systems in the computer labs of the Faculty of Sciences.
- Federfarma Friuli Venezia Giulia, Udine, Italy — **Contractor**, 2010
  I designed an integer linear programming model to determine the shifts of the pharmacies of the region Friuli Venezia Giulia.
- Viten s.r.l, Udine, Italy — **Contractor**, March 2009
  I wrote a dozen queries for a database and I used Visual Basic 2005 for the connection and interface with Microsoft SQL Server.

OTHER

- I have been an amateur developer for the iOS Platform from Spring 2012 to Spring 2014
- I was a tutor for high school and university students for mathematics and computer science during my studies at the University of Udine; during my doctoral studies, I taught Italian to a French high school student who was later admitted to a dual degree program between the Sorbonne University (Paris 1) in France and the University of Florence in Italy
- During my high school studies and my studies at the University of Udine (from December 2005 to February 2011), I worked part-time (15 hours/week) as a bartender in a multiplex cinema (Cinecity Art & Cinemas s.r.l., Udine, Italy)