

# Matteo Cimini

## Curriculum Vitae

### Education

- Ph.D. in *Reykjavik University*, Iceland, January 2012.  
Computer Science Advisors: Prof. Luca Aceto and Prof. Anna Ingólfssdóttir.
- M.Sc. in *University of Bologna*, Italy, 2008.  
Computer Science M.Sc. thesis supervisor: Prof. Davide Sangiorgi.  
Co-supervisor: Prof. Claudio Sacerdoti Coen.
- B.Sc. in *University of Bologna*, Italy, 2005.  
Computer Science

### Employment

- present time *University of Massachusetts Lowell*, MA, USA.  
- Sept. 2017 Assistant Professor.
- Aug. 2017 - *Indiana University*, Bloomington, IN, USA.  
Feb. 2014 Research Associate (July 2016 - Aug. 2017).  
Postdoctoral fellow (Feb. 2014 - June 2016).
- Jan. 2014 - *INRIA-Saclay*, France.  
Oct. 2012 Postdoctoral researcher.
- Sept. 2012 - *Reykjavik University*, Iceland.  
Jan. 2009 Doctoral Student and Research Assistant (Jan. 2009 - Dec. 2011).  
Postdoctoral researcher (Jan. 2012 - Sept. 2012).

### Grants and Awards

- 2023 - 2026 NSF SHF: SMALL: Language-agnostic Proofs. (Oct. 2023 - Sept. 2026)  
PI: Matteo Cimini (sole PI).  
Award amount (includes REU supplement): \$233,336  
(*SHF (Software and Hardware Foundations) is the NSF core program in my field.*)  
(*SMALL is a core program (as opposed to other programs with specificity such as CRII).*)
- 2023 Best Paper Award at the 17th International Conference on Tests and Proofs (TAP 2023).  
2021 Teaching Excellence Award at UMass Lowell.  
2020 Launch Mentors Award at UMass Lowell.

### Publications

Here, *publications* also include papers “accepted for publication” though not yet in print.

#### Summary by the numbers:

- ◆ 43 publications in total (incl. a conference proceedings).
- ◆ Since joining UMass Lowell: 24 publications (incl. a conference proceedings).
- ◆ Since joining UMass Lowell: 16 first-author papers.
- ◆ Since joining UMass Lowell: 8 publications with my students.

UMass Lowell students who are (or were) under my supervision are underlined

- [43] **A Typestate Approach to Purpose-aware Programming.**  
Joan Montas, Samuel Dodson, Anitha Gollamudi, Matteo Cimini.  
Accepted for publication in the proceedings of the *2026 Workshop on Formal Techniques for Judicious Programming (FTfJP 2026)*.
- [42] **From Program Logics towards Language Logics.**  
Matteo Cimini.  
In *Proceedings of the 22nd International Colloquium on Theoretical Aspects of Computing (ICTAC 2025)*, pages 220-238, 2025.
- [41] **Type Soundness of Functional Languages with Subtyping in Lang-n-Prove.**  
Matteo Cimini, Joan Montas.  
In the journal *Science of Computer Programming*, Volume 248, 103380, March 2026.  
(accepted for publication in 2025).
- [40] **A Debugging System for Language-Parameterized Proofs.**  
Charlesowityear Ly, Eswarasanthosh Kumar Mamillapalli, Matteo Cimini.  
In *Rebeca for Actor Analysis in Action. Lecture Notes in Computer Science*, vol 15560. Springer, Cham, pages 364-389, 2025. (Festschrift volume dedicated to Marjan Sirjani.)
- [39] **Language-parameterized Proofs for Functional Languages with Subtyping.**  
Seth Galasso, Matteo Cimini.  
In *Proceedings of the 17th International Symposium on Functional and Logic Programming (FLOPS 2024)*, pages 291-310, May 2024.
- [38] **Towards the Complexity Analysis of Programming Language Proof Methods.**  
Matteo Cimini.  
In *Proceedings of the 20th International Colloquium on Theoretical Aspects of Computing (ICTAC 2023)*, pages, 100-118, December 2023.
- [37] **Testing Languages with a Languages-as-Databases Approach.**  
Matteo Cimini.  
In *Proceedings of the 17th International Conference on Tests and Proofs (TAP 2023)*, pages 108-126, July 2023.  
**Best Paper Award.**
- [36] **A Declarative Validator for GSOS Languages.**  
Matteo Cimini.  
In *Proceedings of the 14th International Workshop on Programming Language Approaches to Concurrency- and Communication-centric Software (PLACES 2023)*, pages 14-25, April 2023.
- [35] **A Query Language for Language Analysis.**  
Matteo Cimini.  
In *Proceedings of the 20th edition of the International Conference on Software Engineering and Formal Methods (SEFM'22)*, pages 57-73, September 2022.
- [34] **Lang-n-Prove: A DSL for Language Proofs.**  
Matteo Cimini.  
In *Proceedings of the 15th ACM SIGPLAN International Conference on Software Language Engineering (SLE'22)*, pages 16-29, December 2022.
- [33] **Lang-n-Send Extended: Sending Regular Expressions to Monitors.**  
Matteo Cimini.  
In *Proceedings of the 15th Interaction and Concurrency Experience (ICE 2022)*, pages 69-84, June 2022.

- [32] **Lang-n-Send: Processes That Send Languages.**  
Matteo Cimini.  
*In Proceedings of the 13th International Workshop on Programming Language Approaches to Concurrency- and Communication-centric Software (PLACES 2022)*, pages 46–56, April 2022.
- [31] **A Calculus for Multi-Language Operational Semantics.**  
Matteo Cimini.  
*In Proceedings of the 13th Working Conference on Verified Software: Theories, Tools, and Experiments (VSTTE 2021)*, pages 25–42, October 2021.
- [30] **Language Transformations in the Classroom.**  
Matteo Cimini, [Benjamin Mourad](#).  
*In Proceedings of the Combined 28th International Workshop on Expressiveness in Concurrency and 18th Workshop on Structural Operational Semantics (EXPRESS/SOS 2021)*, pages 43–58, August 2021.
- [29] **A Declarative Gradualizer with Language Transformations.**  
[Benjamin Mourad](#), Matteo Cimini.  
*In Proceedings of the 32nd Symposium on Implementation and Application of Functional Languages (IFL 2020)*, pages 44–54, September 2020.
- [28] **Extrinsically Typed Operational Semantics for Functional Languages.**  
Matteo Cimini, Dale Miller, Jeremy G. Siek.  
*In Proceedings of the 13th ACM SIGPLAN International Conference on Software Language Engineering (SLE 2020)*, pages 108–125, November 2020.
- [27] **On the Effectiveness of Higher-Order Logic Programming in Language-Oriented Programming.**  
Matteo Cimini.  
*In Proceedings of the 15th International Symposium on Functional and Logic Programming (FLOPS 2020)*, pages 106–123, April 2020.
- [26] **System Description: Lang-n-Change - A Tool for Transforming Languages.**  
[Benjamin Mourad](#), Matteo Cimini.  
*In Proceedings of the 15th International Symposium on Functional and Logic Programming (FLOPS 2020)*, pages 198–214, April 2020.
- [25] **A Calculus for Language Transformations.**  
[Benjamin Mourad](#), Matteo Cimini.  
*In Proceedings of the 46th International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM 2020)*, pages 547–555, Limassol, Cyprus, January 2020.
- [24] **Early Experience in Teaching the Basics of Functional Language Design with a Language Type Checker.**  
Matteo Cimini.  
*In Proceedings of the 20th International Symposium on Trends in Functional Programming (TFP 2019)*, pages 21–37, Vancouver, Canada, June 2019.
- [23] **Towards Gradually Typed Capabilities in the Pi-Calculus.**  
Matteo Cimini.  
*In Proceedings of Interaction and Concurrency Experience (ICE 2019) - 12th International Workshop*, pages 61–76, Copenhagen, Denmark, June 2019.
- [22] **Proceedings of the 30th Symposium on Implementation and Application of Functional Languages (IFL 2018).**  
Matteo Cimini, Jay McCarthy.  
Proceedings of the IFL 2018 symposium, Lowell, MA, USA – September 05 - 07, 2018.

- [21] **Languages as First-Class Citizens (Vision Paper).**  
Matteo Cimini.  
*In Proceedings of the 11th ACM SIGPLAN International Conference on Software Language Engineering (SLE 2018)*, pages 65–69, Boston, USA, November 2018.
- [20] **Ghostbuster: A Tool for Simplifying and Converting GADTs.**  
Timothy Zakian, Trevor McDonell, Matteo Cimini, Ryan Newton.  
In the journal *Journal of Functional Programming (JFP)*, Volume 28, e16, 2018.
- **Remark:** Below are the publications of Prof. Cimini prior to joining UMass Lowell.
- [19] **Automatically Generating the Dynamic Semantics of Gradually Typed Languages.**  
Matteo Cimini and Jeremy G. Siek.  
*In Proceedings of the 44th ACM SIGPLAN Symposium on Principles of Programming Languages, POPL 2017, Paris, France, January 2017.*
- [18] **Fractional Permissions for Race-Free Mutable References in a Dataflow Intermediate Language.**  
Matteo Cimini and Jeremy Siek.  
*In Proceedings of the 1st Workshop on Programming Models and Languages for Distributed Computing (PMLDC 2016), Rome, Italy, July 2016.*
- [17] **Ghostbuster: A Tool for Simplifying and Converting GADTs.**  
Trevor McDonell, Timothy Zakian, Matteo Cimini, Ryan Newton.  
*In Proceedings of the 21st annual ACM SIGPLAN International Conference on Functional Programming (ICFP 2016) , Nara, Japan, September 2016*, pages 338–350, 2016.
- [16] **PTRebeca: Modeling and Analysis of Distributed and Asynchronous Systems.**  
Ali Jafari, Ehsan Khamespanah, Marjan Sirjani, Holger Hermanns, Matteo Cimini.  
In the journal *Science of Computer Programming*, 128:22–128:50, 2016.
- [15] **The Gradualizer: A Methodology and Algorithm for Generating Gradual Type Systems.**  
Matteo Cimini and Jeremy G. Siek.  
*In Proceedings of the 43rd Annual ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, POPL 2016, St. Petersburg, Florida, United States, January 20-22, 2016.* pages 443–455, 2016.
- [14] **Refined Criteria for Gradual Typing.**  
Jeremy G. Siek, Michael M. Vitousek, Matteo Cimini, and John Tang Boyland.  
*In 1st Summit on Advances in Programming Languages, SNAPL 2015, May 3-6, 2015, Asilomar, California, USA*, pages 274–293, 2015.
- [13] **Monotonic References for Efficient Gradual Typing.**  
Jeremy G. Siek, Michael M. Vitousek, Matteo Cimini, Sam Tobin-Hochstadt, and Ronald Garcia.  
*In 24th European Symposium on Programming, ESOP 2015, London, UK, April 11-18, 2015*, pages 432–456, 2015.
- [12] **Principal Type Schemes for Gradual Programs.**  
Ronald Garcia and Matteo Cimini.  
*In Proceedings of the 42nd Annual ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, POPL 2015, Mumbai, India, January 15-17, 2015*, pages 303–315, 2015.
- [11] **A Lightweight Formalization of the Meta-theory of Bisimulation-up-to.**  
Kaustuv Chaudhuri, Matteo Cimini, and Dale Miller.  
*In Proceedings of the 2015 Conference on Certified Programs and Proofs, CPP 2015, Mumbai, India, January 15-17, 2015*, pages 157–166, 2015.

- [10] **Modelling and simulation of asynchronous real-time systems using Timed Rebeca.**  
Arni Hermann Reynisson, Marjan Sirjani, Luca Aceto, Matteo Cimini, Ali Jafari, Anna Ingólfssdóttir, and Steinar Hugi Sigurdarson.  
In the journal *Science of Computer Programming*, 89:41–89:68, 2014.
- [9] **Rule formats for distributivity.**  
Luca Aceto, Matteo Cimini, Anna Ingólfssdóttir, Mohammadreza Mousavi, and Michel A. Reniers.  
In the journal *Theoretical Computer Science*, 458:1–458:28, 2012.
- [8] **Nominal SOS.**  
Matteo Cimini, MohamadReza Mousavi, Michel A. Reniers and Murdoch J. Gabbay.  
In *Proceedings of the 28th Conference on the Mathematical Foundations of Programming Semantics (MFPS XXVIII), Bath, UK, Electronic Notes in Theoretical Computer Science, Elsevier*, 2012.
- [7] **Proving the validity of equations in GSOS languages using rule-matching bisimilarity.** Luca Aceto, Matteo Cimini, and Anna Ingólfssdóttir.  
In the journal *Mathematical Structures in Computer Science.*, 22(2):291–331, Cambridge University Press, 2012.
- [6] **SOS rule formats for zero and unit elements.**  
Luca Aceto, Matteo Cimini, Anna Ingólfssdóttir, MohammadReza Mousavi, and Michel A. Reniers.  
In the journal *Theoretical Computer Science*, 412(28):3045–3071, 2011.
- [5] **Modelling and simulation of asynchronous real-time systems using Timed Rebeca.**  
Luca Aceto, Matteo Cimini, Anna Ingólfssdóttir, Arni Hermann Reynisson, Steinar Hugi Sigurdarson, and Marjan Sirjani.  
In *Proceedings of the 10th International Workshop on the Foundations of Coordination Languages and Software Architectures (FOCLASA 2011), volume 58 of Electronic Proceedings in Theoretical Computer Science*, pages 1–19, 2011.
- [4] **Rule formats for distributivity.**  
Luca Aceto, Matteo Cimini, Anna Ingólfssdóttir, Mohammadreza Mousavi, and Michel A. Reniers.  
In *Proceedings of the 5th International Conference on Language and Automata Theory and Applications (LATA 2011), volume 6638 of Lecture Notes in Computer Science*, pages 79–90, Springer-Verlag, 2011.
- [3] **On rule formats for zero and unit elements.**  
Luca Aceto, Matteo Cimini, Anna Ingólfssdóttir, MohammadReza Mousavi, and Michel A. Reniers.  
In *Proceedings of the 26th Conference on the Mathematical Foundations of Programming Semantics (MFPS XXVI), Ottawa, Canada, volume 265 of Electronic Notes in Theoretical Computer Science*, pages 145–160. Elsevier B.V., The Netherlands, 2010.
- [2] **Functions as processes: Termination and the  $\bar{\lambda}\mu\tilde{\mu}$ -Calculus.**  
Matteo Cimini, Claudio Sacerdoti Coen, and Davide Sangiorgi.  
In *Proceedings of the 5th Symposium on Trustworthy Global Computing (TGC 2010), volume 6084 of Lecture Notes in Computer Science*, pages 73–86, *Revised Selected Papers*, Springer-Verlag, 2010.
- [1] **A bisimulation-based method for proving the validity of equations in GSOS languages.**  
Luca Aceto, Matteo Cimini, and Anna Ingólfssdóttir.  
In *Proceedings of the 6th Workshop on Structural Operational Semantics 2009 (SOS 2009), August 31, 2009, Bologna (Italy), volume 18 of Electronic Proceedings in Theoretical Computer Science*, pages 1–16, 2010.

## Mentoring

*Below, all students are (or were) students at UMass Lowell except the high school student.*

- 2024 – Ph.D. student: Joan Montas.  
present time 2 publications with Prof. Cimini.
- Spring 2025 Undergraduate student: Tristan McDermott.  
Spring 2025 Undergraduate student: Merlyn Zimmerman.  
Spring 2025 Undergraduate student: Nikolaos Tentas.  
Merlyn’s and Nikolaos’ work led to a software tool in my research themes.  
(See CongruenceTool: <https://github.com/mcimini/CongruenceTool> )
- 2024 Master’s student: Eswarasanthosh Kumar Mamillapalli.  
1 publication with Prof. Cimini and Charlesowityear Ly.  
M.Sc. Thesis supervised by Prof. Cimini. Graduated in 2024.
- 2024 Undergraduate student: Charlesowityear Ly.  
1 publication. (The above-mentioned paper.)
- 2023 & 2024 Undergraduate student: Tess Galasso.  
1 publication with Prof. Cimini [39].
- 2019 - 2021 Master’s student: Benjamin Mourad.  
Remark: I consider it as if we did “Ph.D. level” work even if formally for Master’s.  
4 publications with Prof. Cimini.  
M.Sc. Thesis supervised by Prof. Cimini. Graduated in 2021.  
Employed at Draper Laboratory after degree.
- Fall 2021 High school student (local high school in the general area of Lowell, MA).  
*Duties:* Learn Programming Language Theory and assist in research.
- 2020 Master’s student: Nandan Kulkarni (Co-supervised with Prof. Narain, UMass Lowell).

## Teaching Experience

Summary by the numbers:

- ◆ 6 distinct courses. (3 undergraduate, 2 graduate, 1 corporate education)

To help, one instance of my distinct courses is in **bold underlined font**.

Courses taught at University of Massachusetts Lowell

- Spring 2026 **COMP.3010 Organization of Programming Languages** - (Undergraduate)  
Fall 2025 *COMP.3010 Organization of Programming Languages* - Section 201 (Undergraduate)  
Fall 2025 *COMP.3010 Organization of Programming Languages* - Section 202 (Undergraduate)  
Spring 2025 **COMP.5020 Foundations of Computer Science (Graduate level)**  
Fall 2024 *Parental leave*  
Spring 2024 *COMP.3010 Organization of Programming Languages* (Undergraduate level)  
Fall 2023 *COMP.3010 Organization of Programming Languages* (Undergraduate level)  
Fall 2023 **COMP.5310 Design of Programming Languages (Graduate level)**  
Summer '23 *COMP.3010 Organization of Programming Languages* (Undergraduate level)  
Spring 2023 *COMP.3010 Organization of Programming Languages* (Undergraduate level)  
Spring 2023 **COMP.4040 Analysis of Algorithms (Undergraduate level)**  
Fall 2022 *COMP.3010 Organization of Programming Languages* (Undergraduate level)  
Fall 2022 *COMP.5310 Design of Programming Languages* (Graduate level)  
Spring 2022 *Parental leave*  
Fall 2021 *COMP.3010 Organization of Programming Languages* (Undergraduate level)  
Fall 2021 *COMP.5310 Design of Programming Languages* (Graduate level)

Spring 2021	<i>COMP.3010 Organization of Programming Languages - Section 201 (Undergraduate)</i>
Spring 2021	<i>COMP.3010 Organization of Programming Languages - Section 202 (Undergraduate)</i>
Spring 2021	<b><u>Developing Radar Signal Processing</u></b> (Corporate education course, as co-instructor, my part was 2/3rd of the course.)
Fall 2020	<i>COMP.4040 Analysis of Algorithms - Section 201 (Undergraduate level)</i>
Fall 2020	<i>COMP.4040 Analysis of Algorithms - Section 202 (Undergraduate level)</i>
Spring 2020	<b><u>COMP.3040 Foundations of Computer Science (Undergraduate level)</u></b>
Spring 2020	<i>COMP.3010 Organization of Programming Languages (Undergraduate level)</i>
Fall 2019	<i>COMP.5310 Design of Programming Languages (Graduate level)</i>
Spring 2019	<i>COMP.5310 Design of Programming Languages (Graduate level)</i>
Fall 2018	<i>COMP.5020 Foundations of Computer Science (Graduate level)</i>
Spring 2018	<i>COMP.5310 Design of Programming Languages (Graduate level)</i>
Fall 2017	<i>COMP.5020 Foundations of Computer Science (Graduate level)</i>

## Professional Service

- 2027 ♦ OOPSLA 2027, Review Committee Member.
- 2026 ♦ SEFM 2026, (Int. Conf. on Software Engineering and Formal Methods). PC Member.
- ♦ FORTE 2026, (Int. Conf. on Formal Techniques for Distributed Objects, Components, and Systems). PC member.
- ♦ ICE 2026 (Interaction and Concurrency Experience, workshop). PC member.
- 2025 ♦ NEPLS 2025, Part of the organization of the New England Programming Languages and Systems Symposium at UMass Lowell in May 2025.
- ♦ SLE 2025, (Int. Conf. on Software Language Engineering), PC Member.
- ♦ IFL 2025, (Symposium on Implementation and Application of Functional Languages), PC Member.
- ♦ FORTE 2025, (Int. Conf. on Formal Techniques for Distributed Objects, Components, and Systems). PC Member.
- ♦ ICE 2025 (Interaction and Concurrency Experience, workshop). PC member.
- 2024 ♦ FLOPS 2024, (Int. Symposium on Functional and Logic Programming). PC Member.
- ♦ EXPRESS/SOS 2024 (Int. Workshop on Expressiveness in Concurrency + Int. Workshop on Structural Operational Semantics). PC member.
- 2023 ♦ OOPSLA 2023, External Review / Artifact Evaluation Committee Member.
- ♦ EXPRESS/SOS 2023 (Int. Workshop on Expressiveness in Concurrency + Int. Workshop on Structural Operational Semantics). PC member.
- 2022 ♦ FLOPS 2022, (Int. Symposium on Functional and Logic Programming). PC Member.
- 2021 ♦ ICFP 2021, PC Member.
- ♦ ICE 2021 (Interaction and Concurrency Experience, workshop). PC member.
- 2020 ♦ POPL 2020, PC Member.
- ♦ ICE 2020 (Interaction and Concurrency Experience, workshop). PC member.
- 2019 ♦ SLE 2019, (Int. Conf. on Software Language Engineering), PC Member.
- ♦ TFP 2019, (Symposium on Trends in Functional Programming), PC Member.
- ♦ ICE 2019 (Interaction and Concurrency Experience, workshop). PC member.
- ♦ EXPRESS/SOS 2019 (Int. Workshop on Expressiveness in Concurrency + Int. Workshop on Structural Operational Semantics). PC member.

- 2018 ♦ IFL 2018, Co-Chair.  
(30th Symposium on Implementation and Application of Functional Languages)
- ♦ SBMF 2018 (21st Brazilian Symposium On Formal Methods). PC member.
- ♦ PLDI 2018, External Review Committee.
- ♦ PLDI Artifact Evaluation 2018, Evaluation Committee.
- ♦ OOPSLA Artifact Evaluation 2018, Evaluation Committee.
- ♦ ICE 2018 (Interaction and Concurrency Experience, workshop). PC member.
- 2017 ♦ POPL SRC 2017, (Student Research Competition), Evaluation Committee Member.
- ♦ OOPSLA Artifact Evaluation 2017, Evaluation Committee.
- ♦ ICE 2017 (Interaction and Concurrency Experience, workshop). PC member.
- 2016 ♦ EXPRESS/SOS 2016 (Int. Workshop on Expressiveness in Concurrency + Int. Workshop on Structural Operational Semantics). PC member.
- ♦ PrePost 2016, PC member.  
(First International Workshop on Pre- and Post-Deployment Verification Techniques)
- ♦ ICE 2016 (Interaction and Concurrency Experience, workshop). PC member.
- 2015 ♦ YR-CONCUR 2015, satellite workshop of CONCUR 2015, Organizer and PC chair.
- ♦ EXPRESS/SOS 2015 (Int. Workshop on Expressiveness in Concurrency + Int. Workshop on Structural Operational Semantics). PC member.
- ♦ ICE 2015 (Interaction and Concurrency Experience, workshop). PC member.
- 2014 ♦ EXPRESS/SOS 2014 (Int. Workshop on Expressiveness in Concurrency + Int. Workshop on Structural Operational Semantics). PC member.
- 2011 ♦ PACO 2011, satellite workshop of DisCoTec 2011, Organization Chair.  
(First Workshop on Process Algebra and Coordination Languages)

*To the present time* Journal reviewer for: Journal of Functional Programming, Journal of Computer Languages, Information and Computation, Science of Computer Programming, Logical and Algebraic Methods in Programming, Journal of Software and Systems Modeling, Information Processing Letter.

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## University / Department Service at UMass Lowell

*(Only some selected examples are listed. I served multiple times in some items below.)*

- ♦ Undergraduate Curriculum Committee member.
- ♦ Scholarship and Award Committee (Chair).
- ♦ Faculty Hiring Search Committee member.
- ♦ Operations Committee member.
- ♦ Faculty Senate member.
- ♦ Volunteer at UMass Lowell Welcome Day and Open House (for prospective students)
- ♦ Summer Advising.
- ♦ and others.