



Dr. Nicolas Mazzocchi

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Summary

Postdoctoral computer scientist in formal methods. Experience in **grant** writing, **teaching**, and **mentoring**. Publications in RV, CONCUR, MFCS, FCT, DLT, CAV, FSTTCS, IJFCS and JCSS. Reviews in LICS, FSTTCS, CONCUR, ATVA and JLMCS.

Education

- | | | |
|---|---|---|
|  | Postdoc at ISTA (IST Austria) | 01/2022 → today |
| topic | Resources/precision tread-off in quantitative extensions of monitoring | |
| advisor | Thomas A. Henzinger | |
|  | Postdoc at IMDEA Software Institute | 12/2020 → 12/2021 |
| topic | Decision procedures for language inclusion based on well quasi-orders | |
| advisor | Pierre Ganty | |
|  | Postdoc at Colorado-Boulder University | 11/2020 |
| topic | Logical approaches for the representation of knowledge and beliefs | I revoked this contract due to the COVID19 |
| advisor | Sriram Sankaranarayanan | |
|  | Doctorate at Université libre de Bruxelles | 10/2016 → 10/2020 |
| title | Contributions to formalisms for the specification and verification of quantitative properties | |
| advisor | Emmanuel Filiot and Jean-François Raskin | |
|  | Master at ENS Paris-Saclay (ENS Cachan) | 9/2014 → 9/2016 |
| name | Algorithmique et Fondements de la Programmation (a.k.a. MPRI) | |
|  | Bachelor at Aix-Marseille University | 9/2014 → 9/2011 |
| name | Licence Science et Technologies, mention informatique | |

Research Internships

- | | | |
|---|---|------------------|
|  | Université libre de Bruxelles | 33 weeks, 4/2016 |
| title | Decidable weighted expressions for sum-automata with Lipschitz robustness applications | |
| advisor | Emmanuel Filiot | |
|  | RWTH Aachen University | 11 weeks, 6/2015 |
| title | Uniformization of automatic relations by sub-sequential transducers | |
| advisor | Christof Löding | |
|  | École des Mines d'Alès & Incubator Innov'up | 4 weeks, 6/2014 |
| title | Simultaneous real-time location and mapping for sub-aquatic environment | |
| advisor | Jean-Marie Coldol | |
|  | Aix-Marseille University | 4 weeks, 7/2013 |
| title | Randomized singular value decomposition applied to spectral learning for regular automata | |
| advisor | François Denis | |
|  | INSERM Luminy | 1 week, 10/2011 |
| title | Polymerase chain reaction applied to transfer the fluorescence gene of jellyfish | |
| advisor | Constance Hammond | |

Publications (authors ordered alphabetically)

Proceedings of international conferences with a peer-reviewed committee

1. U. Boker, T. A. Henzinger, N. Mazzocchi and N. E. Saraç. Safety and Liveness for Quantitative Automata in CONCUR23 proceedings, **SUBMITTED for publication**.
2. T. A. Henzinger, P. Kebis, N. Mazzocchi and N. E. Saraç. Regular Methods for Operator Precedence Languages in ICALP23 proceedings, **ACCEPTED for publication**.
3. T. A. Henzinger, N. Mazzocchi and N. E. Saraç. Quantitative Safety and Liveness in FOSSACS23 proceedings, pages 349–370, 2023.
URL: https://doi.org/10.1007/978-3-031-30829-1_17
4. T. A. Henzinger, N. Mazzocchi and N. E. Saraç. Abstract Monitors for Quantitative Specifications in RV22 proceedings, pages 200–220, 2022
URL: https://doi.org/10.1007/978-3-031-17196-3_11
5. K. Doveri, P. Ganty and N. Mazzocchi. FORQ-based Language Inclusion Formal Testing in CAV22 proceedings, pages 109–129, 2022
URL: https://doi.org/10.1007/978-3-031-13188-2_6
6. I. Jecker, N. Mazzocchi and P. Wolf. Decomposing Permutation Automata in CONCUR21 proceedings, pages 18:1–18:19, 2021
URL: <https://doi.org/10.4230/LIPIcs.CONCUR.2021.18>
7. E. Filiot, N. Mazzocchi, J.-F. Raskin, S. Sankaranarayanan and A. Trivedi. Weighted Transducers for Robustness Verification in CONCUR20 proceedings, pages 17:1–17:21, 2020
URL: <https://doi.org/10.4230/LIPIcs.CONCUR.2020.17>
8. I. Jecker, O. Kupferman and N. Mazzocchi. Unary Prime Languages in MFCS20 proceedings, pages 51:1–51:12, 2020
URL: <https://doi.org/10.4230/LIPIcs.MFCS.2020.51>
9. E. Filiot, S. Guha and N. Mazzocchi. Two-way Parikh Automata in FSTTCS19 proceedings, pages 40:1–40:14, 2019
URL: <https://doi.org/10.4230/LIPIcs.FSTTCS.2019.40>
10. E. Filiot, N. Mazzocchi and J.-F. Raskin. Pattern Logic for Automata with Outputs in DLT18 proceedings, pages 304–317, 2018
URL: https://doi.org/10.1007/978-3-319-98654-8_25
11. E. Filiot, N. Mazzocchi and J.-F. Raskin. Decidable Weighted Expressions with Presburger Combinators in FCT17 proceedings, pages 243–256, 2017.
URL: https://doi.org/10.1007/978-3-662-55751-8_20

International journals with a peer-reviewed committee

12. I. Jecker, N. Mazzocchi and P. Wolf. Decomposing Permutation Automata. **SUBMITTED for publication** (Journal of Foundations of Computer Science)
13. E. Filiot, N. Mazzocchi and J.-F. Raskin. Pattern Logic for Automata with Outputs in International Journal of Foundations of Computer Science, volume 31, pages 711–748, 2020
URL: <https://doi.org/10.1142/S0129054120410038>
Invited to IJFCS as a special issue of DLT18
14. E. Filiot, N. Mazzocchi and J.-F. Raskin. Decidable Weighted Expressions with Presburger Combinators in Journal of Computer and System Sciences, volume 106, pages 1–22, 2019
URL: <https://doi.org/10.1016/j.jcss.2019.05.005>
Invited to JCSS as a special issue of FCT17

Public repository (PhD thesis and extended versions of conference papers)

15. T. A. Henzinger, P. Kebis, N. Mazzocchi and N. E. Saraç. Regular Methods for Operator Precedence Languages in CoRR of arXiv, 2023.
URL: <https://doi.org/10.48550/arXiv.2305.03447>
16. T. A. Henzinger, N. Mazzocchi and N. E. Saraç. Quantitative Safety and Liveness in CoRR of arXiv, 2023.
URL: <https://doi.org/10.48550/arXiv.2301.11175>
17. K. Doveri, P. Ganty and N. Mazzocchi. FORQ-based Language Inclusion Formal Testing in CoRR of arXiv, 2022.
URL: <https://doi.org/10.48550/arXiv.2207.13549>
18. I. Jecker, N. Mazzocchi and P. Wolf. Decomposing Permutation Automata in CoRR of arXiv, 2021

- URL: <https://doi.org/10.48550/arXiv.2107.04683>
19. *N. Mazzocchi. Contributions to formalisms for the specification and verification of quantitative properties. PhD thesis, Université libre de Bruxelles, 2020*
URL: <https://difusion.ulb.ac.be/vufind/Record/ULB-DIPOT:oai:dipot.ulb.ac.be:2013/313199/Details>
PDF: https://mazzocchi.github.io/PhD_thesis_Mazzocchi.pdf
 20. *E. Filiot, S. Guha and N. Mazzocchi. Two-way Parikh Automata in CoRR of arXiv, 2019*
URL: <https://doi.org/10.48550/arXiv.1907.09362>
 21. *E. Filiot, N. Mazzocchi and J.-F. Raskin. Pattern Logic for Automata with Outputs in CoRR of arXiv, 2018*
URL: <https://doi.org/10.48550/arXiv.1810.03515>
 22. *E. Filiot, N. Mazzocchi and J.-F. Raskin. Decidable Weighted Expressions with Presburger Combinators in CoRR of arXiv, 2017*
URL: <https://doi.org/10.48550/arXiv.1706.08855>

Research communications

Paper presentations

- 22nd International Conference RV, online September 28th→30th, 2022
- 32nd International Conference CONCUR, online August 23rd→27th, 2021
- 31st International Conference CONCUR, online September 1st→4th, 2020
- 39th IARCS Annual Conference FSTTCS, Mumbai December 11th→13th, 2019
- 22nd International Symposium DLT, Tokyo September 10th→14th, 2018
- 21st International Symposium FCT, Bordeaux September 11th→13th, 2017

Workshop talks

- 7th Highlights of Logic, Games, and Automata, Warsaw September 17th→20th, 2019
- 6th Highlights of Logic, Games, and Automata, Berlin September 18th→21st, 2018
- 2nd Winter School in Engineering and Computer Science, Jerusalem December 17th→21st, 2017
- 5th Highlights of Logic, Games, and Automata, London September 12th→15th, 2017

Invited Seminars

- IST Austria, Klosterneuburg September 2021
- Colorado Boulder University, online April 2020
- IST Austria, Klosterneuburg February 2018

Professional activity

Reviews

Conferences: FSTTCS, LICS, CONCUR, ATVA
Journal: Logical Methods in Computer Science

Grant writing

Doctoral Quantitative Models for Verification and Applications 9/2016
fellowship FRIA-B1 and FRIA-B2 of the Belgian FNRS. **Granted.**
The objective of the FRIA grants is to complete a Ph.D. in 4 years in fields of research related to industry or agriculture. It is in the form of two successive grants: B1 for a maximum duration of 27 months and B2 for a maximum duration of 21 months.

Responsibilities

- Organization of the team seminars at ISTA 9/2022→today
- Co-organization of the inter-team (ISTA, TU Wien) seminars at ISTA 9/2022→today
- Co-organization of the inter-team seminars at IMDEA 5/2021→9/2021
- Organization of the team seminars at ULB 2017→2020
- SVN Administrator of the research team Modelization and Verification at ULB 2017→2020

- Conference organizer of RP19. Administrator of the EasyChair submissions, and welcome packs manager. URL: <https://sites.uclouvain.be/rp2019/organizers.html> 9/2019

Training

- **Marie Curie Postdoctoral Fellowships seminar series**, ISTA 8/2022
- Scientific writing courses, ISTA 6/2022
- Gender equity in Science, ISTA 5/2022
- **Grant implementation workshop**, ISTA 5/2022
- Research Integrity and Ethics, ISTA 4/2022
- The 2nd Winter School in Engineering and Computer Science, HUJI 12/2017
- International Summer School Marktoberdorf 2017 (selective registration), TUM 8/2017

Software

function	Büchi automata inclusion checker	Spring 2021
developer	<i>Nicolas Mazzocchi</i>	
advisor	<i>Pierre Ganty</i>	
description	FORKLIFT is an inclusion checker for Büchi automata. This tool has been awarded the badge “available” by the CAV22 artifact committee. URL: https://doi.org/10.5281/zenodo.6552870	
function	Deterministic finite state automata learner	Spring 2013
developer	<i>Mattias Gybels</i> (main), <i>Nicolas Mazzocchi</i>	
advisor	<i>François Denis</i>	
description	DFA spectral learner based on randomized singular value decomposition of Hankel matrix used to solve some PAutomaC challenges.	
function	Led’s Chat game	Spring 2013
developer	<i>Nicolas Mazzocchi</i>	
advisor	<i>Peter Niebert, Mathieu Caralp</i>	
description	Pure parallel programming of microcontrollers in Led’s Chat to promote the city of Marseille being the European Capital of Culture 2013. URL: https://mozaik.leds-chat.com	

Teaching

Teaching assistant

- Formal Verification at ULB Spring 2017, 2018, 2019, 2020
Full-semester, 20-25 graduated students
Preparation and teaching of practicals based on courses.
Managing and grading personalized group projects of 3,4 or 5 students.
- Embedded systems at ULB Spring 2018, 2019
Full-semester, 25-30 graduated students
Teaching practicals on computer. Introduction to model-checkers Lustre, JKind, UPPAAL tige and Prism.
- Fundamental computer science at ULB Spring 2018
Full-semester, 60-70 undergraduate students
Managing and grading a C++ project on SAT solver (MiniSAT)

Teaching instructor

- Foundation of Model Checking at ISTA. Spring 2023 (scheduled)
Half-semester, 5 PhD students.
Based on my experience, I prepared and submitted this new course to the IST graduate school.

Students Advising

- Co-advisor, with Thomas A. Henzinger, of the intern *Pavol Kebis* at ISTA. 7/2022 → today
Preparation of its research subject, and regular discussions on its progress.
- Consultant of the Ph.D. student *N. Ege Saraç* at ISTA. 2/2022 → today
Collaborations in the writing of the conference paper (RV22), and preparation for future submission.
- Consultant of the Ph.D. student *Kyveli Doveri* at IMDEA Software Institute 3/2021 → 12/2021
Collaboration in the writing of the conference paper (CAV22)

Miscellaneous

Language: French (native), English (professional), Czech (learning at Charles University since 1/2023)
Citizenship: French / EU

Referees

1. *Thomas A. Henzinger*

title Professor / President of ISTA
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2. *Pierre Ganty*

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3. *Orna Kupferman*

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4. *Jean-François Raskin*

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