



# 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, and JLMCS.

## Education

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

## Research Internships

	<b>Université libre de Bruxelles</b>	33 weeks, 4/2016
title	Decidable weighted expressions for sum-automata with Lipschitz robustness applications	
advisor	Emmanuel Filiot	
	<b>RWTH Aachen University</b>	11 weeks, 6/2015
title	Uniformization of automatic relations by sub-sequential transducers	
advisor	Christof Löding	
	<b>École des Mines d'Alès &amp; Incubator Innov'up</b>	4 weeks, 6/2014
title	Simultaneous real-time location and mapping for sub-aquatic environment	
advisor	Jean-Marie Coldol	
	<b>Aix-Marseille University</b>	4 weeks, 7/2013
title	Randomized singular value decomposition applied to spectral learning for regular automata	
advisor	François Denis	
	<b>INSERM Luminy</b>	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. T. A. Henzinger, N. Mazzocchi and N. E. Saraç. Quantitative Safety and Liveness in FOSSACS23 proceedings, **ACCEPTED for publication**.
2. 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](https://doi.org/10.1007/978-3-031-17196-3_11)
3. 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](https://doi.org/10.1007/978-3-031-13188-2_6)
4. 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>
5. 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>
6. 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>
7. 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>
8. 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](https://doi.org/10.1007/978-3-319-98654-8_25)
9. 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](https://doi.org/10.1007/978-3-662-55751-8_20)

### International journals with a peer-reviewed committee

10. I. Jecker, N. Mazzocchi and P. Wolf. Decomposing Permutation Automata. **SUBMITTED for publication** (Journal of Foundations of Computer Science)
11. 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**
12. 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)

13. K. Doveri, P. Ganty and N. Mazzocchi. FORQ-based Language Inclusion Formal Testing in CoRR in arXiv, 2022.  
URL: <https://doi.org/10.48550/arXiv.2207.13549>
14. I. Jecker, N. Mazzocchi and P. Wolf. Decomposing Permutation Automata in CoRR in arXiv, 2021  
URL: <https://doi.org/10.48550/arXiv.2107.04683>
15. 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](https://mazzocchi.github.io/PhD_thesis_Mazzocchi.pdf)
16. E. Filiot, S. Guha and N. Mazzocchi. Two-way Parikh Automata in CoRR in arXiv, 2019  
URL: <https://doi.org/10.48550/arXiv.1907.09362>
17. E. Filiot, N. Mazzocchi and J.-F. Raskin. Pattern Logic for Automata with Outputs in CoRR in arXiv, 2018  
URL: <https://doi.org/10.48550/arXiv.1810.03515>

18. E. Filiot, N. Mazzocchi and J.-F. Raskin. Decidable Weighted Expressions with Presburger Combinators in CoRR in arXiv, 2017  
URL: <https://doi.org/10.48550/arXiv.1706.08855>

## Research communications

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### Paper presentations

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

### Workshop talks

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

### Invited Seminars

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

## Professional activity

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### Reviews

Conference: FSTTCS18, LICS20, FSTTCS21(conflict of interests), LICS22  
Journal: Logical Methods in Computer science, volume 16

### 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 2<sup>nd</sup> 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. <b>This tool has been awarded the badge “available” by the CAV22 artifact committee.</b> URL: <a href="https://doi.org/10.5281/zenodo.6552870">https://doi.org/10.5281/zenodo.6552870</a>	
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: <a href="https://mozaik.leds-chat.com">https://mozaik.leds-chat.com</a>	

## 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

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### 1. *Thomas A. Henzinger*

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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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