Dr. Nicolas Mazzocchi

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Summary

Postdoctoral computer scientist in <u>formal methods</u>. 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

Postdoc at 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
advisor *Sriram Sankaranarayanan*

I revoked this contract due to the COVID19

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 Cachan~~ ENS Paris-Saclay
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. *T. A. Henzinger, N. Mazzocchi* and *N. E. Saraç*. Abstract Monitors for Quantitative Specifications in RV22 proceedings, **ACCEPTED: https://rv22.gitlab.io/accepted/**

2. *K. Doveri, P. Ganty* and *N. Mazzocchi*. FORQ-based Language Inclusion Formal Testing in CAV22 proceedings, pages 109–129, 2022
DOI: 10.1007/978-3-031-13188-2_6

3. *I. Jecker, N. Mazzocchi* and *P. Wolf*. Decomposing Permutation Automata in CONCUR21 proceedings, pages 18:1–18:19, 2021
DOI: 10.4230/LIPIcs.CONCUR.2021.18

4. *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
DOI: 10.4230/LIPIcs.CONCUR.2020.17

5. *I. Jecker, O. Kupferman* and *N. Mazzocchi*. Unary Prime Languages in MFCS20 proceedings, pages 51:1–51:12, 2020
DOI: 10.4230/LIPIcs.MFCS.2020.51

6. *E. Filiot, S. Guha* and *N. Mazzocchi*. Two-way Parikh Automata in FSTTCS19 proceedings, pages 40:1–40:14, 2019
DOI: 10.4230/LIPIcs.FSTTCS.2019.40

7. *E. Filiot, N. Mazzocchi* and *J.-F. Raskin*. Pattern Logic for Automata with Outputs in DLT18 proceedings, pages 304–317, 2018
DOI: 10.1007/978-3-319-98654-8_25

8. *E. Filiot, N. Mazzocchi* and *J.-F. Raskin*. Decidable Weighted Expressions with Presburger Combinators in FCT17 proceedings, pages 243–256, 2017.
DOI: 10.1007/978-3-662-55751-8_20

International journals with a peer-reviewed committee

9. *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
DOI: 10.1142/S0129054120410038
Invited to IJFCS as a special issue of DLT18

10. *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
DOI: 10.1016/j.jcss.2019.05.005
Invited to JCSS as a special issue of FCT17

Public repository (PhD thesis and extended versions)

11. *K. Doveri, P. Ganty* and *N. Mazzocchi*. FORQ-based Language Inclusion Formal Testing in CoRR in arXiv, 2022.
DOI: 10.48550/arXiv.2207.13549

12. *I. Jecker, N. Mazzocchi* and *P. Wolf*. Decomposing Permutation Automata in CoRR in arXiv, 2021
DOI: 10.48550/arXiv.2107.04683

13. *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

14. *E. Filiot, S. Guha* and *N. Mazzocchi*. Two-way Parikh Automata in CoRR in arXiv, 2019
DOI: 10.48550/arXiv.1907.09362

15. *E. Filiot, N. Mazzocchi* and *J.-F. Raskin*. Pattern Logic for Automata with Outputs in CoRR in arXiv, 2018
DOI: 10.48550/arXiv.1810.03515

16. *E. Filiot, N. Mazzocchi* and *J.-F. Raskin*. Decidable Weighted Expressions with Presburger Combinators in CoRR in arXiv, 2017
DOI: 10.48550/arXiv.1706.08855

Research communications

Paper presentations

- 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 — 17th→20th, 2019
- 6th Highlights of Logic, Games, and Automata, Berlin — Berlin, 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

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

Grant writing

Postdoctoral fellowship	HE-MSCA-PF of the European Commission. **Intention to submit** The objective of the Marie Skłodowska-Curie Actions grants is to support researchers' careers and foster outstanding research. It is awarded based on the excellence of the research proposal, the magnitude of its impact, and the feasibility of the work plan.	9/2022
Doctoral fellowship	FRIA-B1-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.	9/2016

Responsibilities

- Organization of the regular team seminars at ISTA — 10/2022
- Organization of the regular team seminars at ULB — 2017→2020
- Administrator of my research team SVN at ULB — 2017→2020
- Conference organizer of RP19 (13th International Conference on Reachability Problems) Administrator of the Easychair submissions and manager of the welcome packs budget. URL: https://sites.uclouvain.be/rp2019/organizers.html — 9/2019

Training

- **Marie Curie Postdoctoral Fellowships webinar 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	*Nicolas Mazzocchi*	
advisor	*Pierre Ganty*	
description	FORKLIFT is an inclusion checker for Büchi automata.	
	This tool has been awarded the badge "available" by the CAV22 artifact committee. DOI: 10.5281/zenodo.6552870	

function	Deterministic finite state automata learner	Spring 2013
developer	*Mattias Gybels* (main), *Nicolas Mazzocchi*	
advisor	*François Denis*	
description	DFA learner based on singular value decomposition of Hankel matrix used to solve some PAutomaC challenges.	

function	Led's Chat game	Spring 2013
developer	*Nicolas Mazzocchi*	
advisor	*Peter Niebert*, *Mathieu Caralp*	
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

- <u>Formal Verification</u> 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.
- <u>Embedded systems</u> at ULB — Spring 2018, 2019
  Full-semester, 25-30 graduated students
  Teaching practicals on computer. Introduction to model-checkers Lustre, JKind, UPPAAL tiga and Prism.
- <u>Fundamental computer science</u> at ULB — Spring 2018
  Full-semester, 60-70 undergraduate students
  Managing and grading a C++ project on SAT solver (MiniSAT)

Teaching instructor

- <u>Foundation of Model Checking</u> at ISTA (half-semester). — Spring 2023 (scheduled)
  With the support of *Krishnendu Chatterjee*, I submitted this new lecture to the IST graduate school. Its status is now ACCEPTED.

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)
Citizenship: French / EU

Referees

1. *Thomas A. Henzinger*

job title	Professor / President of ISTA
relationship	postdoc advisor, co-author
mail	IST Austria
	Am Campus 1
	3400 Klosterneuburg
	AUSTRIA
email	tah@ist.ac.at

2. *Pierre Ganty*

job title	Associate Research Professor
relationship	postdoc advisor, co-author
mail	IMDEA Software Institute
	Campus Montegancedo UPM
	28223 Pozuelo de Alarcón
	SPAIN
email	pierre.ganty@imdea.org