Dr. Nicolas Mazzocchi

Email: nmazzocc@ist.ac.at
Phone: +33 667 859 196
Homepage: https://mazzocchi.github.io

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 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
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 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. *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

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

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

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

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

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

Paper presentations

- 22nd International Conference RV   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   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

Doctoral fellowship	Quantitative Models for Verification and Applications	9/2016
	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   9/2019
  welcome packs manager. URL:https://sites.uclouvain.be/rp2019/organizers.html

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	*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. URL: https://doi.org/10.5281/zenodo.6552870	

function	Deterministic finite state automata learner	Spring 2013
developer	*Mattias Gybels* (main), *Nicolas Mazzocchi*	
advisor	*François Denis*	
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	*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. — 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 (training at Charles University since 1/2023)
Citizenship:	French / EU

Referees

1. Thomas A. Henzinger

title   Professor / President of ISTA
mail   IST Austria
       Am Campus 1
       3400 Klosterneuburg
       AUSTRIA
email   tah@ist.ac.at
URL   https://pub.ist.ac.at/~tah/

2. Pierre Ganty

title   Associate Research Professor
mail   IMDEA Software Institute
       Campus Montegancedo UPM
       28223 Pozuelo de Alarcón
       SPAIN
email   pierre.ganty@imdea.org
URL   https://software.imdea.org/~pierreganty/

3. Orna Kupferman

title   Professor & former Vice Rector of HUJI
mail   School of Computer Science and Engineering
       Hebrew University
       91904 Jerusalem
       ISRAEL
email   orna@cs.huji.ac.il
URL   https://www.cs.huji.ac.il/~ornak/

4. Jean-François Raskin

title   Professor
mail   Departement informatique CP-212
       ULB Campus de la Plaine
       1050 Bruxelles
       BELGIUM
email   jraskin@ulb.ac.be
URL   http://di.ulb.ac.be/verif/jfr/