Dr. Nicolas Mazzocchi

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DBLP:https://dblp.org/pid/202/2438.html

Summary

Full-time researcher in formal verification and automata-theory. Experience in **grant** writing, **teaching**, and **mentoring**. Publications in conferences CAV, CONCUR (x4), DLT, FCT, FOSSACS, FSTTCS, ICALP, MFCS, RV, and journal IJFCS, JCSS.

Education and professions

Full Researcher at Slovak University of Technology — 6/2024 → today

chief *Milan Vojvoda*
funding State of Slovakia

Postdoc at ISTA (IST Austria) — 1/2022 → 5/2024

topic Quantitative extensions of monitoring, safety, and liveness
advisor *Thomas A. Henzinger*
funding VAMOS project ERC-2020-AdG 101020093

Postdoc at IMDEA Software Institute — 12/2020 → 12/2021

topic Decision procedures for language inclusion based on well quasi-orders
advisor *Pierre Ganty*
funding BOSCO project PGC2018-102210-B-I00

Doctorate at Université libre de Bruxelles — 10/2016 → 10/2020

title Contributions to formalisms for the specification and verification of quantitative properties
advisors *Emmanuel Filiot* and *Jean-François Raskin*
funding Competitive doctoral grant FNRS-F.R.S. FRIA

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 and Visits

University of Liverpool — 11/2023

visit Collaboration on temporal explorability games.
host *Patrick Totzke*
funding COSTRA project EPSRC EP/V025848/1

Université libre de Bruxelles — 4/2016

internship Decidable weighted expressions for sum-automata with Lipschitz robustness applications
advisor *Emmanuel Filiot*

RWTH Aachen University — 6/2015

internship Uniformization of automatic relations by sub-sequential transducers
advisor *Christof Löding*

École des Mines d'Alès & Incubator Innov'up — 6/2014

internship Simultaneous real-time location and mapping for sub-aquatic environment
advisor *Jean-Marie Coldol*

Aix-Marseille University — 7/2013

internship Randomized singular value decomposition applied to spectral learning for regular automata
advisor *François Denis*

Publications (authors ordered alphabetically)

Proceedings of conferences with a peer-reviewed committee (total: 14)

2025 *P. Austin, S. Bose, N. Mazzocchi and P. Totzk*. Temporal Explorability Games. **SUBMITTED** (CSL 2025).

2024 *M. Chalupa, T. A. Henzinger, N. Mazzocchi, and N. E. Saraç*. QuAK: Quantitative Automata Kit. **SUBMITTED** (ISOLA 2024).

- *T. A. Henzinger, N. Mazzocchi* and *N. E. Saraç*. Strategic Dominance: A New Preorder for Nondeterministic Processes in **CONCUR24** proceedings, pages 29:1–29:20, 2024.
  URL: https://doi.org/10.4230/LIPIcs.CONCUR.2024.29

2023 *U. Boker, T. A. Henzinger, N. Mazzocchi* and *N. E. Saraç*. Safety and Liveness for Quantitative Automata in **CONCUR23** proceedings, page 17:1–17:18.
URL: https://doi.org/10.4230/LIPIcs.CONCUR.2023.17

- *T. A. Henzinger, P. Kebis, N. Mazzocchi* and *N. E. Saraç*. Regular Methods for Operator Precedence Languages in **ICALP23** proceedings, 129:1–129:20, 2023.
  URL: https://doi.org/10.4230/LIPIcs.ICALP.2023.129
- *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

2022 *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

- *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

2021 *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

2020 *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

- *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

2019 *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

2018 *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

2017 *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

Journals with a peer-reviewed committee (total: 5)

2025 *T. A. Henzinger, P. Kebis, N. Mazzocchi* and *N. E. Saraç*. Regular Methods for Operator Precedence Languages. **SUBMITTED** (Journal of Theoretical Computer Science)

2023 *T. A. Henzinger, N. Mazzocchi* and *N. E. Saraç*. Quantitative Safety and Liveness.
ACCEPTED: Invited to TCS as a special issue of CONCUR23

2022 *I. Jecker, N. Mazzocchi* and *P. Wolf*. Decomposing Permutation Automata. **ACCEPTED** (Journal of Foundations of Computer Science)

2020 *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
Invited to IJFCS as a special issue of DLT18

URL: https://doi.org/10.1142/S0129054120410038

2019 *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
Invited to JCSS as a special issue of FCT17
URL: https://doi.org/10.1016/j.jcss.2019.05.005

Research communications

Conference Paper Presentations

- 34th International Conference CONCUR, Calgary 9/2024
- 33rd International Conference CONCUR, Antwerp 9/2023
- 26th International Conference FOSSACS, Paris 4/2023
- 50th International Symposium ICALP, Paderborn 7/2023
- 22nd International Conference RV, online 9/2022
- 32nd International Conference CONCUR, online 8/2021
- 31st International Conference CONCUR, online 9/2020
- 39th IARCS Annual Conference FSTTCS, Mumbai 12/2019
- 22nd International Symposium DLT, Tokyo 9/2018
- 21st International Symposium FCT, Bordeaux 9/2017

Workshop talks

- 12th Highlights of Logic, Games, and Automata, Bordeaux 9/2024
- 7th Highlights of Logic, Games, and Automata, Warsaw 9/2019
- 6th Highlights of Logic, Games, and Automata, Berlin 9/2018
- 2nd Winter School in Engineering and Computer Science, Jerusalem 12/2017
- 5th Highlights of Logic, Games, and Automata, London 9/2017

Invited talk

- VUT Brno, Czech Republic 7/2024
- Slovak University of Technology, Slovakia 3/2024
- University of Liverpool, UK 11/2023
- IST Austria, Klosterneuburg 9/2021
- Colorado Boulder University, online 4/2020
- IST Austria, Klosterneuburg 2/2018

Professional activity

Reviews

Conferences: ATVA, CONCUR(x2), LICS(x2), FOSSACS, FSTTCS(x2)
Journal: Logical Methods in Computer Science (x2)

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.

R3 researcher fellowship — OPRAVA – Verification of real-life programs. — 7/2024
Call 09I03-03-V04 of the Slovak VAIA. **Lack of Allocations**.
The call aimed to support basic and applied research carried out in Slovakia by excellent Slovak and foreign researchers in all domain of science and is part of the European project “plan obnovy”. My submission for the R3 fellowship fulfilled the requirement of excellence but was denied due to the competition.

Responsibilities

- Member of the Bachelor/Master evaluation committee — 7/2024 → today
- Organization of the team seminars at ISTA — 9/2022 → 6/2024
- Co-organization of the inter-team (ISTA, TU Wien) seminars at ISTA — 9/2022 → 6/2024
- Co-organization of the inter-team seminars at IMDEA — 5/2021 → 9/2021
- Organization of the team seminars at ULB — 1/2017 → 9/2020
- SVN Administrator of the research team Modelization and Verification at ULB — 1/2017 → 9/2020
- Conference organizer of RP19. Administrator of the Easychair submissions, and welcome packs manager. URL:https://sites.uclouvain.be/rp2019/organizers.html — 9/2019

Training

- Grant implementation workshop, ISTA — 5/2023
- Marie Curie Postdoctoral Fellowships seminar series, ISTA — 8/2022
- Scientific writing courses, ISTA — 6/2022
- Gender Equity in Science, ISTA — 5/2022
- Research Integrity and Ethics, ISTA — 4/2022
- 2nd Winter School in Engineering and Computer Science, HUJI — 12/2017
- International Summer School Marktoberdorf 2017, TUM — 8/2017

Teaching

Invited (lecture only)

- Automata making programs reliable at STU — Spring 2024
  Single lecture, 20-25 undergraduate students
  Vulgarization of the decision procedures for logic and arithmetic for students knowing automata in compilation.

Teaching Assistant (exercises only)

- 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 Tiga 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 (lectures and exercises)

- Foundation of Model Checking at ISTA. — Spring 2023
  Half-semester, 5 PhD students.
  I prepared and introduced this new course to the IST graduate school.

Advising Students

- Advisor of *Alexandra Reviláková* at STU. — 9/2022 → today
  Preparation of the Master Thesis research subject and supervision.
- Co-advisor, with Thomas A. Henzinger, of the intern *Pavol Kebis* at ISTA. — 7/2022 → 9/2022
  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 writing conference papers.
- Consultant of the Ph.D. student *Kyveli Doveri* at IMDEA Software Institute — 3/2021 → 12/2021
  Collaboration in writing a conference paper

Software

function	Quantitative automata safety-liveness monitoring, checker, and synthesizer	Summer 2024
developer	*Nicolas Mazzocchi (main), N. Ege Saraç, Marek Chalupa*	
advisor	*Thomas A. Henzinger*	
description	QuAK: Quantitative Automata Kit. **This tool has been SUBMITTED to TACAS25 as an artifact of a tool demonstration paper.** URL: https://github.com/ista-vamos/QuAK	

function	Büchi automata inclusion checker	Spring 2021
developer	*Nicolas Mazzocchi*	
advisor	*Pierre Ganty*	
description	FORKLIFT is a Ramsey-based inclusion checker with antichain heuristics. **This tool has been peer-reviewed by the CAV22 artifact committee.** URL: https://github.com/Mazzocchi/FORKLIFT	

function	Deterministic finite state automata learner	Spring 2013
developer	*Mattias Gybels* (main), *Nicolas Mazzocchi*	
advisor	*François Denis*	
description	An automata 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	

Miscellaneous

Language:	French (native), English (professional), Italian (B1 in 2011), Czech (A1.1 in 2023), Slovak (A1 in 2024)
Citizenship:	French / EU

Referees

1. *Thomas A. Henzinger*

title	Professor
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
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. *Ondřej Lengál*

title	Vědecký pracovník
mail	Faculty of Information Technologies VUT Božetěchova 2 612 00 Brno CZECH REPUBLIC
email	lengal@fit.vut.cz
URL	https://ondrik.github.io/