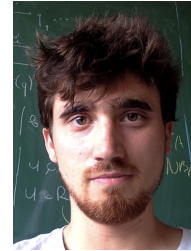


# Nicolas Mazzocchi

☎ (+33) 6 67 85 91 96

✉ nicolas.mazzocchi@imdea.org

🌐 <https://mazzocchi.github.io/>



**Keywords:** counter machines, decidable logics, formal methods model-checking, Presburger arithmetic, transducers, weighted automata.

## Education

- **Postdoctoral researcher** **IMDEA Software Institute**  
*Decision procedure for language inclusion based on well quasi-orders and anti-chaines* Madrid – Spain  
advised by P. Ganty DEC 2020 → \*\*
- **Postdoctoral researcher (revoked due to the COVID19)** **Colorado Boulder University**  
*Logical approach for the representation of knowledge and beliefs* Boulder – USA  
advised by S. Sankaranarayanan 1/NOV/2020 → 5/NOV/2020
- **Doctoral degree (defended on October 9th, 2020)** **Université libre de Bruxelles**  
*Contributions to formalisms for the specification and verification of quantitative properties* Brussels – Belgium  
advised by E. Filiot and J.-F. Raskin, founded by the FRIA-FNRS fellowship OCT 2016 → OCT 2020
- **Master degree** **ENS-Cachan ENS Paris-Saclay**  
*Algorithmique et Fondements de la Programmation (a.k.a. MPRI)* Cachan – France  
M1 rank 12/25, M2 rank 39/61, average grade > 70% SEP 2014 → SEP 2016
- **Bachelor degree** **Aix-Marseille University**  
*Licence Science et Technologies, mention informatique* Marseille – France  
only the first year was shared with the bachelor of Maths, average grade > 80% SEP 2011 → SEP 2014

## Responsibilities

### Teaching Assistant

- “Formal Verification” at ULB (level: M2, duration: 12h) Spring 2017, 2018, 2019, 2020  
**Content (exercises, detailed solutions, advising the project of each group of students):** Transition system {trace languages, simulation, bi-simulation}, LTL {satisfiability, semantics equivalences, Büchi automata, model-checking}, CTL {satisfiability, semantics equivalences, reachability game, model-checking}, Symbolic CTL {Switch functions, BDD, ROBDD, SOBDD}, Probabilistic CTL {satisfiability, semantics equivalences, linear system induced, model-checking, steady-state distribution, expected mean-payoff, expected cost-to-target, cost-bounded reachability}
- “Embedded systems” at ULB (level: M1/M2 duration: 12h) Spring 2018, 2019  
**Content (exercises, partial solutions):** Introduction to model-checkers Lustre, JKind, UPPAAL tige and Prism.
- “Fundamental computer science” at ULB (level: B3, duration: 12h) Spring 2018  
**Content (semester project design, detailed solutions, implementation):** Modeling and solving schedules of a train company in C++ with a SAT solver (library MiniSAT)

### Miscellaneous

- SVN admin 2017 → 2020
- Organization of the regular team seminars 2017 → 2020
- Help to organize the conference *RP* (EasyChair settings, Welcome packs) 11–13 Septembre 2019

## Skills

### Languages

- Natural languages: French (native), English (professional).
- Programming languages: Bash, C/C++, Coq, HTLM, Java, OCaml, Prolog, Python, SQL, TeX, XPath, Why3

## Implementations

- Forq-lift (not published yet): Language inclusion formal testing based on family of right quasi-order. Spring 2021
- DFA learner based on singular value decomposition of Hankel matrix (solving some PAutomataC challenges). Fall 2013
- Parallel program in Led's Chat (leds-chat.com) for Marseille being the European Capital of Culture. Spring 2013

## Publications

### Proceedings of international conference with review committee

- Ismaël Jecker, Nicolas Mazzocchi and Petra Wolf. Decomposing Permutation Automata in CONCUR'21 proceedings, pages 18:1–18:19, 2021  
Out of 95 submissions, 35 articles were accepted (36.8 %)
- E. Filiot, N. Mazzocchi, J.-F. Raskin, S. Sankaranarayanan and A. Trivedi. Weighted Transducers for Robustness Verification in CONCUR'20 proceedings, pages 17:1–17:21, 2020  
Out of 112 submissions, 45 articles were accepted (40.1 %)
- I. Jecker, O. Kupferman and N. Mazzocchi. Unary Prime Languages in MFCS'20 proceedings, pages 51:1–51:12, 2020  
Out of 242 submissions, 82 articles were accepted (33.8 %)
- E. Filiot, S. Guha and N. Mazzocchi. Two-way Parikh Automata in FSTTCS'19 proceedings, pages 40:1–40:14, 2019  
Out of 93 submissions, 45 articles were accepted (48.4 %)
- E. Filiot, N. Mazzocchi and J.-F. Raskin. Pattern Logic for Automata with Outputs in DLT'18 proceedings, pages 304–317, 2018  
Out of 84 submissions, 39 articles were accepted (46.4 %)
- E. Filiot, N. Mazzocchi and J.-F. Raskin. Decidable Weighted Expressions with Presburger Combinators in FCT'17 proceedings, pages 243–256, 2017  
Out of 99 submissions, 29 articles were accepted (29.3 %)

### International journals with review committee

- 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 special issue of DLT18
- 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 special issue of FCT17

## Research Activities

### Talks

- 32nd Internationale conference on CONCUR  
"Decomposing Permutation Automata" (20min) **ONLINE**  
23-27 August 2021
- IMDEA Software Seminar Series  
"Decomposing Permutation Automata" (45min) **ONLINE**  
29 June 2021
- Public Ph.D. defense  
"Contributions to formalisms for the spec. and verif. of quantitative properties" (45min) **ONLINE**  
9 October 2020
- Private Ph.D. defense  
"Contributions to formalisms for the spec. and verif. of quantitative properties" (45min) **ONLINE**  
18 September 2020
- 31st Internationale conference on CONCUR  
"Weighted transducers for robustness verification" (20min) **ONLINE**  
1-4 September 2020
- Nicolas's colloquium  
"Presburger arithmetic in automata theory" (40min) **ONLINE**  
20 April 2020
- 39th Indian conference on FSTTCS  
"Two-way Parikh automata" (20min) **Mumbai – India**  
December 11–13, 2019

- 7th European conference: Highlights of Logic, Games and Automata  
"Two-way Parikh automata" (8min)
- 6th European conference: Highlights of Logic, Games and Automata  
"Pattern Logic for automata with output" (8min)
- 22nd International symposium on DLT  
"Pattern Logic for automata with output" (20min)
- Invited seminar RiSE at the IST Austria  
"Decidable weighted expressions with Presburger combinators" (40min)
- Student spotlight, improvised presentation  
"Decidable weighted expressions with Presburger combinators" (6min)
- 5th European conference: Highlights of Logic, Games and Automata  
"Decidable weighted expressions with Presburger combinators" (8min)
- 21st International symposium on FCT  
"Decidable weighted expressions with Presburger combinators" (20min)

**Warsaw – Poland**  
17–20 September 2019

**Berlin – Germany**  
18–21 September 2018

**Tokyo – Japan**  
10–14 September 2018

**Vienna – Austria**  
2 February 2018

**Jerusalem – Israel**  
17–21 December 2017

**London – UK**  
12–15 September 2017

**Bordeaux – France**  
11 – 13 September 2017

## Research school.....

- Marktoberdorf summer school 2017 6 days
- Jerusalem winter school 2017 5 days

## Internships.....

- Decidable weighted expressions for sum-automata with Lipschitz robustness applications **33 weeks**  
*Université libre de Bruxelles*  
advised by E. Filiot and J.-F. Raskin, grade 80% *Brussels – Belgium*  
April 2016 → August 2016
- Uniformization of automatic relations by sub-sequential transducers **11 weeks**  
*RWTH Aachen University (Rheinisch-Westfälische Technische Hochschule)*  
advised by C. Löding, grade 90% *Aachen – Germany*  
June 2015 → August 2015
- Simultaneous real-time location and mapping for sub-aquatic environment **4 weeks**  
*École des Mines d'Alès, Incubator Innov'up*  
advised by J.-M. Coldol, voluntary internship *Alès – France*  
Juin 2014
- Randomized singular value decomposition applied to spectral learning for regular automata **4 weeks**  
*LIF (Laboratoire d'Informatique Fondamentale)*  
advised by F. Denis, voluntary internship *Marseille – France*  
July 2013
- Polymerase chain reaction applied to transfer the fluorescence gene of jellyfish **1 week**  
*INSERM Luminy (Institut national de la santé et de la recherche médicale)*  
advised by C. Hammond, voluntary internship *Marseille – France*  
October 2011