

# Gaëtan Staquet

*Inria postdoctoral researcher*

Inria, DEVINE team at Irisa-Inria

Campus de Beaulieu IRISA/Inria Rennes, 263 avenue du Général Leclerc,  
35 042 Rennes, France

✉ [gaetan.staquet@inria.fr](mailto:gaetan.staquet@inria.fr)

🏠 [www.gaetanstaquet.com](http://www.gaetanstaquet.com)

📄 [DocSkellington](#)

📞 0000-0001-5795-3265



Last updated on  
November 5, 2024.

## Research Experience

**01 Oct 2024 –  
Ongoing**

Inria, in the DEVINE  
team

**Inria postdoctoral researcher**

Under the supervision of Nathalie Bertrand

**01 Oct 2020 – 30  
Sep 2024**

F.R.S.-FNRS, University  
of Mons, University of  
Antwerp, Belgium

**Research Fellow of the F.R.S.-FNRS (PhD Thesis)**

Title: Improvement of the state of the art regarding the theory of learning algorithms for automata models extended with resources and its applications to black-box model-checking. Supervisors: Véronique Bruyère (University of Mons) and Guillermo A. Perez (University of Antwerp).

**01 Aug 2023 – 27  
Oct 2023**

Radboud Universiteit,  
The Netherlands

**Research Stay**

Research stay to collaborate with Frits W. Vaandrager.

**01 Dec 2019 – 15  
Jun 2020**

University of Mons,  
Belgium

**Master's Thesis**

Title: Efficient Learning of Automata and Automata with One Counter. Supervisor: Véronique Bruyère.

**09 Sep 2019 – 03  
Dec 2019**

University of Antwerp,  
Belgium

**Internship**

Implementation of an active learning algorithm for visibly one-counter automata. Supervisor: Guillermo A. Perez.

**01 Aug 2018 – 31  
Aug 2018**

University of Mons,  
Belgium

**Research initiation internship**

Subject: Efficient algorithms for Nash equilibrium computation. Supervisors: Aline Goeminne, Thomas Brihayé, Véronique Bruyère, and Hadrien Mélot.

## Awards

**2023** Best paper award at FORMATS 2023 for our paper Automata with Timers

## Publications

Authors are ordered alphabetically by their last name.

## Conferences

**[BPSW23] Automata with Timers.** Véronique Bruyère, Guillermo A. Pérez, Gaëtan Staquet, and Frits W. Vaandrager. *Formal Modeling and Analysis of Timed Systems (FORMATS)*, 2023. DOI: 10.1007/978-3-031-42626-1\_3. arXiv: 10.48550/arXiv.2305.07451. Won a Best Paper Award at the conference.

**[BPS23] Validating Streaming JSON Documents with Learned VPAs.** Véronique Bruyère, Guillermo A. Pérez, and Gaëtan Staquet. *29th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS)*, 2023. DOI: 10.1007/978-3-031-30823-9\_14. arXiv: 10.48550/arXiv.2211.08891.

**[BPS22] Learning Realtime One-Counter Automata.** Véronique Bruyère, Guillermo A. Pérez, and Gaëtan Staquet. *28th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS)*, 2022. DOI: 10.1007/978-3-030-99524-9\_13. arXiv: 10.48550/arXiv.2110.09434.

**[KJLSW20] Optimization of Answer Set Programs for Consistent Query Answering by Means of First-Order Rewriting.** Aziz Amezian El Khalfoui, Jonathan Joertz, Dorian Labeeuw, Gaëtan Staquet, and Jef Wijsen. *29th ACM International Conference on Information and Knowledge Management (CIKM)*, 2020. DOI: 10.1145/3340531.3411911.

## Preprints

**[BGP+24] Active Learning of Mealy Machines with Timers.** Véronique Bruyère, Bharat Garhewal, Guillermo A. Pérez, Gaëtan Staquet, and Frits W. Vaandrager. 2024. arXiv: 10.48550/arXiv.2403.02019.

## Projects

### Validating JSON Documents with Learned VPAs

Implementation of oracles to actively learn a JSON document from a JSON schema, of an algorithm to validate streaming JSON documents against a schema, and benchmarks to compare our algorithm and the classical algorithm. See our paper "Validating Streaming JSON Documents with Learned VPAs" for more information. See also the project "JSON Schema Tools" for the classical algorithm.

Homepage: <https://github.com/DocSkellington/ValidatingJSONDocumentsWithLearnedVPA>

## JSON Schema Tools

Implementation of tools to manipulate JSON schemas, to generate (randomly or exhaustively) JSON documents from a schema, and to validate a JSON document against a schema. See our paper "Validating Streaming JSON Documents with Learned VPAs" for more information. See also the project "Validating JSON Documents with Learned VPAs" for a new validation algorithm.

Homepage: <https://github.com/DocSkellington/JSONSchemaTools>

## Learning Realtime One-Counter Automata

Implementation of an active automata learning for realtime one-counter automata, and benchmarks based on randomly generated automata and on JSON documents. See our paper "Learning Realtime One-Counter Automata" for more information.

Homepage: <https://github.com/DocSkellington/LStar-ROCA-Benchmarks>

## Learning Visibly One-Counter Automata

Implementation of an active learning algorithm dedicated to visibly one-counter automata, based on a paper by Daniel Neider and Christof Löding: Learning Visibly One-Counter Automata in Polynomial Time. This project was realized during my internship at University of Antwerp, under the supervision of Guillermo A. Pérez

Homepage: <https://github.com/DocSkellington/LearningVCA>

## Talks

Only given talks are listed here. Whenever applicable, the slides can be consulted on my web page. Attended events are also listed there.

### 2024

- 20 Sep 2024 **Active Learning of Automata with Timers**, Highlights of Logic, Games and Automata, LaBRI, Bordeaux, France.
- 30 May 2024 **Active Learning of Mealy Machines with Timers**, MOVEP 2024, IRISA/Inria, Rennes, France.
- 06 Apr 2024 **Validating Streaming JSON Documents with Learned Visibly Pushdown Automata**, LiVe 2024, Luxembourg, Luxembourg.

### 2023

- 15 Dec 2023 **Automata with Timers**, CFV - Centre Fédéré de Vérification, ULB, Brussels, Belgium.
- 01 Dec 2023 **Automata with Timers**, WG Verification Days (Journées du GT Vérification), IRIF, Paris, France.
- 07 Nov 2023 **Automata with Timers**, 68NQRT - Formal Methods Seminar of IRISA and Inria Rennes, Rennes, France.
- 10 Oct 2023 **Automata with Timers**, Seminary of the Software Science Department, Radboud Universiteit, Nijmegen, The Netherlands.

- 20 Sep 2023 **Automata with Timers**, International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS), Antwerpen, Belgium.
- 25 Jul 2023 **Automata with Timers**, Highlights of Logic, Games and Automata, Kassel, Germany.
- 24 May 2023 **Verification of Computer Systems thanks to State Machines**, Day of the INFORTECH research institute, Mons, Belgium.
- 24 Apr 2023 **Validating Streaming JSON Documents with Learned Visibly Pushdown Automata**, 29th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), Paris, France.

---

## 2022

- 15 Nov 2022 **Verification of computer systems thanks to state machines**, Annual national day of F.R.S.-FNRS doctoral school COMPLEX, Mons, Belgium.
- 26 Oct 2022 **Learning Realtime One-Counter Automata**, Seminary of the LRDE (Laboratoire de Recherche et Développement de l'EPITA), Paris, France.
- 24 Oct 2022 **Vérifier un système informatique grâce à un automate**, Séminaire Jeune (vulgarization talk towards third-year and above students), Mons, Belgium.
- 21 Oct 2022 **Learning Realtime One-Counter Automata**, Formal Methods and Verification (FMV) seminary, Brussels, Belgium.
- 29 Jun 2022 **Active Learning of Automata for JSON-Streaming Validation**, Highlights of Logic, Games and Automata, Paris, France.
- 06 May 2022 **Vérifier efficacement un document JSON grâce à un automate**, Séminaire Jeune (vulgarization talk towards third-year and above students), Mons, Belgium.
- 05 Apr 2022 **Learning Realtime One-Counter Automata**, 28th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), Munich, Germany (talk done online).

---

## 2021

- 17 Nov 2021 **Learning Realtime One-Counter Automata**, WG Verification Days (Journées du GT Vérification), Gif-sur-Yvette, France.
- 17 Sep 2021 **Learning Realtime One-Counter Automata**, Highlights of Logic, Games and Automata, Online.
- 10 Mar 2021 **L'apprentissage d'automates et ses applications**, Mois du doctorat (a month dedicated to popularization presentations of PhD theses), Online (University of Mons).

---

## 2020

22 Oct 2020      **Optimization of Answer Set Programs for Consistent Query Answering by Means of First-Order Rewriting**, 29th ACM Internal Conference Conference on Information and Knowledge Management (CIKM), Online.

---

## Teaching

Second semester of academic years 2021-2022 to 2023-2024      **Logic programming**, BA3 Computer Science, *Teaching assistant*  
Teaching assistant supervising the practical sessions (Prolog).  
University of Mons

First semester of academic years 2021-2022 to 2023-2024      **Functional programming**, BA3 Computer Science and BA2 Mathematics, *Teaching assistant*  
Teaching assistant supervising the practical sessions (Scheme).  
University of Mons

First semester of academic year 2020-2021      **Challenges in Artificial Intelligence**, MSc Computer Science, *Teaching assistant*  
Teaching assistant supervising the practical sessions.  
University of Mons

First semester of academic years 2018-2019 and 2019-2020      **Programming and Algorithms I**, BA1 Computer Science, BA1 Mathematics, and BA2 Physics, *Student teaching assistant*  
Student teaching assistant supervising the practical sessions (Python 3).  
University of Mons

Second semester of academic years 2018-2019 and 2019-2020      **Programming and Algorithms II**, BA1 Computer Science, and BA1 Mathematics, *Student teaching assistant*  
Student teaching assistant supervising the practical sessions (Java 11).  
University of Mons

August 2016      **Programming and Algorithms I and II**, BA1 Computer Science, BA1 Mathematics, and BA2 Physics, *Student tutor*  
Gave courses to students retaking an exam.  
University of Mons

## Supervision

### Introductory research internship

- August 2024 **Julien Ladeuze**, *Co-supervised with Véronique Bruyère*  
Implementation of an algorithm to convert a *generalized Mealy machine with timers* into a Mealy machine with timers and of benchmarks.  
University of Mons, Belgium
- August and September 2022 **Nicolas Vallois and Hugo Venturoso**, *Co-supervised with Véronique Bruyère*  
Improvement of an algorithm to compute a data structure needed for our article on JSON validation.  
University of Mons, Belgium
- August 2021 **Christophe Grandmont**, *Co-supervised with Véronique Bruyère and Clément Tamines*  
Solving generalized parity games using a symbolic representation.  
University of Mons, Belgium

## Collective and administrative responsibilities

### Reviewer

- 2023 Reviewer for LMCS
- 2022 Reviewer for GandALF, FMSD, and MFCS

### Outreach experience

- 25 and 26 March 2023 Participation to the "Printemps des Sciences" ("Spring of Sciences"), a vulgarization festival for the general public. With Véronique Bruyère and computer science students, we introduced the ideas behind various sorting algorithms.
- 23 and 24 March 2023 **À vous de jouer**, a vulgarization workshop for high school students, in the context of the "Journées Math-Sciences" ("Days Math-Sciences") at University of Mons. This was a joint work with Chloé Capon, Aline Goeminne, Nicolas Lecomte, James Main, Mickael Randour, Alexandre Terefenko, and Pierre Vandenhove.

———— **Council member**

October 2020 to September 2024      Member of the Faculty Council

November 2021 to September 2024      Member of the Council of the Computer Science Department

———— **Informant role**

2024      Informant at the University of Mons' open house day

2023      Informant at the University of Mons' open house day

2021      Informant at the Brussels SIEP fair