

Research topics

Formal Methods	Concurrent systems (Higher Dimension Automata, Higher Dimensional Timed Automata), Multi-agents systems, Timed Automata, Robustness, Temporal Logic, SMT, Monitoring
Geometry & Algebra	Polyedra, Symbolic Optimisation, Well Quasi-order, Complexity, Algebraic Topology

Positions

2024-now	Post-doctoral researcher , <i>LIPN</i> , Université Sorbonne Paris Nord, Under the supervision of Étienne André , LoVe Team Keywords : Monitoring, Verification, Hyperproperties, Temporal Logic
2023-2024	A.T.E.R. (Teacher & Reseacher) , <i>IRIF</i> , Université Paris Cité, Verification and Modelisation Team , Collaborators : Jeremy Ledent, Enzo Erlich, Uli Fahrenberg, Amazigh Amrane, Hugo Bazille, Sylvain Schmitz, Damien Bossato-Gaston, John Mackay Keywords : Higher Dimensional Automata, Linear Temporal Logic, Algebraic Topology, Well Quasi-order, Robustness
2022-2023	Post-doctoral researcher , <i>ISIR</i> , Sorbonne Université, Under the supervision of Nicolas Perrin-Gilbert Keywords : Multi-Agent systems, SMT, Reinforcement Learning, Collision Avoidance, Timed Automata
2018-2022	PhD Candidate , <i>Centre Inria de l'Université de Rennes & Mitsubishi Electric Centre R&D Europe</i> , Université de Rennes, Under the supervision of Thierry Jéron , Nicolas Markey and David Mentré Keywords : Robustness, Timed Automata

Collaborations

2018-2023	ANR Project TickTac , <i>Efficient Techniques and Tools for the Verification and Synthesis of Real-Time Systems</i> , Head : Ocan SANKUR Labs : IRISA (Rennes), LaBRI (Bordeaux), LIS (Marseille), LSV (Cachan), ISIR (Paris), LRDE (Paris)
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Talks (slides are one my webpage)

Seminars

2024	LoVe Team Seminar , <i>LIPN, Villeteuse</i>
2024	Lab Seminar , <i>LACL, Créteil</i>
2024	Modélisation et Vérification Team Seminar , <i>Lip6, Paris</i>
2023	Distributed Computing , <i>LMF, Saclay</i>
2023	Automata Team Seminar , <i>IRIF, Paris</i>
2023	Verification and Modelisation Team Seminar , <i>IRIF, Paris</i>
2023	AMAC Team Seminar , <i>ISIR, Paris</i>
2022	ELSE Seminar , <i>IRISA/Centre Inria de l'Université de Rennes</i>
2022	Syroco Team Seminar , <i>ISIR, Paris</i>
2021	Sumo Team Seminar , <i>IRISA/Centre Inria de l'Université de Rennes</i>
2019	Sumo Team Seminar , <i>IRISA/Centre Inria de l'Université de Rennes</i>
2018	School Seminar , <i>ENS Rennes, Ker Lann (Rennes)</i>

Conferences

- 2023 **FORMATS**, *Antwerp, Belgium*
- 2020 **FORMATS**, *Online*

Research (GDR) & Work groups (GT)

- 2024 **National of of GT-Daal**, *Talk*, IRISA, Rennes
- 2024 **National day of GDR-IFM**, *Poster*, Université Grenoble Alpes
- 2023 **National day of GT-Verif**, *Talk*, IRIF, Paris
- 2023 **National day of GDR-IM**, *Poster*, IRIF, Paris
- 2023 **National day of MT2V**, *Talk*, LMF, Saclay

Schools

- 2024 **Summer School MOVEP**, *Talk*

ANR Projects

- 2023 **MaveriQ ANR**, *IRIF, Paris*, *Talk*
- 2023 **Ticktac ANR**, *ISIR, Paris*, *Talk*
- 2018 **TickTac ANR**, *EPITA LRE, Paris*, *Talk*

Supervisions

Master students

- 2024 **Enzo Erlich**, *6 month internship*, Temporal Logic for Higher Dimensional Automata
Co-supervision with Jeremy Ledent
Now PhD with Uli Fahrenberg and Jeremy Ledent. I'm collaborating with them in the context of his PhD.

Undergraduate students

- 2024 **Introduction to research**, *Robustness of one-clock Timed Automata*
Co-Supervision with **Florian Renkin** of two students in Mathematics-Informatics Bachelor

Service

Local responsibilities

- 2023-2024 **Equality commission** (<https://www.irif.fr/egalite-fh>), *Member*, IRIF, Paris
- 2023 **HCERES**, *A.T.E.R. Representative*, IRIF, Paris
- 2019-2022 « **Comité de centre** », *Representative of non-permanent members*, Centre Inria de l'Université de Rennes
 - Member of the office (preparation of the meeting agenda, ...) since mai 2021
 - Actions during COVID (Discord creation, Organisation & Participation of Livestrom Seminars to help organise (post-doc, begin of PhD...))
- 2017-2018 **Student representative**, *Université de Rennes*, UFR Mathematics

Teaching (Details in my webpage)

- 2023-2024 **A.T.E.R.**, *166 hours*
Bachelor Students
- 2018-2022 **PhD**, *130 hours*
Bachelor and Master Students

Articles and artifacts reviews

- 2024 **PC member for Artifact Evaluation**, *Formal Methods*
- 2024 **Subreviewer**, *ICALP 2024*

Popularisation of Science

- 2025 **Scientific popularisation for High School Students**, IRIF, Université Paris Cité
- 2023 **Fête de la Science**, IRIF, Université Paris Cité
- 2019 **Je Peux Pas J’Ai Informatique**, IRISA, Rennes
- 2018 - 2019 **LCodentLCreent**, IRISA, Rennes

Publication : Peer-reviewed Publications in International Conference

- RAMICS 2024 **Presenting Interval Pomsets with Interfaces**
Amazigh AMRANE, Hugo BAZILLE, Emily CLEMENT, Uli FAHRENBERG, Krzysztof ZIEMIAŃSKI
arxiv.org/abs/2403.16626
- PETRI NETS 2024 **Languages of Higher-Dimensional Timed Automata**
Amazigh AMRANE, Hugo BAZILLE, Emily CLEMENT, Uli FAHRENBERG
hal.science/hal-04444648
- FORMATS 2023 **Layered Controller Synthesis for Dynamic Multi-agent Systems**
Emily CLEMENT, Nicolas PERRIN-GILBERT, Philipp SCHLEHUBER-CAISSIER hal.science/hal-04237998
- FORMATS 2020 **Computing maximally-permissive strategies in acyclic timed automata**
Emily CLEMENT, Thierry JÉRON, Nicolas MARKEY, David MENTRÉ. hal.science/hal-02895344

Preprints

- October 2024 **Expressivity of Linear Temporal Logic for Pomset Languages of Higher Dimensional Automata**
Emily CLEMENT, Enzo ERLICH, Jeremy LEDENT
arxiv.org/abs/2410.12493
Submitted at FOSSACS’2025

Implementations

- 2020- **Robustness of Timed Automata**, *Proof of concept*
 - Python, Licence : GNU AGPLv3, Dockerfile available.
 - **Link :**
 - gitlab.inria.fr/emclemen/formats-symbolic-tools (7922 LoC)
 - gitlab.inria.fr/emclemen/numpyrobustness (6567 LoC)
- 2022 - 2023 **Synthesis of a multi-agent controller**, *Proof of concept*
 - Python, Licence : GNU AGPLv3, (partial) Dockerfile available
 - **Contributors :** Emily CLEMENT Philipp SCHLEHUBER-CAISSIER, Nicolas PERRIN-GILBERT
 - **Link :** gitlab.com/Milly/robotic-synthesis (3136 LoC) (3161 lignes de codes)
 - **Démo :** perso.eleves.ens-rennes.fr/people/Emily.Clement/Implementation/multi-agent.html