Emily CLEMENT

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French, born in 1994
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Research topics

Formal Methods	**Concurrent and Timed systems (Timed automata, Higher Dimension Automata) , SMT, Monitoring, Robustness, Temporal Logic**
Geometry & Algebra	**Polyedra, Symbolic Optimisation, Well Quasi-order, Randomly generated groups**

Positions

2024-now — **Post-doctoral researcher**, *LIPN*, 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)**, *IRIF*, 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**, *ISIR*, Sorbonne Université, Under the supervision of Nicolas Perrin-Gilbert
Keywords : Multi-Agent systems, SMT, Reinforment Learning, Collision Avoidance, Timed Automata

2018-2022 — **PhD Candidate**, *Centre Inria de l'Université de Rennes & Mitsubishi Electric Centre R&D Europe*, Université de Rennes, Under the supervision of Thierry Jéron, Nicolas Markey and David Mentré
Keywords : Robustness, Timed Automata

Education

2018 − 2022 — **PhD in Computer Science**, *Robustness of timed automata : computing the maximally-permissive strategies* , Defended on 11th of march 2022, University : Université de Rennes
Attended master courses : Model-Checking, Formal methods techniques, SAT solvers, Category Theory, Side-channel attack

2017 − 2018 — **Master 2 in Computer Science SIF**, *Université de Rennes & ENS Rennes*, AI & Cybersecurity
Attended courses : Post-quantum cryptography, Security and Privacy (RGPD), Protocol Security, Game Theory, Statistical Machine Learning, Supervised Machine Learning, High Dimensional Statistical Learning
Research Internship : Cryptanalysis for post-quantum cryptography under the supervision of Adeline Roux-Langlois at IRISA lab

2016 − 2017 — **Master 2 in Mathematics**, *Université de Rennes*, Courses for agregation competitive exam
Sucess for the competitive exam "Agregation", Speciality : Computer algebra

2015 − 2016 — **Master 1 of Mathematics**, *Université de Rennes*,
Research Internship : Classification of randomnly generated groups, under the supervision of John Mackay (Bristol University, UK)

2014 − 2015 — **Bachelor of Mathematics**, *Université de Rennes*
Intitulé : sciences, technologies, santé, mention mathématiques
Research Internship : Gabidulin correcting codes, under the supervision of Alain Couvreur (LIX, Saclay)

2014 − 2018 — **Normalien Student at ENS Rennes**, *Mathematics*

2011 − 2014 — **Classes Préparatoires aux Grandes Écoles**, *Maths-Physics*, Chateaubriand High School (Rennes)

Collaborations

2024-now	**ANR project BisoUS**, *Better Synthesis for Underspecified Quantitative Systems*, Head : Didier Lime
	Labs : IRISA (Rennes), LIPN (Paris 13), LS2N (Nantes), LMF (Saclay)
2018-2023	**ANR Project TickTac**, *Efficient Techniques and Tools for the Verification and Synthesis of Real-Time Systems*, Head : Ocan SANKUR
	Labs : IRISA (Rennes), LaBRI (Bordeaux), LIS (Marseille), LSV (Cachan), ISIR (Paris), LRDE (Paris)

Talks (slides are one my webpage)

Talks on Seminars

2025	**Veridis Team**, *Loria, Nancy*
2025	**Distributed Computing**, *LMF, Saclay*
2024	**Cosynus Team Seminar**, *LIX, Saclay*
2024	**LoVe Team Seminar**, *LIPN, Villetaneuse*
2024	**Lab Seminar**, *LACL, Créteil*
2024	**Modélisation et Vérification Team Seminar**, *Lip6, Paris*
2023	**Distributed Computing**, *LMF, Saclay*
2023	**Automata Team Seminar**, *IRIF, Paris*
2023	**Verification and Modelisation Team Seminar**, *IRIF, Paris*
2023	**AMAC Team Seminar**, *ISIR, Paris*
2022	**ELSE Seminar**, *IRISA/Centre Inria de l'Université de Rennes*
2022	**Syroco Team Seminar**, *ISIR, Paris*
2021	**Sumo Team Seminar**, *IRISA/Centre Inria de l'Université de Rennes*
2019	**Sumo Team Seminar**, *IRISA/Centre Inria de l'Université de Rennes*
2018	**School Seminar**, *ENS Rennes, Ker Lann (Rennes)*

Talks on Conferences

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

Talks or Posters at Research (GDR) & Work groups (GT)

2024	**National day of GT-Verif**, *Talk*, IRCICA, Lille
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

Talks at Schools

2024	**Summer School MOVEP**
2020	**Summer School MOVEP**

Talk on ANR Projects

2025	**BisoUS ANR**, *LIPN, Villetaneuse*
2023	**MaveriQ ANR**, *IRIF, Paris*
2023	**Ticktac ANR**, *ISIR, Paris*
2018	**TickTac ANR**, *EPITA LRE, Paris*

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 responsabilities

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-permament 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, HugoBazille , 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

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 controler**, *Proof of concept*
- — Python, Licence : GNU AGPLv3, (partial) Dockerfile available
- — **Contributors :** Emily CLEMENT Philipp SCHLEHUBER-CAISSIER, Nicolas PERRIN-GILBERT
- — **Link :** gitlab.com/Millly/robotic-synthesis (3136 LoC) (3161 lignes de codes)
- — **Démo :** perso.eleves.ens-rennes.fr/people/Emily.Clement/Implementation/multi-agent.html