JULIE CAILLER

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RESEARCH EXPERIENCES

Associate Professor — Since Sept. 2024
Loria, University of Lorraine | Nancy, France
- Member of the VeriDis research team.
- Teaching at the Faculty of Science and Technology.

Postdoctoral Researcher — Sept. 2023 – Aug. 2024
University of Regensburg | Regensburg, Germany
- Member of the Chair of Theoretical Computer Science.
- Teaching assistant at the Faculty of Informatics and Data Science.

Ph.D. Candidate — Sept. 2020 – Aug. 2023
LIRMM, University of Montpellier | Montpellier, France
- Member of the MAReL research team.
- Teaching assistant at the Faculty of Sciences.

Internship – Reliability Assessment in a Decision Support Tool — Jun. 2019 – Aug. 2019
INRAE | Montpellier, France
- Developpement of metrics to take in account uncertainties in user feedback.
- Visualisation and integration of these metrics in the DOCAMEX project.
- Survey among users to take into account their feedback and improve the tool.

Intership – An Application for Multi-modal Travel — Jun. 2018 – Jul. 2018
LIRMM and Faciligo | Montpellier, France
- Conception and implementation of a module which matches the shortest path in multi-modal travel mode.
- Taking into account constraints regarding the client's disabilities in the context of cotravel.

SKILLS

Topics
Logic, automated & interactive theorem proving, parallel programming.

Programming Skills
`Go, Scala, Python, Rocq, Ocaml, C/C++, Java, SQL, LaTeX, Git`

Languages
- French (Mother tongue)
- English (Professional proficiency)
- German (Beginner)
- Spanish (Beginner)

EDUCATION

🎓 **PhD in Computer Science** 2023

LIRMM, University of Montpellier | France

- Thesis topic: "Designing an Automated Concurrent Tableau-Based Theorem Prover for First-Order Logic".
- Advisors: David DELAHAYE, Hinde Lilia BOUZIANE and Simon ROBILLARD.
- Jury: Gilles DOWEK, Philipp RÜMMER, Serenella CERRITO, Damien DOLIGEZ, Marie-Laure MUGNIER, Olivier HERMANT.
- This thesis focuses on the use of the method of analytic tableaux in the field of automatic deduction in first-order logic. In particular, it demonstrates how the use of concurrency can overcomes most of the fairness challenges, improve the management of theories in tableaux and the interactions with proof assstants. These results led to the creation of the automated theorem prover Goéland.

🎓 **Master Degree in Computer Science** 2020

University of Montpellier | France

- Courses mainly focused on big data, artificial intelligence and natural language processing.
- Class representative.

🎓 **Bachelor in Computer Science** 2018

University of Montpellier | France

- Introduction courses on a wide range of Computer Science subjects, including programming, logic, graph algorithms and network.
- Class representative.

SCIENTIFIC PRODUCTIONS

📖 **Conference Papers**

Abdulla, Parosh Aziz, Mohamed Faouzi Atig, **Julie Cailler**, Chencheng Liang, and Philipp Rümmer (2025). **Guiding Word Equation Solving Using Graph Neural Networks**. In: *Automated Technology for Verification and Analysis*. Ed. by S. Akshay, Aina Niemetz, and Sriram Sankaranarayanan. Cham: Springer Nature Switzerland, pp. 279–301. ISBN: 978-3-031-78709-6.

Rosain, Johann, Richard Bonichon, **Julie Cailler**, and Olivier Hermant (2024). **A Generic Deskolemization Strategy**. In: *Proceedings of 25th Conference on Logic for Programming, Artificial Intelligence and Reasoning*. Vol. 100, pp. 246–263.

Julie Cailler, Johann Rosain, David Delahaye, Simon Robillard, and Hinde Lilia Bouziane (2022). **Goéland: a Concurrent Tableau-Based Theorem Prover (System Description)**. In: *IJCAR 2022-11th International Joint Conference on Automated Reasoning*. Vol. 13385, pp. 359–368.

📖 **Workshop Papers**

Julie Cailler and Simon Guilloud (2024). **SC-TPTP: An Extension of the TPTP Derivation Format for Sequent-Based Calculus**. In: *9th Workshop on Practical Aspects of Automated Reasoning*.

📖 **Posters**

- Who Killed Agatha? 2022
  PhD seminar | LIRMM, University of Montpellier, France
- A Concurrent Tableaux Proof-Search 2021
  PhD seminar | LIRMM, University of Montpellier, France

Software

- `Goéland` **2022**
  Authors : Julie Cailler, David Delahaye, Isaac Lluís and Johann Rosain
  `Goéland` is an automated theorem prover using a concurrent procedure for the tableau method for first-order logic. It is implemented in the Go programming language (with about 40 000 lines of code). As the main developer of the tool, I also supervised the different people that work or have worked on it. `Goéland` can be found at the following link: `https://github.com/GoelandProver/Goeland`

- `SC-TPTP Utilities` **2022**
  Authors : Julie Cailler and Simon Guilloud
  `SC-TPTP Utilities` is a library of tools able to deal with the `SC-TPTP` format. It includes software able to handle, import, export and transform proofs in `SC-TPTP` format, to add intermediate proof steps, and to export them into `Rocq`. `SC-TPTP`, as well as more document about the format, can be found at the following link: `https://github.com/SC-TPTP/sc-tptp`

TALKS

Automated Deduction Techniques

- Formal Methods Day **2025**
  Loria, France

SC-TPTP : Extending the TPTP Format for Sequent-based Proofs

- National day of Scalp research group (Formal structures for CALculus and Proofs) **2025**
  IRCICA, University of Lille, France
- National day of LVP research group (Languages and Program Verification) **2025**
  IRIF, University Paris-Cité, France
- Formal Methods Seminar **2025**
  Loria, Nancy, France
- 13th TPTP Tea Party **2024**
  Nancy, France

Design of a Tableau-Based Automated Theorem Prover and Output of Machine-Checkable Proofs

- EuroProofNet School on Natural Formal Mathematics **2025**
  University of Bonn, Bonn, Germany
- Chair of Theoretical Computer Science Seminar **2024**
  FAU, Erlangen-Nuremberg, Germany
- VeriDis team seminar **2024**
  Loria, University of Nancy, France
- LARA team seminar **2024**
  École Polytechnique Fédérale de Lausanne (EPFL), Switerland
- IGG team seminar **2024**
  ICube, University of Strasbourg, France

Goéland: a Concurrent Tableaux-Based Theorem Prover

- AVM2023 **2023**
  Prague, Czech Republic
- PDAR2022 **2022**
  Haifa, Israel
- IJCAR2022 **2022**
  Haifa, Israel

Formal Method: The Art of Using Logic to Build Safer Systems

- Chair of Theoretical Computer Science **2023**
  Faculty of Informatics and Data Science, University of Regensburg, Germany

Reasoning Methods in Automated Theorem Proving

- BOREAL team seminar **2023**
  LIRMM, University of Montpellier, France

Who Killed Agatha?

- PhD seminar **2022**
  LIRMM, University of Montpellier, France

A Concurrent Tableaux Proof-Search Procedure

- MaREL team seminar **2022**
  LIRMM, University of Montpellier, France
- PhD seminar **2021**
  LIRMM, University of Montpellier, France
- Proof day **2021**
  LIRMM, University of Montpellier, France

PRIZES AND DISTINCTIONS

3rd Prize – 3MT **2023**
French edition of 3 minutes thesis | *Nîmes, France*

Contest in which each candidate must popularise his thesis in 3 minutes. I won the 3rd prize at the regional final.

1st Prize – 5 Minutes to Convince **2023**
University of Montpellier | *Montpellier, France*

Contest in which each candidate must present an innovant project in 5 minutes. I won the 1st price at the PhD category.

Woody Bledsoe Award **2022**
IJCAR2022 | *Haïfa, Israel*

Student grant won at IJCAR2022 for the paper "Goéland: a Concurrent Tableau-Based Theorem Prover (System Description)"

Best Newcomer Prover **2022**
CASC2022 | *Haïfa, Israel*

Award for the best new prover at CASC, a prover competition.

SCIENCE PROMOTION

Introduction to Logic

Introduction to logical reasoning and software verification by solving riddles.

- *National Training Plan* | *University of Lorraine, France* **2025**
- *MATh.en.JEANS* | *University of Lorraine, France* **2025**
- *World Logic Day* | *AoE* **2025**
- *Regional academic delegation to research and innovation* | *LIRMM, France* **2022**
- *LIRMM's open days* | *LIRMM, France* **2022**

Automated Reasoning: Techniques and Applications (a short introduction) — 2023

University of Regensburg | *Regensburg, Germany*

Article in a series of books published by the university presenting each of its components.

The Importance of Popularisation

Promotion of sience popularisation through the experience of 3 minute thesis.
- *Science radio programme* | *Divergence FM* — **2023**
- *University newsletter* | *University of Montpellier* — **2023**

Chiche : 1 scientist, 1 class

Presentation of the resarcher's work to high school students.
- *Antoine de Saint-Exupéry high school* | *Fameck, France* — **2025**
- *Jules GUESDE high school* | *Montpellier, France* — **2023**

Girls and STEM

Exchanges between female high school students and female scientists about computer science, to promote girls in science.
- *Les Cignognes* | *University of Lorraine and University of Strasboug* — **2025**
- *Girls and Maths* | *Women and Maths, Animaths* — **2023**
- *MathsC2+* | *French Mathematics Society, Ministry of education, Animaths* — **2022**

EVENT ORGANISATION

31st International Symposium on Model Checking Software (SPIN) — 2025

AE Chair | *Hamilton, Canada*

Formal Methods in Computer-Aided Design (FM-CAD) — 2024

Web Chair | *Vienna, Austria*

11th Workshop on Horn Clauses for Verification and Synthesis (HCVS24) — 2024

PC Chair | *Luxembourg City, Luxembourg*

1st Summer School of Interactions of Proof Assistants and Mathematics — 2023

Volunteer Student | *Regensburg, Germany*

Session of National Council of Universities, 27th Section (CNU27) — 2022

Volunteer Student | *Montpellier, France*

The 11th International Colloquium on Graph Theory and combinatorics (ICGT) — 2022

Volunteer Student | *Montpellier, France*

The 20th International Conference on Software & Systems Reuse (ICSR) — 2022

Volunteer Student | *Online*

30th Anniversary of LIRMM   2022
Volunteer Student | Montpellier, France

PhD Seminar of LIRMM   2021, 2022
Volunteer Student | Montpellier, France

REVIEWS

PC Member
- Journées Francophones des Langages Applicatifs   2026
  (JFLA)
- International Symposium on Theoretical Aspects of   2025
  Software Engineering (TASE)

Subreviewer
- International Conference on Interactive Theorem Prov-   2025
  ing (ITP)
- International Conference on Automated Deduction   2025
  (CADE)
- Formal Methods in Computer-Aided Design (FM-   2024
  CAD)
- International Conference on Verification, Model   2024
  Checking, and Abstract Interpretation (VMCAI)
- Certified Programs and Proofs (CPP)   2023, 2024
- International Joint Conference on Automated Rea-   2022, 2024
  soning (IJCAR)

Artifact Reviewer
- International Conference on Verification, Model   2025
  Checking, and Abstract Interpretation (VMCAI)
- International Symposium on Formal Methods (FM)   2024

TEACHING

University of Lorraine
- Software Analysis and Design   2024-2025
  Fist year of master's degree in computer science
- Functional Programming   2024-2025
  Third year of bachelor in computer science
- System: processes, memory and files   2024-2025
  Second year of bachelor in computer science
- Student's projects supervision   2024-2025
  Second year of bachelor in computer science
- Logic   2024-2025
  Second year of bachelor in computer science
- Algorithms and Imperative Programming   2024-2025
  First year of bachelor in computer science

University of Regensburg
- Programming II   2023-2024
  First year of bachelor in computer science
- Introduction to Theoretical computer sciences   2023-2024
  First year of bachelor in computer science

University of Montpellier

- Program Verification — 2022–2023
  Third year of bachelor in computer science
- Functional Programming — 2022–2023
  First year of bachelor in computer science
- Data Warehouse and Big Data — 2021–2022
  First year of master in computer science
- First-Order Logic — 2021–2022
  Third year of bachelor in computer science
- Network and Concurrent Programming — 2021–2022
  Third year of bachelor in computer science
- Parallel and Distributed Programming — 2020–2021
  First year of master in computer science
- Network, System and Web — 2020–2021
  First year of bachelor in computer science

Internship Supervision

- Titouan LE PEN — 2025
  Development of an automated theorem prover | 2nd year of bachelor in engineering
- Achille RAZAFIMAHARO — 2025
  Development of an automated theorem prover | 2nd year of bachelor in engineering

Internship Co-Supervision

- Filip JAGIELLOWICZ — 2024
  Implementation of a decision procedure for CaAL | 1st year of master in computer science
- Dylan BETTENDROFFER — 2023
  A Dedukti output for `Goéland` | 2nd year of master in computer science
- Johann ROSAIN — 2023
  Deskolemization in First-Order Logic | 3rd year of bachelor in computer science
- Matthieu PIERRET — 2023
  Interactive proof in Goéland | 2rd year of bachelor in computer science
- Lorenzo PUCCIO — 2022
  A `Rocq` output for `Goéland` | 3rd year of bachelor in computer science
- Adrien MECIBAH — 2022
  Interactive traces for ATP | 2nd year of bachelor in computer science
- Nina JANEVA — 2021
  Automated tool for benchmark | 3rd year of bachelor in computer science
- Johann ROSAIN — 2021
  Code trees for unification | 2nd year of bachelor in computer science

Bachelor's Thesis Co-Supervision

- Johann ROSAIN — 2021-2022
  Deduction modulo theory and polymorphism in `Goéland`
- Cédric BERTHET, Enzo GOULESQUE, Lorenzo PUCCIO, Margaux RENOIR, Tom SIMULA — 2021-2022
  Arithmetic in `Goéland`

COLLECTIVE TASKS

Jury CAPES NSI — 2025
Ministry of National Education, Higher Education and Research

Speaker at Recruitment Preparation Workshops — 2024
French Research Group Programming and Software Engineering (GDR GPL)

Editor of the AAR newsletter   Since June 2024
Association for Automated Reasoning

Contribution to the Team's Website   Sept. 2023 – Aug. 2024
Faculty of Informatics and Data Science | *Regensburg, Germany*
Addition of articles and various updates

Research Group HRS4R   Dec. 2022 – May. 2024
University of Montpellier | *Montpellier, France*
Reflection group on the needs of researchers in the scope of the "HR Excellence in Research" label.

PhD Council of the Laboratory   Mar. 2022 – Sept. 2023
LIRMM | *Montpellier, France*
Organisation of scientific and cultural activities for the laboratory's doctoral students.

Doctoral School Council (I2S, ED166)   Jun. 2021 – Sept. 2023
I2S | *France*
Doctoral students' representative in the doctoral school council.

Laboratory Council   Oct. 2020 – Sept. 2023
LIRMM | *Montpellier, France*
Doctoral students' representative in the laboratory council.

PROFESSIONNAL EXPERIENCES

Project Leader in Clinical Supply Chain   Aug. 2019– Aug. 2020
Sanofi | *Montpellier, France*
- Project leader of the software migration for translation of drug leaflets.
- Data visualisation and criticality analysis of the application park.
- Documentation and validation strategies.