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, Coq, 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 Coq.

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 |*   **2022**
  LIRMM, France
- *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 (JFLA)   2026
- International Symposium on Theoretical Aspects of Software Engineering (TASE)   2025

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

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

TEACHING

University of Lorraine – Faculty of Science and Technology
- 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 – Faculty of Informatics and Data Science
- 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 *Third year of bachelor in computer science*	**2022–2023**
• Functional Programming *First year of bachelor in computer science*	**2022–2023**
• Data Warehouse and Big Data *First year of master in computer science*	**2021–2022**
• First-Order Logic *Third year of bachelor in computer science*	**2021–2022**
• Network and Concurrent Programming *Third year of bachelor in computer science*	**2021–2022**
• Parallel and Distributed Programming *First year of master in computer science*	**2020–2021**
• Network, System and Web *First year of bachelor in computer science*	**2020–2021**

Internship Supervision

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

Bachelor's Thesis Co-Supervision

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

Internship Co-Supervision

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

COLLECTIVE TASKS

Editor of the AAR newsletter *Association for Automated Reasoning*	**Since June 2024**
Contribution to the Team's Website *Faculty of Informatics and Data Science* | *Regensburg, Germany* Addition of articles and various updates	**Sept. 2023 – Aug. 2024**

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.