JULIE CAILLER

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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.

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)
- Spanish (Beginner)
- German (Beginner)

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 of Nancy.

Postdoctoral Researcher — **Sept. 2023 – Aug. 2024**

University of Regensburg | *Regensburg, Germany*

- Member of the Chair of Theoretical Computer Sciences of University of Regensburg.

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.

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*

Softwares

- `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 developper 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 softwares able to handle, import, export and transform proofs in SC-TPTP format, to add intermediate proof steps, and to export them into Coq.

TALKS

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

- 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 — 2023

Theoretical Computer Science Group | *Faculty of Informatics and Data Science, University of Regensburg, Germany*

Reasoning Methods in Automated Theorem Proving — 2023

BOREAL team seminar | *LIRMM, University of Montpellier, France*

Who Killed Agatha? 2022
PhD seminar | *LIRMM, University of Montpellier, France*

A Concurrent Tableaux Proof-Search Procedure
- *MaREL team seminar* | *LIRMM, University of Montpellier, France* 2022
- *PhD seminar* | *LIRMM, University of Montpellier, France* 2021
- *Proof day* | *LIRMM, University of Montpellier, France* 2021

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 3^{rd} 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 1^{st} 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

- 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 (FMCAD) — **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**
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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**
  1st 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 — **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

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`

Internship Co-Supervision

- Filip Jagiellowicz — **2024**
  Implementation of a decision procedure for CaAL | *1st year of master*
- Dylan Bettendroffer — **2023**
  A Dedukti output for `Goéland` | *2nd year of master*
- Johann Rosain — **2023**
  Deskolemization in First-Order Logic | *3rd year of bachelor*
- Matthieu Pierret — **2023**
  Interactive proof in Goéland | *2rd year of bachelor*
- Lorenzo Puccio — **2022**
  A Coq output for `Goéland` | *3rd year of bachelor*
- Adrien Mecibah — **2022**
  Interactive traces for ATP | *2nd year of bachelor*
- Nina Janeva — **2021**
  Automated tool for benchmark | *3rd year of bachelor*
- Johann Rosain — **2021**
  Code trees for unification | *2nd year of bachelor*

COLLECTIVE TASKS

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– Sept. 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.