# 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.
- Rank: 3rd/18 (Semester 1) - 1st/17 (Semester 2) - 2nd/12 (Semester 3).

### 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.
- Rank: 7th/113.

## SKILLS

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

**Programming Skills** — Go, Python, Coq, Ocaml, C/C++, Java, SQL, LaTeX, Git

**Languages**

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

## RESEARCH EXPERIENCES

**Postdoctoral Researcher** — **Since Sept. 2023**

***University of Regensburg*** | *Regensburg, Germany*

- Position within the Chair of Theoretical Computer Sciences of University of Regensburg.

**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.

**Rubik's Cube Solver** — **Oct. 2018 – May 2019**

***University of Montpellier*** | *Montpellier, France*

- Detection of the current configuration of the cube using a camera.
- Resolution using multiple algorithms (shortest moves, didactic).
- 3D animation of the resolution's steps.

**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.

**Shannon Switching Game** — **Oct. 2017 – May 2018**

***University of Montpellier*** | *Montpellier, France*

- Implementation of the connection game created by C. Shannon.
- Grid generation (winning for a given player), movement animation.
- Single or two-players mode, artifical intelligence with difficulty levels.

## SCIENTIFIC PRODUCTIONS

**Conference Paper**

**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.

**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, Johann Rosain, David Delahaye***
  `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`

## TALKS

**Design of a Tableau-Based Automated Theorem Prover and Output of Machine-Checkable Proofs** — 2024
*VeriDis team seminar* | *Loria, University of Nancy, France*

**Design of a Tableau-Based Automated Theorem Prover and Output of Machine-Checkable Proofs** — 2024
*LARA team seminar* | *École Polytechnique Fédérale de Lausanne (EPFL), Suisse*

**Design of a Tableau-Based Automated Theorem Prover and Output of Machine-Checkable Proofs** — 2024
*IGG team seminar* | *ICube, University of Strasbourg, France*

**Goéland: a Concurrent Tableaux-Based Theorem Prover** — 2023
*AVM2023* | *Prague, Czech Republic*

**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*

**Goéland: a Concurrent Tableaux-Based Theorem Prover** — 2022
*Haifa, Israel*
- *IJCAR2022*
- *PDAR2022*

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

**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

**Introduction to Research** 2023

*Jules GUESDE high school* | *Montpellier, France*

Presentation of the resarcher's work to high school students.

**Who Killed Agatha?**

Introduction to logical reasoning and software verification by solving riddles.

- *Regional academic delegation to research and innovation* | *LIRMM, France* 2022
- *LIRMM's open days* | *LIRMM, France* 2022

**Introduction to Computer Sciences**

*Girls and STEM*

Exchanges between female high school students and female scientists about computer science, to promote girls in science.

- *Girls and Maths* | *Women and Maths, Animaths* 2023
- *MathsC2+* | *French Mathematics Society, Ministry of education, Animaths* 2022

**Introduction to Logic** 2020-2023

*LIRMM* | *Montpellier, France*

Multiple presentations of logic towards administratives managers, scientists from outside the field or interns. Introduction to logic in everyday life with puzzles and debates.

## EVENT ORGANISATION

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

*TU Wien* | *Vienna, Austria*

**11th Workshop on Horn Clauses for Verification and Synthesis (HCVS24)** — 2024
*University of Luxembourg* | *Luxembourg City, Luxembourg*

**1st Summer School of Interactions of Proof Assistants and Mathematics** — 2023
*University of Regensburg* | *Regensburg, Germany*

**Session of National Council of Universities, 27th Section (CNU27)** — 2022
*University of Montpellier* | *Montpellier, France*

**The 11th International Colloquium on Graph Theory and combinatorics (ICGT)** — 2022
*University of Montpellier* | *Montpellier, France*

**The 20th International Conference on Software & Systems Reuse (ICSR)** — 2022
*University of Montpellier* | *Online*

**30th Anniversary of LIRMM** — 2022
*LIRMM* | *Montpellier, France*

**PhD Seminar of LIRMM** — 2021, 2022
*LIRMM* | *Montpellier, France*

## REVIEWS

**Certified Programs and Proofs (CPP)** — 2023, 2024

**International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI)** — 2024

**International Joint Conference on Automated Reasoning (IJCAR)** — 2022, 2024

## TEACHING

**University of Regensburg – Faculty of Informatics and Data Science**

- Introduction to theoretical computer sciences — 2023-2024
  *First year of bachelor in computer science*
- Programming II — 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

### Contribution to the Team's Website — Since Sept. 2023

***Faculty of Informatics and Data Science*** | *Regensburg, Germany*

Addition of articles and various updates

### Research Group HRS4R — Dec. 2022 – Sept. 2023

***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.

## REFERENCES


**Pr David DELAHAYE** — PhD Advisor
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