

# JULIE CAILLER

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## EDUCATION



### PhD in Computer Science

Oct. 2020 - Sept. 2023

*LIRMM, University of Montpellier | France*

- Thesis topic: "Using concurrency for tableaux in first-order logic".
- Advisors: David DELAHAYE, Hinde Lilia BOUZIANE and Simon ROBILLARD.
- The aim of this thesis is the development and implementation in a tool of techniques using concurrency for the method of tableaux in first-order logic. The resulting prover, *Goéland*, has already shown the advantages of this approach, especially to manage fairness in proof-search.



### Master Degree in Computer Science

Sept. 2018 - Aug. 2020

*University of Montpellier | France*

- Courses mainly focused on big data, artificial intelligence and natural language processing.
- Class representative.
- Rank: 3<sup>rd</sup>/18 (Semester 1) - 1<sup>st</sup>/17 (Semester 2) - 2<sup>nd</sup>/12 (Semester 3).



### Bachelor in Computer Science

Sept. 2015 - Aug. 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: 7<sup>th</sup>/113.

## SKILLS



### Topics

Logic, automated & interactive theorem proving, parallel programming.



### Programming Skills

Go, Python, Coq, Ocaml, C/C++, Java, SQL,  $\text{\LaTeX}$ , Git



### Languages

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

## RESEARCH EXPERIENCES



### Reliability Assessment in a Decision Support Tool

Jun. 2019 - Aug. 2019

*INRAE | Montpellier, France*

- Development 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, artificial intelligence with difficulty levels.

## SCIENTIFIC PRODUCTIONS



### Conference Paper

**Julie Cailler**, David Delahaye, Olivier Harmant, Simon Robillard, Johann Rosain, and Hinde Lilia Bouziane (2023). **Complete Proof Search for Free-Variable Tableaux with Eager Closure**. (submitted at TABLEAUX 2023 - 32nd International Conference on Automated Reasoning with Analytic Tableaux and Related Methods).

**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 30 000 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>

## TALKS



### 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

	<b>Reasoning Methods in Automated Theorem Proving</b> <i>BOREAL team seminar   LIRMM, University of Montpellier, France</i>	2023
	<b>Who Killed Agatha?</b> <i>PhD seminar   LIRMM, University of Montpellier, France</i>	2022
	<b>Goéland: a Concurrent Tableaux-Based Theorem Prover</b> <i>IJCAR2022   Haifa, Israel</i>	2022
	<b>A Concurrent Tableaux Proof-Search Procedure</b> <i>LIRMM, University of Montpellier, France</i>	
	• <i>MaREL team seminar</i>	2022
	• <i>PhD seminar</i>	2021
	• <i>Proof day</i>	2021

## PRIZES AND DISTINCTIONS

	<b>3<sup>rd</sup> Prize - 3MT</b> <i>French edition of 3 minutes thesis   Nîmes, France</i> Contest in which each candidate must popularise his thesis in 3 minutes. I won the 3 <sup>rd</sup> prize at the regional final.	2023
	<b>1<sup>st</sup> Prize - 5 Minutes to Convince</b> <i>University of Montpellier   Montpellier, France</i> Contest in which each candidate must present an innovant project in 5 minutes. I won the 1 <sup>st</sup> price at the PhD category.	2023
	<b>Woody Bledsoe Award</b> <i>IJCAR2022   Haïfa, Israel</i> Student grant won at IJCAR2022 for the paper "Goéland: a Concurrent Tableau-Based Theorem Prover (System Description)"	2022
	<b>Best Newcomer Prover</b> <i>CASC2022   Haïfa, Israel</i> Award for the best new prover at CASC, a prover competition.	2022

## SCIENCE PROMOTION

	<b>The Importance of Popularisation</b> Promotion of science popularisation through the experience of 3 minute thesis.	
	• <i>Science radio programme   Divergence FM</i>	2023
	• <i>University newsletter   University of Montpellier</i>	2023
	<b>Introduction to Research</b> <i>Jules GUESDE high school   Montpellier, France</i> Presentation of the researcher's work to high school students.	2023



### Who Killed Agatha?

Introduction to logical reasoning and software verification by solving riddles.

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



### Introduction to Computer Sciences

#### **Girls and STEM**

Exchanges between female high school student and female scientist 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 administrative managers, scientists from outside the field or interns. Introduction to logic in everyday life with puzzles and debates.

## EVENT ORGANISATION



### Session of National Council of Universities, 27<sup>th</sup> Section (CNU27)

**2022**

*Montpellier, France*



### The 11<sup>th</sup> International Colloquium on Graph Theory and combinatorics (ICGT)

**2022**

*Montpellier, France*



### The 20<sup>th</sup> International Conference on Software & Systems Reuse (ICSR)

**2022**

*Montpellier, France*



### 30<sup>th</sup> Anniversary of LIRMM

**2022**

*Montpellier, France*



### PhD Seminar of LIRMM

**2021, 2022**

*Montpellier, France*

## REVIEWS



### Certified Programs and Proofs (CPP)

**2024**



### International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI)

**2024**



### Certified Programs and Proofs (CPP)

**2022**



### International Joint Conference on Automated Reasoning (IJCAR)

**2022**

## TEACHING



### University of Montpellier

- Parallel and Distributed Programming 2020-2021  
*First year of master 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*
- Program Verification 2022-2023  
*Third year of bachelor in computer science*
- Network, System and Web 2020-2021  
*First year of bachelor in computer science*
- Functional Programming 2022-2023  
*First year of bachelor in computer science*



### Bachelor's Thesis Co-Supervision

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



### Internship Co-Supervision

- Dylan BETTENDROFFER 2023  
*A Dedukti output for Goéland | 2<sup>nd</sup> year of master*
- Johann ROSAIN 2023  
*Deskolemization in First-Order Logic | 3<sup>rd</sup> year of bachelor*
- Matthieu PIERRET 2023  
*Interactive proof in Goéland | 2<sup>nd</sup> year of bachelor*
- Lorenzo PUCCIO 2022  
*A Coq output for Goéland | 3<sup>rd</sup> year of bachelor*
- Adrien MECIBAH 2022  
*Interactive traces for ATP | 2<sup>nd</sup> year of bachelor*
- Nina JANEVA 2021  
*Automated tool for benchmark | 3<sup>rd</sup> year of bachelor*
- Johann ROSAIN 2021  
*Code trees for unification | 2<sup>nd</sup> year of bachelor*

## COLLECTIVE TASKS



### 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.

## PROFESSIONAL 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**

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Head of the Computer Science Department  
Faculty of Sciences  
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**PhD  
Advisor**



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