

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 overcome most of the fairness challenges, improve the management of theories in tableaux and the interactions with proof assistants. 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, artificial 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 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
-  **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 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 | Haifa, Israel
Student grant won at IJCAR2022 for the paper "Goéland: a Concurrent Tableau-Based Theorem Prover (System Description)"
-  **Best Newcomer Prover** 2022
CASC2022 | Haifa, 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 science 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 researcher'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* | 2022
LIRMM, France

• *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 administrative 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

TEACHING



University of Regensburg – Faculty of Informatics and Data Science

- Introduction to theoretical computer sciences
First year of bachelor in computer science

2023-2024



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



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

- 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 | 2nd 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.

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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**PhD
Advisor**



**Dr Hinde Lilia
BOUZIANE**

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**PhD
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**Dr Simon
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**PhD
Advisor**