

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.



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, 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.



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 Papers

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 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 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



- Representing Sequent-style Derivations in TPTP with SC-TPTP 2024
13th TPTP Tea Party | Nancy, France



- Design of a Tableau-Based Automated Theorem Prover and Output of Machine-Checkable Proofs 2024
Chair of Theoretical Computer Science Seminar | FAU, Erlangen-Nuremberg, Germany



- 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*
- *PhD seminar*
- *Proof day*

2022

2021

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 <i>Jules GUESDE high school</i> 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. <ul style="list-style-type: none"> • <i>Regional academic delegation to research and innovation</i> 2022 LIRMM, France • <i>LIRMM's open days</i> LIRMM, France 2022
	Introduction to Computer Sciences <i>Girls and STEM</i> Exchanges between female high school students and female scientists about computer science, to promote girls in science. <ul style="list-style-type: none"> • <i>Girls and Maths</i> Women and Maths, Animaths 2023 • <i>MathsC2+</i> French Mathematics Society, Ministry of education, Animaths 2022
	Introduction to Logic 2020-2023 <i>LIRMM</i> 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 <i>TU Wien</i> Vienna, Austria
	11th Workshop on Horn Clauses for Verification and Synthesis (HCVS24) 2024 <i>University of Luxembourg</i> Luxembourg City, Luxembourg
	1st Summer School of Interactions of Proof Assistants and Mathematics 2023 <i>University of Regensburg</i> Regensburg, Germany
	Session of National Council of Universities, 27th Section (CNU27) 2022 <i>University of Montpellier</i> Montpellier, France
	The 11th International Colloquium on Graph Theory and combinatorics (ICGT) 2022 <i>University of Montpellier</i> Montpellier, France
	The 20th International Conference on Software & Systems Reuse (ICSR) 2022 <i>University of Montpellier</i> Online
	30th Anniversary of LIRMM 2022 <i>LIRMM</i> Montpellier, France



PhD Seminar of LIRMM
LIRMM | Montpellier, France

2021, 2022

REVIEWS



International Symposium on Formal Methods (FM) 2024



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

- 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 RENAI, 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 | 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



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.