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, 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, artifical 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 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

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* 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

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 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.