Damien Rouhling

Professeur agrégé in mathematics – Post-doctoral fellow

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Career history

2019 – Present **Post-doctoral fellow**, *Inria Nancy - Grand Est.*
In the CAMUS team.

2016 – 2019 **PhD candidate with teaching duty**, *Université Côte d'Azur, Inria Sophia Antipolis - Méditerranée.*
Supervised by Yves Bertot and Cyril Cohen in the MARELLE team.

2015 – Present **Professeur agrégé in mathematics**.
Civil servant teacher, temporarily released from my teaching duty since September 1st, 2019.

2012 – 2016 **Civil servant student**, *ENS de Lyon.*

Education, diplomas, competitive exams

2016 – 2019 **PhD in computer science**, *Université Côte d'Azur, Inria Sophia Antipolis - Méditerranée.*
Supervised by Yves Bertot and Cyril Cohen, defended on September 30, 2019.
Formalisation Tools for Classical Analysis – A Case Study in Control Theory.

2017 **French speaking version of the "My PhD in 180 seconds" competition**.
Local final of French Riviera: `https://www.youtube.com/watch?v=BxCrw0uIIEI`.

2015 – 2016 **Master 2 recherche informatique fondamentale**, *ENS de Lyon*, with highest honours.
Master's degree in theoretical computer science.

2015 **Diplôme de l'ENS**, *ENS de Lyon.*
Diploma apart from the standard Bachelor-Master-Doctorate system, awarded by the ENS to students whose education comprises interdisciplinarity, assumption of responsability and international mobility.

2015 **Agrégation de mathématiques**, ranked 98th.
Civil service competitive exam in mathematics.

2014 – 2015 **Master 2 pro enseignement spécialité mathématiques**, *ENS de Lyon.*
Master's degree in mathematics; it was mainly a training year for the agrégation.

2013 – 2014 **M1 informatique fondamentale**, *ENS de Lyon.*
First year of master in theoretical computer science.

2012 – 2013 **Licence informatique fondamentale**, *ENS de Lyon*, with high honours.
Bachelor's degree in theoretical computer science.

2012 **Competitive entrance exams for several schools**.
Admitted, among others, in the ENS de Lyon.

2010 – 2012 **Classes préparatoires aux grandes écoles**, *Lycée Henri Poincaré*, Nancy.
Two years of training to the entrance exams of some schools, among which the ENS, with majors in mathematics and physics (MPSI-MP*).

2010 **Baccalauréat S option mathématiques**, *Lycée Henri Poincaré*, Nancy, with highest honours.
Diploma at the end of high school, scientific stream with speciality in mathematics.

Teaching

2018 – 2019 **Teaching assistant**, *IUT R&T*, Sophia Antipolis.
C programming language, Fourier analysis, approximation of functions and asymptotic developments. Supervisor of the Fourier analysis teaching unit.

2017 – 2018 **Teaching assistant**, *IUT R&T*, Sophia Antipolis.
C programming language and Fourier analysis. Supervisor of the Fourier analysis teaching unit.

2016 – 2017 **Teaching assistant**, *IUT R&T*, Sophia Antipolis.
C programming language, integral, differential calculus and Fourier analysis.

2012 – 2013 **Tutor for ninth grade pupils**, *Collège Joliot-Curie*, Bron.
For the association Trait d'Union of the ENS de Lyon.
Refresher courses in methodology with a view to the brevet des collèges (equivalent to the GCSEs) and to the entrance to high school.

Research

Talks

September 2018 **Seminar of the Inria project-team Gallium**, Paris.
Asymptotic Reasoning in Coq.

June 2018 **Journées FastRelax**, Sophia Antipolis.
Formal Proofs for Control Theory and Robotics: A Case Study.

January 2018 **International conference CPP**, Los Angeles.
A Stability Proof for the Inverted Pendulum.

September 2017 **International conference ITP**, Brasilia.
A formal proof in Coq of LaSalle's invariance principle.

May 2017 **Journées FastRelax**, Paris.
A formal proof in Coq of LaSalle's invariance principle.

March 2017 **Seminar "Computations and Proofs" of the Inria project-team SpecFun**, Palaiseau.
Refinement: a reflection on proofs and computations.

January 2017 **National conference JFLA**, Gourette.
Refining the `ring` tactic.

November 2014 **Journées LAC**, Chambéry.
Constraint systems for proof-search modulo a theory.

November 2013 **PSATTT international workshop**, Palaiseau.
Delayed instantiation of existential variables in presence of a theory.

Internships

January 2016 – June 2016 **Research internship**, *Inria*, Sophia Antipolis.
Under the supervision of Cyril Cohen.
Automatic refinements in Coq.

June 2014 – August 2014 **Research internship**, *Chalmers University of Technology*, Gothenburg, Sweden.
Under the supervision of Thierry Coquand.
Dependently typed lambda calculus with a lifting operator.

June 2013 – July 2013 **Research internship**, *Laboratoire d'Informatique de l'École polytechnique (LIX laboratory)*, Palaiseau.
Under the supervision of Stéphane Graham-Lengrand and Assia Mahboubi.
Congruence closure and proof-search modulo a theory.

Computer skills

Programming	OCaml, C, C++, Python, Haskell, mainly.
Web	HTML, CSS, Javascript (notions).
Operating systems	Linux (diverse distributions), Microsoft Windows, Mac OS.
Certifications	B2I, C2I2E (French certifications about basic computer skills).
Miscellaneous	LaTeX, Pack Office (notions), Inkscape (notions), Git.

Languages

French	Mother tongue.	
English	Professional use.	*Certified at level B2 (CLES2).*
German	School level.	*Certified at level B1 (Deutsches Sprachdiplom der Kulturministerkonferenz).*
Esperanto	Notions.	

Miscellaneous

Involvement in associations	Vice-President of the chess club of Antibes from February 2018 to September 2019, Qualified teacher for the French chess federation, Federal arbiter at the club level.
Driving license	Permis B (license for cars).
First aid	Attestation de formation aux premiers secours (first aid certificate).
Interests	Reading, music, strategy games.

Publications

[1] Damien Rouhling. *Formalisation Tools for Classical Analysis - A Case Study in Control Theory.* PhD thesis, University of Côte d'Azur, Nice, France, 2019.

[2] Reynald Affeldt, Cyril Cohen, and Damien Rouhling. Formalization Techniques for Asymptotic Reasoning in Classical Analysis. *Journal of Formalized Reasoning*, October 2018.

[3] Damien Rouhling. A Formal Proof in Coq of a Control Function for the Inverted Pendulum. In June Andronick and Amy P. Felty, editors, *Proceedings of the 7th ACM SIGPLAN International Conference on Certified Programs and Proofs, CPP 2018, Los Angeles, CA, USA, January 8-9, 2018*, pages 28–41. ACM, 2018.

[4] Cyril Cohen and Damien Rouhling. A Formal Proof in Coq of LaSalle's Invariance Principle. In Mauricio Ayala-Rincón and César A. Muñoz, editors, *Interactive Theorem Proving - 8th International Conference, ITP 2017, Brasília, Brazil, September 26-29, 2017, Proceedings*, volume 10499 of *Lecture Notes in Computer Science*, pages 148–163. Springer, 2017.

[5] Cyril Cohen and Damien Rouhling. A refinement-based approach to large scale reflection for algebra. In *JFLA 2017 - Vingt-huitième Journées Francophones des Langages Applicatifs*, Gourette, France, January 2017.

[6] Damien Rouhling, Mahfuza Farooque, Stéphane Graham-Lengrand, Assia Mahboubi, and Jean-Marc Notin. Axiomatic Constraint Systems for Proof Search Modulo Theories. In Carsten Lutz and Silvio Ranise, editors, *Frontiers of Combining Systems - 10th International Symposium, FroCoS 2015, Wroclaw, Poland, September 21-24, 2015. Proceedings*, volume 9322 of *Lecture Notes in Computer Science*, pages 220–236. Springer, 2015.