

Rémi Prébet | Curriculum Vitæ

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Education

2024- : KU Leuven

Leuven, Belgium

- *Post-doctoral researcher* at Mathematics department
- Supervisor : Fatemeh Mohammadi

2020-2023: Sorbonne Université

Paris

- *PhD candidate* in the PolSys team at LIP6
- Supervisor: Mohab Safey El Din
- Subject: *Connectivity problems in semi-algebraic sets: algorithms, implementations and applications*

2015–2020: École Normale Supérieure Paris-Saclay, Cachan, France

2019-2020: *Master 2 research degree: Applied Algebra for Cryptography and Formal Calculus - UVSQ*

2018-2019: *Gap year authorised by the school (see below)*

2017-2018: *Master 2 degree of teaching and preparation for agrégation in mathematics.*

Laureate of the *agrégation* of mathematics with the option : Algebra and symbolic computation. Rank : 75/381.

2016-2017: *Master 1 Hadamard : Mathematics and Applications.*

It is a high level master in partnership with *École Polytechnique* and *Paris-Sud University*.

2015-2016: *Bachelor degree of pure and applied Mathematics.*

2012–2015: Lycée Dumont D'Urville/ Lycée Masséna

Toulon/Nice.

Three years in Higher School Preparatory Classes

Research

Submitted to peer-reviewed journal.....

2024: *Computing roadmaps in unbounded smooth real algebraic sets II: algorithm and complexity*
with M. Safey El Din et É. Schost, submitted to Journal of Symbolic Computation on 04/02/2024
[arXiv:2402.03111] (60 pages)

Publications in peer reviewed journals.....

2022: *Computing roadmaps in unbounded smooth real algebraic sets I: connectivity results*
with M. Safey El Din and É. Schost, *Journal of Symbolic Computation (in revision)*
[10.1145/3597066.3597081] - [arXiv:2203.03961]

2019: *A Data-Adaptive EOF-Based Method for Displacement Signal Retrieval From InSAR Displacement Measurement Time Series for Decorrelating Targets*
with Y. Yan, M. Jauvin and É. Trouvé, *IEEE Transactions on Geoscience and Remote Sensing*
[10.1109/TGRS.2019.2902719]

Publications in peer reviewed proceedings of conferences.....

2024: Algebraic Tools for Computing Polynomial Loop Invariants
with E. Bayarmagnai, F. Mohammadi, submitted to *ISSAC '24*
[arXiv:2405.09232]

2023: *Algorithm for connectivity queries on real algebraic curves*
with Md N. Islam and A. Poteaux, *ISSAC '23*
[10.1145/3597066.3597081] - [arXiv:2302.11347]

2022: *Deciding cuspidality of manipulators through computer algebra and algorithms in real algebraic geometry*
with D. Chablat, M. Safey El Din, D. Salunkhe and P. Wenger, *ISSAC '22*
[10.1145/3476446.3535477] - [arXiv:2203.04578]

2018: *A Data-Adaptive Eof Based Method for Displacement Signal Extraction from Interferogram Time Series*
with Y. Yan, M. Jauvin and É. Trouvé, *IGARSS 2018*
[10.1109/IGARSS.2018.8518382]

Presentations in conferences

Jul. 2023: *Algorithm for connectivity queries on real algebraic curves*

48th International Symposium on Symbolic and Algebraic Computation, Tromsø, Norway

Jul. 2023 (invited): *Efficiently answering connectivity queries on real algebraic space curves*

SIAM AG 2023, Eindhoven, Netherlands

Mar. 2023: *Efficiently solving connectivity queries on real algebraic curves*

Journées Nationales de Calcul Formel 2023, CIRM, Luminy, France

Jul. 2023: *Deciding Cuspidality of Manipulators through Computer Algebra and Algorithms in Real Algebraic Geometry*

47th International Symposium on Symbolic and Algebraic Computation, Lille, France

Mar. 2022: *On the algebra and geometry of cuspidality: algorithms and complexity*

Journées Nationales de Calcul Formel 2022, CIRM, Luminy, France

Mar. 2021: *Towards faster roadmap algorithms for smooth and unbounded real algebraic sets*

Journées Nationales de Calcul Formel 2021, CIRM, Luminy, France (online)

Presentation in seminars and working groups

Jun. 2023: *Computational Semi-Algebraic Geometry for Differential Equations and Robotics*

NUMA Seminar, KU Leuven, Leuven, Belgium

Jun. 2023: *Computing with real algebraic curves: topology and connectivity properties*

Number Theory and Algebraic Geometry Seminar, KU Leuven, Leuven, Belgium

Sep. 2022: *Connectivity issues in semi-algebraic geometry: algorithms, complexity and robotics applications through computer algebra*

ORCCA Joint Lab Meeting, University of Waterloo, Waterloo, Ontario, Canada

Feb. 2021: *On the computation of roadmap of smooth unbounded semi-algebraic sets.*

Meeting of ANR ECARP project members (online)

Nov. 2020: *Towards faster roadmap algorithms for smooth and unbounded real algebraic sets*

Internal joint working group of PolSys-Specfun teams

Presentation of posters

Apr. 2023: *Answering connectivity queries in semi-algebraic sets through roadmaps: an application to robotics*

Journées Nationales de l'Informatique Mathématique 2023, IRIF, Université Paris Cité, France

Oct. 2022: *Answering connectivity queries in semi-algebraic sets through roadmaps: an application to robotics*

Workshop on Solving Polynomial Equations and Applications, CWI, Amsterdam, Netherlands

Mar. 2022: *Symbolic and geometric computation applied to the resolution of an effective problem in robotic*

Journées Nationales de l'Informatique Mathématique 2022, CRISTAL, Univ. Lille, France

Research Internships

02-08/2020: LIP6, Sorbonne Université

Paris

- Subject: *Algorithms in computer algebra for connectivity queries in semi-algebraic sets*
- Generalizing theoretical proofs and results from the state-of-the-art
- Led to a submission in Journal of Symbolic Computation

Supervisor: Mohab Safey El Din

04-07/2017: LISTIC, Université Savoie Mont Blanc

Annecy

- Subject: *Extraction of the displacement signal from a time series of Sentinel-1 interferograms in mountainous environments*
- Designing, implementing and analyzing new methods for signal processing
- Results published in IEEE Transactions on Geoscience and Remote Sensing and the proceedings of IGARSS '18

Supervisors: Yajing Yan and Emmanuel Trouvé

02-06/2016: CMLA/LMO, ENS Cachan/Orsay

Cachan/Orsay

- Subject: *Traffic congestion and Mean Field Games*
- Proof of theoretical results and implementation of efficient numerical methods

Supervisors: Filippo Santambrogio and Anthony Preux

Research visits

09-11/2022: Visiting Researcher at University of Waterloo

Waterloo ON, Canada

Research visit with Éric Schost

Teaching activities

2024: Teaching Assignments - 12h

Leuven, Belgium

- Department of Mathematics - KU Leuven

2020-2023: PhD student with teaching duties - 192h

- Department of Computer Sciences - Sorbonne Université
- Tutorials, Practical Classes, Corrections and courses

2016-2017: Contractual faculty in Computer Sciences - 42h

- Preparatory Classe PC*, Blaise Pascal, Orsay
- Design of Courses, Tutorials, Practicals and (two) Exams, all from scratch
- Lectures, Tutorials, Practical Classes, Corrections and Pedagogic Support
- Preparation of 34 students to national entrance exams for Engineering Schools

Reference: Emmanuel Roblet - emmanuel.roblet@wanadoo.fr

Year	Teaching unit	Level	CM	TD	TP
2024	Linear Algebra & Analysis	Bachelor	-	12h	-
2022-2023	Introduction to Cryptography	M1	-	20h	20h
	Introduction to Algebraic Algorithms	M1	2h	-	-
2021-2022	Data Structures	L2	-	19.5h	19.5h
	Numerical Representation and Methods	L2	-	13.5h	13.5h
2020-2021	Introduction to Programming II (with C language)	L1	-	38.5h	-
	Numerical Representation and Methods	L2	-	13.5h	13.5h
2016-2017	Introduction to Programming (with Python)	PC*	6h	12h	24h

Supervision

2023-2025: PhD supervision committee - PhD student - KU Leuven

Member of the annual committee and PhD defense committee - Erdenebayar Bayarmagnai

07/2021: Co-supervision - first year Master internship - Orsay

Connectivity computations on real algebraic curves, Anis Zidani

Other scientific activities

2023: Reviewer for an article submitted to *Journal of Algebra* and one to ISSAC

2024: Co-organizer of a reading seminar on algorithms in algebraic geometry

[Webpage]

2021-2023: Co-organizer of the MATHEXP-PolSys Seminar

Webpages : [MATHEXP]- [PolSys]

Involvement in the institutions

2021-2023: Elected representative at the Faculty Council and the Training Commission of Sorbonne Université

2020-2021: Representative at the PhD students council of LIP6

2016-17: Elected representative at the Student Life Commission of École Normale Supérieure Paris-Saclay

Skills & Languages

Languages: Français (maternelle), Anglais (Avancé), Espagnol (intermédiaire, 5 mois en Amérique Latine)

Programming: C, PYTHON, JAVASCRIPT, SQL, HTML/CSS

Softwares: \LaTeX , SAGEMATH, MAPLE, UNIX SHELL, GIT

Personal Experiences

2018–2019: Gap year - World tour hitchhiking

Pedagogic project with three classes of first year in middle school and volunteering.

See more: lemondeapetitpas.wordpress.com