Rémi Prébet | Curriculum Vitæ

remi.prebet@lip6.fr • https://lip6.fr/Remi.Prebet

Education

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

In preparation

2023: *Computing roadmaps in unbounded smooth real algebraic sets II: algorithm and complexity*
with M. Safey El Din et É. Schost, (approx. 50 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

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

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
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

07/2021: **Co-supervision of first year Master student**
Connectivity computations on real algebraic curves, Anis Zidani

Autres activités scientifiques

2023: Reviewer for the *Journal of Algebra*
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

Langues: Français (maternelle), Anglais (Avancé), Espagnol (intermédiaire, 5 mois en Amérique Latine)
Programmation: C, Python, Javascript, SQL, HTML/CSS
Logiciels: 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