Antoine Béreau

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Summary

PhD Student at École polytechnique and Inria in the TROPICAL team working on the topic of tropical polynomial system solving using game theoretical tools.

Interests: Tropical geometry, polynomial system solving, resultant theory, symbolic computation, combinatorics, polytopes, mean pay-off games

Education

Present	PhD student on tropical polynomial systems solving at CMAP (École polytechnique) and Inria supervised by Marianne Akian and Stéphane Gaubert	
2021	Master's degree at **ENS Rennes** and **Sorbonne Université** *mention très bien*	(16.275/20)
2020	*Agrégation de mathématiques*	(ranked 47)
2018	Bachelor's degree at **ENS Rennes** and **Université Rennes 1** *mention très bien*	(16.000/20)
2017	Admission at **École Normale Supérieure de Rennes (ENS Rennes)**	
2014	*Baccalauréat Scientifique mention très bien*	(18.000/20)

Publications & preprints

Eigenvalue Methods for Sparse Tropical Polynomial Systems (upcoming) 2024

Marianne Akian, Antoine Béreau, Stéphane Gaubert
To be published in *Lecture Notes in Computer Science* in the proceedings of ICMS 2024
https://inria.hal.science/hal-04575772

The Nullstellensatz and Positivstellensatz for Sparse Tropical Polynomial Systems 2024
(Extended version of the ISSAC' 23 article)

Marianne Akian, Antoine Béreau, Stéphane Gaubert
Submitted to *Foundations of Computational Mathematics* in February 2024
https://arxiv.org/abs/2312.05859

The Tropical Nullstellensatz and Positivstellensatz for Sparse Polynomial Systems 2023

Marianne Akian, Antoine Béreau, Stéphane Gaubert
ISSAC '23: *Proceedings of the 2023 International Symposium on Symbolic and Algebraic Computation*
https://doi.org/10.1145/3597066.3597089

Softwares

Tropical Polynomial System Solving (see the project on Gitlab:)

This project consists in a Python implementation of tropical polynomial and matrices, full and sparse, as classes, and provides some base tools to work with these objects, in particular to examine the solvability of a sparse tropical polynomial system.

Grants & awards

2023 ISSAC 2023 Distinguished Student Author Award
2021 PhD Fellowship: *Contrat doctoral spécifique normalien* (*CDSN*)

Talks

Conference ICMS 2024 in Durham (upcoming) Jul 22 – Jul 25, 2024

Eigenvalue Methods for Sparse Tropical Polynomial Systems

Conference ISSAC 2023 in Tromsø Jul 24 – Jul 27, 2023

The Nullstellensatz and Positivstellensatz for Sparse Tropical Polynomial Systems

SIAM Conference on Applied Geometry in Eindhoven Jul 10 – Jul 14, 2023

The Nullstellensatz and Positivstellensatz for Sparse Tropical Polynomial Systems

Rencontres Doctorales Lebesgue 2023 in Nantes Apr 19 – Apr 21, 2023

Un tour d'horizon des mathématiques tropicales

Journées nationales de calcul formel in CIRM, Marseille Mar 6 – Mar 10, 2023

The Nullstellensatz and Positivstellensatz for Sparse Tropical Polynomial Systems

Workshop ARGO 2022 in Santiago Aug 30 – Sept 2, 2022

The Nullstellensatz for Sparse Tropical Polynomial Systems

Teaching

Teaching assistant 2021–2024

in first year of Bachelor of Science at École polytechnique for the fall semester course MAA101 Linear Algebra for three years

Mathematics and computer science examiner 2020–2021

in first and second year of *classe préparatoire BCPST* (biology, chemistry, physics and geology) at lycée Chaptal, Paris

Mathematics examiner 2019–2020

in first year of *classe préparatoire PCSI* (physics, chemistry and engineering) at ECAM Rennes

Miscellaneous

2022–2023	Referent researcher for the *MATh.en.JEANS* project (a school year long workshop to introduce high school students to mathematical research on open problems) in lycée Gustave Eiffel, Gagny
2018, 2021	Juror and team leader for the 10th and 13th editions of the International Tournament of Young Mathematicians
2018, 2019, 2020	Organiser, juror and team leader for several occurrences of the *Tournoi Français des Jeunes Mathématiciennes et Mathématiciens (TFJM²)*
2018	Local organiser for the *Rendez-vous des Jeunes Mathématiciennes* (a weekend of conferences and research on problems to encourage young girls in high schools to engage in mathematical activities)

Skills

Languages	French (mother tongue), English (fluent C1-C2), German (good level B2-C1)
Computer Skills	Python, Scilab/Matlab, Lean, OCaml, Html/css, LaTeX and Office suite

Last updated: 19th May 2024