Seta Rakotomandimby

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SUMMARY

PhD student at the applied mathematics Cermics lab in École des Ponts ParisTech, my research topics are losses based on subdifferential representations for multiclassification in machine learning and nonconvex dual methods to solve sparse minimization problems. I graduated from the highly recognized engineering school ENSTA Paris in applied mathematics and from the Parisian operational research master MPRO.

RESEARCH EXPERIENCES

PhD: Algorithms in Generalized Convexity Application to Sparse Optimization

Cermics, École des Ponts ParisTech   November 2023 - present

Supervisor: Michel De Lara. I study nonconvex dual methods to solve sparse minimization problems from compressive sensing. I also design convex new losses for multiclassification in machine learning, using convex representations of maximal monotone operators. I implement these methods in `Julia` and `Python`.

Perturbation-Duality Scheme in Combinatorial Optimization and Algorithms in Generalized Convexity

Cermics, École des Ponts ParisTech   April 2023 - September 2023

During this internship, I studied the (Rockafellar) perturbation-duality scheme applied to integer linear programming duality. In a second independent part, I implemented in `Julia` the Capra cutting plane method for sparse problems.

Information Theoretic Clustering Based on Data Compression Principles

University of Eastern Finland   Mai 2022 - August 2022

During this internship in Finland, I studied the minimum description length principle and implemented in `C/C++` the corresponding methods for parameter selection in K-Means.

EDUCATION

2022 - 2023	Operational Research Master (MSc)	(GPA: $\sim$ 4.0)
	at **Conservatoire Nationale des Arts et Métiers (CNAM)**	
2020 - 2023	Applied Mathematics Engineering Degree (MSc)	(GPA: 3.96)
	at **École Nationale des Techniques Avancées (ENSTA)**	
2017 - 2020	*Classe Préparatoire* at Lycée Kléber, Strasbourg, France	

Three years of very demanding courses (about 35 hours per week of science courses, mostly in Mathematics and Physics, with about the same amount of personal work) are dedicated to the preparation for nationwide, extremely competitive exams.

AWARD

2024   Operations Research and Decision Support Master's Thesis Prize

PUBLICATION

[1] S. Rakotomandimby, J.-P. Chancelier, M. De Lara, and M. Blondel. Learning with Fitzpatrick losses, 2024. preprint, link.