

Guilhem Repetto

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Computer Science graduate student
ENS Rennes · IP Paris

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EDUCATION

Polytechnique Institute of Paris (IP Paris)	2024 – 2025
<i>Graduated from the Cyber-Physical Systems program</i>	Paris, France
École normale supérieure (ENS) of Rennes	2022 – 2026
<i>Computer Science Master, Mathematics bachelor</i>	Rennes, France
MPSI – MP	2019 – 2022
<i>Classe préparatoire aux Grandes Écoles, lycée Joffre</i>	Montpellier, France

RESEARCH PROJECTS

Zero-Knowledge Proofs and Multi-Party Computation	2025
<i>Supervised by I. Visconti</i>	Sapienza University , Rome, Italy
Topological analysis of neural networks	2025
<i>Supervised by E. Goubault & S. Putot</i>	École Polytechnique , Palaiseau, France
Zero-knowledge Proofs and Applications	2024
<i>Supervised by F. Koushanfar, G. De Micheli & N. Sheybani</i>	University of California San Diego , CA
Attack Tree Synthesis	2023 – 2024
<i>Supervised by S. Pinchinat & D. Vojtisek</i>	IRISA , Rennes, France
Study of random distributions in the LWE problem	2023
<i>Supervised by A. Roux-Langlois & M. Dien</i>	GREYC , Caen, France

PUBLICATIONS

Popularisation article: *Autour du théorème de Cantor*, to be published in [Quadrature](#)

Textbook: co-author of a mathematics textbook (in French) for high school students entitled [Problèmes originaux pour l'éveil d'une curiosité mathématique](#), Ellipses editions, June 2024.

TECHNICAL SKILLS

Python, OCaml, Rust, Julia, C, Linux, Git

LANGUAGES

French: native speaker
English: C1 Cambridge level, perfect TOEIC score
Mandarin Chinese: notions

ACTIVITIES OF PERSONAL INTEREST

Music: graduated from the music conservatory of Montpellier in percussions. Four sessions in the *Cambridge Heidelberg Montpellier Youth Orchestra* (CHMYO). Various orchestras

Sports: parachutism ($\approx$ 65 jumps), half-marathons

Computer Science

Introduction to algorithms [ALGO1] <i>Graphs, data structures, flows, complexity</i>	F. Schwarzentruher
Advanced algorithms [ALGO2] <i>Study of the NP and co-NP classes, approximation and random algorithms</i>	F. Schwarzentruher
Introduction to cryptography [CRYPTO] <i>Basis of cryptography, levels of security, post-quantum encryption</i>	A. Roux-Langlois
Logic [FOND2] <i>Logic for informatics, proof systems, skolemisation, compactness</i>	D. Baelde
Theory of languages and computability [FOND1] <i>Formal languages, automata and Turing machines</i>	G. Lesventes
Signal processing [TS] <i>Fourier transform, sparse representation</i>	N. Keriven, C. Elvira
Image processing [TRIMG] <i>Pattern search, reconstruction, sparsity</i>	E. Carruyer
Architecture and system [ARCSYS1] <i>Programming in C, introduction to networks</i>	R. Hutin
Programming in OCaml [PROG1] <i>Concepts of functional programming, applications in OCaml</i>	D. Baelde
Programming in C++ [PROG2] <i>Object oriented programming, project</i>	M. Quinson

Mathematics

Algebra and cryptography [MAG1] <i>Finite fields, error correcting codes, elliptic curves</i>	F. Ulmer
Group theory [THGR] <i>Classification of finite order abelian groups, Sylow theorems, simplicity, semi-direct products</i>	T. Schmidt
Rings and arithmetics [ANAR] <i>Principal and factorial rings, formal series, fractions, quotient and localisation</i>	D. Bourqui
Optimisation [MAG1] <i>Extrema on varieties, Lagrange multipliers, Karush-Kuhn-Tucker theorem</i>	B. Huguet
Statistics and probability [MATH2] <i>Estimators, central limit theorem, random walks</i>	F. Schwarzentruher
Lebesgue integration [MATH1] <i>Construction of the Lebesgue integral, introduction to measure theory</i>	R. Carles
General topology [TOPG] <i>Introduction to topology</i>	Z. Ammari
Differential calculus [CD] <i>Infinite dimension, partial differentials, extrema</i>	K. Beauchard
Normed vector spaces [EVN] <i>Ascoli theorem, Hilbert spaces, Fourier series, Baire theorem</i>	J. Sabin

ENS RENNES – MASTER 1 IN COMPUTER SCIENCE

Information theory [TI] <i>Introduction to compression, entropy, correction</i>	É. Fabre
Semantics and proof assistants [SEM] <i>Programming in Rocq</i>	S. Blazy
Complexity theory [THX] <i>PSPACE, EXPTIME, alternating machines, polynomial hierarchy, undecidability</i>	F. Schwarzentruher
Machine learning [ML] <i>Binaires decision trees, reinforcement learning, neural networks</i>	E. Kijak, R. Gaudel
Compilation [GCC] <i>General compilation concepts</i>	S. Rokicki

IP PARIS – MASTER 2 IN CYBER-PHYSICAL SYSTEMS

Introduction to the verification of neural networks [CSC_54441_EP] <i>Explainability, fairness, formal methods approaches for verification of neural networks</i>	S. Putot
Decision Procedures for Artificial Intelligence [CSC_54656_EP] <i>Task planning, SMT techniques, CDCL algorithms and classical constraint programming</i>	A. Chapoutot
Modeling and analysis of security risks in complex systems [CSC_55L03_TP] <i>Modeling of information security, threat modeling, quantitative methods for risk management</i>	J. Leneutre
Navigation for Autonomous Systems [CSC_54456_EP] <i>Navigation, obstacle avoidance, localization, mapping, filtering and optimization techniques</i>	D. Filliat
Numerical methods for dynamical systems [CSC_53656_EP] <i>Safe numerical simulation methods, resolution of differential equations</i>	J.-A. dit Sandretto
Embedded Critical Real-Time Systems (STREC), part 1 [CSC_55E01_TP] <i>Real-time System Scheduling, mono and multiprocessor systems</i>	L. Pautet
Embedded Critical Real-Time Systems (STREC), part 2 [CSC_55E02_TP] <i>Code generation, temporal logics</i>	D. Blouin
Introduction to Control Theory [APM_4AUT2_TA] <i>Linear, PID and MPC controllers, controllability and observability</i>	E. Vanneaux
Introduction to Cryptology [CSC_51058_EP] <i>Cryptanalysis, discrete logarithm, asymmetrical cryptography, signature, real life protocols</i>	F. Morain
Advanced Cryptology [CSC_52068_EP] <i>Elliptic curves, lattices, side-channel attacks, post-quantum cryptography</i>	B. Smith

COLLÈGE DE FRANCE

Introduction to complexity classes <i>PSPACE, EXPTIME, alternating machines, polynomial hierarchy, undecidability</i>	Sir T. Gowers
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