Augustin ALBERT

PhD student, Theoretical Computer Science

I am a first year PhD student at École Polytechnique in the Cosynus team working on directed algebraic topology and homology theories with application to distributed systems, under the supervision of Éric Goubault and Jérémy Dubut.

Education

2025-2028 **PhD in computer science**, *Polytechnique*, Palaiseau
Supervised by Éric Goubault and Jérémy Dubut

2024-2025 **Parisian Master of Research in Computer Science – M2**, *Université Paris-Cité*, Paris

2022-2023 **Parisian Master of Research in Computer Science – M1**, *École Normale Supérieure Paris-Saclay*, Gif-Sur-Yvette

2021–2022 **Bachelor's in Computer Science**, *ENS Paris-Saclay*, Gif-sur-Yvette

2019–2021 **Classe préparatoire MPSI then MP***, *Lycée Malherbe*, Caen

Previous Research Experience

2025 **Supervised by Éric Goubault and Jérémy Dubut**, *LIX*, Palaiseau, 5 months
Concurrency theory and persistent homology
- Introduction of abelian framed bicategories
- applications to directed homology theories

2023–2024 **Supervised by Kathryn Hess Bellwald**, *EPFL*, Lausanne, 10 months
Graph Homology for Higher Order Interactions in Networks
- Homological perspective on graph invariants

2023 **Supervised by Giuseppe Rosolini**, *DIMA*, Genoa, 5 months
Doctrines, Modalities, and the Computational Lambda Calculus
- Categorical approach to modality operators in Moggi's computational λ-calculus

2022 **Supervised by David Delahaye**, *LIRMM*, Montpellier, 6 weeks
Resolution Modulo Theories using Superdeduction
- Adding new rules to a proof search method
- Implementation in the Vampire automated theorem prover

Academic Projects

2022–2023 **Proost**, *Computer Science Department*, ENS Paris-Saclay
Proof assistant written in Rust

Languages

French **Native**

English **Advanced C1**, *Cambridge English qualification*

Computer Skills

Languages **Ocaml, Rust, Coq, C, C++, Python**

Tools **LaTeX, Typst, Linux, Z3, Jupyter, Macaulay2**

augustin.albert@ens-paris-saclay.fr
www.lix.polytechnique.fr/~albert/

Teaching

2025 **Introduction to Computer Programming**, *Tutorials*, Bachelor of science, Polytechnique
Programming in Python for first year bachelor students

2026 **Concurrent and Distributed Computing**, *Tutorials*, Bachelor of science, Polytechnique
Programming in C++ for third year bachelor students

Talks

2025 **Invited talk at RaPS#3**