Samuel Debray

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Education

Degrees

- 2023 ÉNS Paris-Saclay Diploma, École Normale Supérieure Paris-Saclay, Gif-sur-Yvette Computer Science track, International Research path
- 2022 Master of Cognitive Science, École Normale Supérieure, Paris, magna cum laude
- 2020 Bachelor of Theoretical Computer Science, Université Paris-Cité, Paris, summa cum laude
- 2017 **French Baccalaureate**, *Lycée du Parc*, Lyon, summa cum laude Biology, Further Mathematics and Advanced English.

Curriculum

- 2023–2026 **Graduate Studies**, *Université Paris-Saclay*, Saclay Subjet: Representation of Mathematical Concepts in the Human Brain and Artificial Neural Networks (working title) Advisor: Prof. Stanislas Dehaene
- 2021–2022 Second year of CogMaster, École Normale Supérieure, Paris, magna cum laude Classes followed: Education and Cognition, Methods in Neuroimaging, Super Semantics, The Origins of Concepts.
 External courses: Theoretical Neuroscience (Biology department).

2020–2021 First year of Master Parisien de Recherche en Informatique (MPRI), École Normale Supérieure Paris-Saclay, Gif-sur-Yvette, magna cum laude Classes followed: Basics of Verification, Initiation to Research, Lambda-calculi and Categories, Probabilistic Aspects of Computer Science, Rewritting Techniques, Tree Automata and Applications. External courses: Algebraic Combinatorics (Université Paris-Saclay), Introduction to Greek History (ÉNS).

- 2019-2020 **Third year of Bachelor in Theoretical Computer Science**, *École Normale Supérieure Paris-Saclay*, Cachan, summa cum laude Classes followed: Algorithmics, Computability and Complexity, Database, Discrete Mathematics, Formal Languages, Lambda-calculus, Logic, Logic Project (Coq and DPLL), Machine Architecture and Operating Systems, Programming and Semantics, Programming Project (C to Assembly compiler).
- 2017-2019 Classes Préparatoires aux Grandes Écoles, Lycée du Parc / Lycée Louis-le-Grand, Lyon / Paris, MPSI–MP*

Two-year intensive training program in mathematics, physics and computer science. First year in Lyon and second year in Paris.

Work experience

Research internships

2022–2023 Year-long Internship Abroad, *ILLC – University of Amsterdam*, Amsterdam

Study of the conditional reasoning abilities of LLMs (GPT-3 and OPT). We also created a dataset of conditional sentences featuring different kind of causal relations between the antecedent and the consequent.

2021-2022 M2 Research Internship, UNICOG - INSERM-CEA, Gif-sur-Yvette

Subject: A Concurrent NLP-fMRI Approach to the Brain's Mathematical Network Supervisor: Prof. Stanislas Dehaene

Creation of a semantic map of mathematics using a vocabulary generated from Wikipedia. We then used this data to model the brain's mathematical networks. In parallel, we tried to compare a neural network's performance to human subjects' on mathematical tasks.

February- M1 Research Internship, Computer & Information Sciences Department – University of Strath-

July 2021 clyde, Glasgow

Subject: Deterministic Strategies in Concurrent Games and their Relation with Semantics and Logic Supervisors: Prof. Glynn Winskel and Dr. Simon Castellan

Study of correspondences between some strategies in concurrent games and morphisms of other structures (domains and dialectica categories). This allows to build a bridge between concurrent games and semantics on the one hand, and with linear logic on the other hand.

June-July L3 Research Internship, IRIF - Université Paris-Cité, Paris

2020 Subject: Coq-certified Extensions of a First Order Logic Course Supervisor: Prof. Pierre Letouzey

Pedagogical encoding of first order logic and natural deduction in Coq. I participated in the encoding of Peano Arithmetics, ZF set theory and an enriched λ -calculus (along with the associated Curry-Howard isomorphism); and to the simplification of preexisting proofs thanks to the creation of suitable tactics.

2018–2019 **Travaux d'Initiative Personnelle Encadrés (TIPE)**, *Lycée Louis-le-Grand*, Paris Subject: Geometry and Cryptologic Interests of Elliptic Curves Small research project for students of classes préparatoires, supervised by their mathematics teacher.

Teaching

- 2023–2026 Teaching Assistant, *IUT d'Orsay*, Saclay
 64 hours per year of exercise sessions in mathematics and computer science for undergraduate students.
- 2021–2022 **Oral Examination in Classes Préparatoires**, *Lycée Janson de Sailly*, Paris 58 hours of mathematics oral examination in first year of classes préparatoires (Mathematics, Physics and Engineering track).
- 2020–2021 **Oral Examination in Classes Préparatoires**, *Lycée Polyvalent de Cachan*, Cachan 95 hours of mathematics oral examination in first year of classes préparatoires (Technology and Egineering track).

March-April Pedagogical Internship, Lycée du Parc, Lyon, (remote)

2020 Mathematics and physics classes to students preparing the French Baccalaureate. Due to the lockdown, we had to think of alternative ways of making students interact together, which led to the publication of an article in a French review for high school teachers.

Languages

French Mother tongue

English Fluent

German Working knowledge

IELTS Academic, score 8.5 / 9