Sacha Ben-Arous

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Education

École Normale Supérieure Paris-Saclay, Department of Mathematics.

- **Master 1 :** Master Jacques Hadamard, Paris-Saclay University. Sept 2024 - July 2025
- **License 3 :** License de Mathématiques renforcée, Paris-Saclay University. Sept 2023 - July 2024

École Normale Supérieure Paris-Saclay, Department of Computer Science.

- **License 3 :** License d'Informatique renforcée, Paris-Saclay University. Sept 2022 - July 2023

Lycée Janson de Sailly, Classes préparatoires aux grandes écoles (CPGE), Paris.

- MPSI, MP* : Mathematics, Physics, Computer Science. Sept 2020 – July 2022

Interships

Paradifferential K.A.M theory, supervised by Thomas Alazard, E.N.S Paris-Saclay. April 2023 – June 2023

- Simplified approach of K.A.M-like theorems using the theory of paradifferential operators.

The MP-LWE problem, supervised by Alice Pellet-Mary, University of Bordeaux. June 2022 – July 2022

- Study of the Learning With Errors (LWE) problem and reduction of some of its polynomial variants.

Projects

Go language compiler

- Developed a compiler of a simplified version of the Go language to ASMx86-64.
- Tools Used: OCaml, ASMx86-64, Menhir, Yacc.

Automatic proofs of first order predicates

- Implemented the method of semantic tableaux to constructively prove or refute a first order predicate.
- Tools Used: OCaml, Menhir, Yacc.

Minimal computer

- Emulated, in a custom framework, a simple computer with a cpu and ram, only using logic gates.
- Tools Used: Assembly x86-64.

Custom shell

- Wrote my own shell for Unix OS.
- Tools Used: Bash, C, Menhir, Yacc.

Syntaxic analyser

- Wrote a syntaxic analyser for a toy language that checks if a program is syntactically correct, then pretty print it and performs random specification tests.
- Tools Used: C, Flex.

Awards

Mathematics Olympiads, Martinique (1st): Ranked 1st among high school students in the department of Martinique, France.

Technologies

Languages: Python,TEX, Sagemath, OCaml, C, Bash, Assembly x86-64.