Théo LACOSTE

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SKILLS

French
Native

English
C1+ (speaking)
B2 (writing)

Formal methods

Programmation

Writing & Presenting

HOBBIES

Cooking / Baking

Video games

Badminton

Curriculum Vitae

WORK EXPERIENCES

Oct 2024 to Today

PhD computer science co-supervised
A Process for the Development of Correct-by-construction and Time-aware System Specification

- B method, Event-B and their tools
- Time representation CCSL, TASTD
- Case studies

Mars 2024 to July 2024

Internship : Formal Modelisation of Railway Interlocking - SNCF

- Graph modelisation of railway network for instantiating verification properties
- Learn and use SNCF database
- Understanding of previous works (master's thesis & PhD thesis)
- Learn and use a specific langage for railway system similar to NuSMV
- Formal verification using NuSMV

May 2023 to July 2023

Research Intership – LaBRI

- Understanding of an article by Corto Mascle and Stefan Kiefer
- Implement an algorithm finding killing Words in unanbiguous automata
- Pseudo-random generation of unanbiguous automata

FORMATION

Sept 2024 to Today — *PhD - UPEC/UDS*

Logiciels de preuve (UPEC)
- Lectures on B method

Théorie du calcul (UDS)
- Clomplexity classes of computer science problems and proofs of their belonging (P, NP, BQP, PSPACE) + quantum computing

MOOC
- Scientific integrity
- Teach at the University

Sept 2022 à Aug 2024 — *Master Software Verification - UBx*

Seminars
- Presentation of « Thread modularity at many levels », on the verification of concurrent programs with Master's degree students as targeted audiance
- Presentation of « ICE : A robust framework for learning invariants », on the research of invariants of programs with a new framework (Implication, Counter-example, Example)
- Presentation of « Memoryless determinacy of parity and mean payoff games : a simple proof »

Software verification (multiples lectures)
- Bounded Model checking
- Abstract interpretation
- Proofs with Frama-C, WP calculus
- Simulations and computing on Altarica

Introduction to verification
- LTL to Büchi (Ocaml), project aiming at converting a LTL formula into a Büchi automata
- Learning of different logics FO, LTL, CTL and their sub-families

Calculability and complexity
- Creation of SAT solver (Z3) for a game (Sudoku-like)
- Complexity classes

Logics and languages
- Learning of logics MSO and relational and proofs using Ehrenfeucht-Fraïssé theorem

Sept 2018 to May 2022 — *Licence Computer Science – Ubx*

Coq/Rocq (Proof assistant)
Binary trees handling on Ocaml
Projects in Java
Learning of different languages of programmation :
- Ocaml, Y86, LaTeX, Python, Java, C

2018 — *Baccalauréat S – Lycée P. Cousteau*

Spécialité Mathématiques
Mention Assez bien

TEACHINGS

Sept 2022 to Oct 2022 — *Introduction à Python – UBx – (about 9h)*
- Teacher assistant
- Helping strugling first year students in Python

Jan 2025 to April 2025 — *Introduction à l'assembleur – UPEC - 19h*
- Lab sessions on NASM
- First year students

Jan 2025 to April 2025 — *Architecture Matérielle – UPEC - 32h*
- Lab sessions 20h : building a PC
- TA 12h : logical circuits, Propositional logic
- First year students

Jan 2025 to April 2025 — *Représentation des données – UPEC – 10,5h*
- Tutorial classes : binary/hexa, binary calculus, conversion to flots and their operations
- First year students

Aug 2025 to Dec 2025 — *Logique et mathématiques discrètes – UDS – 39h*
- Teacher assistant
- First order using Tarski, proof assistant PANDAS, sets and relations, B method via ProB
- First to third year students

Jan 2026 to April 2026 — *Logique et mathématiques discrètes – UDS – 39h*
- Tutorial classes
- First order using Tarski, proof assistant PANDAS, sets and relations, mathematical proofs
- First to third year students