

Andrea Laretto

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
EDUCATION

M.Sc in Computer Science (expected 110/110 hons., avg. 31.48/30) "Software: Programming, Principles and Techniques" Curriculum (in English)	University of Pisa, IT Sept. 2020 – Oct. 2022 (expected)
B.Sc in Computer Science (110/110 hons., avg. 29.75/30) "Languages and Systems" Curriculum	University of Turin, IT Sept. 2017 – June 2020


THESES

Categorical Presentation of Quantified Temporal Logics in Agda (Upcoming) M.Sc Thesis, supervisor Fabio Gadducci, co-supervisor Davide Trotta	University of Pisa, IT Feb. 2022 – Oct. 2022
Formalizations of the Church-Rosser Theorem in Agda () () B.Sc Thesis, supervisor Ugo de' Liguoro, co-supervisor Riccardo Treglia	University of Turin, IT Nov. 2019 – Apr. 2020

PREPRINTS

Positive normal forms for counterpart-based temporal logics () () Joint work with Fabio Gadducci, Davide Trotta	June 2022
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ACHIEVEMENTS

AILA 3+2 prize for best Italian theses in logic Awarded to the B.Sc thesis "Formalizations of the Church-Rosser Theorem in Agda"	2021  Announcement (in Italian)
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WORK EXPERIENCE

University Tutor Private in-person Haskell and Agda tutoring with CS university students	Turin Feb. 2022 – July 2022
Upwork Tutor Remote assistance with Haskell and OCaml homeworks, projects, university exams	online May 2021 – Sept. 2021

PROJECT WORK (SELECTION)

Contributions to <i>agda-categories</i> Additions to the <i>agda-categories</i> library, with Fosco Loregian (@tetrapharmakon); monad morphisms , category of adjunctions splitting a monad , representable profunctors , coEilenberg-Moore categories and Mac Lane comparison functor , Kleisli extension and isomorphisms in Kleisli , quantaes , simple/ordinary slices and Kleisli/Eilenberg-Moore categories of the product comonad	Nov. 2021 – ongoing  agda/agda-categories
Formal Methods in Agda Agda formalizations for some of the material in the "Formal Methods for Computer Science" bachelor's course: semantics of imperative languages, separation logic and frame rule, Hoare logic, security-based type systems with their type preservation and progress	Sept. 2020  formal-methods
MicroC LLVM compiler Compiler for a C-like language written in OCaml, using LLVM as compilation backend and ocamllex/Menhir as frontend; supporting multidimensional arrays and structs	Dec. 2020 - Feb. 2021  compiler-course-unipi
Monoid Forth Bootstrapping x86_64 operating system and minimal Forth interpreter, easily portable and self-bootstrapping, with small-footprint UEFI interfacing and support	Aug. 2021  monoid-forth
Sol language Toy interpreter for a Smalltalk-inspired programming language written in Java, with metaclasses, tail recursion, dictionary-based class reflection, HTTP and sockets support	Nov. 2019  sol-lang

INTERESTS

- (implementations of) dependent type theory, proof assistants, category theory, homotopy type theory
- functional programming, programming language theory, operational and denotational semantics
- models of computation, λ -calculus, confluence, term rewriting, graph rewriting, e-graphs
- compilers, abstract machines, static analysis, concatenative programming

COURSES ATTENDED (SELECTION)

Foundation of Computing	2021
Category theory, algebraic and logical foundations; higher-order, recursive typing, Curry-Howard, CCC; petri nets, PCF, π -calculus and their models; LTS and coalgebras	Ugo Montanari Grade: 30L/30
Principles for Software Composition	2021
Models of computations, operational and denotational semantics; modelling languages with higher-order, concurrent, probabilistic features; temporal and modal logics	Roberto Bruni Grade: 30L/30
Languages, Compilers, and Interpreters	2020
Lexical analysis, parsing, intermediate representations, abstract interpretation; laboratory project developing a C-like compiler in OCaml with LLVM, ocamllex, Menhir	Letterio Galletta, Roberta Gori Grade: 30L/30
Advanced Programming	2020
Modern concepts and pragmatics of programming languages; OOP and design patterns, JVM and Java Streams, Haskell and monads, implementation and semantics of Python	Andrea Corradini Grade: 30L/30
Software Validation and Verification	2022
Temporal and modal logics, LTL, CTL, CTL*; safety and liveness properties, fairness; Büchi automata, ω -regular properties, model checking algorithms; spatial logics	Fabio Gadducci Grade: 30/30
Laboratory for Innovative Software	2022
Hands-on research work on hardware-based security; student group project implementing microarchitectural CPU models with secure interruptible enclaves in OCaml	Gian-Luigi Ferrari, Chiara Bodei Grade: 30L/30
Language-based Technology for Security	2022
Low-level security flaws, memory corruption, language implementation and attacks; security measures, hidden channels, information flow security, static analysis	Gian-Luigi Ferrari, Chiara Bodei Grade: 30L/30
Formal Methods for Computer Science	2019
Hoare logic, imperative semantics for IMP, Isabelle theorem prover (now in Agda!); type systems for confidentiality and information flow, separation logic and VeriFast	Ugo de' Liguoro Grade: 30L/30

TECHNICAL SKILLS

Languages: Haskell, Agda, OCaml, Rust, TypeScript, Idris, Elm, Scheme, C/C++, Java, Python, JavaScript, HTML/CSS
Frameworks: LLVM, Menhir, Dune, Parsec, Megaparsec, Warp, NumPy, OpenMP, Pandas, SciPy, Matplotlib
Tools: Visual Studio Code, Git, GitHub, LaTeX, TikZ
Operating Systems: NixOS, Xubuntu, Windows

LANGUAGES

Italian: native
English: professional (C1 self-assessed, B2 certificate)
Japanese: good reading skills, limited working proficiency

SHORT SELF-INTRODUCTION

Always eager to learn new concepts, with equal interest in both the theoretical and the practical point of view. Extremely passionate about teaching and explaining new concepts to others, striving for practicality, simplicity, and ease of understanding. Comfortable working both in groups as well as delivering results individually. Currently a mentee in the SIGPLAN-M long term mentoring program under the supervision of Fosco Loregian.