Amelia Dobis

PhD Candidate at Princeton Universtiy · Programming Languages and Compilers
Paris, Île-de-France, France, 95011
amelia.dobis@princeton.edu https://cs.princeton.edu/~ad4048 dobios

research interests: Hardware Language Design, Compiler Construction, Modal Logics, Formal Verification

Education

Princeton University — Princeton, NJ, USA

Doctor of Philosophy, PhD in Computer Science — August 2024 - present

- Advisor: Mae Milano, Princeton PL/SNS groups; co-advised by Kevin Laeufer at Cornell University.
- Researching Programming Languages for Hardware-Software Co-Design and Verification.

Eidgenössische Technische Hochschule Zürich (ETH Zürich) — Zürich, ZH, Switzerland

Master of Science, MSc. in Computer Science — August 2021 - April 2024

- Major: Secure and Reliable Systems; minor: Computer Graphics.
- Thesis: Formal Verification of Hardware using MLIR, advised by Kevin Laeufer (UC Berkeley) and Prof. Zhendong Su (ETH Zürich).

École Polytechnique Fédérale de Lausanne (EPFL) — Lausanne, VD, Switzerland

Bachelor of Science, BSc. in Computer Science — August 2016 - Septembre 2020

- Focus: Computer Engineering.
- Thesis: Accelerating Ray-tracing on FPGA (at the Processor Architecture Lab (LAP) EPFL).

Experience

Research Engineer — Paris, IDF, France (remote)

YosysHQ — June 2026 - Present

Part-time researcher on the PropertyIR project, focused on developing a general solution for gradually synthesizing SVA properties.

Doctoral Researcher — Princeton, NJ, USA

Princeton University — August 2024 - Present

Working at the intersection of Programming Languages and Computer Architecture to create a unified language for embedded systems projects that can model and verify full hardware-software co-design systems.

Compiler Engineer — Berkeley, CA, USA

SiFive, Inc. — March 2024 - August 2024

Worked on both the CIRCT and Chisel teams on various formal verification projects. Specifically on extending temporal logic support in CIRCT and introducing a verification based Intermediate representation capable of supporting modular specifications.

Visiting Researcher — Berkeley, CA, USA

University of California, Berkeley — August 2023 - April 2024

Extended the CIRCT hardware compiler framework to support formal verification of linear temporal logic specifications.

Research Assistant — Lugano, TI, Switzerland

Università della Svizzera Italiana (USI) — June 2023 - April 2024

Software Engineer for the SURE sustainable development project, where we developed a video game called “Ensured Energy”, illustrating the impacts of energy management decisions, as well as natural and societal disasters, on the Swiss energy grid.

Software Engineer — Lausanne, VD, Switzerland

Gamelab Lausanne — March 2020 - March 2023

Game developer for the GameLab research group at the University of Lausanne in collaboration with Digital Kingdom and LeTemps across two projects named “Lausanne 1830” and “Quatre Apparts et un Confinement”.

Research Assistant — Copenhagen, Denmark

Technical University of Denmark (DTU) — September 2020 - September 2021

Researched High-level hardware verification, through the Chiselverify project, which adds support in Chisel for Constraint Random Testing, Functional Coverage, Bus Functional Models and functional coverage driven mutation based fuzzing for digital circuits.

Publications

Encoding Purely Functional Languages in an RTL-based Compiler LATTE 2026
Amelia Dobis*, Gongqi Huang*, Mae Milano March 2026

Incremental Conversion of SVA Properties to Synthesizable Hardware LATTE 2025
Amelia Dobis, Fabian Schuiki, Mae Milano March 2025

Formal Verification of Hardware using MLIR Masters Thesis, ETH Zürich
Amelia Dobis April 2024

Verification of Chisel Hardware Designs with ChiselVerify Microprocessors and Microsystems, Volume 96
Amelia Dobis, Kevin Laeufer, Hans Jakob Damsgaard, Tjark Petersen, Kasper Hesse, Enrico Tolotto, Simon Thye Andersen, Richard Lin, Martin Schoeberl February 2023

Enabling Coverage-Based Verification in Chisel ETS 2022
Amelia Dobis, Hans Jakob Damsgaard, Enrico Tolotto, Kasper Hesse, Tjark Petersen, Martin Schoeberl May 2022

Towards Functional Coverage-Driven Fuzzing for Chisel Designs WOSET 2021
Amelia Dobis, Tjark Petersen, Martin Schoeberl Novembre 2021

ChiselVerify: An Open-Source Hardware Verification Library for Chisel and Scala NorCaS 2021
Amelia Dobis, Tjark Petersen, Hans Jakob Damsgaard, Kasper Hesse, Enrico Tolotto, Simon Thye Andersen, Richard Lin, Martin Schoeberl October 2021
Best paper award

Teaching

Graduate Instructor (teach lectures, design & grade exams and assignments, supervise TAs):

COS-417: Operating Systems Spring 2026 - Princeton University
COS-217: Introduction to Programming Systems Fall 2025 - Princeton University
252-0061-00L: Systems Programming & Computer Architecture Fall 2021 - ETH Zürich

Teaching Assistant (help students in lab sessions, grade assignments/exam):

DTU-02155: Computer Architecture and Engineering Fall 2020 - Technical University of Denmark
CS-209: System-on-Chip Architecture Spring 2020 - EPFL

Awards & Fellowships

Oregon Programming Languages Summer School Full Fellowship July 2025
Princeton Engineering Graduate Fellowship August 2024
Cornell Bowers CIS Dean's Excellence Fellowship February 2024
Swiss Game Award 2022 for Best Serious Game November 2022
NorCaS 2021 - Best Paper Award October 2021

Service

Program Committee Member: LATTE'26, DSD'23, DSD'24, DSD'25, DSD'26, VALID'23
Journal Reviewer: TODAES - 2024, 2025
Conference Co-Chair: NJPLS Dec 2025
Steering Committee: NJPLS

Skills

Languages: English (Native), French (Native), Portuguese (Native), German (B2), Japanese (N3), Danish (A2)
Programming Languages: C/C++ (+ LLVM MLIR), Python, Scala, C#, Bash, Rust, OCaml, Haskell, Java, Kotlin,…