

Mehrad Haghshenas

PHD, UNIVERSITY OF WATERLOO

Canada

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Research Interests

Formal Verification

Automated Theorem Proving

Programming Languages

Static Analysis

Logic

Functional Programming

Education

University of Waterloo

Canada

PH.D. IN COMPUTER SCIENCE (MEMBER OF THE CRYSP LAB)

Expected: Jan. 2029

- Cumulative GPA: **94.00 / 100.00**.
- Working on developing a *Rust-based transpiler that converts programs and specifications into SMT-LIB formulas, used to encode reference implementations of interpreters to support automated formal verification, equivalence checking, and enumerative testing* supervised by **Dr. Meng Xu**.

Utrecht University

Netherlands

COMPUTING SCIENCE

Graduation: Jan. 2024

- Cumulative GPA: **3.94 / 4.00** (*Summa cum laude*).
- Thesis: *Automated Verification of Hoare Triples: A Comparative Study on Static Inference of Loop Invariants* – Grade: **4.00 / 4.00**, supervised by Dr. S.W.B. Wishnu Prasetya and Prof. dr. ir. Frank van der Stappen.

Awards

2025 **International Doctoral Student Award (IDSA)**, Awarded by the University of Waterloo.

Canada

2023 **Scholarship**, Awarded by Utrecht University.

Netherlands

Work Experience

ABN AMRO

Netherlands

FULL-TIME MAINFRAME DEVELOPER

Mar. 2024 - Dec. 2024

- Reviewed and refactored legacy COBOL code. Investigated automated testing frameworks (*Topaz for Total Test*). Updated technical documentation. Collaborated in Agile teams following Scrum methodologies.

Hudson Dynamics B.V.

Netherlands

EMBEDDED SOFTWARE ENGINEER INTERN

Jun. 2023 - Dec. 2023

- Worked on the development of automated vehicles. Programmed the robotic arm of an electric loader to ensure precise vertical lift path control. Designed its control system using Parker IQAN software. Modeled the arm's search space with Denavit–Hartenberg notation and applied forward and inverse kinematic analysis.

Volunteering Activities

Hack the North

Canada

PARTICIPANT

12 – 14 Sep. 2025

- Selected to join Canada's biggest hackathon, organized by the University of Waterloo.

Rust Z3 bindings

GitHub

OPEN-SOURCE CONTRIBUTOR TO THE [Z3 Rust API](#).

Sep. 2025

- Contributed feature enhancements including floating-point NaN constructors, Int–Real mixed arithmetic, 128-bit integer support, string comparison, sequence utilities, and rounding-mode APIs. Implemented correctness fixes such as improved handling of *Probe::It* arguments and model retrieval documentation. Authored the [Rust bindings guide](#), published on the official Z3 project website.

Stanford University Code in Place

Online

VOLUNTEER TUTOR

Apr.–May 2023, 2024, & 2025

- Volunteer tutor for Stanford's Code in Place (2023, 2024, 2025), mentoring 15 students over 6 weeks each year.

Formal Methods Europe

Europe

MEMBER

Oct. 2023 – Present

- An organization that promotes research in formal methods to improve software and hardware systems.

Utrecht University Hackathon

Netherlands

PARTICIPANT

24 – 25 May 2023

- Co-hosted by SUE Co., the event focused on the applications of AI in Software Development, GitHub Copilot, and AWS.

TEDx Organizing Committee

ORGANIZING COMMITTEE VOLUNTEER, TEDx EVENT.

- Served on the organizing committee for a TEDx event focused on the themes Fight or Flight and Sustainability.

Netherlands

15 Apr. 2023

Teaching Assistant

Software and Systems Security

Canada

CS 453 / 698 @ UNIVERSITY OF WATERLOO

May 2025 - Aug. 2025

- Authored Assignment 2 for CS 453/698, designed to teach students fuzzing, differential testing, and reducing test cases via delta debugging.

Introduction to Computer Science 2

Canada

CS 116 @ UNIVERSITY OF WATERLOO

Jan. 2025 - May 2025

- Graded assignments on the fundamentals of programming.

Summer School

Queen Mary University of London

England

THREE-WEEK COURSE: *Business and Society: The Changing World of Work*

Jul. 2022 - Aug. 2022

- 15 UK credits (7.5 ECTS); grade: **A** (75.6/100).

Utrecht University

Netherlands

ONE-WEEK COURSE ON *Advanced Functional Programming in Haskell* (DR. WOUTER SWIERSTRA)

Jul. 2022

- No exam was administered.

Miscellaneous

Languages English (**IELTS 8.5**, taken on Nov. 3, 2023), Persian (native).

Programming Rust, Coq, C, Python, Haskell, Java, COBOL, MATLAB, JavaScript, R, SQL, C#.

Relevant Courses Software & Systems Security, Languages & Compilers, Functional Programming, Software Testing & Verification, Logic for Computer Science, Operating Systems, Software Verification Using Proof Assistants.