

# Negar Fathi

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[Webpage](#) | [LinkedIn](#) | [GitHub](#) | [Google Scholar](#)

## PROFILE

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Ph.D. student in Computer Science at the University of Nebraska-Lincoln specializing in program analysis, formal verification, and automated reasoning. Interested in static and dynamic program analysis, SAT/SMT-based reasoning, compiler-driven techniques, and software testing to improve software reliability and verification.

## EDUCATION

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**Ph.D. in Computer Science** 2023–Present

University of Nebraska-Lincoln (UNL), Lincoln, NE, USA

**GPA:** 3.85/4.00 (current)

**Research Focus:** *Formal verification and program analysis methods for verifying safety and liveness properties, with an emphasis on termination and non-termination reasoning.*

**Advisor:** [Dr. Rahul Purandare](#)

**M.Sc. in Computer Engineering (Software)** 2018–2021

Iran University of Science and Technology (IUST), Tehran, Iran

**GPA:** 18.69/20.00 (Ranked 1st)

**Thesis:** *Development of a Constraint Solver to Determine the Domain for Complex Data Types*

**Supervisor:** [Dr. Saeed Parsa](#)

**B.Sc. in Computer Engineering (Software)** 2013–2017

Babol Noshirvani University of Technology (NIT), Babol, Mazandaran, Iran

**GPA:** 17.29/20.00 (Ranked 1st)

**Final Project:** *Study and Investigation of Routing Protocols in Wireless Sensor Networks*

**Supervisor:** [Dr. Mojtaba Mansouri](#)

## SKILLS

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**Program Analysis & Verification:** LLVM/Clang, Roslyn, DG & Frama-C (static slicers), KLEE, Z3

**Testing & Fuzzing:** AFL (coverage-guided fuzzing), NUnit, IntelliTest

**Programming Languages:** C, C++, C#, Python

**Frontend Development:** HTML, CSS, JavaScript

**Backend Development:** Entity Framework Core, ASP.NET Core (Web API, MVC)

**Databases:** Microsoft SQL Server, PostgreSQL

**DevOps & Tools:** Docker, Git

## PUBLICATIONS

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- Manuscript on automated reasoning about program termination and non-termination, *under peer review*, 2025.
- A. Kalaei, S. Parsa, and N. Fathi, “COSMOS: A Comprehensive Framework for Automatically Generating Domain-Oriented Test Suite,” *Information and Software Technology*, vol. 154, p. 107091, Feb. 2023, doi: [10.1016/j.infsof.2022.107091](https://doi.org/10.1016/j.infsof.2022.107091).

## EXPERIENCE

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**Graduate Research Assistant**

*Fall 2023–Summer 2025*

University of Nebraska-Lincoln, Advisor: Dr. Rahul Purandare

## SELECTED PROJECTS

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- **Hospital Admission System** models and optimizes hospital workflows using BPMN, UML, DFD, and dashboard analysis to enhance efficiency and performance evaluation.
- **Software Modularization** analyzes and visualizes software structure using class dependency extraction, clustering with Bunch, and automated package diagram generation in C#, Graphviz, and Rational Rose.
- **UML-Based Code Generation and Unit Testing** implements class diagrams, automated C# code generation, and verification through unit tests using Visual Paradigm, Visual Studio, and NUnit.
- **Clean Code Analyzer** analyzes C# source code using Roslyn to detect violations of clean code principles, including naming, structure, and complexity metrics, with detailed visualization in a Windows Forms interface.
- **COSMOS** implements a comprehensive framework for automatically generating domain-oriented test suites.
- **Client-Server Communication** implements synchronous and asynchronous client interaction with a C# web service to demonstrate performance and concurrency differences.
- **Warehouse Management System** implements a PostgreSQL-based backend with table inheritance, data queries, stored procedures, and C# integration through Npgsql in Visual Studio.
- **Taxi Density Clustering** performs spatial clustering of taxi trajectory data using DBSCAN in ELKI after randomized data sampling with C#, identifying regions of high taxi density based on geographic coordinates.
- **EDFNet** implements an early-fusion framework of RGB, edge, and depth modalities for thin-obstacle segmentation in UAV navigation.

## CERTIFICATIONS

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- **C# Programming – Beginner Certification**, Information Technology Learning Lab (LAITEC), Sharif University of Technology, *Jan. 2019*
- **ASP.NET**, Information Technology Learning Lab (LAITEC), Sharif University of Technology, *Oct. 2019*
- **ASP.NET MVC – .NET Framework**, Information Technology Learning Lab (LAITEC), Sharif University of Technology, *Nov. 2020*
- **Oregon Programming Languages Summer School (OPLSS): Types, Semantics, and Applications**, Boston University, *Jun. 2024*
- **Oregon Programming Languages Summer School (OPLSS): Types, Logic, and Formal Methods**, University of Oregon, *Jun. 2025*

## HONORS & AWARDS

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- Ranked 1st among B.Sc. students in Computer Engineering, Babol Noshirvani University of Technology, *2017*
- Ranked 1st among M.Sc. students in Computer Engineering, Iran University of Science and Technology, *2021*
- Othmer Fellowship, University of Nebraska-Lincoln, *2023–2025*

## LANGUAGES

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English (Fluent), Persian (Native)