

Shabnam Ghasemirad

✉ shabnam.ghasemirad@inf.ethz.ch | 🏠 shabnamrad.github.io

Research Interests and Areas of Expertise

My research interests lie in the intersection of **formal verification** and **distributed systems**. In particular, I am working on the modeling and verification of distributed **database** systems and **concurrency control protocols**.

Education

Doctorate in Computer Science, ETH Zurich *Nov 2022 - Present*

Supervised by Prof. David Basin & Dr. Christoph Sprenger
Information Security Group, Department of Computer Science (D-INFK)

M.Sc. Computer Science, ETH Zurich *Sep 2020 - Nov 2022*

Major: Secure and Reliable Systems, Minor: Data Management.

GPA: 5.49/6

Relevant Coursework: Formal Methods in Information Security (6), Program Verification (5.75), Big Data (5.25)
Data Management Systems (5.75), Informal Methods (5.75), Information Security Lab (6).

BSc Computer Engineering, Sharif University of Technology *Sep 2015 - Feb 2020*

Major: Software Engineering

GPA: 19.01/20

Publications

Verlso: Verifiable Isolation Guarantees for Database Transactions

Shabnam Ghasemirad, Si Liu, Christoph Sprenger, Luca Multazzu, and David Basin
Proc. VLDB Endow., 2025

Pushing the Limit: Verified Performance-Optimal Causally-Consistent Database Transactions

Shabnam Ghasemirad, Christoph Sprenger, Si Liu, Luca Multazzu, and David Basin
In Tools and Algorithms for the Construction and Analysis of Systems - 31st International Conference, TACAS 2025, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2025, 2025

Research Projects and Experience

International Summer School Marktoberdorf *1–12 August 2023*

Safety and Security through Formal Verification, organized by: TU Munich

Master's Thesis, ETH Zürich *Apr – Oct 2022*

Mechanized Data Consistency Models for Distributed Database Transactions

Grade: 6

Supervisors: Dr. Christoph Sprenger, Dr. Si Liu, Prof. David Basin

MSc Semester Project, ETH Zürich

Spring 2021

Modular Reasoning about Distributed Systems in Igloo

Supervisors: Dr. Christoph Sprenger, Dr. Si Liu, Prof. David Basin

- Bachelor's Thesis, Sharif University of Technology** *Fall 2019*
 Strategy Design for Expert Aggregation to Predict Stock Market
 Supervisor: Dr. MohammadAmin Fazli, Algorithms & Systems Design Group
- Research Intern, Max Planck Institute for Software Systems** *Summer 2019*
 A Fine-Grained Concurrent Queue Verification in Iris/Coq Separation Logic Framework
 Supervisor: Prof. Derek Dreyer, Foundations of Programming Group
- Research Intern, EPFL (École Polytechnique Fédérale de Lausanne)** *2018*
 An Improved Materialization Algorithm for DBToaster
 Supervisor: Prof. Amir Shaikhha, Data Analysis Theory and Applications Lab

Teaching Experience

- Information Security (Head TA since 2025, exercises and exam) *Spring 2024 & 2025*
- Security Engineering (exercise sessions & exam creation) *Fall 2023 & 2024*
- Computer-Aided Modeling & Reasoning (exercises & course project) *Spring 2023*
- Data Structures & Algorithms, Compiler Design, Computer Networks, *2017-2020*
 System Analysis, Game Theory, Probability & Statistics (student TA experiences)

Honors and Awards

- SNSF (Swiss National Science Foundation) grant's Employee (PhD Candidate)
 for the Project "*Formal Verification of Isolation Guarantees in Database Systems*" *2024*
- Awarded a Direct Doctorate position and scholarship at ETH Zürich *2020*
- Ranked **8th** in Cumulative GPA in the Department of Computer Engineering *2019*
Among about 130 BSc students of the department, the class of 2019
- Ranked **10th** in National Student Olympiad for Computer Engineering *2019*
Among about 1,000 students
- Ranked **81st** in Iranian National University Entrance Exam (Concours) for B.Sc level *2015*
Among about 300,000 students
- Awarded fellowship of *Iran's National Elites Foundation* *2015*

Skills

- Languages:** English(C1, TOEFL:109), German(B2), French(A2), Persian(Native)
- Theorem Provers:** Isabelle/HOL (expert), Rocq (Intermediate), Tamarin (Intermediate)
- Database Systems:** SQL & RDBMSs (PostgreSQL, MySQL, SQLite), JSONiq, Spark
- Programming Languages:** Java, Scala, OCaml, Python, C/C++
- Web & Tools:** Git, L^AT_EX, Django, ReactJs, JavaScript, HTML & CSS/SCSS
- Arts and Sports:** Professional Classical Violin, Piano, Choir, Ballet