Nesa Abbasimoghadam

Department of Electrical and Computer Engineering, University of Tehran, Tehran, Iran
(+98) 910-966-2699 nesaabbasimoghadam@gmail.com NesaAbbasi NesaAbbasi nesabbasi.github.io

Research Interests

- Formal Methods
- Software Verification
- Programming Languages
- Programming Languages

Education

University of Tehran **Sep. 2020 – Sep. 2024**
Bachelor of Science in Computer (Software) Engineering — GPA: 18.26/20 (3.95/4) *Tehran, Iran*

National Organization for Development of Exceptional Talents (NODET) **Sep. 2017 – Sep. 2020**
Diploma in Mathematics and Physics - GPA: 19.66/20 (4/4) *Tehran, Iran*

Publications

Hybrid Rebeca Revisited 2024
To be submitted to NFM 2025
S. Zhiany, F. Ghassemi, N. Abbasimoghadam, A. Hodaei, A. Ataollahi, M. Sirjani

Benchmarking Large Language Models for Persian: A Preliminary Study Focusing on ChatGPT 2023
Accepted in LREC-COLING 2024

Honors and Awards

- Ranked in **top 15%** of B.Sc. students in Computer Engineering at the University of Tehran.
- Granted Straight Admission to the Master's Degree at the Sharif University of Technology.
- Ranked **2nd** in the 21th Project Day in school of ECE University of Tehran
- Ranked in **top 1%** among almost 160,000 participants in the Nationwide Iranian University Entrance Exam in Mathematics and Physics

Research Experience

Formal Methods and Validation of Systems Lab **Sep. 2023 – Present**
University of Tehran Tehran, Iran
Under Supervision of Prof. F. Ghassemi
Our research focuses on the verification of asynchronous, event-based Cyber-Physical Systems (CPSs) using advanced model-checking techniques. We developed tools to generate state spaces for CPSs specified by Hybrid Rebeca, a formal actor-based modeling language. This language has been enhanced to incorporate continuous variables and equations, allowing for a more accurate representation of the dynamics inherent in physical systems.
Repository: https://github.com/SaeedZhiany/HybridRebecaReachabilityAnalysis

Natural Language Processing Lab **Mar. 2023 – Oct. 2023**
University of Tehran Tehran, Iran
Under Supervision of Prof. Y. Yaghoobzadeh
Our research investigates the capabilities and limitations of large language models (LLMs) for the Persian language. We conducted a comprehensive benchmarking study across various tasks, including reasoning and knowledge-based, to evaluate LLM performance and identify areas for improvement.
Repository: https://github.com/Nesabbasi/Benchmarking_ChatGPT_for_Persian

Convergent Technologies Research Institute (NBIC) **Jun. 2023 – Aug. 2023**
University of Tehran Tehran, Iran
Under Supervision of Prof. Y. Yaghoobzadeh and Prof. M. Abolghasemi Dehaqani
My research focuses on developing a mobile app for early autism detection in children, using interactive games to analyze facial expressions and speech patterns. Also improved the user interface with React and evaluated models like Meta's SeamlessM4T and Google's Speech-to-Text for Persian language processing.

Teaching Assistant Experience

- **Introduction to Computing Systems and Programming** Fall 2022
  Instructor: Prof. H. Moradi and Prof. M. Hashemi
- **Data Structure and Algorithm** Fall 2022
  Instructor: Prof. H. Faili
- **Advanced Programming** Spring 2023 - Present
  Instructor: Prof. R. Khosravi
- **Engineering Probability and Statistics** Fall 2023
  Instructor: Prof. M. Tavassolipour
- **Computer Aided Design** Fall 2023
  Instructor: Prof. M. Modarressi
- **Operating Systems** Fall 2023 - Present
  Instructor: Prof. M. Kargahi
- **Database Design** Spring 2024 - Present
  Instructor: Prof. A. Shakery
- **Machine Learning** Summer 2023
  Organizer: Summer of Code - ACM Student Chapter

Projects

Cyber-Physical Systems Course Projects | *C++, QML, QT*
Developed cyber-physical systems, including a cloud-based entrance control system with Qt, HTTP, WebSocket, and RFID, and an Android app for Motion-based user Authentication using Accelerometer and Gyroscope sensors.

Software Testing Course Projects | *JUnit, Java*
Explored software testing techniques like unit testing, API testing, mutation testing, and BDD for a Spring Boot-based e-commerce system.

Distributed Systems Course Projects | *Go*
Developed concurrent systems in Go using goroutines and channels, and a distributed ordering system with gRPC.

LogicPL Compiler | *Java*
Designed a compiler from scratch, implementing lexical and syntax analysis, abstract syntax tree construction, name and type analysis, and Java bytecode generation.

Operating System Course Projects | *C++, C*
Projects related to Operating System course such as Socket Programming, Pipes, and Multi-Threading.

Operating System Lab Projects | *C*
A modified xv6 operating system with several extra features such as various new system calls, multilevel queue scheduling, and synchronization.

Technical Skills

Programming Languages: Python, C/C++, Java, Go, R, NoSQL/SQL, MATLAB, HTML/CSS, Verilog VHDL, LaTeX
Technologies/Frameworks: Git(Version Control), Docker, Kubernetes, MongoDB, Elasticsearch, PostgreSQL, Redis
Hardware & System Design: Arduino, ModelSim-Altera, Intel Quartus Prime, NI Multisim, PSPICE

Languages

- **English:** Professional Working Proficiency
  IELTS: Speaking (6.5), Listening (9), Reading (7), Writing (6.5) — Overall: 7.5
- **Persian:** Native

Voluntary Works

University of Tehran ACM Student Chapter Jun. 2023 - May 2024
Executive Committee Member
Organized and led several events by managing the staff team, negotiating with sponsors, and handling various other tasks. These events included hackathons, coding workshops, and various cultural events.