

# NESA ABBASIMOGHADAM

Department of Electrical and Computer Engineering, University of Tehran, Tehran, Iran

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## Research Interests

- Formal Methods
- Software Verification
- Programming Languages
- Cyber-Physical Systems

## Education

### University of Tehran

*Bachelor of Science in Computer (Software) Engineering — GPA: 18.26/20 (3.95/4)*

Sep. 2020 – Feb. 2024

Tehran, Iran

### National Organization for Development of Exceptional Talents (NODET)

*Diploma in Mathematics and Physics - GPA: 19.66/20 (4/4)*

Sep. 2017 – Sep. 2020

Tehran, Iran

## Publications

### Hybrid Rebeca Revisited

2024

*Under Preparation*

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](#) : The 2024 Joint International Conference on Computational Linguistics, Language Resources and Evaluation*

## Honors and Awards

- Ranked in **top 15%** of B.Sc. students in Computer Engineering at University of Tehran.
- Granted Straight Admission to the Master's Degree at 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 Nation-wide 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](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

<ul style="list-style-type: none"><li>• <b>Introduction to Computing Systems and Programming</b> Fall 2022 Instructor: <a href="#">Prof. H. Moradi</a> and <a href="#">Prof. M. Hashemi</a></li><li>• <b>Data Structure and Algorithm</b> Fall 2022 Instructor: <a href="#">Prof. H. Faili</a></li><li>• <b>Advanced Programming</b> Spring 2023 - Present Instructor: <a href="#">Prof. R. Khosravi</a></li><li>• <b>Engineering Probability and Statistics</b> Fall 2023 Instructor: <a href="#">Prof. M. Tavassolipour</a></li></ul>	<ul style="list-style-type: none"><li>• <b>Computer Aided Design</b> Fall 2023 Instructor: <a href="#">Prof. M. Modarressi</a></li><li>• <b>Operating Systems</b> Fall 2023 - Present Instructor: <a href="#">Prof. M. Kargahi</a></li><li>• <b>Database Design</b> Spring 2024 - Present Instructor: <a href="#">Prof. A. Shakery</a></li><li>• <b>Machine Learning</b> Summer 2023 Organizer: <a href="#">Summer of Code - ACM Student Chapter</a></li></ul>
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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, L<sup>A</sup>T<sub>E</sub>X  
**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.