Abolfazl Mohammadi Zoghalchali

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Education

Babol Noshirvani University of Technology   **2021 − 2025**
Bachelor of Science in Computer Science (GPA: 3.82/4 over last two years)   *Babol, Mazandaran*

Awards and Honors

Ranked top 6% among the Participants of the 6th edition AlgoNIT Programming Competition
ranked the 11th team in 167 Participants   *2025*

Ranked top student to finish in 7 main semesters
Among All the Faculties at the university   *2025*

Finished a four year bachelor program in three and half years
Achieved 140 credits at Babol Noshirvani University of Technology(Ranked 501-600 via Times Higher Education)   *2025*

Ranked top 15% among students of Computer Science faculty
Among about 70 students over last four semesters   *2025*

Ranked top 11% among the Participants of the 4th edition AlgoNIT Programming Competition
ranked the 25th team in 247 Participants   *2024*

Ranked top 19% among the Participants of the 2nd edition AlgoNIT Programming Competition
ranked the 5th team in 27 teams   *2023*

Ranked top 5% in Iranian university entrance exam
Among about 130,000 participants   *2021*

Ranked top student in High School for Iranian university entrance exam
Among fellow students specializing in Mathematics and Physics   *2021*

Achieved silver medal in the national jujitsu competition.
ranked 2nd place in the National Tournament of Martyr Hossein Ali Moradi Cup   *2016*

Research Interests

- Deep Learning
- Neural Networks
- Machine Learning
- Image Processing
- AI in Healthcare
- Prompt Engineering

On-going Research

The Role of Machine Learning in Diagnosis of Acute Occlusion Myocardial Infarction | *A Mohammadi, A Ariaei*
in Presence of Left Bundle Branch Block (LBBB)

This research introduces a deep learning-based approach to segment ECG images, extracts ECG signals from each segmented image to identify the presence of myocardial infarction.

Teaching Assistant

Compiler Design
Instructed by: Dr.Ali Gholami Rudi | Babol Noshirvani University of Technology   *2025*

Software Systems Analysis & Design
Instructed by: DR.Mehdi Emadi | Babol Noshirvani University of Technology   *2024*

Operating Systems
Instructed by: Dr.Ali Gholami Rudi | Babol Noshirvani University of Technology   *2024*

Compiler Design
Instructed by: Dr.Ali Gholami Rudi | Babol Noshirvani University of Technology   *2024*

Databases
Instructed by: DR.Mehdi Emadi | Babol Noshirvani University of Technology   *2024*

Data Structures
Instructed by: Mahyar Hassanpour | Babol Noshirvani University of Technology *2023*

Theory of Formal languages & Automata
Instructed by: Mahyar Hassanpour | Babol Noshirvani University of Technology *2023*

Academic Projects

Deep learning-based ECG image segmentation **On-going**

An ECG image segmentation app that uses **nnUNet** as the main deep learning asset, uses doctor segmented RGB images as training grounds and proceeds to convert these images and segmentations to Compressed NIfTI (.nii.gz) for compatibility with the nnUNet image format.

Computational Intelligence Algorithms: Design, Implementation and Evaluation **2025**

I implemented various well-known machine learning algorithms, including from-scratch implementations of models such as Genetic Algorithms, Learning Vector Quantization (LVQ) and reinforcement learning, as well as library-based implementations including Multilayer Perceptron (MLP), K-Means, K-Nearest Neighbor (KNN) and Self-Organizing Maps (SOM). Each model was applied and tested with a unique experimental scenario and dataset.

Design and Implementation of Teslang Compiler: A Lexical, Syntax, and Semantic Analyzer for a Custom Programming Language **2024**

I created a multi-layer compiler for the custom language **Teslang**, which includes lexical analysis and error handling, syntax checker and dynamic error handling with recovery to stable state for further analysis on input code, and complex semantic analyzer.

A CNN image classifier for CIFAR-10 dataset **2024**

This project implements a Convolutional Neural Network (CNN) for classifying images from the CIFAR-10 dataset. The model is trained using PyTorch and incorporates k-fold cross-validation to improve generalization. The dataset consists of 60,000 images across 10 classes, with 80% allocated for training and 20% for testing

Smart University chatbot implementation: Telegram-Based QA with LLM Integration and prompt engineering **2024**

This is my bachelor's graduation final project under the supervision of **DR.Mehdi Emadi**, We try to implement a specialized chatbot designed to assist students from Noshirvani University of Technology (NIT) by providing fast and accurate access to university regulations, manuals, and relevant student guidelines. The chatbot is used to quickly find information from the university's official manual and other academic resources. It uses ChatGPT, Elasticsearch, and LangChain to efficiently search and retrieve relevant sections from PDFs and structured documents with prompt engineering

Design and Execution of a Fault-Tolerant File Encryption Service Using Sockets and Python **2024**

I created a Python-based client-server system using sockets to verify and handle the encryption of JSON files (via MD5). Implemented a commander process to detect missing or improperly encrypted files, a server that creates and manages up to five worker processes dynamically to ensure robust encryption, with error detection and fault tolerance through warnings and faulty worker termination.

Experiences

Research Experience

- **Research Assistant at Artificial Intelligence Research Lab, Babol Noshirvani Univer-** *2025–present*
  sity of Technology
  Engaged in research projects focusing on software systems and applications of artificial intelligence.

Notable Courses

Introduction to the Computational intelligence
Instructed by: DR.Hesam Omranpour & DR.Fateme Zamani | Babol Noshirvani University of Technology   2024

Fundamental of Computer Vision
Instructed by: DR.Mehdi Ezoji | Babol Noshirvani University of Technology   2024

Fundamentals of Secure Computing
Instructed by: DR.Hassan Nasiraee | Babol Noshirvani University of Technology   2024

Introduction to the information retrieval
Instructed by: DR.Mpjtaba Mansoori | Babol Noshirvani University of Technology   2024

Introduction to Artificial Intelligence (AI)
Instructed by: DR.Fateme Zamani | Babol Noshirvani University of Technology   2023

Algorithms Design
Instructed by: DR.Fateme Zamani | Babol Noshirvani University of Technology   2023

applied linear algebra
Instructed by: DR.Nooshin Maghsoodi | Babol Noshirvani University of Technology   2023

Extracurricular Activities

Executive Member of the 5th National Programming Contest (AlgoNIT)
Electrical & Computer Engineering Faculty | Babol Noshirvani University of Technology   2024

Part of the Public Relations Team of the RainoCup International Event
Multiple Faculties | Babol Noshirvani University of Technology   2023

Technical Skills

Programming Languages & Frameworks: Python, C#, Java, VHDL, Matlab, Shell, .NET

Libraries: scikit-learn, Pandas, Numpy, OpenCV, matplotlib, LangChain, Entity Framework

Technologies: Docker, Microservices, ChatGPT API, Git, LaTeX

Test Scores

* **IELTS Academic Score:** Preparing for exam (to be taken on October 31st)

Hobbies and Interests

* Playing the guitar
* Reading novels
* Playing video games
* Calisthenics
* jujitsu

References

DR. Mehdi Emadi   **Assistant Professor**
Faculty of Electrical & Computer Engineering | Babol Noshirvani University of Technology   *m.emadi@nit.ac.ir*

DR. Ali Gholami Rudi   **Assistant Professor**
Faculty of Electrical & Computer Engineering | Babol Noshirvani University of Technology   *gholamirudi@nit.ac.ir*

DR. Hesam Omranpour   **Associate Professor**
faculty of Electrical & Computer Engineering | Babol Noshirvani University of Technology   *h.omranpour@nit.ac.com*