# Shakiba **Bolbolian Khah**

(+98) 919-855-5074 | shakiba.bolbolian@gmail.com | shakiba-bolbolian-khah | shakiba-bolbolian-khah

## Education

**University of Tehran** — *Tehran, Iran*

Bachelor of Science in Computer Engineering — *Sep. 2017 - Jul. 2021 (Expected)*

- Overall GPA: 3.85/4.0 - 18.19/20.0 (till now)

**National Organization for Development of Exceptional Talents (Sampad) School** — *Semnan, Iran*

High School Diploma in Mathematics — *Sep. 2013 - Jun. 2017*

- Overall GPA: 4.0/4.0 - 19.91/20.0

## Honors

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|---|---|
| 2020 | **Among 15 percent** of high-ranked Computer Engineering B.Sc. students, University of Tehran. |
| 2020 | **Winner** of the University of Tehran M.Sc. Fellowship Award (Exempted from the graduate entrance exam). |
| 2018 - present | **Member** of Iran's National Elites Foundation. |
| 2017 | **Ranked 305$^{th}$** among more than 150,000 participants in Nationwide Universities Entrance Exam (B.Sc.). |

## Research Interests

**Artificial Intelligence** | **Machine Learning** | **Reinforcement Learning** | **Software Engineering**

## Working Experience

**Mobile Communications Laboratory at University of Tehran** — *Tehran, Iran*

SOFTWARE ENGINEER INTERN — *Apr. 2020 - Sep. 2020*

- Supervisor: **Dr. Vahid Shah-Mansouri** | Email Address: vmansouri@ut.ac.ir
- Layer 2 Testing Principles: Different types of network layer 2 testing methods, their goals and functionality based on RFC2889 such as congestion control, forward pressure, maximum forwarding rate, address learning rate, address caching rate, etc.
- Raw Sockets: Learning socket programming using raw sockets.
- Multi-threading: Using multi-threading to implement tests in linux environment.
- Tcpdump: Using to trace packets in network while implementation.

**University of Tehran ACM Student Chapter** — *Tehran, Iran*

VICE CHAIR — *Jun. 2019 - Sep. 2020*

- Faculty Sponsor: **Dr. Ramtin Kosravi** | Email Address: r.khosravi@ut.ac.ir
- Holding various events such as Internet Programming Contest(UT ICPC), Algorithm Courses, Maze Competition, etc.
- Editor of Science and Technology Magazine of ACM Student Chapter called 'F1'.

## Skills

| | |
|---|---|
| **Industry Knowledge** | Machine Learning, Object-Oriented Programming(OOP), Operating Systems, Alogorithm |
| **Programming Languages** | C++, C, Python, Java, HTML, CSS, MATLAB, R, Verilog, VHDL |
| **Frameworks & Libraries** | React.js, Bootstrap, Numpy, Pytorch |
| **Database** | MySQL |
| **Other Technologies** | Git, Maven, Docker, Kubernetes, LaTeX, Mininet, Linux |

## Teaching Assistance Experience

**Discrete Mathematics** — *University of Tehran*

Instructor: **Dr. Siamak Mohammadi** | Email Address: smohamadi@ut.ac.ir — *Spring & Fall 2020*

- Responsibilities: Supervisor (Reviewing Designed Questions and Solutions, Assessing Questions' Quality), Grader.

**Introduction to Computing Systems and Programming** — *University of Tehran*

Instructor: **Dr. Hadi Moradi** | Email Address: moradih@ut.ac.ir — *Spring 2020*

- Responsibilities: Quiz Designer, Laboratory TA.

**Formal Languages and Automata Theory** — *University of Tehran*

Instructor: **Dr. Hossein Hojjat** | Email Address: hojjat@ut.ac.ir — *Fall 2019 & Spring 2020*

- Responsibilities: Homework Designer and Grader, Teacher at Problem-Solving Sessions.

### Programming Languages and Compiler

*University of Tehran*

Instructor: **Dr. Fatemeh Ghassemi** | Email Address: fghassemi@ut.ac.ir *Fall 2019*

- Responsibilities: Homework Designer and Grader, Computer Assignment Grader, Teacher at Problem-Solving Sessions.

### Engineering Probability and Statistics

*University of Tehran*

Instructor: **Dr. Behnam Bahrak** | Email Address: bahrak@ut.ac.ir *Fall 2019*

- Responsibilities: Grader.

### Digital Logic Design

*University of Tehran*

Instructor: **Prof. Zainalabedin Navabi** | Email Address: navabi@ut.ac.ir *Spring 2019*

- Responsibilities: Grader.

### Introduction to Computing Systems and Programming

*University of Tehran*

Instructor: **Dr. Mahmoud Reza Hashemi** | Email Address: rhashemi@ut.ac.ir *Fall 2018*

- Responsibilities: Grader.

## Course Projects

### Artficial Intelligence

*Spring 2020*

- **Note:** All projects are implemented with Python in Jupyter notebook and Google Colab.
- **Neural Network from Scratch** : Implementing a neural network from scratch and analyzing that from different aspects.
- **Price Estimation with Regression** : Processing a dataset containing spoken text data about second-hand mobile devices and their prices to estimate new entries using different Python libraries such as Numpy, Pandas, SciKit-Learn, and various techniques like bag of words model.
- **Image Classification with Multi-layer Neural Network** : Implementing a multi-layer neural network using Pytorch library to learn pictures of a dataset including pictures of 52 different types of accessories. Analyzing and adjusting various effective variables like batch size, momentum, learning rate, etc.
- **Machine Learning with SciKit-Learn Library** : Using different classifiers like desicion tree, KNN, etc. beside ensemble learning methods to process a dataset of some markets' customers to estimate whether they will come back to the market or not.
- **Text Processing using Bayesian Networks** : Processing news with different techniques like bag of words to classify their category using Bayesian networks.
- **Replacement Decoding with Genetic Algorithm** : Implementing a decoder to obtain a key based on genetinc algorithm to decode a text encoded by replacement method.
- **Search Algorithms** : Simulating a situation like search problem and using uninfomed search methods including BFS and DFS, and A* as an informed search method to obtain an optimal solution for problem.

### Internet Engineering

*Spring 2020*

- **Loghme, Online Food Delivery Web Application**
  - **Back end** : Implementing in Java during 8 phases in IntelliJ IDEA using various tools and technologies such as Apache Tomcat, Spring MVC, MySQL as database, etc. and deploying using Kubernetes and Docker.
  - **Front end** : Implementeing using HTML, CSS, JavaScript, React.js, Nginx (with Kubernetes and Docker for deployment), etc.

### Computer Networks

*Fall 2020*

- **Ryu Controller with Dijkstra SDN Routing Algorithm** : Simulating a network using mininet and implementing a Ryu controller with Dijkstra as SDN routing algorithm and implementing a tracer in Python to process outputs.
- **Analyzing Different TCP Congestion Management** : Using NS2 to simulate a network using TCP New-Reno, TCP Tahoe ,and TCP Vegas and analyze their congestion control methods.

### Operating Systems

*Fall 2019*

- **Introduction to Xv6 OS** : Getting familiar with Xv6, its execution, debugging, improving its console by adding some features, and implementing new program to copy text data from a file to another one.
- **System Calls** : Implementing new system calls in Xv6 to enable it to run commands out of the directory in which their execution file exists, sleep a process for an arbitrary period using Xv6's ticks, and obtain current process's pid and its children and grandchildren.
- **Process Scheduling** : Implementing multilevel feedback queue scheduling (MFQ) including lottery, HRRN, and SRPF methods as scheduling levels in Xv6.
- **Process Synchronization Mechanisms** : Adding synchronization mechanisms to prevent out-of-order execution of processes and use mutex more than once in recursive programs.
- **Monitors** : Simulating transportation systems and controlling air pollution using monitors.
- **Ensemble Classification** : Implementing an ensemble classifier using named and unnamed pipes.

### Programming Languages and Compilers *Spring 2019*

- **Toorla, Tiny Object Oriented Readable Language** : Toorla's name shows its nature completely: an object oriented Java-like Language which supports inheritance. Each Toorla program with .trl foramt contains one or more classes that have some fields and methods. Toorla has been implemented in four phases using Java in IntelliJ IDEA.
- **Phase I, Lexer & Parser** : Defining Toorla's grammar with ANTLR and implementing a parser to create abstract syntax tree (AST) of input program.
- **Phase II, Name Analyzer** : Gathering information about classes, fields, methods, local variables, and scopes of program and finding name analysis errors like undefined variables or redefinition.
- **Phase III, Type Analyzer** : Checking types of variables in input program, finding relevant errors based on Toorla's documentation and setting initial value for various types.
- **Phase IV, Code Generation** : Converting Toorla's code to jasmin as a middle layer. Jasmin assembler converts its codes to class files which can be executed by JVM later.

### Computer Architecture *Spring 2019*

- **Note:** All projects are implemented with Verilog in Modelsim.
- **Linear Classification** : Designing datapath and controller to implement a linear classification as well as implementing the classifier using MATLAB and comparing final results.
- **Single Cycle MIPS** : Implementing single cycle MIPS architecture in a minimal system with an ALU supporting various operators.
- **Multi Cycle MIPS** : Implementing multi cycle MIPS architecture which works based on stack providing more limiter operators.
- **Pipeline Architecture** : Implementing MIPS processor using pipeline architecture as well as determining and resolving possible hazards. Implementing ARM processor with pipeline architecture in the computer architecture laboratory.

### Advanced Programming *Spring 2018*

- **Jeek Jeek, Twitter-like Local Web Application** : Implementing Jeek Jeek with special focus on object oriented programming principles as a local web application to behave like Twitter in C++.

## Relevant Courses

**Software Engineering** *Ongoing*
Instructor: **Dr. Ramtin Khosravi** | Email *Fall 2020*

**Computer Networks** *20/20*
Instructor: **Dr. Ahmad Khonsari** | Email *Spring 2020*

**Internet Engineering** *20/20*
Instructor: **Dr. Ehsan Khamespanah** | Email *Spring 2020*

**Database Design** *19.4/20*
Instructor: **Dr. Azadeh Shakery** | Email *Spring 2020*

**Operating Systems** *19/20*
Instructor: **Dr. Mehdi Kargahi** | Email *Fall 2019*

**Programming Languages and Compiler** *19.1/20*
Instructor: **Dr. Hossein Hojjat** | Email *Spring 2019*

**Engineering Probability and Statistics** *19.7/20*
Instructor: **Dr. Behnam Bahrak** | Email *Fall 2018*

**Operation Research** *Ongoing*
Instructor: **Dr. Mohammad Shokri** | Email *Fall 2020*

**Artificial Intelligence** *20/20*
Instructor: **Dr. Hakimeh Fadaei** | Email *Spring 2020*

**Algorithmic Graph Theory** *17.5/20*
Instructor: **Dr. Behnam Bahrak** | Email *Spring 2020*

**Systems Analysis and Design** *18.7/20*
Instructor: **Dr. Fatemeh Ghassemi** | Email *Spring 2020*

**Algorithm Design** *18.1/20*
Instructor: **Dr. Hamid Mahini** | Email *Spring 2019*

**Data Structures** *19.1/20*
Instructor: **Dr. Hesham Feili** | Email *Fall 2018*

**Advanced Programming** *17.25/20*
Instructor: **Dr. Ramtin Khosravi** | Email *Spring 2018*

## Extracurricular Activity

### IEEE University of Tehran Student Branch *Tehran, Iran*

Student Volunteer *Sep. 2018 - May. 2019*

- Being staff in various events such as IEEE day 2018, IEEE freshmen ceremony, etc. to help main team members.

### 16th Iran Internet Programming Contest(ICPC) *Tehran, Iran*

Participant *Nov. 2018*

- Participating in 16th Iran Internet Programming Contest, using Python as programming language.

## Languages

**English** : Fluent ( **IELTS Score - Overal: 7.5** | R: 8.5 | L: 8 | S: 7 | W: 7)

**Persian** : Native