# ALIREZA ARBABI

School of Electrical and Computer Engineering ◇ University of Tehran

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## EDUCATION

**University of Tehran** 2020 - Present(Expected July 2024)

B.Sc. in Computer Engineering (Software) University of Tehran

- Total GPA: 17.8/20 (3.82/4) (Faculty Average: 15.10/20)
- Selected Courses: Artificial Intelligence (20/20), Cryptocurrencies (19.8/20)

## RESEARCH INTERESTS

- Blockchain Technology / Distributed Systems
- Privacy and Security
- Artificial Intelligence and Machine Learning
- Computer Networks

## PUBLICATIONS

**Mixing Solutions In Bitcoin and Ethereum Ecosystems: A Review and Tutorial** 2023

**A. Arbabi**, A. Shojaeinasab, B. Bahrak, H. Najjaran
*submitted to Journal of Network and Computer Applications*

**RPoA: Redefined Proof of Activity** 2023

S. Kamali, S. Shabihi, T. Fakharian, **A. Arbabi**, P. Tajmehrabi, M. Saadati, B. Bahrak
*submitted to IET Blockchain Journal*

## RESEARCH/WORK EXPERIENCE

**Research Assistant** July 2023 - January 2024

ACIS Lab, University of Victoria *Remote - Victoria, Canada*
*Under Supervision of Prof. Homayoon Najjaran*

Our research focuses on investigating the obstacles and constraints within existing **cryptocurrency mixing services**. We analyze a range of mixers, including traditional ones in bitcoin and advanced ZKP-based mixers, as well as secure coins. The objective is to assess the capabilities of each mixer and determine the most suitable method for achieving effective mixing.

**Research Assistant** Jul 2022 - Jul 2023

Data Analytics Lab, University of Tehran *Tehran, Iran*
*Under Supervision of Prof. Behnam Bahrak*

We designed an alternative **consensus protocol** based on Proof-of-Activity to combine the benefits of using both the PoS and PoA protocols and also reduce the power costs of the original PoA consensus. As a proof of concept, we implemented a cryptocurrency for storing files (blockchain-based decentralized file sharing system) called Crystalline.

**Research Assistant** Sep 2023 - Present

University of Tehran *Tehran, Iran*
*Under Supervision of Prof. Pooya Shariatpanahi*

We are working on utilizing graph theory techniques to enhance the effectiveness of cryptocurrency mixing solutions. Our focus is on minimizing mutual information between sender and recipient addresses, as well as reducing entropy within address clusters to counter mixing attacks.

**Blockchain Instructor** Jul 2023 - Sep 2023

University of Tehran ACM Chapter *Tehran, Iran*

Me and AmirPasha Motamed (Ph.D. student) served as the primary instructors for the Blockchain & Web3 course during our university's summer school. We presented the course through 14 comprehensive online sessions and 2 challenging computer assignments, focusing on blockchain technology and the foundations of the decentralized systems.

## SKILLS

**Programming:** C/C++, Python, LaTeX, JavaScript(Node JS), R, Verilog
**Paradigms:** Git(Version Control), Docker, NoSQL/SQL database systems, REST-API design, OOP, MakeFile
**Operating Systems:** Ubuntu Linux, Microsoft Windows

## TEACHING ASSISTANT EXPERIENCE

**Cryptocurrencies**                                                    Spring 2024
*Prof. Pooya Shariatpanahi*
Head Teaching Assistant

**Artificial Intelligence**                                    Spring 2023 - Fall 2023
*Prof. Yadollah Yaghoobzadeh* and *Dr. Hakimeh Fadaei*

**Engineering Probability and Statistics**                                Fall 2022
*Prof. Behnam Bahrak*

**Data Structure and Algorithm**                                          Fall 2022
*Prof. Hesham Faili*

**Introduction to Computing Systems and Programming**                     Fall 2022
*Prof. Hadi Moradi* and *Prof. Mahmoodreza Hashemi*

## ACADEMIC PROJECTS

### Crystalline

Crystalline is an open-source cryptocurrency powered by Redefined proof of activity(RPoA), developed as a proof of concept on pure python.

### XV6 Modernized

A customized version of the MIT xv6 operating system, with significant modifications in CLI, process scheduling, semaphores, system calls, and the memory management scheme; which make it perform on par with modern Linux-based systems in many aspects.

### Socket-Based Hotel Management System

A hotel management system implemented in c++, consists of a server and multiple clients which communicate with each others using sockets.The server handles requests from clients and manages the hotel reservation database. The coding was done based on the OOP design.

### Node Social Sedia

This project was the final assignment of the backend summer course at the University of Tehran, ACM chapter. In this course, I learned the fundamental of backend programming, NoSQL databases(MongoDB), Computer networks, and how to use documentation in projects. The project was coded in Node JS environment.

### MIPS Processor

An implementation of MIPS processor with single/multi-cycle architecture based on Verilog-HDL programming language as a final project of the Computer Architecture course. This processor has 16 different operations to perform tasks.

## HONORS AND AWARDS

- **Being in (Top 0.6%) in Konkour**, National Organization of Educational Testing (NOET)
- **Received scholarship**, Supporter Foundation of the University of Tehran

## LANGUAGES

**English**   Advanced, IELTS Academic: 7.5 (L:8, R:9, W:6.5, S:7)
**Persian**   Native