ALIREZA ARBABI

School of Electrical and Computer Engineering ◇ University of Tehran
Email ◇ WebPage ◇ Linkedin ◇ GitHub

EDUCATION

University of Tehran   2020 - Present(Expected July 2024)
B.Sc. in Computer Engineering (Software) University of Tehran

- Total GPA: 17.83/20 (3.82/4) (Faculty Average: 15.10/20)
- Selected courses: Artificial Intelligence (20/20), Cryptocurrencies (19.8/20), ZKP-MOOC (Audit)

RESEARCH INTERESTS

- Security and Privacy / Applied Cryptography
- Blockchain Technology / Distributed Systems
- 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 - Present
ACIS Lab, University of Victoria   *Victoria, Canada*
Under Supervision of Prof. Homayoon Najjaran and Prof. Masoud Jalayer

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 effective method for achieving anonymous mixing.

Research Assistant   Jul 2022 - Jul 2023
Data Analysis 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 information 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 detection 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 & Cryptography course during our university's summer school. We presented the course through 14 comprehensive online sessions and 2 challenging computer assignments, focusing on cryptography 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