Kianoush Arshi

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Education

University of Tehran 2019–2024
BSc in Computer Engineering (Software) Cumulative GPA: 18.53/20.00

Publications

1. **K. Arshi** and A. Goharshady, "The Solitude of Greed: Congesting Blockchains with A Single Transaction", Under submission at *IEEE International Conference on Blockchain and Cryptocurrency (ICBC), December 2023*

Experience

Hong Kong University of Science and Technology Prof. Amir Goharshady
Research Intern July 2023-December 2023

- Introduced and evaluated two attacks based on the rationality of miners on Ethereum. These attacks capitalized on the gas limit imposed on the blockchain and the expressiveness of Turing Complete smart contract languages
- Developing a private decentralized banking system for proving the availability of assets without revealing the amount or the history of transactions. The idea is to use blind signatures for privacy instead of zero-knowledge proofs which are more expensive

University of Tehran
Research Assistant Prof. Behnam Bahrak

- Smart Contract Security Audits March 2023 - July 2023
  - Participated in Code4rena Security Audits and discovered security vulnerabilities in smart contracts developed for DeFi projects
- A Comparative Analysis of MEV Transactions Pre- and Post-Ethereum Merge June 2022-February 2023
  - Implemented a framework for collecting blockchain data with high speed without setting up a node
  - Designed an MEV transaction classifier for detecting arbitrage and liquidation transactions
  - Analysed arbitrage and liquidation transactions before and after the merge
- Monero Miner Detector May 2022 - June 2022
  - Developed a Monero Miner Classifier using the features of the network packets for detecting malicious mining on the user's browser
  - Worked on optimizing the detector by filtering out network packets based on their frequency

Divar Tehran, Iran
Full-stack Web Developer June 2021-August 2021

- Developed a platform with similar applications to Kaggle in a team of 4 developers
- Implemented distributed message passing using Celery
- Implemented several data engineering functionalities
- Implemented workflow DAG visualization

Teaching Assistant Fall 2020-Spring 2023

- Artificial Intelligence - Dr. Yaghoubzadeh, Dr. Fadaei Fall 2022-Fall 2023
- Formal Languages and Automata Theory - Dr. Hojjat Fall 2021-Spring 2023
- Engineering Probability and Statistics - Dr. Bahrak Fall 2022
- Compiler Design and Programming Languages - Dr. Ghassemi Spring 2022
- Advanced Programming - Dr. Khosravi Fall 2021-Spring 2022
- Introduction to Computing Systems and Programming - Dr. Moradi Fall 2020 and Fall 2021
- Technical English - Dr. Fatemi Fall 2021-Fall 2022

Scholarships and Awards

- Received full scholarship from University of Tehran (Tuition fee waved) 2019–2024
- Ranked among the top 0.01% of the participants of the Iranian National University Entrance Exam 2019

Skills

Programming Languages: Python, Golang, Solidity, C++, C, Java, Bash, Javascript

Technologies and Paradigms: Blockchains, Smart Contracts, Zero Knowledge Proofs, Web3 and DeFi

Tools and Frameworks: Foundry, gnark, Slither, ReactJS, Docker, Spring, Maven, Django, Web3.py

Languages: English(Fluent, **IELTS score 8**), Persian(Native), German(Beginner)

Notable Projects

TLSC Inspector [source code]
Source code for data collection and analysis of the Solitude of Greed paper — Python, Web3, PostgresDB

- Implemented a framework for fast blockchain data collection without setting up a node
- Discovered vulnerabilities due to block information dependence in high-valued contracts
- Evaluated the effects of EIP-1559 and the merge on Ethereum

Bitcoin Protocol and Mechanisms [source code] — Crypto Currency Course
Two projects: — Python, Bitcoinlib

- Evaluated the consensus protocol of Bitcoin using probabilistic analyses
- Implemented Bitcoin address generation, transaction mechanisms, and mining

Oak [source code] — Internet Engineering Course
Implemented a project similar to Amazon marketplace — Java, Docker, Spring, ReactJS, Maven

Mini Kaggle [source code] — Divar Internship
A Kaggle clone made using the Django framework — Python, Django, Celery, PostgreSQL

TCP Network [source code] — Computer Networks Course
An implementation of a TCP network with congestion controls and sliding window — C++

Image Classifier [source code] — AI Course
Two neural networks projects: — Python, NumPy, Pandas, TensorFlow, Scikit-Learn

- Implemented a feed-forward neural network from scratch
- Developed an animal classifier using TensorFlow

CMM Compiler [source code] — Compiler Course
A compiler for a new functional Language called CMM. The project had four phases: — Java, ANTLR, Jasmin

- Grammar specification
- Name Analysis
- Type Analysis
- ByteCode Generation