Zhaorun Lin, Kevin

MPhil student in CS

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SUMMARY

I'm a year 2 MPhil student at the Hong Kong University of Science and Technology (HKUST) major in Computer Science with my research interests in Algorithms, Blockchain, and their intersections. I am a member of the ALPACAS Research Group which focuses its research on Theoretical Computer Science. In my undergraduate study, I major in Computer Engineering which exposed me to a lot of different fields such as AI, software engineering, etc.

SKILLS

Programming Languages: C++, Python, Rust, Solidity, JavaScript, HTML.

Technologies: Ethereum · Blockchain · Smart Contract · Cryptosystems · zkSNARK · Consensus Algorithms · Game Theory · Algorithms · Data Structures · AI · Machine Learning

Languages: English - IELTS 7.5, **Mandarin, Cantonese** - native

EDUCATION

09/2023 – Present
MPhil in Computer Science — **HKUST**
- Supervised by Prof. Amir K. Goharshady

09/2019 – 07/2023
BEng in Computer Engineering — **HKUST**
- Minor in Big data Technology

PUBLICATIONS

(Authors ordered alphabetically)

2025
Fast and Gas-efficient Private Sealed-bid Auctions — **PODC**
J. Ballweg, A. K. Goharshady, Z. Lin

2025
Improved Gas Optimization of Smart Contracts — **FSEN**
T. Barakbayeva, S. Farokhnia, A. K. Goharshady, P. Li, Z. Lin

2024
Blind Vote: Economical and Secret Blockchain-based Voting — **IEEE Blockchain**
A.K. Goharshady, Z. Lin

INTERNSHIPS

07/2023 – 09/2023
Research Assistant — **HKUST**
- Worked on a vacancy detection system for smart carpark, including optimizing code and setting up environments for edge devices such as OrangePi Mini computer and Jetson Orin NX board.
- Integrated an elderly fall detection system in a web application for displaying extracted human gesture in real time and alert in case a fall is detected.

`Edge AI / CUDA / cv2 / Yolov8 / Django`

07/2022 – 09/2022
AI & Data Engineering Intern — **Baronford & Associates**
- Developed a MERN (MongoDB, Express, React Node.js) stack app that supports basic CRUD applications for recording information.
- Performed exploratory data analysis on patient datasets to draw meaningful insights and built a random forest regression model on predicting patient vitals, then optimized model using automated hyperparameter tuning by GridSearchCV.
- Data augmentation of the patient dataset using SMOTE, RandomOversampler and GaussianCopula from SDV. The synthesized data has a high similarity of >95% in distribution and <0.5 of bivariate correlation difference.

`MERN Stack / EDA / Random Forest Regression / Data Augmentation`

12/2021 – 02/2022
Junior Developer — **Radiance Tech International Ltd.**
- Designed and implemented the company's webpage using HTML, JavaScript, and CSS. Continuously improved the prototype interface and optimized user experience through trial and error and user feedback.
- Worked in a team to build and fine-tune a Cantonese voice recognition system using DeepSpeech and CommonVoice corpus.

`HTML / JavaScript / CSS`

PROJECTS

01/2025 – present
Optimizing Coin Selection Strategies in UTXO-based blockchains
Trying to map the coin selection problem in multi-assets UTXO-based blockchains (multi-objective Knapsack problem) to graph problems and develop tree-based parameterized algorithms.

09/2024 – 02/2025 **Ethereum Smart Contract Gas Optimization**
Improved the state-of-the-art Syrup2.0 gas optimization tool by using it as a black box and combined with a dynamic programming approach. Our method further doubled the savings produced by Syrup2.0, and reduced the gas usage of real-world smart contracts by 11.23%.

09/2023 – 01/2024 **Blockchain-based E-voting system using Blind Signatures** **Github**
Designed and implemented a voting system on blockchain (Ethereum) by utilizing the technique of blind signature. The protocol achieves untraceable anonymity and other properties such as verifiability, transparency, completeness, etc., while being at least 40% more efficient than other existing e-voting systems in terms of gas cost.

02/2023 – 05/2023 **3-party Random Number Generation on Ethereum** **Github**
Designed and implemented a decentralized protocol that achieves uniformly random number generation on blockchain. The protocol makes use of Goldwasser-Micali cryptosystem for homomorphic encryption of random numbers, RSA and commitment scheme to ensure security and privacy.

08/2022 – 05/2023 **Real-time Vacancy Detection System Using Fisheye Cameras** **Github**
Built a vacancy detection system for smart carparks using fisheye cameras and computer vision technologies by leveraging the state-of-the-art yolov5 model and training a convolutional neural network. The system achieves an 92.8% accuracy in identifying vacant parking slot and won the Best FYP award.

02/2022 – 05/2022 **Stock Price Predictor** **Github**
Built a price predictor of the stock Apple Computer, Inc(APPL) by training a Long Short Term Memory (LSTM) Network using historic stock price from Yahoo Finance 2022. The next-hour trend of the stock can be displayed on the webpage for user interaction with the use of AWS.

TEACHING ASSISTANTSHIPS

09/2024 – 12/2024 **Honors Discrete Mathematical Tools for Computer Science** **HKUST**

02/2024 – 06/2024 **Computer Organization** **HKUST**

AWARDS

06/2023 **Professor Samuel Chanson Best FYP Award**

06/2023 **Industry Sponsored Best FYP Award**

11/2019 **Dean of Engineering Scholarship**