

ZHIYUAN ZHAO

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EDUCATION

The Chinese University of Hong Kong, Shenzhen

B.Eng. of Electronic Information Engineering - Electrical Engineering

Sep 2020 - now

Current CGPA: 3.763/4.0, ranking in the top 5%; **Current MGPA:** 3.797/4.0, ranking in the top 5%.

Core Curriculum: *Discrete Mathematics, Data Structures, Stochastic Processes, Blockchain and Decentralized Applications, Principles of Communication Systems, Signals and Systems, Digital Logic and Systems, Introduction to Computer Science: Programming Paradigms, Machine Learning, Microprocessors and Computer Systems, Microprocessor System Design Laboratory, Optimization.*

RESEARCH EXPERIENCE

The Optimal File Size of Private Information Retrieval and Secret Sharing

Apr 2023 - now

School of Science and Engineering, CUHK-Shenzhen

Supervisor: Zitan Chen

- Identified the smallest possible file size for the rate-optimal byzantine-resistant communication-efficient secret sharing scheme
- Disproved the findings of “[Communication Efficient Secret Sharing With Small Share Size](#)” by demonstrating the incorrectness of their claim regarding achieving a smaller share size and decoding delay
- Confirmed the optimality of the file size had been achieved in the scheme proposed by “[Communication Efficient Secret Sharing](#)”
- Investigated the lower file size bound for balanced capacity-achieving private information retrieval file size, thus establishing a minimum file size requirement for balanced capacity-achieving private information retrieval

Communication Efficient Secret Sharing and Multi-Party Computation

Jul 2022 - Mar 2023

School of Science and Engineering, CUHK-Shenzhen

Supervisor: Zitan Chen

- Explored the properties and characteristics of secret-sharing schemes with optimal communication bandwidth and information rate
- Designed and proposed a matrix-based approach inspired by the research presented in “[Communication Efficient Secret Sharing](#)”, aiming to make the scheme applicable for computer program implementation
- Referenced the book “[Secure Multiparty Computation and Secret Sharing](#)” and “[Lecture Notes in Secret Sharing](#)” to gain further insights and deepen understanding in the field

PROJECT

Bouncing Ball Game in Microprocessor

Sep 2022 - Dec 2022

- Developed a bouncing ball game on a microprocessor from scratch using C language
- Implemented an always-moving baffle in the middle of the game, enabling the ball to bounce back upon collision with the baffle
- Introduced ball speed boost functionality for both Player A and B, allowing them to accelerate the ball's movement using designated keys
- Created a flashing ball effect where, after every five collisions with the board and the baffle, the ball briefly disappears and flashes to provide visual feedback

CarRenting Smart Contract

Nov 2022 - Dec 2022

- Developed a decentralized car rental system using Solidity programming language on the Ethereum blockchain
- Implemented a smart contract called CarRenting that enables users to participate in car rental auctions and make bids

- Designed functions for placing bids, canceling auctions, withdrawing funds, and adding reviews for rented cars

TEACHING EXPERIENCE

The Undergraduate Student Teaching Fellow

School of Data Science, CUHK-Shenzhen

Course: *Introduction to Computer Science: Programming Paradigms (CSC3002)*

Sep 2022 - Dec 2022

Shenzhen, Guangdong

- Led computer science tutorials for a diverse group of over 200 students, providing comprehensive instruction and guidance on various topics within the field
- Designed and developed a sample case for an assignment, allowing students to gain practical experience and apply theoretical concepts to real-world scenarios
- Conducted weekly one-hour office hours, offering students a platform for Q&A, clarifications, and additional support of their homework and projects

The Undergraduate Student Teaching Fellow

School of Science and Engineering, CUHK-Shenzhen

Course: *Advanced Mathematics (MAT1008)*

Sep 2021 - Dec 2021

Shenzhen, Guangdong

- Led calculus tutorials for 27 freshmen in the School of Medicine, providing in-depth explanations and guidance on complex calculus concepts
- Corrected and provided feedback on homework assignments for all 27 students, ensuring accuracy and facilitating their understanding of the material
- Held weekly one-hour office hours, addressing student questions and concerns, clarifying doubts, and providing additional support

EXTRA-CURRICULAR ACTIVITIES AND HONORS

Soccer Achievements

- Member of the Men's Soccer Team at CUHK-Shenzhen
- Won two gold medals in the College Soccer Competition
- Earned a silver medal in the Freshmen Soccer Competition

Go Game Achievements

- Holds an amateur 5th dan rank in Go game
- Achieved 4th place in the Shenzhen Go Game League One

IEEE Student Branch Involvement

- Vice-Chair of the CUHK(SZ) student branch for IEEE
- Conducted and published interviews on the official WeChat account of CUHK(SZ) IEEE, promoting the organization's mission and enhancing its visibility

ACADAMIC HONORS

- AY 2020-2021 Academic Performance Scholarship: Class A (0.5% in CUHK-Shenzhen)
- 20th Round Undergraduate Research Award (5% in CUHK-Shenzhen)
- SSE Dean's List Award of AY 2020-21 (20% in CUHK-Shenzhen)
- SSE Dean's List Award of AY 2021-22 (20% in CUHK-Shenzhen)

SKILLS

- Computer Language: C++, C, Python, Java, Solidity, HTML, CSS
- Software: MATLAB, LaTeX