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" (available at here) 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" (available at here)
- 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" (available at here), aiming to make the scheme applicable for computer program implementation
- Referenced the book "Secure Multiparty Computation and Secret Sharing" (available at here) and "Lecture Notes in Secret Sharing" (available at here) to gain further insights and deepen understanding in the field

TEACHING EXPERIENCE

The Undergraduate Student Teaching Fellow   Sep 2021 - Dec 2021
School of Science and Engineering, CUHK-Shenzhen   *Shenzhen, Guangdong*
Course: *Advanced Mathematics (MAT1008)*

- 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

The Undergraduate Student Teaching Fellow   Sep 2022 - Dec 2022
School of Data Science, CUHK-Shenzhen   *Shenzhen, Guangdong*
Course: *Introduction to Computer Science: Programming Paradigms (CSC3002)*

- 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

ACADAMIC HONNORS

- 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)

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

SKILLS

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

EXTRA-CURRICULAR ACTIVITIES AND HONNORS

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