CAO XIZHEN

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ABOUT ME

I am a JC1 student from Hwa Chong Institution, currently a member of Hwa Chong Infocomm & Robotics Society, President of Project Small Bytes(HCI branch), and have been enrolled in the MOE Art Elective Programme since 2021. My areas of interest consist of Mathematics, science research, and gamedev, and I am also deeply passionate about cybersecurity, computer science, and art.

ACHIEVEMENTS

2025

- ❖ 1st Place AI CTF 2025 Qualifiers, 4th Place Finals
- ❖ 5th Place GreyCTF Finalist
- ❖ Finalist at DSTA Brainhack CDDC 2025
- ❖ 3rd Place SSM CTF 2025
- ❖ 8th Place Lag and Crash CTF 2025
- ❖ 3rd Place NES Connect 2025
- ❖ 3rd Place Articulation Prize 2025

2024

- ❖ Winner of JP Morgan GenerationTech 2024
- ❖ Awarded Bronze at Singapore Mathematics Project Festival 2024
- ❖ Finalist at National Olympiad in Informatics 2024
- ❖ Awarded Lively Places Fund under Urban Redevelopment Authority (URA)
- ❖ Honourable Mention at SMO Open 2024
- ❖ 4th runner up in Sentinel Challenge 2024
- ❖ Recipient of Nanyang Honour Roll

2023

- ❖ Honourable Mention at SMO Open & Senior 2023
- ❖ Distinction for Mathematics research project in Number Theory & Cryptography
- ❖ Participated in Sentinel Challenge 2023

2022

- ❖ Distinction for Mathematics Research Project on probability & combinatorics
- ❖ Awarded Bronze at SMO Junior 2022

EXPERIENCES/PROJECTS/EVENTS

- ❖ **Science Research**
  - ➢ Research Intern @ A*STAR IMRE
    - ■ Project title: Implementation of quantum logic gates with solid-state qubits interfaced with an optical metasurface
  - ➢ Student researcher under Centre for Quantum Technologies (CQT) & HCI CenTaD research Programme
    - ■ Project scope: Finite key analysis on CVQKD (continuous variable quantum key distribution) under noisy conditions with imperfect detectors.

- ❖ **Mathematics research**
  - ➤ List III: Project on cryptoanalysis techniques & number theory in 2023 & 2024
  - ➤ Project on probability & combinatorics, developed an algorithm to solve Wordle in 2022
- ❖ **SieberrsecCTF 2025 (SCTF 6.0)**
  - ➤ Core organising team for SCTF 6.0
  - ➤ Publicity Head, Ceremony IC, challenge setter and planner.
- ❖ **Community service/volunteering**
  - ➤ Project Small Bytes (2025-2026)
    - ■ Teaching primary 5 level schoolchildren Python programming and Pygame
  - ➤ Singapore Red Cross (2022-2024)
- ❖ **Conferences/events**
  - ➤ Student Coordinator for Wavesparks Future Re:Wired, held as part of SWITCH 2025
  - ➤ Off-By-One Conference 2025
  - ➤ SuperAI Conference 2025
- ❖ **Sentinel Programme**
  - ➤ Enrolled in the Sentinel Pilot Programme from 2022 - 2023
  - ➤ Awarded Certificate of Achievement for 2 years
- ❖ **Art Elective Programme (AEP)**
  - ➤ HCI Art Elective Programme (PEACH) 2025-2026
    - ■ Overseas immersion trip to Japan in June 2025
  - ➤ NYGH Art Elective Programme 2021-2024
    - ■ Overseas immersion trip to Taiwan in May 2024
    - ■ Awarded MOE Art Elective Programme Scholarship

SKILLS & INTERESTS

- ❖ **Game Development/Design**
  - ➤ Proficient in Unity, Godot, Blender
  - ➤ Skilled in 3D modelling, storyboarding, animation
- ❖ **Programming languages**
  - ➤ C#, C++
  - ➤ Python
  - ➤ Javascript/HTML/CSS
- ❖ **Cybersecurity**
  - ➤ Cryptography
    - ■ Advanced modular arithmetic, group theory
    - ■ Familiar with cryptosystems such as Lattices, RSA, ECC and AES
  - ➤ Binary Exploitation (Pwn)
    - ■ Familiar with tools such as pwndbg and Ghidra
    - ■ Familiar with stack-based binary exploitation
- ❖ **Competitive Programming**
  - ➤ Familiar with various medium-level algorithms & competitive programming skills
- ❖ **Quantum Computing**
  - ➤ Familiar with various Quantum Key Distribution protocols
  - ➤ Proficiency in software and Python libraries such as Qiskit, Netquid, and QuTiP.