SHR EN CHEN

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Education

Duration

The Hong Kong University of Science and Technology 2022 - 2026
Major: Data Science and Technology
Major: Mathematics
Current GPA: 4.003/4.3

Technical University of Munich 2025 Spring
TUM Exchange program in School of Computation, Information and Technology

Experience

Final Year Thesis in Computer Science, HKUST **Sep 2025– Present**
Range counting over general metric space under differential privacy ***Advisor:*** *Ke, Yi*

- Advanced the field of efficient data structures for range counting over general metric spaces under differential privacy, focusing on theoretical guarantees and practical implementations.

Undergraduate Research Opportunity Program (UROP), HKUST **Sep 2024– Present**
Architecture-intact oracle for fastest path and time queries on dynamic spatial networks ***Advisor:*** *Raymond Wong*

- Enhanced the efficiency of dynamic spatial network queries by improving the probabilistic bound to a guaranteed bound, achieving efficient updates and queries with time complexity $O(\log^c n)$, where c is a constant.

Undergraduate Summer Research Program, NCTS **Jul 2024– Aug 2024**
Regret Bound Analysis for Offline Reinforcement Learning ***Advisor:*** *Pei-Yuan Wu*

- Utilized martingale methods to extend machine learning algorithms for reinforcement learning, ensuring robust regret bound analysis. Leveraged theoretical foundations, including the Riesz representation theorem and Mercer's theorem, to support the kernel trick and enhance algorithm performance with theoretical guarantees.

Teaching Assistant of COMP2011 Programming with C++, HKUST **Jul 2025– Aug 2025**
Design assignment and answer questions from students ***Advisor:*** *Tsz-Him Cheung*

- Designed a Go game programming assignment emphasizing recursion from scratch, assigned to approximately 400 students.

Math Tutor in MATH Support Centre, HKUST **Sep 2024– Present**
Answering math questions and teaching students needed at MATH Support Centre

- Leveraging my strengths to assist students in need at the Math Support Center, enhancing my communication skills by clearly explaining complex concepts.

Student Representative at the Liaison Meeting, Department of Mathematics, HKUST **– Nov 12, 2025**
Effectively communicated student concerns and suggestions to faculty, fostering an improved learning environment

Hosting Culture Festival, School of Science, HKUST **– Mar 13 2024**
Helping the Germany Counter for the Science School Culture Festival

Awards

- **Dean List** in 2022 Fall, 2023 Spring, 2023 Fall, 2024 Spring
- **The S.S. Chern Class Scholarship for Elite Students in Mathematics (since 2023)**
  Awarded to top 10% students for outstanding performance and dedication in mathematical studies
- **Epsilon Fund Award for Excellence in Mathematics Research and Scholarship 2025**
  Mathematics scholarship awarded to top 3% of math majors for outstanding academic excellence
- **Simon Marais Mathematic Competition 2024**
  Achieved top 10% ranking among 1,056 participants in a prestigious mathematics competition

Projects

Implementation of Three Deep Generative Models for Image Generation | #NF, #VAE, #Diffusion **2025**

- Developed a Normalizing Radial Flows model with 16 layers to generate complex images from the Moon dataset.
- Implemented a Variational Autoencoder (VAE) to generate handwritten digits using the MNIST dataset.
- Built a Diffusion Model to synthesize high-quality digit images similar to those in the MNIST dataset.

Implementation of Three Classic Algorithms for 3D Reconstruction | #3D Reconstruction #Optical Flow **2025**

- Built a Lukas Kanade Algorithm for estimating optical flow between two consecutive images and achieve MSE < 0.3
- Developed an Eight-Point Algorithm to reconstruct 3D real world images.
- Implemented a 3D reconstruction pipeline based on the method described in *Robust Odometry Estimation for RGB-D Cameras*, enabling robust pose estimation and mapping from RGB-D images.

Word2Vec Using Multi-Layer Perceptron | #NumPy#Keras #MLP **2023**

- Built a basic NLP model to group similar words (one-hot vectors) together through Numpy and Keras
- Using two approaches for training: Continuous Bags of Words(CBOW) and Skip-Gram

Skills

- Languages: Mandarin(Native), English(Fluent), German A1.1
- Programming: C++ (advanced), Python(Intermediate), Numpy, Pandas, Scikit-Learn, Tensorflow
- Interests: Gym, Jogging, Hiking