

SHUNYU YAO

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EDUCATION

The Chinese University of Hong Kong

Shatin, Hong Kong

- **M.Phil. in Mathematics**

Aug. 2025 – Present

- Advisor: Prof. Gary Pui Tung Choi
- Topic: Computational Geometry

- **B.Sc. in Mathematics (First Class Honors)**

Sep. 2021 – Jul. 2025

- Stream: Enrichment Stream in Mathematics

RESEARCH EXPERIENCE

Wave Intelligence Lab @CUHK CSE

Shatin, Hong Kong

- **Research Assistant**

June. 2026 – Present

- Investigating memorization in generative models across frequency components.

Mattia Serra's Group @UCSD PHYS

California, United States

- **Research Assistant**

May. 2026 – Present

- Working on multiple topics include inverse design of long-term attraction strip in incompressible Stoke fluid.

Capstone Research Project @CUHK MATH

Shatin, Hong Kong

- **Researcher**

Sep. 2024 – Jul. 2025

- Designed and implemented a computational framework in MATLAB and Python for toroidal density-equalizing maps, harmonic decomposition, and balanced mappings of genus-1 surfaces.

REU Program @UTK EECS

Tennessee, United States

- **Researcher**

May 2024 – Aug. 2024

- Designed a graph-structured search heuristic by integrating two neural networks with ideas from graph convolution on a discrete state space, achieving substantially fewer searched nodes than the reinforcement-learning-based baseline DeepCubeA.

PUBLICATIONS AND MANUSCRIPTS

1. Shunyu Yao and Gary P. T. Choi. Conformal tubular parameterization and toroidal bending of tube-like surfaces. *arXiv preprint arXiv:2605.16305*, 2026
2. Shunyu Yao and Gary P. T. Choi. Toroidal Density-Equalizing Map for Genus-One Surfaces. *Journal of Computational and Applied Mathematics*, 472:116844, 2026
3. Shunyu Yao and Mitchy Lee. Solving a rubik's cube using its local graph structure. *arXiv preprint arXiv:2408.07945*, 2024