

Yu-Sheng Shih

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EDUCATION

- 📅 01/2025–Present M.S. in Computer Science and Information Engineering
National Taiwan University 📍 Taipei, Taiwan
» *Advisor:* Prof. [Shang-En Huang](#)
- 📅 08/2019–06/2024 B.S. in Computer Science and Information Engineering
National Taiwan University 📍 Taipei, Taiwan
» Cumulative GPA: 4.05/4.3
» Double Major in Mathematics

RESEARCH INTERESTS

- » Graph Theory & Graph Algorithms
- » Streaming Algorithms
- » Communication Complexity & Lower Bounds
- » Extremal & Probabilistic Combinatorics
- » Combinatorial Optimization

RESEARCH PROJECTS AND PUBLICATIONS

- » **Coloring Problems on 3-Colorable Graphs**
 - » *Instructor & Collaborator:* Prof. Shang-En Huang
 - » We study coloring problems of 3-colorable graphs, aiming to improve bounds for certain subclasses or reduce general cases to more tractable forms.
 - » **Status:** Ongoing; likely the topic of my master's thesis.
- » **Space Complexity Dichotomies for Subgraph Finding Problems in the Streaming Model**
 - » *Collaborators:* Ying-Sien Wu, Yen-Chu Tsai, Prof. Meng-Tsung Tsai
 - » We study space lower bounds for detecting various subgraphs in streaming models, extending the classical triangle-detection lower bounds to broader graph families and induced or directed settings.
 - » [arXiv: 2602.08002](#)
- » **Semi-Autonomous Mathematical Discovery with Gemini: A Case Study on the Erdős Problems**
 - » *Large collaboration* (incl. Google DeepMind and academic coauthors)
 - » *Contribution:* verified and refined model-generated proof drafts
 - » [arXiv: 2601.22401](#)
- » **Combinatorial proofs of Petrie Pieri rule and Plethystic Pieri rule**
 - » *Collaborators:* Saintan Wu, Prof. Sen-Peng Eu, Kuo-Han Ku
 - » We developed a combinatorial approach to interpret the Petrie value of a skewed Young tableau.
 - » [arXiv: 2509.16872](#)

TEACHING EXPERIENCE

- 📅 02/2026–06/2026 Teaching Assistant — **Graph Theory with Applications**
National Taiwan University 📍 Taipei, Taiwan
- 📅 09/2025–present Founder and organizer of **TCS Study Group** in NTU
National Taiwan University 📍 Taipei, Taiwan
» *Cofounders:* Peng-Ting Lin, Ben Cheung, Shang-En Huang, Po-Yu Chou
- 📅 09/2021–01/2022 Teaching Assistant — **Algorithm Design and Analysis**
National Taiwan University 📍 Taipei, Taiwan

LAB EXPERIENCE

- 📅 06/2025–Present Summer Research Intern → Research Assistant at Streaming Algorithms Lab
Academia Sinica
» *Advisor:* Professor **Meng-Tsung Tsai**
» Research areas: Streaming algorithms, Lower bounds.
- 📅 01/2025–Present Master Student at Fast Graph Algorithms Lab
National Taiwan University
» *Advisor:* Professor **Shang-En, Huang**
» Research areas: Graph algorithms.
- 📅 02/2023–01/2025 Undergraduate Research Assistant at Statistical and Randomized Algorithms Lab
National Taiwan University
» *Advisor:* Professor **Chih-Hung, Liu**
» Research Areas: Randomized algorithms, Differential Privacy.

AWARDS

- » ICPC Taipei Regional — Silver Prize (2022)
- » ICPC Taipei Regional — Silver Prize (2021)
- » 60th IMO — Silver Medal (2019)
- » 59th IMO — Bronze Medal (2018)
- » 30th APMO — Bronze Medal (2018)

EXTRACURRICULAR ACTIVITIES

- 📅 04/2026 Taiwan Team Observer A, European Girl's Mathematics Olympiad
EGMO 📍 Bordeaux, France
- 📅 07/2025 Participant, PCMI 2025 GSS: Extremal and Probabilistic Combinatorics
IAS/PCMI 📍 Park City, Utah, USA
- 📅 2023 Winter Quantitative Research Intern
WorldQuant Taiwan 📍 Taipei, Taiwan

LANGUAGES

Mandarin (Native) English (TOEFL mybest:(R,L,S,W)=(30,28,22,26))
Japanese (Simple Conversation)

PROGRAMMING SKILLS

- » \LaTeX , C++, Python, Linux