

# Yu-Sheng Shih

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## EDUCATION

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- 📅 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

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

## RESEARCH PROJECTS

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- » **Subgraph Detection in Streaming Models**
  - » *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.
  - » **Status:** Ongoing; expected submission to CCC 2026.
- » **Coloring Problems on 3-Colorable Graphs**
  - » *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.
- » **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

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- 📅 09/2025-present      Organizer of **TCS Study Group** in NTU  
**National Taiwan University**      📍 Taipei, Taiwan
- 📅 09/2021–01/2022      Teaching Assistant — **Algorithm Design and Analysis**  
**National Taiwan University**      📍 Taipei, Taiwan

## LAB EXPERIENCE

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- 📅 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 coloring algorithm.
- 📅 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.
- 📅 07/2022–08/2022      Summer Research Intern at Programming Language and Formalization Lab  
**Academia Sinica**  
» *Advisor:* Professor **Shin-Chen, Mu**  
» Research Areas: Programming Language Theory, Functional Programming.

## AWARDS

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- » 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

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- 📅 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

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

## PROGRAMMING SKILLS

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- »  $\text{\LaTeX}$ , C++, Python, Rust, Linux