

# Pingbang Hu



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## EDUCATION

- **University of Illinois Urbana-Champaign** Illinois  
*Ph.D. Student in Information Science, School of Information Science* Aug. 2023 - Present
  - **Advisor:** Jiaqi Ma
  - **Research Area:** Theoretical Artificial Intelligence & Theoretical Computer Science
- **University of Michigan** Michigan  
*B.Sc. in Computer Science, College of Engineering* Aug. 2021 - May 2023
  - Graduate with *Summa Cum Laude*
  - **Minor:** Mathematics, College of Literature, Science, and the Arts
- **National Yang Ming Chiao Tung University** Hsinchu, Taiwan  
*Visiting Scholar* Jan. 2020 - Jul. 2020
- **Shanghai Jiao Tong University** Shanghai, China  
*B.Eng. in Electrical and Computer Engineering, UM-SJTU Joint Institute* Aug. 2019 - Aug. 2023
  - **Minor:** Computer Science, UM-SJTU Joint Institute

## RESEARCH EXPERIENCE

- **Finding Minimal Balanced Separators with Detection Sets** Michigan  
*College of Engineering, University of Michigan* Mar. 2022 - Present
  - **Advisor:** Thatchaphol Saranurak
  - Design the first almost linear time algorithm on finding minimal balanced separator.
- **Deep Learning Foundation** Michigan  
*SURE Program, College of Engineering, University of Michigan* May 2022 - Apr. 2023
  - **Advisor:** Wei Hu
  - Theoretical analysis on intrinsic dimension under isoperimetry assumptions.
- **Theory of Graph Neural Networks** Michigan  
*School of Information, University of Michigan* Dec. 2021 - Jan. 2023
  - **Advisor:** Jiaqi Ma
  - Prove the asymptotic separability of a 1-layer GCN on node classification tasks.

## PRE-PRINTS AND TECHNICAL REPORTS

(\* denotes equal contribution)

[P1] **Pingbang Hu**, Thatchaphol Saranurak, “Finding Minimal Balanced Separators with Detection Sets”. *Manuscript*

[P2] **Pingbang Hu**, “Travel the Same Path: A Novel TSP Solving Strategy”. *Preprint*

## TEACHING EXPERIENCE

- **EECS475 Introduction to Cryptography** Michigan  
*Instructional Aide, College of Engineering, University of Michigan* Jan. 2023 - May 2023
  - An upper-level 100+ student course on the main CS track.
  - Hold discussion and office hour weekly, design assignment and exam problems, grade and guide projects.
  - **Topics:** Historic ciphers, perfect secrecy, symmetric encryption, message authentication, cryptographic hash functions, and public key encryption.
- **EECS572 Randomness and Computation** Michigan  
*Instructional Aide, College of Engineering, University of Michigan* Aug. 2022 - Dec. 2022
  - A graduate-level 70+ student course on the M.S. theory CS track.
  - Hold discussion and office hour weekly, design assignment and exam problems, grade and guide projects.
  - **Topics:** Randomized algorithms, randomized complexity, Markov chains, random walks, expander graphs, pseudo-random generators, and hardness v.s. randomness

- VV285 Honor Mathematics III** 🌐
 

Shanghai, China  
 Mar. 2021 - Aug. 2021

 Teaching Assistant, UM-SJTU Joint Institute, Shanghai Jiao Tong University
  - An undergraduate-level 150+ student course on the main B.Eng. ECE track.
  - Hold discussion and office hour weekly, design and grade assignments and exams.
  - Topics:** *Linear systems of equations, vector spaces, Gram-Schmidt orthonormalization, topology of normed spaces, vector fields, higher derivatives, integration on curves and surfaces; Stokes theorem, the inverse and implicit function theorems*
  - Competition:** Hold the 1<sup>st</sup> UM-SJTU JIntegration Bee competition 🌐.
- VV186 Honor Mathematics II** 🌐
 

Shanghai, China  
 Sep. 2020 - Dec. 2020

 Teaching Assistant, UM-SJTU Joint Institute, Shanghai Jiao Tong University
  - An undergraduate-level 200+ student course on the main B.Eng. ECE track.
  - Hold discussion and office hour weekly, design and grade assignments and exams.
  - Topics:** *Logic, set theory, sequences, convergence, completeness of metric spaces, convergence and continuity, derivative, normed vector spaces, sequences of functions, series and power series, Darboux and Riemann integrals*

## HONORS AND AWARDS

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- Hong Kong, Macao and Taiwan Overseas Chinese Student Scholarship**

Shanghai, China  
 Oct. 2021

 First Prize (Ranked #2) among all HK, MC and TW students in Shanghai Jiao Tong University
- Undergraduate Excellent Scholarship**

Shanghai, China  
 Nov. 2020

 Third Prize among all students in UM-SJTU Joint Institute
- Bao Gang Excellent Scholarship**

Shanghai, China  
 Jun. 2020

 Second Prize (Ranked #3) among all Taiwan students in Shanghai Jiao Tong University
- Hong Kong, Macao and Taiwan Overseas Chinese Student Scholarship**

Shanghai, China  
 Dec. 2019

 First Prize (Ranked #1) among all HK, MC and TW students in UM-SJTU Joint Institute