Pingbang Hu

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Degrees

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

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 ◉
- 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
College of Engineering, University of Michigan — Dec. 2021 - Jan. 2023
- **Advisor**: Jiaqi Ma ◉
- Proving 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". In *preparation*

[P2] **Pingbang Hu**, "Travel the Same Path: A Novel TSP Solving Strategy". In *arXiv 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
Teaching Assistant, UM-SJTU Joint Institute, Shanghai Jiao Tong University — Mar. 2021 - Aug. 2021
- 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 1st UM-SJTU JIntegration Bee competition ❂ .
- **VV186 Honor Mathematics II** ❂   Shanghai, China
  Teaching Assistant, UM-SJTU Joint Institute, Shanghai Jiao Tong University   *Sep. 2020 - Dec. 2020*
  - 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*

Selected Honors and Awards

- **Hong Kong, Macao and Taiwan Overseas Chinese Student Scholarship**   Shanghai, China
  First Prize (Ranked #2) among all HK, MC and TW students in Shanghai Jiao Tong University   *Oct. 2021*
- **Undergraduate Excellent Scholarship**   Shanghai, China
  Third Prize among all students in UM-SJTU Joint Institute   *Nov. 2020*
- **Bao Gang Excellent Scholarship**   Shanghai, China
  Second Prize (Ranked #3) among all Taiwan students in Shanghai Jiao Tong University   *Jun. 2020*
- **Hong Kong, Macao and Taiwan Overseas Chinese Student Scholarship**   Shanghai, China
  First Prize (Ranked #1) among all HK, MC and TW students in UM-SJTU Joint Institute   *Dec. 2019*