Yi Xu

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RESEARCH INTERESTS

Parameter approximation on graphs, spectral graph theory, sublinear algorithms, streaming algorithms, learning theory

EDUCATION

University of Science and Technology of China, Hefei, China

- **Master of Engineering in Computer Science and Technology** Sept. 2023 – Present
  Cumulative GPA: 3.84/4.30 Rank: 44/148
  Advisor: Prof. Pan Peng
- **Bachelor of Engineering in Computer Science and Technology** Sept. 2019 – June 2023
  Cumulative GPA: 3.70/4.30 Rank: 40/170

PREPRINTS

- Pan Peng, Christian Sohler, Yi Xu* (alphabetical order). *Sublinear Algorithms for Estimating Single-Linkage Clustering Costs.* arXiv version.
  Developed sublinear-time algorithms for estimating hierarchical clustering (single-linkage) costs. Primarily responsible for formulating proofs of key theorems and validating results through comprehensive experiments.
- Zhiyuan He, Yi Xu*, Cheng Luo, Lili Qiu, Yuqing Yang. *Replica Server Placement in a Satellite Network.* arXiv version.
  Applied facility location and greedy algorithms to optimize CDN deployment via satellites.
- Kyoungjun Park, Zhiyuan He, Cheng Luo, Yi Xu*, Lili Qiu, etc. *Joint Optimization of Handoff and Video Rate in LEO Satellite Networks.* arXiv version.
  Experimented with reinforcement learning models for adaptive bitrate and satellite selection.

TALKS

Women in Theory Workshop 2025 Simons Institute, UC Berkeley
Student rump session (3 minutes) Slides June 2025
Briefly presented recent work on sublinear algorithms for estimating SLC costs.

Theory Student Day 2025 USTC, Hefei, China
Invited talk (30 minutes) Slides March 2025
Presented an in-depth overview of our work on sublinear algorithms for estimating SLC costs.

ACADEMIC EXPERIENCE

TCS Workshop in Nanjing University in China Nanjing, China
Attendee July 2023 and July 2024

- Engaged in presentations and discussions with researchers from Nanjing University, Google Research, and Miller Institute.

University of Science and Technology of China Hefei, China
Master's Student Sept. 2023 – Present

- Investigated efficient approximation algorithms for maximum matching, k-spanner, and metric Steiner tree problems, building through literature review and collaborative research.

Microsoft Research Asia (MSRA) Shanghai, China
Research Intern, Wireless Group Aug. 2022 – March 2023

- Studied applications and algorithms on satellites; Implemented signal processing on USRP and analyzed wireless sensing data in Python.

TEACHING EXPERIENCE

Teaching Assistant, University of Science and Technology of China, Hefei, China

- Design and Analysis of Algorithms (2024) & Algorithms for Big Data (2025): Designed and graded assignments, led exercise classes to explain solutions, held office hours for student support and mentoring, and assisted with exam grading.

PROJECTS

ASC22-23 International Supercomputing Competition   Hefei, China
Team Leader   Jan. 2022 – May 2023

- Led a team to optimize various applications, including numerical simulation and large language models (LLMs).
- Accelerated a Fortran-based weather forecasting model (WRF) by developing data preprocessing pipelines to observe performance in large-scale datasets, and utilizing Intel VTune to analyze and enhance runtime performance.
- Awarded **Silver Prize** among 24 teams in the final round.

VSCode–Azure DevOps Integration Extension   Microsoft Research Asia, Shanghai, China
Team Leader   Sept. 2022 – Dec. 2022

- Led the design and development of a Visual Studio Code extension enabling pull request (PR) workflows with Azure DevOps.
- Coordinated implementation of secure login, comment management and integration of profile images into PR dashboards.
- Implemented core functionalities including PR creation, display, and completion directly within VSCode.

ISC21 International Supercomputing Competition   Online
Participant   Oct. 2020 – June 2021

- Enhanced a Fortran-based weather forecasting model (WRF) by optimizing compilation flags and parallelization strategies.
- Conducted and improved supercomputing benchmarks (HPL and HPCG) through parameter tuning.
- Ranked **1st** on the WRF application and **6th** overall among 13 finalist teams in the competition.

RoboGame2020 Competition   Hefei, China
Participant   June 2020 – Oct. 2020

- Collaborated in designing and programming a robot with STM32 embedded systems for moving simulated patients to designated beds; programmed and controlled the robotic arm for task execution.
- Achieved **Fourth Place** in the second round of the competition.

Pixel-Style Graphic PC Game   Hefei, China
Participant   Oct. 2019 – June 2021

- Utilized C++ to implement features for character navigation, combat, item selection, map loading and NPC interaction.

SELECTED COURSES

- **Algorithms & Theory:** Design and Analysis of Algorithms, Foundations of Algorithms, Algorithms for Big Data, Formal Languages and Computational Complexity, Data Structures
- **Mathematics:** Graph Theory, Stochastic Processes, Probability and Statistics, Linear Algebra, Algebraic Structures, Calculus, Mathematical Logic
- **Special Topics:** Applied Mathematics for Computer Science, Computational Methods, A Guide to Formal Methods, Privacy Issues in Big Data
- **External Reading (Self-study):**
    - Sublinear Time Algorithms (MIT)
    - Modern Spectral Graph Theory (University of Washington)
    - Eigenvalues and Polynomials (University of Waterloo)

AWARDS & SCHOLARSHIPS

- **First-Class Academic Scholarship**, University of Science and Technology of China (2023, 2024)
- **Silver Prize**, ASC22-23 International Supercomputing Competition (2023)
- **Star of Tomorrow**, Microsoft Research Asia (2022)
- **Silver Award**, Outstanding Student Scholarship, University of Science and Technology of China (2019, 2020)

TEST SCORES

TOEFL iBT: 103/120   Reading: 24   Listening: 27   Speaking: 24   Writing: 28   (Test date: May 2025)

SKILLS

- **Theory:** Approximation algorithms, Computational complexity, Spectral graph theory, Stochastic processes, Linear algebra
- **Programming:** C++, Python, Linux shell script, Verilog (hardware description), STM32 (embedded systems), JavaScript
- **Collaboration and Communication:** Team leadership, Seminar presentation, Mentoring and teaching, Fast learner, Strong intellectual curiosity, Resilience