Yi Xu

Second-year Master's student, University of Science and Technology of China, Hefei, China
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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

PUBLICATIONS

Submitted Conference Paper

- Pan Peng, Christian Sohler, **Yi Xu** (alphabetical order). *Sublinear Algorithms for Estimating Single-Linkage Clustering Costs.* Submitted to SODA 2026.

Preprints

- Zhiyuan He, **Yi Xu**, Cheng Luo, Lili Qiu, Yuqing Yang. *Replica Server Placement in a Satellite Network.*
- Kyoungjun Park, Zhiyuan He, Cheng Luo, **Yi Xu**, Lili Qiu, etc. *Joint Optimization of Handoff and Video Rate in LEO Satellite Networks.* arXiv:2504.04586.

TALKS

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

Theory Student Day 2025 — USTC, Hefei, China
Invited talk (30 minutes) — 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

- Developed sublinear-time algorithms for estimating hierarchical clustering (single-linkage) costs in collaboration with Prof. Christian Sohler and Prof. Pan Peng. Primarily responsible for formulating proofs of key theorems and validating results through comprehensive experiments.
- 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

- Applied facility location and greedy algorithms to optimize CDN deployment via satellites; co-authored a research paper.
- Experimented with reinforcement learning models for adaptive bitrate and satellite selection; co-authored a research paper.
- 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