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Southern University of Science and Technology
Shenzhen, China, 518055

EDUCATION

- Sep. 2022 – Jul. 2025 **Southern University of Science and Technology**
Institute of Future Networks
Master of Engineering in Electronic Science and Technology
GPA: 3.54 / 4.0, Outstanding Graduate Student for 2022-2024, **National Scholarship (1%)**
- Sep. 2017 – Jul. 2022 **Southern University of Science and Technology**
Department of Computer Science and Engineering
Bachelor of Engineering in Computer Science and Technology
GPA: 3.55 / 4.0, Outstanding Undergraduate Student with Third-Class Scholarship
- Jul. 2018 – Sep. 2018 **Leeds International Summer School, University of Leeds**
LISS 1014: Introduction to Robotics and Autonomous Systems (First Class)
LISS 1020: Introduction to Digital Photography (First Class)

MAJOR COURSES

Computer Networks (A+, 97), Compilers (A, 95), Algorithm Design and Analysis (A, 94), Software Engineering (A-, 91), Computer Organization (A-, 90), Advanced Algorithms (A-, 90), Advanced Computer Networks and Big Data (A-, 90), Wireless Network and Mobile Computing (A-, 90), Introduction to Information Technology (A-, 90), Artificial Intelligence, Operating System, Linear Algebra, Discrete Mathematics, Probability and Statistics, Fundamentals of Electric Circuits...

RESEARCH EXPERIENCE

- Sep. 2022 – Present **Team Member**, Time-Sensitive Networks Scheduling Algorithm Research Team, SUSTech
Responsibilities: Design traffic shapers and schedulers; Weekly share and discuss cutting-edge DetNet research.
- Feb. 2023 – Jun. 2024 **Research Assistant (RA)**, School of Architecture and Urban Planning, Shenzhen University
Responsibilities: Deploy and schedule drones for better mobile communications; Road reservation.
- Jan. 2024 – Aug. 2024 **Research Assistant (RA)**, Guangzhou Zendure Technology Co., Ltd Shenzhen R&D Center
Responsibilities: Detect home electrical signal anomalies; Develop electricity usage strategies.
- Sep. 2024 – Present **Research Assistant (RA)**, The Hong Kong University of Science and Technology (Guangzhou)

Research Topic 1: How can the flexibility of drones be used to address the dynamic nature of mobile network demand?
Mobile network demand in cities is dramatically dynamic on both spatial and temporal scales. Benefiting from high flexibility and probability of line-of-sight, deploying unmanned aerial vehicles (UAVs) as aerial access points has emerged as a promising solution for ensuring reliable wireless connectivity in crowded events. Among this, two critical issues to ensure quality of service are the 2D deployment and the continuous scheduling of UAVs.

[1] Ruide Cao, Jiao Ye, Jin Zhang, etc. "[An Adaptive UAV Scheduling Process to Address Dynamic Mobile Network Demand Efficiently](#)". *Design, Automation and Test in Europe Conference (DATE)*, 2024.

[2] Ruide Cao, Jiao Ye, Qian You, etc. "[Poster: A Novel Region-of-Interest Based UAV Planning Strategy for Mitigating Urban Peak Demand](#)". *The 24th International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing (MobiHoc)*, 2023.

Research Topic 2: How can road reservations improve the experience of travelling during peak hours in urban areas?

Based on the context of intelligent and refined management of urban transportation, reservation as a means of demand control for road traffic can help to systematically alleviate traffic congestion during peak hours.

[3] Jiao Ye, Ruide Cao, Biao He, etc. "[Disaggregated Spatiotemporal Traffic Assignment for System-Optimal Oriented Road Reservation Service](#)". *Physica A: Statistical Mechanics and its Applications*, 2024.

Research Topic 3: How response-time analysis can be made more flexible to apply to autonomous real-time systems?

Autonomous systems increasingly rely on more flexible task triggering mechanisms (event- and self- instead of time-triggering) to improve their adaptability. Real-time guarantees need to be provided for these flexible flows at the network level to ensure the time-correctness of the system behaviors. Schedule-Abstraction Graph (SAG) and Time-Sensitive Networking (TSN) techniques can provide theoretical delay/jitter upper bounds through scheduling analysis.

[4] Ruide Cao, etc. "[Poster Abstract: Extending Schedule-Abstraction Graph for Event-Triggered Response-Time Analysis](#)". *The 23rd ACM/IEEE Conference on Information Processing in Sensor Networks (IPSN)*, 2024.

[5] Ruide Cao, etc. "[SAGkit: A Python Toolkit for Analyzing the Response Time of Hybrid-Triggered ...](#)". *The 28th ACM International Conference on Hybrid Systems: Computation and Control (HSCC)*, 2025. (Under Review)

[6] Ruide Cao, etc. "[ARTSN: Exact and Adaptive Self-triggered Traffic Scheduling for Reliable ARTS Networks](#)". *The IEEE International Conference on Computer Communications (INFOCOM)*, 2025. (Under Review)

Research Topic 4: Can multi-agent deep reinforcement learning (MADRL) improve battery scheduling decisions?

The geographically distributed edge servers can conveniently draw power from nearby renewable energy generators. Complemented by the dynamic scheduling of energy storage batteries, edge service providers can build low- or even zero carbon edge computing systems. We consider limited information sharing among them and system heterogeneity.

[7] Hanlong Liao, Guoming Tang, ..., Ruide Cao. "[Rethinking Low-Carbon Edge Computing System Design with Renewable Energy Sharing](#)". *The 53rd International Conference on Parallel Processing (ICPP)*, 2024.

RESEARCH INTERESTS

- Designing and analyzing scheduling algorithms to create robust, predictable, dependable, and high-performance platforms for critical cyber-physical and autonomous real-time systems.
- Infrastructure for transportation and wireless communication in smart city.
- End-edge-cloud architectures for distributed computing and control in smart grid.

SKILLS & SPECIALTY

Languages: English (IELTS 7.5), Mandarin (Native), Python, Java, MATLAB, C/C++, C#, Verilog, Solidity, LaTeX.
Frameworks / Platforms: OMNeT++, NS-3, PyTorch, TensorFlow, Vivado, CUDA, UPPAAL, Docker, Qt, WordPress.
Specialty: Ten-year marathon runner (once a year since 2015). **Championship** of 1500-meter and 3000-meter at the 8th Annual Southern University of Science and Technology Track and Field Sports Competition (record-breaking).

INTERNSHIPS

Aug. 2022 – Present **Heyuan Bay Area Digital Economy Technology Innovation Center**

Cloud Center Operation: *Allocate compute and network resources. Regularly check the hardware status.*

Jul. 2021 – Sep. 2021 **Tencent Technology (Shenzhen) Co., Ltd.** (subsidiary of Tencent, Fortune Global 500)

Local Quality Assurance: *Automate the software anomaly detection using Python. Collect anomaly rules.*

Jun. 2021 – Jul. 2021 **Lenovo Information Products Co., Ltd.** (subsidiary of Lenovo, Fortune Global 500)

Project Manager Assistance: *Detailed schedule of project progress. Manage the risk of project delays.*

COMMUNITY SERVICE

✧ **GitHub / AtsushiSakai / PythonRobotics** (23.5k stars, 6.6k forks, 100.0% in Python)

Fixed the `rewire()` function of RRT* path planning. Pull request #812. Fixed issue #550.

✧ **GitHub / jhy / jsoup** (11k stars, 2.2k forks, 84.7% in Java, 15.3% in HTML) Fixed issue #1425.

✧ **GitHub / ChuanyuXue / tsnkit** (51 stars, 17 forks, 95.3% in Python, 4.7% in C++) Pull request #27.

✧ Red Cross First Aider, Registered Volunteer in Shenzhen City, Blood Donor.

✧ **Student Assistant (SA)** for a semester in the student affairs center of SUSTech.

✧ **Teaching Assistant (TA)** for Computer Networks (CS305) and Experimental Phonetics (HUM033) courses.