

Sizhe Wang

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RESEARCH INTERESTS

Experimental Wireless (5G / LEO Satellite) Networking, Extended Reality (VR/AR), Video Streaming, Machine Learning for Graphs, Internet Content Routing, Big Data Analytics, Mobile Computing

EDUCATION

Northeastern University, Boston, USA

Ph.D. in Computer Engineering, NUWiNS Lab

(Second Year) Jan 2024 – Present

Advisor: Dimitrios Koutsonikolas

Concentration: Wireless Networks and Systems

M.S. in Electrical & Computer Engineering

Sep 2022 - Dec 2023

Huazhong University of Science and Technology, Wuhan, China

Bachelor of Software Engineering

Sep 2015 – Jun 2019

Concentration: Digital Media Technology

RESEARCH EXPERIENCE

NUWiNS Lab, Northeastern University, Boston, USA

Jan 2024 – Present

Graduate Research Assistant

- Working on IP classification and clustering for Starlink backbone network using graph transformers.
- Built an automated Starlink network measurement testbed to collect multi-modal datasets including throughput / latency performance, antenna metrics, backbone network scanning, satellite connection information and sky views using Dockerized scripts (Python & Shell) with time-series DBs (Prometheus, InfluxDB, & ClickHouse) with real-time Grafana dashboards.
- Conducted drive tests on head-to-head measurements with LEO satellite (Starlink) and cellular networks (AT&T, T-Mobile, Verizon) in Alaska and Hawaii to analyze the digital divide regarding coverage and performance of wireless technologies in the wild and study the potential of multipath transport to bridge the connectivity gap in non-contiguous US regions.
- Performed a pioneering study on Apple's spatial video codec (MV-HEVC) and streaming with Apple Vision Pro headsets, conducting QoE assessment on spatial videos and proposing a new multipath scheduling design tailored for spatial video streaming.

AT&T Services, Inc., Bedminster, NJ, USA

Jun 2025 – Aug 2025

Research Intern

- Conducted in-depth Internet host IP geolocation study with an implementation based on RFC 8805 geofeeds, Reverse-DNS and latency multilateration.
- Built multi-dimensional Internet routing analysis pipelines supporting ML-based traffic classification for mobile network optimization.
- Crafted a comprehensive ISP-CDN traffic monitoring system independently using Snowflake and PowerBI, enabling content routing analysis between content provider networks and a mobile ISP network.

WurQ Inc, Harvard Innovation Lab, Boston, USA

May 2023 – Dec 2023

Mobile App Developer (Co-op)

- Optimized Bluetooth Low-Energy (BLE) connectivity between wearable IMU devices and smartphones for robust real-time sensor data streaming.
- Developed a cross-platform bridge connecting native iOS/Android sensor SDKs with React Native, enabling synchronized multi-sensor data capture.
- Crafted real-time BLE data ingestion and frontend–backend synchronization pipeline for dual-IMU sensors, supporting ML-based movement recognition and fitness analytics.

Tencent Music Entertainment Group, Shenzhen, China

Oct 2020 - Mar 2022

Web Front-end Development Engineer

- Developed music games using React Native and Cocos2d, which are played by over 10 million users.
- Engineered message feed and comment components for the MOO Music app using Flutter.
- Developed a web system for campaign operation for the QQ Music app, boosting internal operation efficiency.

Tencent Computer System Corporation, Shenzhen, China

Jul 2019 - Oct 2020

Operation & Maintenance Engineer

- Built a Role-Based Access Control system with Restful APIs using Python, securing over 30 systems.
- Led the migration of admin systems to a SPA+API architecture, establishing CI/CD pipelines and unit tests to enhance agility and reliability.
- Developed front-end components for an asynchronous logging system and financial dashboards, streamlining the data visualization process.

PUBLICATIONS

- **Wang, S.**, Ghoshal, M., Feng, Y., Khan, I., Dinh, P., Basit, O., Yu, Z., Hu, Y. C., & Koutsonikolas, D. (2025). *Exploring the 5G Digital Divide in the Non-Contiguous US: LEO Satellites to the Rescue?* In Proceedings of the ACM International Conference on Measurements and Modeling of Computer Systems (SIGMETRICS '26). <https://doi.org/10.1145/3771568> | <https://ece.northeastern.edu/fac-ece/dkoutsonikolas/publications/sigmetrics26.pdf>
- Ghoshal, M., Basit, O., **Wang, S.**, Dinh, P., Khan, I., Feng, Y., Yu, Z., Hu, Y. C., & Koutsonikolas, D. (2025). *A First Large-Scale Study of Operational 5G Standalone Networks*. In Proceedings of the 21st ACM International Conference on Emerging Networking EXperiments and Technologies (Co-Next '25). <https://doi.org/10.1145/3768990> | https://ece.northeastern.edu/fac-ece/dkoutsonikolas/publications/conext_sa25.pdf
- Ghoshal, M., Basit, O., Khan, I., Kong, Z. J., **Wang, S.**, Feng, Y., Dinh, P., Hu, Y. C., & Koutsonikolas, D. (2025). *Replication: "Performance of Cellular Networks on the Wheels."* In Proceedings of the 25th ACM Internet Measurement Conference (IMC '25). <https://doi.org/10.1145/3730567.3764486> | https://ece.northeastern.edu/fac-ece/dkoutsonikolas/publications/imc_rep25.pdf
- Chen, G.*, **Wang, S.***, Chakareski J., Koutsonikolas, D., & Dasari, M. (2025). *Spatial Video Streaming on Apple Vision Pro XR Headset*. In Proceedings of the 26th International Workshop on Mobile Computing Systems and Applications (HOTMOBILE '25). <https://doi.org/10.1145/3708468.3711878>
- **Wang, S.**, Liu, M., Dasari, M., & Koutsonikolas, D. (2024). *A First Look at Apple's Stereoscopic Video and its Potential in Live Video Streaming for XR Headsets*. Poster presented at MobiCom '24. <https://doi.org/10.1145/3636534.3697437>
- Guo, Y., **Wang, S.**, Ghoshal, M., Hu, Y. C., & Koutsonikolas, D. (2023). *The power of asynchronous SLAM in multi-user AR over cellular networks: A measurement study*. In Proceedings of the 2023 Workshop on Emerging Multimedia Systems (EMS '23). <https://doi.org/10.1145/3609395.3610598>

TECHNICAL SKILLS

Network Standards: 5G, LTE, 3GPP Non-Terrestrial Network (NTN), WiFi, Bluetooth, NFC, TCP/IP

Machine Learning: PyTorch, GNNs, Graph Transformers

Programming: Python, Shell Scripting, SQL, JavaScript/TypeScript, C++/C, Java, Swift

Data Analytics: Pandas, Numpy, Snowflake, SQL, Clickhouse, Prometheus, InfluxDB

Framework/Tools: Wireshark, tcpdump, nttcp/iperf, tc, network diagnosis tools (ping/traceroute/dig etc.), Docker, Prefect, Grafana, Matlab