Caitao Zhan

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ABOUT ME

I now work in `quantum` networking/computing/sensing. Previously I work in `classical` networking/computing/sensing.

EDUCATION

Aug. 2017 ∼ Jan. 2024	Stony Brook University GPA: 3.9/4.0	Ph.D. Candidate in Computer Science Advisor: Himanshu Gupta, Thesis: PDF
Sept. 2013 ∼ Jun. 2017	China University of Geosciences GPA: 92/100	B.S. in Computer Science and Technology Rank: 1/122

EMPLOYMENT

Feb. 2024 ∼ Present	**Postdoc @ Argonne National Lab (Data Science and Learning Division)** Quantum networks, SeQUeNCe, Quantum Internet architecture
May 2021 ∼ Aug. 2021	**Software Engineering Intern @ Microsoft (Azure)** `C#` development: Active Directory/Light-weight Directory Service (AD/LDS) Replay Tool Automation
Jun. 2018 ∼ Jan. 2024	**Research assistant @ Stony Brook University** Wireless sensor networks, data center networks, quantum networks, and quantum sensor networks
Sep. 2017 ∼ May 2018	**Teaching assistant @ Stony Brook University**

RESEARCH EXPERIENCE

Feb. 2024 ∼ Present	Quantum Network [17], SeQUeNCe and Quantum Network Simulation [13, 14, 16]
Jan. 2021 ∼ Jan. 2024	Efficient Quantum Communication Networks. [8, 15] Design/implement routing algorithms/protocols for quantum networks. Bell states, GHZ, Graph states.
Sep. 2021 ∼ Jan. 2024	Discrete Outcome Quantum Sensor Networks. [9, 12] Quantum state/channel discrimination, initial state optimization, semidefinite programming, theory.
Aug. 2022 ∼ Sep. 2023	Quantum Sensor Network Algorithms for Transmitter Localization. [10] Quantum sensing, quantum state discrimination, quantum machine learning
Nov. 2019 ∼ Mar. 2022	Intelligent Radio with Deep Learning. [5, 7, 11] Design/implement CNNs to solve wireless network problems: wireless localization & spectrum allocation. Reframe wireless problems to computer vision problems: image-to-image translation & object detection.
Mar. 2019 ∼ Oct. 2019	Efficient Localization of Multiple Intruders in Shared Spectrum System. [3] Design/implement. Bayesian approach. Testbed(Odroid,Raspberry Pi,USRP,HackRF).
Dec 2018 ∼ Sep. 2020	Datacenter Networks. [4] Multi-hop circuit switch scheduling. Greedy, approximation proof. Participate in implementation.
July 2018 ∼ July 2019	Selection of Sensors for Efficient Transmitter Localization. [2, 6] Implement. Greedy, approximation proof. Bayesian approach. GPU acceleration.
Oct. 2015 ∼ Sept. 2016	Optimization using Evolutionary Algorithms. [1] Design/implement. Shortest path-finding using ant colony optimization algorithms. Proposed a probability-based evolutionary algorithm solving shape formation problems.

SKILLS & TOOLS

Python and **C++** are my most frequently used languages. I also have experience in **C#**, **Java**, **C**, and **Matlab**. Machine learning: **PyTorch**, **scikit-learn**, and **ML.NET**. Quantum: quantum network simulator **NetSquid**, quantum development SDK **Qiskit**, and quantum machine learning library **TorchQuantum**. GPU programming: **CUDA** and **Numba**. Software-defined radio: **GNU Radio**. Database: **MySQL** and **SQLite**. Convex optimization: **OR-Tools** and **CVXPY**.

Selected Awards and Honors

China National Scholarship	2014, Chinese Ministry of Education, Top 1%
Travel Grant for ACM IMC	2018, ACM Internet Measurement Conference
Best Poster Award (Participants Choice) in Graduate Research Day	2022, Department of CS, Stony Brook University
Outstanding Poster Presentation Award in Postdoctoral Symposium	2024, Argonne National Lab
Best Paper Award	2025, IEEE QCE, QNET track

Academic Services

Co-chair of Argonne National Lab Postdoctoral Research and Career Symposium 2025

Program Committee of QCE 2024, QNSim 2024, QCNC 2025, HAIQ 2025, QNSim 2025, QCE 2025, QCNC 2026

Artifact Evaluation Committee of ACM MobiCom 2023

Reviewer of journals: Elsevier J. Netw. Comput. Appl., Elsevier PMC, IEEE TON, IEEE IoT-J, IEEE OJCOMS, IEEE TCOM, ACM TQC, Npj Quantum Inf.

Reviewer of conferences: ISIT 2025, Euro-Par 2025.

Unpublished

[17] Joaquin Chung, Daniel Dilley, ···, **Caitao Zhan**, et al., "InterQnet: A Heterogeneous Full-Stack Approach to Co-designing Scalable Quantum Networks", 2025

Publication

[16] Laura d'Avossa, **Caitao Zhan**, Joaquin Chung, Rajkumar Kettimuthu, Angela Sara Cacciapuoti, Marcello Caleffi, "Simulation of Quantum Transduction Strategies for Quantum Networks", IEEE QCE 2025, PDF. *Best Paper Award.*

[15] X. Fan, **C. Zhan**, H. Gupta, C.R. Ramakrishnan, "Optimized Distribution of Entanglement Graph States in Quantum Networks", IEEE Transactions on Quantum Engineering, 2025, PDF.

[14] **Caitao Zhan**, Joaquin Chung, Rajkumar Kettimuthu, Allen Zang, Alexander Kolar, "Design and Simulation of the Adaptive Continuous Entanglement Generation Protocol", QCNC 2025, arXiv.

[13] Francesco Mazza, **Caitao Zhan**, Joaquin Chung, Rajkumar Kettimuthu, Marcello Caleffi, Angela Sara Cacciapuoti, "Simulation of Entanglement-Enabled Connectivity in QLANs using SeQUeNCe", IEEE ICC 2025, arXiv.

[12] **C. Zhan**, H. Gupta, M. Hillery, "Optimizing Initial State of Detector Sensors in Quantum Sensor Networks", ACM Transactions on Quantum Computing, 2024. PDF.

[11] M. Ghaderibaneh, **C. Zhan**, H. Gupta, "DeepAlloc: CNN-Based Approach to Efficient Spectrum Allocation in Shared Spectrum Systems", IEEE Access 2024, PDF.

[10] **C. Zhan**, H. Gupta, "Quantum Sensor Network Algorithms for Transmitter Localization", IEEE QCE 2023, PDF.

[9] M. Hillery, H. Gupta, **C. Zhan**, "Discrete Outcome Quantum Sensor Networks", Physical Review A, 2023, PDF.

[8] M. Ghaderibaneh, **C. Zhan**, C.R. Ramakrishnan, H. Gupta, "Efficient Quantum Network Communication using Optimized Entanglement-Swapping Trees", IEEE Transactions on Quantum Engineering, 2022. PDF.

[7] **C. Zhan**, M. Ghaderibaneh, P. Sahu, H. Gupta, "DeepMTL Pro: Deep Learning Based Multiple Transmitter Localization and Power Estimation", Elsevier Pervasive and Mobile Computing, 2022, PDF.

[6] A. Bhattacharya, **C. Zhan**, A. Maji, H. Gupta, S. Das, P. Djuric, "Selection of Sensors for Efficient Transmitter Localization", IEEE/ACM Transactions on Networking 2021, PDF.

[5] **C. Zhan**, M. Ghaderibaneh, P. Sahu, H. Gupta, "DeepMTL: Deep Learning Based Multiple Transmitter Localization", IEEE WoWMoM 2021, PDF.

[4] H. Gupta, M. Curran, **C. Zhan**, "Near-Optimal Multihop Scheduling in General Circuit-Switched Networks", ACM CoNEXT 2020, PDF.

[3] **C. Zhan**, H. Gupta, A. Bhattacharya, M. Ghaderibaneh, "Efficient Localization of Multiple Intruders in Shared Spectrum System", ACM/IEEE IPSN 2020, PDF.

[2] A. Bhattacharya, **C. Zhan**, H. Gupta, S. Das, P. Djuric, "Selection of Sensors for Efficient Transmitter Localization", IEEE INFOCOM 2020, PDF.

[1] **C. Zhan** and C. Li, "Shape Formation in Games: a Probability-based Evolutionary Approach", 2016 International Conference on Computational Intelligence and Security, PDF.