Shahrooz Pouryousef

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Legal Status

- **U.S. Permanent Resident**

Research interests

Distributed fault tolerant quantum computing, security in quantum machine learning, quantum networks

Education

UMass Amherst **Aug. 2020 – Jun 2025**
Ph.D degree in Computer Science

UMass Amherst **Aug. 2017 – Aug. 2020**
Master Degree in Computer Science

Sharif University of Technology **Sep. 2013 – Aug. 2015**
Master Degree in Computer Engineering

Research Experience

Cisco quantum lab (Cisco Systems) Research Scientist **Summer 2025 – Present**

- Circuit partitioning for fault-tolerant distributed quantum computing
- Conduct research on using classical data center architectures for a quantum data center.
- Develop simulation and scheduling frameworks for large-scale fault-tolerant distributed quantum systems.

Cisco Quantum lab Intern **Summer 2023**

- Scheduler for remote-gate execution in a quantum data centers
- Formulating quantum network planning as an optimization problem
- Formal analysis and evaluation of different entanglement distribution protocols

ACQUIRE (Quantum networks research lab) **September. 2020 - Jun 2025**

- Design and evaluation of Quantum Storage Networks (QSNs).
- Resource allocation for entanglement generation and distillation in quantum networks
- Accelerating Quantum Error Correction with Machine Learning-Based Decoding

Advanced Networked Systems Research lab **Aug. 2017 - Aug. 2020**

- Design and implementation of a logically centralized architecture for interdomain routing
- Implementation of a reinforcement learning system for traffic engineering in Intradomain routing for ISPs

Calipr research group **Aug. 2017 - Dec 2019**

- Developing an open source framework which conducts longitudinal Internet-scale measurements to identify when popular domains are victims of typosquatting

Publications

- Network-Aware Scheduling for Remote Gate Execution in Quantum Data Centers

- **Shahrooz Pouryousef**, Reza Nejabati, Don Towsley, Ramana Kompella, and Eneet Kaur
- arXiv:2504.20176

- Analyzing the Impact of Network Constraints on Fault-Tolerant Distributed Quantum Computing

- **Shahrooz Pouryousef**, Hassan Shapourian Eneet Kaur, and Reza Nejabati
- Under submission

- SoK: Critical Evaluation of Quantum Machine Learning for Adversarial Robustness

- Jesus Lopez, Saeefa Rubaiyet Nowmi **Shahrooz Pouryousef**, and Mohammad Saidur Rahman
- Submitted to NDSS 25

- Optimized quantum circuit partitioning across multiple quantum processors

- Eneet Kaur, **Shahrooz Pouryousef**, Shapourian, H., Zhao, J., Kilzer, M., Kompella, R. and Nejabati
- IEEE Transactions on Quantum Engineering (2025)

o Leveraging Internet Principles to Build a Quantum Network

- Bacciottini, Leonardo, Matheus Guedes De Andrade, **Shahrooz Pouryousef**, Emily A. Van Milligen, Aparimit Chandra, Nitish K. Panigrahy, Nageswara SV Rao, Gayane Vardoyan, and Don Towsley
- IEEE Networks (2025)

o Resource Placement for Rate and Fidelity Maximization in Quantum Networks

- **Shahrooz Pouryousef**, Hassan Shapourian, Alireza Shabani, Ramana Kompella, and Don Towsley
- IEEE Transactions on Quantum Engineering (2024)

o Analysis of Asynchronous Protocols for Entanglement Distribution in Quantum Networks

- **Shahrooz Pouryousef**, Hassan Shapourian, and Don Towsley
- International Conference on Quantum Communications, Networking, and Computing 2024

o On the Analysis of Quantum Repeater Chains with Sequential Swaps

- Matheus Guedes de Andrade, Emily A Van Milligen, Leonardo Bacciottini, Aparimit Chandra, **Shahrooz Pouryousef**, Nitish K Panigrahy, Gayane Vardoyan, Don Towsley
- arXiv preprint arXiv:2405.18252

o Quantum Network Planning for Utility Maximization

- **Shahrooz Pouryousef**, Hassan Shapourian, Alireza Shabani, and Don Towsley
- 1st Workshop on Quantum Networks and Distributed Quantum Computing, pp. 13-18. 2023.

o A Quantum Overlay Network for Efficient Entanglement Distribution

- **Shahrooz. Pouryousef**, Nitish K. Panigrahy , and Don Towsley
- IEEE INFOCOM 2023.

o Scaling Limits of Quantum Repeater Networks

- Mahdi Chehimi, **Shahrooz Pouryousef**, Nitish K Panigrahy, Don Towsley, Walid Saad
- QCE 2023. Bellevue, Washington, USA (Sep 2023).

o Resource Management in Quantum Virtual Private Networks."

- **Shahrooz. Pouryousef**, Nitish K. Panigrahy, Monimoy Deb Purkayastha, Sabyasachi Mukhopadhyay, Gert Grammel, Dominoko Di Mola, and Don Towsley.
- QCE23 poster

o Towards Logically Centralized Interdomain Routing

- **Shahrooz. Pouryousef**, Lixin Gao, and Arun Venkataramani
- 17th USENIX Symposium on Networked Systems Design and Implementation (NSDI '20 Fall).

o Extortion or Expansion? An investigation into the costs and consequences of ICANN's gTLD experiments

- **Shahrooz. Pouryousef**, Muhammad Daniyal Dar, Suleman Ahmad, Phillipa Gill, and Rishab Nithyanand
- Passive and Active Measurement Conference, Measurement tools and Network security and privacy track, 2020.

Teaching Experience

o **Instructor**

- **Introduction to Computer Programming (CICS 110)**
  UMass Amherst, CICS, Fall 2024
  Enrollment: **54 students**

- **First-Year Undergraduate Seminar on Exploring Modern Computing**
  UMass Amherst, CICS, Fall 2023
  Enrollment: **40 students**

- **Teaching Assistant**
  - **CS453 Computer Networks**
    UMass Amherst, Spring 2023
  - **Computer Network Security**
    Sharif University of Technology, Spring 2013
  - **Wireless Networks**
    Sharif University of Technology, Spring 2014

Outreach & Service

- **Reviewer**
  IEEE Transactions on Networking (ToN) journal and ICC conference
- **CQN SLC Industry Officer**
  Organized events to foster community within the Center for Quantum Networks (CQN) 2023–2024
- **CICS Graduate Student Representative**
  UMass Amherst, CICS, 2022–2023
  Attended weekly faculty meetings to discuss department issues, hiring, and promotions
- **Member, UMASS CICS Social Committee**
  Served for two semesters to enhance social engagement 2019–2020
- **Member, Graduate Students Committee for Faculty Hiring**
  Participated in interviewing faculty candidates for three semesters 2021–2022
- **PhD Applicants Support Program (PASP) Committee Member**
  Assisted applicants from underrepresented groups in improving PhD applications 2021–2023

Mentoring Experience

- **Undergraduate Mentorship in Quantum Research**
  Mentored four undergraduates on projects related to quantum error correction and distributed quantum computing.