SHIXIONG QI

AFFILIATION

Department of Computer Science and Engineering September 2018 - Present
University of California, Riverside

State Key Laboratory of Integrated Service Networks (ISN) September 2015 - June 2018
School of Telecommunications Engineering, Xidian University

EDUCATION

University of California, Riverside
PhD ongoing in Computer Science September 2018 - Present
Overall GPA: 3.85/4

Xidian University, Xi'an, Shaanxi, China
M.S. in Communication & Information Systems September 2015 - June 2018
Overall GPA: 3.71/4 (Ranking 25/284)

Nanjing University of Posts and Telecommunications, Nanjing, Jiangsu, China
B.S. in Electronic Information Engineering September 2011 - July 2015
Overall GPA: 3.69/4 (Ranking 5/97)

CURRENT RESEARCH INTERESTS

Serverless Computing, Container Network Interface (CNI), extended Berkeley Packet Filter (eBPF), Network Function Virtualization in 5G cellular network

PUBLICATIONS

Journal

- **Shixiong Qi**, Sameer G. Kulkarni, and K. K. Ramakrishnan, "Assessing container network interface plugins: Functionality, performance, and scalability," *IEEE Transactions on Network and Service Management*. IEEE, 2020. (Accepted and in press)
- Lei Huang, Kun Wang, **Shixiong Qi**, Huaxi Gu, and Yintang Yang, "Panzer: A 6× 6 photonic router for optical network on chip," *IEICE Electronics Express* 13, no. 21 (2016): 20160719-20160719.
- Kun Wang, **Shixiong Qi**, Zheng Chen, Yintang Yang, and Huaxi Gu, "SMONoC: Optical network-on-chip using a statistical multiplexing strategy," *Optical Switching and Networking* 34 (2019): 1-9.
- Jiaxiang Li, Huaxi Gu, **Shixiong Qi**, Haoran Wang, and Kang Wang, "ALPHA: A hybrid topology for memory-centric network," *IEICE Electronics Express* 16, no. 4 (2019): 20181108-20181108.

Conference

- **Shixiong Qi**, Sameer G. Kulkarni, and K. K. Ramakrishnan, "Understanding container network interface plugins: design considerations and performance," *2020 IEEE International Symposium on Local and Metropolitan Area Networks (LANMAN)*. IEEE, 2020.
- **Shixiong Qi**, Huaxi Gu, Haibo Zhang, and Yawen Chen, "Testudo: A low latency and high-efficient memory-centric network using optical interconnect," *GLOBECOM'2017 - 2017 IEEE Global Communications Conference*. IEEE, 2017.

- **Shixiong Qi**, Kun Wang, Huaxi Gu, Kang Wang, and Xiaolu Wang, "Crosstalk analysis for closed ring-based optical network-on-chip," *In 2015 IEEE International Conference on Communication Problem-Solving (ICCP)*, pp. 331-333. IEEE, 2015.
- Lei Huang, **Shixiong Qi**, Kun Wang, and Huaxi Gu, "LACE: A non-blocking on-chip optical router by utilizing the wavelength routing technology," *In 2017 16th International Conference on Optical Communications and Networks (ICOCN)*, pp. 1-3. IEEE, 2017.
- Xinglong Diao, Lei Huang, Wei Tan, **Shixiong Qi**, and Huaxi Gu, "A low-crosstalk optical router using multi-layer coupled MR for ONoC," *In 2017 16th International Conference on Optical Communications and Networks (ICOCN)*, pp. 1-3. IEEE, 2017.

Technical Report

- **Shixiong Qi**, Sameer G. Kulkarni, and K. K. Ramakrishnan, "Assessing container network interface plugins: Functionality, performance, and scalability," *UC Riverside, UCR CSE Networking Group Tech. Rep. Net-2020- 1221*, 2020. [Online]. Available: https://www.cs.ucr.edu/∼sqi009/Net-2020-1221.pdf

P.R.C. PATENT

- Kun Wang, **Shixiong Qi**, Zheng Chen, Huaxi Gu, Yintang Yang, Long Zhao. An Optical Network-on-Chip System and Communication Scheme based on Statistical Multiplexing Strategy. 2016-03. Application No.201610165497.1
- Lei Huang, Kun Wang, Huaxi Gu, Yintang Yang, **Shixiong Qi**, Wei Tan. A Multi-port Scalable On-chip Optical Router Supporting Multicast Communication. 2016-05. Application No.201610312528.1

HONOURS AND AWARDS

- Second-class scholarship, Nanjing University of Posts and Telecommunications 2012, 2013, 2014
- Excellent Student Award, Nanjing University of Posts and Telecommunications 2013
- First Prize in Jiangsu Province, the National Mathematical Modeling Contest 2013
- Honorable Mention, Mathematical Contest In Modeling 2014
- First-class scholarship, Xidian Univertsity 2015
- Second-class scholarship, Xidian Univertsity 2016
- Excellent Student Award, Xidian University 2016
- National scholarship, Xidian University (Top 3% of 700+) 2017

EXPERIENCE

University of California, Riverside Sep 2018 - Present
Research assistant *Riverside, CA*

- Research on providing an in-depth understanding of the different Container Network Interface (CNI) plugins through qualitative analysis and a careful measurement-driven evaluation. We identified the key design considerations and associated performance of different CNI plugins.
- Develop a eBPF-based monitoring system for Mizar[1] (a large scale and high-performance cloud network platform), which can be used to provide network-related metrics for further processing, i.e. auto-scaling and smart placement. A auto-scaler framework is also developed for the Mizar to flexibly scale in/out the networking components.
- Research on developing high-performance 5G Network Function Virtualization platform.

[1] https://github.com/CentaurusInfra/mizar

Xidian University August 2015 - June 2018
Research assistant *Xi'an, China*

· Lead the application for the Opening Foundation of State Key Laboratory of Computer Science by Institute of Computing Technology, Chinese Academy of Sciences.
· Take part in the application for National Natural Science Foundation of China as the main participant.
· Develop the simulation platform for optically connected memory system based on OMNET++ simulator.
· Design interconnection network for the communication between cores and Hybrid Memory Cube (HMC) by using optical interconnect technology, including the topology, the communication method and the network interface.
· Research on the design and improvement of cache coherence protocol in optical interconnect memory system.
· Research on the design of on-chip optical router with high scalability.

University of Otago August 2017
Visiting Student *Dunedin, New Zealand*

· Research on efficient design on Optical Network-on-Chips.
· Develop a C++ based simulator for testing the on-chip multicast communication algorithm, which can realize non-blocking multicast communication between different cores.

REFEREES

Prof. K. K. Ramakrishnan
Department of Computer Science and Engineering
University of California, Riverside
Email: kk@cs.ucr.edu

Prof. Huaxi Gu
State Key Laboratory of Integrated Service Networks
Xidian University
Email: hxgu@xidian.edu.cn

Dr. Yawen Chen
Department of Computer Science
University of Otago
Email: yawen@cs.otago.ac.nz