

Yangming Zhao  
Research Scientist

Department of Computer Science and Engineering, University at Buffalo  
Email: yangming@buffalo.edu Cell phone: (716)322-8729  
Google Scholar: [https://scholar.google.com/citations?user=5\\_gP3W8AAAAJ](https://scholar.google.com/citations?user=5_gP3W8AAAAJ)  
Homepage: <https://zhaoymbuffalo.github.io/homepage/>

### ***Employment History***

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<b>Research Scientist</b> , University at Buffalo, Computer Science and Engineering	03/2016 - Present
<b>Research Scientist</b> , Alcatel-Lucent Shanghai Bell Co.. Bell Labs China	08/2015 - 03/2016

### ***Education Background***

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<b>Ph.D.</b>	University of Electronic Science and Technology of China Communication and Information Engineering Dissertation: "Routing and Resource Allocation in Data Center Networks"	09/2010 – 06/2015
<b>Visiting Ph.D. Student</b>	Hong Kong University of Science and Technology Department of Computer Science and Engineering	11/2013 – 03/2014
<b>Visiting Ph. D. Student</b>	University at Buffalo Department of Computer Science and Engineering,	04/2013 – 10/2013
<b>Graduate Study</b>	University of Electronic Science and Technology of China Transfer to Ph.D. program before finishing my master degree	09/2008 – 06/2010
<b>B.S.</b>	University of Electronic Science and Technology of China Thesis: "Network Traffic Engineering Based on Flow Deviation"	09/2004 – 06/2008

### ***Selected Awards and Honors***

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First Prize of Excellent Graduate Scholarship	2010 – 2011
Excellent Postgraduate Award	2008 – 2009
Meritorious Winner in The Interdisciplinary Contest in Modeling (ICM) for Undergraduate	02/2007
National Scholarship	2006 – 2007

### ***Teaching Experience***

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<b>Fill-in Instructor</b> for CSE 410 "Introduction for Deep Learning" at UB	Fall 2019
<b>Fill-in Instructor</b> for CSE 368 "Introduction for Artificial Intelligence" at UB	Fall 2019
<b>Instructor</b> for CSE 489/589 "Modern Network Concepts" at UB	Summer 2019
<b>Teaching Assistant</b> for CSE 487/587 "Data Intensive Computing" at UB	Spring 2019
<b>Teaching Assistant</b> for "Graph Theory and Its Applications" at UESTC	Fall 2011
<b>Teaching Assistant</b> for "Computer Communication Networks" at UESTC	Fall 2010

### ***Selected Journal Publications***

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- [12] **Y. Zhao**, C. Tian, J. Fan, T. Guan, X. Zhang and C. Qiao "Joint Reducer Placement and Coflow Bandwidth Scheduling for Computing Clusters", IEEE/ACM Transactions on Networking, to appear
- [11] **Y. Zhao**, X. Liu, L. Tu, C. Tian and C. Qiao "Dynamic Service Entity Placement for Latency Sensitive Applications in Transportation Systems", IEEE Transactions on Mobile Computing, to appear
- [10] J. Fan, M. Jiang, Ori Rottenstreich, **Y. Zhao\***, T. Guan, R. Ramesh, S. Das and C. Qiao, "A Framework for Provisioning Availability of NFV in Data Center Networks", IEEE J. of Sele. Area in Commu. , Volume: 36, Issue: 10, pp. 2246 – 225, Oct. 2018 (corresponding author)
- [9] C. Tian, A. Munir, A. Liu, J. Yang and **Y. Zhao**, "OpenFunction: An Extensible Data Plane Abstraction

- Protocol for Platform-Independent Software-Defined Middleboxes”, IEEE/ACM Transactions on Networking, Volume: 26, Issue: 3, pp. 1488 – 1501, Jun. 2018
- [8] **Y. Zhao**, C. Tian, Z. Zhu, J. Cheng, C. Qiao and A. Liu “Minimize the Make-span of Batched Requests for FPGA Pooling in Cloud Computing”, IEEE Transactions on Parallel and Distributed Systems, Volume: 29, Issue: 11, pp. 2514 – 2527, Nov. 2018
- [7] H. Chen, X. Wang, **Y. Zhao**, T. Song, Y. Wang, S. Xu and L. Li “MOSC: a method to assign the outsourcing of service function chain across multiple clouds”, Computer Networks, Volume 133, Issue: 14, pp. 166-182, Mar. 2018
- [6] S. Luo, H. Yu, **Y. Zhao**, B. Wu, S. Wang, S. Yu and L. Li, “Towards Practical and Near-optimal Coflow Scheduling for Data Center Networks”, IEEE Trans. on Parallel and Distributed Systems, Volume: 27, Issue: 11, pp. 3366 – 3380, Nov. 2016
- [5] Y. Peng, K. Chen, G. Wang, W. Bai, **Y. Zhao**, H. Wang, Y. Geng, Z. Ma and L. Gu, “Towards Comprehensive Traffic Forecasting in Cloud Computing: Design and Application”, IEEE/ACM Transactions on Networking, Volume: 24, Issue: 4, pp. 2210 – 2222, Aug. 2016
- [4] X. Zhang, S. Wang, **Y. Zhao**, S. Xu, X. Wang, X. Gao, C. Qiao, “Multi-Objective Optimization for Green Network Routing in Game Theoretical Perspective”, IEEE J. of Sele. Area in Commu., Volume: 33, Issue: 12, pp. 2801 – 2814, Dec. 2015 (Extended version of INFOCOM 2013)
- [3] **Y. Zhao**, S. Wang, S. Luo, V. Anand, H. Yu, S. Xu and X. Zhang, “Dynamic Topology Management in Optical Datacenter Networks”, IEEE J. of Lightwave Tech., Volume: 33, Issue: 19, pp. 4050-4062, Oct. 2015
- [2] X. Gao, Z. Ye, J. Fan, W. Zhong, **Y. Zhao**, X. Cao, H. Yu, C. Qiao, “Virtual network mapping for multicast services with max-min fairness of reliability”, IEEE/OSA J. of Optical Communication Netw., Volume: 7, Issue: 9, pp. 942 – 951, Sep. 2015
- [1] **Y. Zhao**, Y. Huang, K. Chen, M. Yu, S. Wang and D. Li, “Joint VM Placement and Topology Optimization for Traffic Scalability in Dynamic Datacenter Networks”, Computer Networks, Volume 80, Issue: 7, pp. 109-123, Apr. 2015

### ***Selected Conference Publications***

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- [27] **Y. Zhao**, X. Liu, T. Wang, Y. Hou and C. Qiao “EdgePS: Selective Parameter Aggregation for Distributed Machine Learning in Edge Computing”, Submitted to IEEE International Conference on Computer Communications (INFOCOM) 2021
- [26] **Y. Zhao** and C. Qiao “Redundant Entanglement Provisioning and Selection for Throughput Maximization in Quantum Networks”, Submitted to IEEE International Conference on Computer Communications (INFOCOM) 2021
- [25] **Y. Zhao**, X. Liu, Y. Hou, T. Wang, T. Song, S. Wang and C. Qiao “JointPS: Joint Parameter Server Placement and Flow Scheduling for Machine Learning Clusters”, Submitted to IEEE International Conference on Computer Communications (INFOCOM) 2021
- [24] Z. Wang, H. Xu, J. Liu, H. Huang, C. Qiao and **Y. Zhao** “Resource-Efficient Federated Learning with Hierarchical Aggregation in Edge Computing”, Submitted to IEEE International Conference on Computer Communications (INFOCOM) 2021
- [23] Z. Meng, H. Xu, M. Chen, Y. Xu, **Y. Zhao** and C. Qiao, “Learning-Driven Decentralized Machine Learning in Resource-Constrained Wireless Edge Computing”, Submitted to IEEE International Conference on Computer Communications (INFOCOM) 2021
- [22] T. Wang, Q. Hu, J. Zhang, **Y. Zhao**, Y. Xia and L. Wang “Quantizing the Delay with Microburst in Data Center Networks: A Machine Learning Approach”, Submitted to IEEE International Conference on Computer Communications (INFOCOM) 2021
- [21] **Y. Zhao**, J. Fan, L. Su, T. Song, S. Wang and C. Qiao “SNAP: A Communication Efficient Distributed Machine Learning Framework for Edge Computing”, IEEE International Conference on Distributed

- [20] G. Zhao, H. Xu, **Y. Zhao**, C. Qiao and L. Huang “Offloading Dependent Tasks in Mobile Edge Computing with Service Caching”, IEEE International Conference on Computer Communications (INFOCOM) 2020
- [19] X. Liu, **Y. Zhao** and C. Qiao “Autonomous Vehicle Dispatching for Person Evacuation”, IEEE Global Communications Conference (Globecom) 2019
- [18] **Y. Zhao**, C. Tian, J. Fan, T. Guan and C. Qiao “RPC: Joint Online Reducer Placement and Coflow Bandwidth Scheduling for Clusters”, IEEE International Conference on Network Protocols (ICNP) 2018
- [17] **Y. Zhao**, J. Fan, H. Chen and C. Qiao “Providing VNF Services with Pipe & Hose Model Based Nonblocking SDN Networks”, IEEE/ACM International Symposium on Quality of Service (IWQoS) 2018
- [16] **Y. Zhao**, X. Liu and C. Qiao “Job Scheduling for Acceleration systems in Cloud Computing”, IEEE International Conference on Communications (ICC) 2018
- [15] **Y. Zhao**, S. Luo, Y. Wang and S. Wang “Cotask Scheduling in Cloud Computing”, IEEE International Conference on Network Protocols (ICNP) 2017
- [14] **Y. Zhao** and C. Qiao “Enhancing the Robustness of Interdependent Cyber-Physical Systems by Designing the Interdependency Relationship”, IEEE International Conference on Communications (ICC) 2017
- [13] X. Zhang, **Y. Zhao**, S. Guo and Y. Li “Performance-aware Energy-efficient Virtual Machine Placement in Cloud Data Center”, IEEE International Conference on Communications (ICC) 2017
- [12] J. Fan, C. Guan, **Y. Zhao** and C. Qiao “Availability-aware Mapping of Service Function Chains”, IEEE International Conference on Computer Communications (INFOCOM) 2017
- [11] **Y. Zhao**, M. Pithapur, C. Qiao “On Progressive Recovery in Interdependent Cyber Physical Systems”, IEEE Global Communications Conference (Globecom) 2016
- [10] **Y. Zhao**, K. Chen, W. Bai, M. Yu, C. Tian, Y. Geng, Y. Zhang, D. Li, S. Wang, “RAPIER: Integrating Routing and Scheduling for Coflow-aware Data Center Networks”, IEEE International Conference on Computer Communications (INFOCOM) 2015.
- [9] S. Luo, H. Yu, **Y. Zhao**, B. Wu, S. Wang. L. Li, “Minimizing Average Coflow Completion Time with Decentralized Scheduling”, IEEE International Conference on Communications (ICC) 2015
- [8] **Y. Zhao**, S. Wang, S. Luo, H. Yu, S. Xu and X. Zhang, “Dynamic Topology Management in Optical Datacenter Networks”, IEEE Global Communications Conference (Globecom) 2014.
- [7] W. Bai, K. Chen, H. Wu, W. Lan and **Y. Zhao**, “PAC: Taming TCP Incast Congestion Using Proactive ACK Control”, IEEE International Conference on Network Protocols (ICNP) 2014.
- [6] H. Wang, **Y. Zhao** and H. Guang “On Pricing Schemes in Data Center Network with Game Theoretic Approach”, IEEE International Conference on Computer Communications and Networks (ICCCN) 2014.
- [5] **Y. Zhao**, S. Wang, S. Xu, X. Wang, X. Gao and C. Qiao, “Load Balance vs Energy Efficiency in Traffic Engineering: A Game Theoretical Perspective”, IEEE International Conference on Computer Communications (INFOCOM) 2013
- [4] G. Feng, **Y. Zhao** and S. Wang, “A Modified Implementation of Bounded Shortest Path Algorithm for Constrained Multicast Routing”, IEEE International Conference on Information Science and Technology Information Science and Technology (ICIST) 2012
- [3] **Y. Zhao**, S. Xu, B. Wu, X. Wang and S. Wang, “Monitoring Trail Allocation in All-Optical Networks with the Random Next Hop Policy”, IEEE International Conference on High Performance Switching and Routing (HPSR) 2012
- [2] **Y. Zhao**, S. Wang, H. Cai and X. Wang, “A New Framework to Design Distributed Query System”, IET International Conference on Advanced Intelligence and Awareness Internet (AIAI) 2011

- [1] **Y. Zhao**, S. Xu, X. Wang and S. Wang, “A New Heuristic for Monitoring Trail Allocation in All-Optical WDM Networks”, IEEE Global Communications Conference (Globecom) 2010

### ***Presentations***

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- [9] “RPC: Joint Online Reducer Placement and Coflow Bandwidth Scheduling for Clusters”, IEEE ICNP 2018, Cambridge, UK
- [8] “Providing VNF Services with Pipe & Hose Model Based Nonblocking SDN Networks”, ACM/IEEE IWQoS 2018, Banff, Canada
- [7] “On Progressive Recovery in Interdependent Cyber Physical Systems”, IEEE Globecom 2016, Washington D.C., USA
- [6] “RAPIER: Integrating Routing and Scheduling for Coflow-aware Data Center Networks”, IEEE INFOCOM 2015, Hong Kong
- [5] “Dynamic Topology Management in Optical Datacenter Networks”, IEEE Globecom 2014, Austin, TX, USA
- [4] “Monitoring Trail Allocation in All-Optical Networks with the Random Next Hop Policy”, HPSR 2012, Belgrade, Serbia
- [3] “A Modified Implementation of Bounded Shortest Path Algorithm for Constrained Multicast Routing”, ICIST 2012, Wuhan, China
- [2] “A New Framework to Design Distributed Query System”, IET AIAI 2011, Shenzhen, China
- [1] “A New Heuristic for Monitoring Trail Allocation in All-Optical WDM Networks”, IEEE Globecom 2010, Miami, FL, USA

### ***TPC Members***

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- The 11th EAI International Conference on Communications and Networking in China, Chongqing, 2016
- The Seventeenth International Conference on Networks, Athens, Greece, 2018

### ***Reviewers***

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- IEEE Internet of Things Journal
- IEEE Transactions on Cloud Computing
- IEEE Transactions on Networking
- IEEE Transactions on Parallel and Distributed Systems
- IEEE Journal of Selected Area on Communications
- IEEE/OSA Journal of Optical Communications and Networking
- Elsevier Journal of Computer Communications
- Security and Communication Networks
- Journal of Network and Computer Applications
- Digital Communications and Networks
- KSII Transactions on Internet and Information Systems
- Concurrency and Computation: Practice and Experience
- IEEE International Conference on Distributed Computing Systems
- IEEE International Conference on Communications
- IEEE Global Communications Conference
- IFIP Networking
- CloudCom