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## Objective

Internship position in the field of networking (with special interest in software defined networking and data center networking), scheduling in switches, and software engineering. Available: Summer and Fall 2018

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## Education

**Georgia Institute of Technology**, Atlanta, GA, USA

Ph.D. Candidate in Computer Science (GPA: 3.91/4.0)

2015.8 - 2020.5 (**Expected**)

**University of Science and Technology of China**, Hefei, Anhui, China

M.Eng. in Communication and Information Systems (GPA: 3.81/4.3)

2012.9 - 2015.6

B.Eng. in Electronic Information Engineering (GPA: 3.75/4.3)

2008.9 - 2012.6

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## Intern Experience

**Alibaba Group (U.S.) Inc.**, Bellevue, WA, USA

2018.5 - 2018.8

Intern

Mentor: Gang Cheng

Built a highly scalable multi-tenant BGP as an important part of a high-performance and high-availability SDN based hybrid cloud network solution.

**AT&T Labs Research**, Bedminster, NJ, USA

2016.5 - 2016.7

Research Intern

Mentor: He Yan and Zihui Ge

Developed tools to automate the dynamics analysis in services supported by virtualized environment.

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## Projects

### Crossbar Scheduling

2016.2 - Present

- Designed the **first** parallel iterative crossbar scheduling which has constant per-port time complexity and can provably achieve the same performance (both throughput and delay) as the family of maximal matching based schedulers that have at least logarithmic per-port time complexity.
- Designed a crossbar scheduling algorithm, which can exactly emulate the linear-time centralized version (*i.e.*, SERENA) in logarithmic rounds. (IEEE/ACM Transactions on Networking under submission)
- Designed a simple yet effective “add-on” crossbar scheduling algorithm for input-queued switches, which can boost the performance (switch throughput or delay or both) of existing crossbar scheduling algorithms (*e.g.*, iSLIP and SERENA) with almost “no” computational overhead. (SIGMETRICS 2017)
- Built an efficient and flexible input-queued switch simulator in C++.

### Time Capsule for Online Social Activities

2015.9 - Present

- Designed a hybrid streaming-sampling algorithm for high accurate measurements of Online Social Networking (OSN) cascade statistics, using limited memory, which decreased the errors (measured in  $\ell_2$ ) by more than one order of magnitude. (ICCCN 2017)

### Network Virtualization

2012.2 - 2015.6

- Proposed the **first** integer linear programming formulations for the virtual optical network embedding problems in the contexts of flexible-grid elastic optical networks, and designed efficient algorithms which achieved much better performance. (Journal of Lightwave Technology)
- Built the **first** OpenFlow-based network virtualization platform in which the underlying infrastructure is the flexible-grid elastic optical networks. (Master Thesis)
- Designed a novel virtual network embedding algorithm, which increased the network utilization and decreased the time complexity. (INFOCOM 2014)

- Proved the **first** inapproximability result of the location-constrained virtual network embedding (LC-VNE) problems, and designed efficient algorithms for solving LC-VNE, which achieved much better performance (in terms of both resource consumption and fairness). (IEEE/ACM Transactions on Networking)

## Selected Publications [[Google Scholar](#)]

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1. **Long Gong**, Lanxi Huang, Paul Tune, Jinyoung Han, Chen-Nee Chuah, Matthew Roughan, and Jun Xu. Foreststream: Accurate measurement of cascades in online social networks. **accepted to ICCCN** 2017, 2017
2. **Long Gong**, Paul Tune, Liang Liu, Sen Yang, and Jun (Jim) Xu. Queue-proportional sampling: A better approach to crossbar scheduling for input-queued switches. *Proc. ACM Meas. Anal. Comput. Syst.*, 1(1):3:1–3:33, June 2017
3. Zuqing Zhu, Xiahe Liu, Yixiang Wang, Wei Lu, **Long Gong**, Shui Yu, and Nirwan Ansari. Impairment- and splitting-aware cloud-ready multicast provisioning in elastic optical networks. *IEEE/ACM Transactions on Networking*, 25(2):1220–1234, Apr. 2017
4. **Long Gong**, Huihui Jiang, Yixiang Wang, and Zuqing Zhu. Novel Location-Constrained Virtual Network Embedding (LC-VNE) Algorithms Towards Integrated Node and Link Mapping. *IEEE/ACM Transactions on Networking*, 24(6):3648–3661, Dec. 2016
5. Lulu Yang, **Long Gong**, and Zuqing Zhu. Incorporating network coding to formulate multicast sessions in elastic optical networks. In *2016 International Conference on Computing, Networking and Communications (ICNC)*, pages 1–5, Feb. 2016
6. Huihui Jiang, Yixiang Wang, **Long Gong**, and Zuqing Zhu. Availability-aware survivable virtual network embedding in optical datacenter networks. *IEEE/OSA Journal of Optical Communications and Networking*, 7(12):1160–1171, Dec. 2015
7. Lulu Yang, **Long Gong**, Fen Zhou, Bernard Cousin, Miklós Molnár, and Zuqing Zhu. Leveraging light forest with rateless network coding to design efficient all-optical multicast schemes for elastic optical networks. *Journal of Lightwave Technology*, 33(18):3945–3955, Sept. 2015
8. Jingjing Yao, Ping Lu, **Long Gong**, and Zuqing Zhu. On Fast and Coordinated Data Backup in Geo-Distributed Optical Inter-Datacenter Networks. *Journal of Lightwave Technology*, 33(14):3005–3015, Jul. 2015
9. **Long Gong**, Yonggang Wen, Zuqing Zhu, and Tony Lee. Toward Profit-Seeking Virtual Network Embedding Algorithm via Global Resource Capacity. In *IEEE International Conference on Computer Communications (INFOCOM)*, pages 1–9, Apr. 2014
10. **Long Gong** and Zuqing Zhu. Virtual Optical Network Embedding (VONE) Over Elastic Optical Networks. *Journal of Lightwave Technology*, 32(3):450–460, Feb. 2014
11. Huihui Jiang, **Long Gong**, and Zuqing Zhu. Efficient joint approaches for location-constrained survivable virtual network embedding. In *IEEE Global Communications Conference (GLOBECOM)*, pages 1810–1815, Dec. 2014
12. **Long Gong**, Yonggang Wen, Zuqing Zhu, and Tony Lee. Revenue-driven virtual network embedding based on global resource information. In *IEEE Global Communications Conference (GLOBECOM)*, pages 2294–2299, Dec. 2013
13. **Long Gong**, Wenwen Zhao, Yonggang Wen, and Zuqing Zhu. Dynamic transparent virtual network embedding over elastic optical infrastructures. In *IEEE International Conference on Communications (ICC)*, pages 3466–3470, Jun. 2013
14. **Long Gong**, Xiang Zhou, Xiahe Liu, Wenwen Zhao, Wei Lu, and Zuqing Zhu. Efficient resource allocation for all-optical multicasting over spectrum-sliced elastic optical networks. *IEEE/OSA Journal of Optical Communications and Networking*, 5(8):836–847, Aug. 2013
15. Xiahe Liu, **Long Gong**, and Zuqing Zhu. On the spectrum-efficient overlay multicast in elastic optical networks built with multicast-incapable switches. *IEEE Communications Letters*, 17(9):1860–1863, Sept. 2013

16. Xiahe Liu, **Long Gong**, and Zuqing Zhu. Design integrated rsa for multicast in elastic optical networks with a layered approach. In *IEEE Global Communications Conference (GLOBECOM)*, pages 2346–2351, Dec. 2013
17. Xiahe Liu, **Long Gong**, and Zuqing Zhu. Spectrum- and energy-efficient multicasting over multicast-incapable eons with member-only flexible relay. In *Asia Communications and Photonics Conference (ACP)*, page AW4H.6. Optical Society of America, 2013
18. Wei Lu, Xiang Zhou, **Long Gong**, Mingyang Zhang, and Zuqing Zhu. Dynamic multi-path service provisioning under differential delay constraint in elastic optical networks. *IEEE Communications Letters*, 17(1):158–161, Jan. 2013
19. Mingyang Zhang, Weiran Shi, **Long Gong**, Wei Lu, and Zuqing Zhu. Bandwidth defragmentation in dynamic elastic optical networks with minimum traffic disruptions. In *IEEE International Conference on Communications (ICC)*, pages 3894–3898, Jun. 2013
20. **Long Gong**, Xiang Zhou, Wei Lu, and Zuqing Zhu. A two-population based evolutionary approach for optimizing routing, modulation and spectrum assignments (rmsa) in o-ofdm networks. *IEEE Communications Letters*, 16(9):1520–1523, Sept. 2012
21. Wei Lu, Xiang Zhou, **Long Gong**, and Zuqing Zhu. Scalable network planning for elastic optical orthogonal frequency division multiplexing (ofdm) networks. In *8th International Symposium on Communication Systems, Networks Digital Signal Processing (CSNDSP)*, pages 1–4, Jul. 2012
22. Xiang Zhou, Wei Lu, **Long Gong**, and Zuqing Zhu. Dynamic rmsa in elastic optical networks with an adaptive genetic algorithm. In *IEEE Global Communications Conference (GLOBECOM)*, pages 2912–2917, Dec. 2012

## Selected Talks

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1. Queue-Proportional Sampling: A Better Approach to Crossbar Scheduling for Input-Queued Switches, ACM SIGMETRICS 2017, Urbana-Champaign, Illinois, USA
2. Toward Profit-Seeking Virtual Network Embedding Algorithm via Global Resource Capacity, IEEE INFOCOM 2014, Toronto, Canada
3. Revenue-Driven Virtual Network Embedding Based on Global Resource Information, IEEE GLOBECOM 2013, Atlanta, GA, USA
4. Dynamic Transparent Virtual Network Embedding over Elastic Optical Infrastructures, IEEE ICC 2013, Budapest, Hungary

## Professional Skills

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*Programming Languages:* C++ (proficient), PYTHON (fluent), JAVA (prior experience)

## Honors and Awards

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### Student Travel Grant Award

ACM SIGMETRICS	2017
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### Excellent Graduate

University of Science and Technology of China, Hefei, Anhui, China	2015
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### National Scholarship (for Master Students)

University of Science and Technology of China, Hefei, Anhui, China	2013
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### Best Paper Award

ONS Symposium, IEEE GLOBECOM 2013	2013
ONS Symposium, IEEE ICC 2013	2013

## Professional Service

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*Reviewer:* IEEE INFOCOM 2016, IEEE COMMUNICATION LETTERS, IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, IEEE/ACM TRANSACTIONS ON NETWORKING, IEEE/OSA JOURNAL OF OPTICAL COMMUNICATIONS AND NETWORKING