

# ZUQING ZHU

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## POSITION

Professor, School of Information Science and Technology,  
University of Science and Technology of China

## RESEARCH INTERESTS

Optical networks, Software-defined networking, Knowledge-defined networking,  
Network function virtualization, Datacenter networks.

## EDUCATION

**University of California, Davis** 09/2003–07/2007  
*Ph.D. in Electrical and Computer Engineering*  
Advisor: Prof. S. J. Ben Yoo  
Dissertation: Highly scalable optical-label switching network systems incorporating label swapping and optical regeneration

**University of California, Davis** 08/2001–09/2003  
*M.S. in Electrical and Computer Engineering*  
Advisor: Prof. S. J. Ben Yoo

**University of Science and Technology of China** 09/1996–07/2001  
*B. S. in Electrical Engineering*

## WORK EXPERIENCE

**Professor** 06/2014–present  
Director of the Intelligent Networking systems & Future InterNet InfrasTructurE (INFINITE) Lab  
School of Information Science and Technology  
University of Science and Technology of China  
Hefei, Anhui, China

**Associate Professor** 01/2011–06/2014  
School of Information Science and Technology  
University of Science and Technology of China  
Hefei, Anhui, China

**Senior Software Engineer** 07/2007–01/2011  
Cisco Systems  
San Jose, California, USA

## **JOURNAL EDITORS**

- Series Editor, Optical Communications Series, IEEE Communications Magazine, 2017–.
- Lead Guest Editor, “Optical Networks in Cloud Computing”, IEEE Network.
- Guest Editor, “Ambient Assisted Living Communications”, IEEE Communications Magazine.
- Editorial Board Member of:
  - IEEE Communications Magazine, 2015–.
  - Optical Switching and Networking (Elsevier), 2010–.
  - IEEE Transactions on Network and Service Management, 2017–.
  - Telecommunication Systems Journal (Springer), 2011–.
  - Photonic Network Communications Journal (Springer), 2015–.
  - European Transactions on Emerging Telecommunications Technologies (Wiley), 2012–.
  - KSII Transactions on Internet and Information Systems, 2015–.

## **CONFERENCE ACTIVITIES**

- Publicity Vice-Chair, IEEE Global Communications Conference (GLOBECOM) 2015.
- Symposium Chair/Co-Chair of:
  - International Conference on Computing, Networking & Communications (ICNC) 2016.
  - ICNC 2015, ICNC 2014, and ICNC 2013.
  - International Conference on Wireless Communications and Signal Processing (WCSP) 2014.
  - International Symposium on Communication Systems, Networks and Digital Signal Processing (CSNDSP) 2012.
- Technical Co-Chair, Workshop on Cloud Computing Systems, Networks and Applications (CCSNA) in GLOBECOM 2015.
- TPC Member of:
  - OSA Signal Processing in Photonic Communications (SPPCom), 2011–2015.
  - IEEE Photonics Conference (IPC), 2013–.
  - INFOCOM, ICC, GLOBECOM, ICNC, and many others.

## **PROFESSIONAL ACTIVITIES**

- Member, Steering Committee of IEEE International Conference on High Performance Switching and Routing (HPSR), 2018–2020.
- Secretary, IEEE Communications Society (ComSoc) Technical Committee on Optical Networking (ONTC), 2017–.
- Member, Best Paper Selection Committee of GLOBECOM 2015.
- Chair, Special Interest Group on Green Multimedia Communications, IEEE ComSoc Technical Committee on Multimedia Communications (MMTC), 2014–.
- Vice-Chair, Special Interest Group on Multimedia Content Distribution: Infrastructure and Algorithms (MCDIA), IEEE ComSoc Technical Committee on Multimedia Communications (MMTC), 2012–2014.

## **PROFESSIONAL Memberships**

- Senior Member of IEEE.
  - Member, IEEE Communication Society.
  - Member, IEEE Photonics Society.
- Senior Member of Optical Society of America (OSA).

## HONORS AND AWARDS

- IEEE ComSoc Distinguished Lecturer, 2018–2019.
- Best Paper Awards from
  - IEEE International Conference on Communications (ICC) 2015.
  - ICNC 2014.
  - GLOBECOM 2013.
  - ICC 2013.
- Team Achievement Award for Outstanding Contributions, Cisco Systems, 2008.

## PUBLICATIONS

### 1. Book Chapters

B1. **Zuqing Zhu**, “Energy-Efficient Optical Transport Networks with Mixed Regenerator Placement,” Chapter 6 in *Intelligent Systems for Optical Networks Design: Advancing Techniques*, IGI Global, DOI: 10.4018/978-1-4666-3652-1, 2013.

### 2. Editorials

E9. Xiang Liu and **Zuqing Zhu**, “Advances in Optical Communications Technologies,” *IEEE Communications Magazine*, vol. 56, no. 2, pp. 176-176, Feb. 2018 (Series Editorial).

E8. Xiang Liu and **Zuqing Zhu**, “Advances in Optical Communications Technologies,” *IEEE Communications Magazine*, vol. 55, no. 8, pp. 155-155, Aug. 2017 (Series Editorial).

E7. Xiang Liu and **Zuqing Zhu**, “Advances in Optical Communications Technologies,” *IEEE Communications Magazine*, vol. 55, no. 2, pp. 142-142, Feb. 2017 (Series Editorial).

E6. Xinlin Huang, Xiaomin Ma, Fei Hu, and **Zuqing Zhu**, “Editorial for Chinacom2015 Special Issue,” *Mobile Networks & Applications*, vol. 21, no. 6, pp. 905-907, Dec. 2016 (Guest Editorial).

E5. Joel J. P. C. Rodrigues, Sudip Misra, Haohong Wang, and **Zuqing Zhu**, “Ambient Assisted Living Communications,” *IEEE Communications Magazine*, vol. 53, no. 1, pp. 24-25, Jan. 2015 (Guest Editorial).

E4. Sana Ullah, Joel J. P. C. Rodrigues, Farrukh Aslam, Christos Verikoukis, and **Zuqing Zhu**, “Protocols and Architectures for Next-Generation Wireless Sensor Networks,” *International Journal of Distributed Sensor Networks*, vol. 2014, pp. 1-3, Dec. 2014 (Guest Editorial).

E3. Piotr Zwierzykowski, Steven Gao, Wai Pang Ng, and **Zuqing Zhu**, “Photonic and RF Communications Systems,” *IET Circuits, Devices & Systems*, vol. 8, no. 5, pp. 331-333, Sept. 2014 (Guest Editorial).

E2. Jason Jue, Vincenzo Eramo, Victor Lopez, and **Zuqing Zhu**, “Software-Defined Elastic Optical Networks,” *Photonic Network Communications*, vol. 28, no. 1, pp. 1-3, Aug. 2014 (Guest Editorial).

E1. **Zuqing Zhu**, S. J. B. Yoo, Zhaohui Li, and Nicolas Fontaine, “Optical Networks in Cloud Computing,” *IEEE Network*, vol. 27, no. 6, pp. 4-5, Nov./Dec. 2013 (Guest Editorial).

### 3. Referred Journal Papers

J94. Wei Lu, Ping Lu, Quanying Sun, Shui Yu, and **Zuqing Zhu**, “Profit-Aware Distributed Online Scheduling for Data-Oriented Tasks in Cloud Datacenters,” *IEEE Access*, in Press, 2018 (Corresponding Author).

- J93. Wei Lu, Xiaofu Yin, Xiaobao Cheng, and **Zuqing Zhu**, “On Cost-Efficient Integrated Multi-layer Protection Planning in IP-over-EONs,” *IEEE/OSA Journal of Lightwave Technology*, in Press, 2018 (Corresponding Author).
- J92. Xiaokang Xie, Qing Ling, Ping Lu, Wei Xu, and **Zuqing Zhu**, “Evacuate before Too Late: Distributed Backup in Inter-DC Networks with Progressive Disasters,” *IEEE Transactions on Parallel and Distributed Systems*, in Press, 2017 (Corresponding Author).
- J91. Xiaoliang Chen, **Zuqing Zhu**, Jiannan Guo, Sheng Kang, Roberto Proietti, Alberto Castro, and S. J. B. Yoo, “Leveraging Mixed-Strategy Gaming to Realize Incentive-Driven VNF Service Chain Provisioning in Broker-based Elastic Optical Inter-Datacenter Networks,” *IEEE/OSA Journal of Optical Communications and Networking*, in Press, 2017 (**Invited**).
- J90. **Zuqing Zhu**, Bingxin Kong, Jie Yin, Sicheng Zhao, and Shengru Li, “Build to Tenants’ Requirements: On-Demand Application-Driven vSD-EON Slicing,” *IEEE/OSA Journal of Optical Communications and Networking*, in Press, 2017 (**Invited**).
- J89. Siqi Liu, Wei Lu, and **Zuqing Zhu**, “On the Cross-Layer Orchestration to Address IP Router Outages with Cost-Efficient Multilayer Restoration in IP-over-EONs,” *IEEE/OSA Journal of Optical Communications and Networking*, vol. 10, no. 1, pp. A122-A132, Jan. 2018 (**Invited**) (Corresponding Author).
- J88. Shengru Li, Kai Han, Nirwan Ansari, Qinkun Bao, Daoyun Hu, Junjie Liu, Shui Yu, and **Zuqing Zhu**, “Improving SDN Scalability with Protocol-Oblivious Source Routing: A System-Level Study,” *IEEE Transactions on Network and Service Management*, in Press, 2017 (Corresponding Author).
- J87. Xiaoliang Chen, Muqing Zhou, Shilin Zhu, Sheng Kang, Lu Sun, and **Zuqing Zhu**, “Optimizing FIPP-p-Cycle Protection Design to Realize Availability-aware Elastic Optical Networks,” *IEEE Communications Letters*, vol. 22, no. 1, pp. 65-68, Jan. 2018 (Corresponding Author).
- J86. Quanying Sun, Yuhan Xue, Shengru Li, and **Zuqing Zhu**, “Design and Demonstration of High-Throughput Protocol Oblivious Packet Forwarding to Support Software-Defined Vehicular Networks,” *IEEE Access*, vol. 5, 24004-24011, 2017 (Corresponding Author).
- J85. Ping Lu and **Zuqing Zhu**, “Data-Oriented Task Scheduling in Fixed- and Flexible-Grid Multilayer Inter-DC Optical Networks: A Comparison Study,” *IEEE/OSA Journal of Lightwave Technology*, vol. 35, no. 24, pp. 5335-5346, Dec. 2017 (Corresponding Author).
- J84. Jing Zhu and **Zuqing Zhu**, “Physical-Layer Security in MCF-based SDM-EONs: Would Crosstalk-Aware Service Provisioning be Good Enough?” *IEEE/OSA Journal of Lightwave Technology*, vol. 35, no. 22, pp. 4826-4837, Nov. 2017 (Corresponding Author).
- J83. Lu Sun, Xiaoliang Chen and **Zuqing Zhu**, “Multi-Broker based Service Provisioning in Multi-Domain SD-EONs: Why and How Should the Brokers Cooperate with Each Other?,” *IEEE/OSA Journal of Lightwave Technology*, vol. 35, no. 17, pp. 3722-3733, Sept. 2017 (Corresponding Author).
- J82. Jie Yin, Jiannan Guo, Bingxin Kong, Heqing Yin, and **Zuqing Zhu**, “Experimental Demonstration of Building and Operating QoS-aware Survivable vSD-EONs with Transparent Resiliency,” *Optics Express*, vol. 25, no. 13, pp. 15468-15480, 2017 (Corresponding Author).
- J81. Junjie Liu, Wei Lu, Fen Zhou, Ping Lu, and **Zuqing Zhu**, “On Dynamic Service Function Chain Deployment and Readjustment,” *IEEE Transactions on Network and Service Management*, vol. 14, no. 3, pp. 543-553, Sept. 2017 (Corresponding Author).
- J80. Lipei Liang, Wei Lu, Massimo Tornatore, and **Zuqing Zhu**, “Game-Assisted Distributed

Decision-Making to Build Virtual TDM-PONs in C-RANs Adaptively,” *IEEE/OSA Journal of Optical Communications and Networking*, vol. 9, no. 7, pp. 546-554, Jul. 2017 (Corresponding Author).

J79. Yixiang Wang, Ping Lu, Wei Lu, and **Zuqing Zhu**, “Cost-Efficient Virtual Network Function Graph (vNFG) Provisioning in Multidomain Elastic Optical Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 35, no. 13, pp. 2712-2723, Jul. 2017 (Corresponding Author).

J78. Shengru Li, Kai Han, Huibai Huang, Quanying Sun, Junjie Liu, Sicheng Zhao, and **Zuqing Zhu**, “SR-PVX: A Source Routing based Network Virtualization Hypervisor to Enable POF-FIS Programmability in vSDNs,” *IEEE Access*, vol. 5, pp. 7659-7666, 2017 (Corresponding Author).

J77. Haitao Wu, Fen Zhou, **Zuqing Zhu**, and Yaojun Chen, “On the Distance Spectrum Assignment in Elastic Optical Networks,” *IEEE/ACM Transactions on Networking*, vol. 25, no. 4, pp. 2391-2404, Aug. 2017.

J76. Jing Zhu, Bin Zhao, and **Zuqing Zhu**, “Leveraging Game Theory to Achieve Efficient Attack-aware Service Provisioning in EONs,” *IEEE/OSA Journal of Lightwave Technology*, vol. 35, no. 10, pp. 1785-1796, May 2017 (Corresponding Author).

J75. **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*, vol. 25, no. 2, pp. 1220-1234, Apr. 2017.

J74. Shengru Li, Daoyun Hu, Wenjian Fang, Shoujiang Ma, Cen Chen, Huibai Huang, and **Zuqing Zhu**, “Protocol Oblivious Forwarding (POF): Software-Defined Networking with Enhanced Programmability,” *IEEE Network*, vol. 31, no. 2, pp. 58-66, Mar./Apr. 2017 (Corresponding Author).

J73. Qiang Fan, Hancheng Lu, Peilin Hong, and **Zuqing Zhu**, “Throughput-Power Tradeoff Association for User Equipments in WLAN/Cellular Integrated Networks,” *IEEE Transactions on Vehicular Technology*, vol. 66, no. 4, pp. 3462-3474, Apr. 2017.

J72. Menglu Zeng, Yan Li, Wenjian Fang, Wei Lu, Xiahe Liu, Hang Yu, and **Zuqing Zhu**, “Control Plane Innovations to Realize Dynamic Formulation of Multicast Sessions in Inter-DC Software-Defined Elastic Optical Networks,” *Optical Switching and Networking*, vol. 23, no. 3, pp. 259-269, Jan. 2017 (Corresponding Author).

J71. 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*, vol. 24, no. 6, pp. 3648-3661, Dec. 2016 (Corresponding Author).

J70. Alberto Castro, Luis Velasco, Lluís Gifre, Cen Chen, Jie Yin, **Zuqing Zhu**, Roberto Proietti, and S. J. B. Yoo, “Brokered Orchestration for End-to-End Service Provisioning across Heterogeneous Multi-Operator (Multi-AS) Optical Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 34, no. 23, pp. 5391-5400, Dec. 2016.

J69. Daoyun Hu, Shengru Li, Huibai Huang, Wenjian Fang, and **Zuqing Zhu**, “Flexible Flow Converging: A Systematic Case Study on Forwarding Plane Programmability of Protocol-Oblivious Forwarding (POF),” *IEEE Access*, vol. 4, pp. 4707-4719, 2016 (Corresponding Author).

J68. Min Ju, Fen Zhou, Shilin Xiao, and **Zuqing Zhu**, “Power-efficient Protection with Directed p-Cycles for Asymmetric Traffic in Elastic Optical Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 34, no. 17, pp. 4053-4065, Sept. 2016.

J67. Xiaoliang Chen, **Zuqing Zhu**, Lu Sun, Jie Yin, Shilin Zhu, Alberto Castro, and S. J. B. Yoo, “Incentive-Driven Bidding Strategy for Brokers to Compete for Service Provisioning Tasks in Multi-

Domain SD-EONs,” *IEEE/OSA Journal of Lightwave Technology*, vol. 34, no. 16, pp. 3867-3876, Aug. 2016 (Corresponding Author).

J66. Wenjian Fang, Menglu Zeng, Xiahe Liu, Wei Lu, and **Zuqing Zhu**, “Joint Spectrum and IT Resource Allocation for Efficient vNF Service Chaining in Inter-Datacenter Elastic Optical Networks,” *IEEE Communications Letters*, vol. 20, no. 8, pp. 1539-1542, Aug. 2016 (Corresponding Author).

J65. Menglu Zeng, Wenjian Fang, and **Zuqing Zhu**, “Orchestrating Tree-Type VNF Forwarding Graphs in Inter-DC Elastic Optical Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 34, no. 14, pp. 3330-3341, Jul. 2016 (Corresponding Author).

J64. Bin Zhao, Xiaoliang Chen, Jing Zhu, and **Zuqing Zhu**, “Survivable Control Plane Establishment with Live Control Service Backup and Migration in SD-EONs,” *IEEE/OSA Journal of Optical Communications and Networking*, vol. 8, no. 6, pp. 371-381, Jun. 2016 (Corresponding Author).

J63. Min Ju, Fen Zhou, **Zuqing Zhu**, and Shilin Xiao, “Distance-adaptive, low CAPEX cost p-cycle design without candidate cycle enumeration in mixed-line-rate optical networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 34, no. 11, pp. 2663-2676, Jun. 2016.

J62. Ping Lu, Qing Ling, and **Zuqing Zhu**, “Maximizing Utility of Time-Constrained Emergency Backup in Inter-Datacenter Networks,” *IEEE Communications Letters*, vol. 20, no. 5, pp. 890-893, May 2016 (Corresponding Author).

J61. Jing Zhu, Bin Zhao, Wei Lu, and **Zuqing Zhu**, “Attack-aware Service Provisioning to Enhance Physical-Layer Security in Multi-Domain EONs,” *IEEE/OSA Journal of Lightwave Technology*, vol. 34, no. 11, pp. 2645-2655, Jun. 2016 (Corresponding Author).

J60. Kaiyue Wu, Ping Lu, and **Zuqing Zhu**, “Distributed Online Scheduling and Routing of Multicast-Oriented Tasks for Profit-Driven Cloud Computing,” *IEEE Communications Letters*, vol. 20, no. 4, pp. 684-687, Apr. 2016 (Corresponding Author).

J59. Mingyang Zhang, Changsheng You, and **Zuqing Zhu**, “On the Parallelization of Spectrum Defragmentation Reconfigurations in Elastic Optical Networks,” *IEEE/ACM Transactions on Networking*, vol. 24, no. 5, pp. 2819-2833, Oct. 2016 (Corresponding Author).

J58. Xiaoliang Chen, Fan Ji, Shilin Zhu, Qinkun Bao, and **Zuqing Zhu**, “Availability-Aware Service Provisioning in SD-EON based Inter-Datacenter Networks,” *Photonic Network Communications*, vol. 31, no. 3, pp. 543-549, Jun. 2016 (Corresponding Author).

J57. Wei Lu, **Zuqing Zhu**, and Biswanath Mukherjee, “Optimizing Deadline-Driven Bulk-Data Transfer to Revitalize Spectrum Fragments in EONs,” *IEEE/OSA Journal of Optical Communications and Networking*, vol. 7, no. 12, pp. B173-B183, Dec. 2015 (**Invited**) (Corresponding Author).

J56. Huihui Jiang, Yixiang Wang, Long Gong, and **Zuqing Zhu**, “Availability-Aware Survivable Virtual Network Embedding (A-SVNE) in Optical Datacenter Networks,” *IEEE/OSA Journal of Optical Communications and Networking*, vol. 7, no. 12, pp. 1160-1171, Dec. 2015 (Corresponding Author).

J55. Shengru Li, Wei Lu, Xiahe Liu, and **Zuqing Zhu**, “Fragmentation-aware service provisioning for advance reservation multicast in SD-EONs,” *Optics Express*, vol. 23, no. 20, pp. 25804-25813, Oct. 2015 (Corresponding Author).

J54. Wei Lu, **Zuqing Zhu**, and Biswanath Mukherjee, “On Hybrid IR and AR Service Provisioning in Elastic Optical Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 33, no. 22, pp. 4659-4669, Nov. 2015 (Corresponding Author).



- J53. Lulu Yang, Long Gong, Fen Zhou, Bernard Cousin, Miklos Molnar, and **Zuqing Zhu**, “Leveraging Light-Forest with Rateless Network Coding to Design Efficient All-Optical Multicast Schemes for Elastic Optical Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 33, no. 18, pp. 3945-3955, Sept. 2015 (Corresponding Author).
- J52. Xiaoliang Chen, Massimo Tornatore, Fan Ji, Wenshuang Zhou, Cen Chen, Daoyun Hu, Shilin Zhu, Liu Jiang, and **Zuqing Zhu**, “Flexible Availability-Aware Differentiated Protection in Software-Defined Elastic Optical Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 33, no. 18, pp. 3872-3882, Sept. 2015 (Corresponding Author).
- J51. Xiaoliang Chen, Shilin Zhu, Liu Jiang, and **Zuqing Zhu**, “On Spectrum Efficient Failure-Independent Path Protection p-Cycle Design in Elastic Optical Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 33, no. 17, pp. 3719-3729, Sept. 2015 (Corresponding Author).
- J50. Nana Xue, Xiaoliang Chen, Suoheng Li, Long Gong, Daoyun Hu, and **Zuqing Zhu**, “Demonstration of OpenFlow-Controlled Network Orchestration for Adaptive SVC Video Multicast,” *IEEE Transactions on Multimedia*, vol. 17, no. 9, pp. 1617-1629, Sept. 2015 (Corresponding Author).
- J49. Ping Lu, Liang Zhang, Xiahe Liu, Jingjing Yao, and **Zuqing Zhu**, “Highly-Efficient Data Migration and Backup for Big Data Applications in Elastic Optical Inter-Data-center Networks,” *IEEE Network*, vol. 29, no. 5, pp. 36-42, Sept./Oct. 2015 (Corresponding Author).
- J48. Ping Lu, Quanying Sun, Kaiyue Wu, and **Zuqing Zhu**, “Distributed Online Hybrid Cloud Management for Profit-Driven Multimedia Cloud Computing,” *IEEE Transactions on Multimedia*, vol. 17, no. 8, pp. 1297-1308, Aug. 2015 (Corresponding Author).
- J47. Jingjing Yao, Ping Lu, Long Gong, and **Zuqing Zhu**, “On Fast and Coordinated Data Backup in Geo-Distributed Optical Inter-Datacenter Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 33, no. 14, pp. 3005-3015, Jul. 2015 (Corresponding Author).
- J46. Wei Lu and **Zuqing Zhu**, “Malleable Reservation based Bulk-Data Transfer to Recycle Spectrum Fragments in Elastic Optical Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol. 33, no. 10, pp. 2078-2086, May 2015 (Corresponding Author).
- J45. Wenjian Fang, Minhua Lu, Xiahe Liu, Long Gong, and **Zuqing Zhu**, “Joint Defragmentation of Optical Spectrum and IT Resources in Elastic Optical Datacenter Interconnections,” *IEEE/OSA Journal of Optical Communications and Networking*, vol. 7, no. 4, pp. 314-324, Mar. 2015 (Corresponding Author).
- J44. **Zuqing Zhu**, Cen Chen, Shoujiang Ma, Lei Liu, Xiaotao Feng, and S. J. B. Yoo, “Demonstration of Cooperative Resource Allocation in an OpenFlow-Controlled Multidomain and Multinational SD-EON Testbed,” *IEEE/OSA Journal of Lightwave Technology*, vol. 33, no. 8, pp. 1508-1514, Apr. 2015 (Invited).
- J43. Xiaoliang Chen, Bin Zhao, Shoujiang Ma, Cen Chen, Daoyun Hu, Wenshuang Zhou, and **Zuqing Zhu**, “Leveraging Master-Slave OpenFlow Controller Arrangement to Improve Control Plane Resiliency in SD-EONs,” *Optics Express*, vol. 23, no. 6, pp. 7550-7558, Mar. 2015 (Corresponding Author).
- J42. **Zuqing Zhu**, Xiaoliang Chen, Cen Chen, Shoujiang Ma, Mingyang Zhang, Lei Liu, and S. J. B. Yoo, “OpenFlow-Assisted Online Defragmentation in Single-/Multi-Domain Software-Defined Elastic Optical Networks,” *IEEE/OSA Journal of Optical Communications and Networking*, vol. 7, no. 1, pp. A7-A15, Jan. 2015 (Invited).
- J41. Cen Chen, Xiaoliang Chen, Mingyang Zhang, Shoujiang Ma, Yan Shao, Suoheng Li, Munir Said Suleiman, and **Zuqing Zhu**, “Demonstrations of Efficient Online Spectrum Defragmentation in Software-Defined Elastic Optical Networks,” *IEEE/OSA Journal of Lightwave Technology*, vol.

32, no. 24, pp. 4701-4711, Dec. 2014 (Corresponding Author).

J40. Xiaoliang Chen, Fan Ji, and **Zuqing Zhu**, "Service Availability Oriented p-Cycle Protection Design in Elastic Optical Networks," *IEEE/OSA Journal of Optical Communications and Networking*, vol. 6, no. 10, pp. 901-910, Oct. 2014 (Corresponding Author).

J39. Wei Lu, Shoujiang Ma, Cen Chen, Xiaoliang Chen, and **Zuqing Zhu**, "Implementation and Demonstration of Revenue-Driven Provisioning for Advance Reservation Requests in OpenFlow-Controlled SD-EONs," *IEEE Communications Letters*, vol. 18, no. 10, pp. 1727-1730, Oct. 2014 (Corresponding Author).

J38. Suoheng Li, Yan Shao, Shoujiang Ma, Nana Xue, Shengru Li, Daoyun Hu, and **Zuqing Zhu**, "Flexible Traffic Engineering (F-TE): When OpenFlow Meets Multi-Protocol IP-Forwarding," *IEEE Communications Letters*, vol. 18, no. 10, pp. 1699-1702, Oct. 2014 (Corresponding Author).

J37. Liang Zhang and **Zuqing Zhu**, "Spectrum-Efficient Anycast in Elastic Optical Inter-Datacenter Networks," *Optical Switching and Networking*, vol. 14, no. 3, pp. 250-259, Aug. 2014 (Corresponding Author).

J36. Fan Ji, Xiaoliang Chen, Wei Lu, Joel. J. P. C. Rodrigues, and **Zuqing Zhu**, "Dynamic p-Cycle Protection in Spectrum-Sliced Elastic Optical Networks," *IEEE/OSA Journal of Lightwave Technology*, vol. 32, no. 6, pp. 1190-1199, Mar. 2014 (Corresponding Author).

J35. Mingyang Zhang, Changsheng You, Huihui Jiang, and **Zuqing Zhu**, "Dynamic and Adaptive Bandwidth Defragmentation in Spectrum-Sliced Elastic Optical Networks with Time-Varying Traffic," *IEEE/OSA Journal of Lightwave Technology*, vol. 32, no. 5, pp. 1014-1023, Mar. 2014 (Corresponding Author).

J34. Long Gong and **Zuqing Zhu**, "Virtual Optical Network Embedding (VONE) over Elastic Optical Networks," *IEEE/OSA Journal of Lightwave Technology*, vol. 32, no. 3, pp. 450-460, Feb. 2014 (Corresponding Author).

J33. Yawei Yin, Huan Zhang, Mingyang Zhang, Ming Xia, **Zuqing Zhu**, Stefan Dahfort, and S. J. B. Yoo, "Spectral and Spatial 2D Fragmentation-Aware Routing and Spectrum Assignment Algorithms in Elastic Optical Networks," *IEEE/OSA Journal of Optical Communications and Networking*, vol. 5, no. 10, pp. A100-A106, Oct. 2013 (**Invited**).

J32. 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*, vol. 17, no. 9, pp. 1860-1863, Sept. 2013 (Corresponding Author).

J31. 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*, vol. 5, no. 8, pp. 836-847, Aug. 2013 (Corresponding Author).

J30. Yichao Jin, Yonggang Wen, Qinghua Chen, and **Zuqing Zhu**, "An Empirical Investigation of the Impact of Server Virtualization on Energy Efficiency for Green Data Center," *The Computer Journal*, vol. 56, no. 8, pp. 977-990, Aug. 2013.

J29. Xiaoliang Chen, Fan Ji, Yanan Wu, and **Zuqing Zhu**, "Energy-Efficient Resilience in Translucent Optical Networks with Mixed Regenerator Placement," *IEEE/OSA Journal of Optical Communications and Networking*, vol. 5, no. 7, pp. 741-750, Jul. 2013 (Corresponding Author).

J28. Weiran Shi, **Zuqing Zhu**, Mingyang Zhang, and Nirwan Ansari, "On the Effect of Bandwidth Fragmentation on Blocking Probability in Elastic Optical Networks," *IEEE Transactions on Communications*, vol. 61, no. 7, pp. 2970-2978, Jul. 2013 (Corresponding Author).



- J27. **Zuqing Zhu**, Ping Lu, Joel J. P. C. Rodrigues, and Yonggang Wen, "Energy-Efficient Wideband Cable Access Networks in Future Smart Cities," *IEEE Communications Magazine*, vol. 51, no. 6, pp. 94-100, Jun. 2013.
- J26. **Zuqing Zhu**, Suoheng Li, and Xiaoliang Chen, "Design QoS-Aware Multi-Path Provisioning Strategies for Efficient Cloud-Assisted SVC Video Streaming to Heterogeneous Clients," *IEEE Transactions on Multimedia*, vol. 15, no. 4, pp. 758-768, Jun. 2013.
- J25. Ping Lu, Yabo Yuan, Zhongzhen Yang, and **Zuqing Zhu**, "On the Performance Analysis of Energy-Efficient Upstream Scheduling for Hybrid Fiber-Coaxial Networks with Channel Bonding," *IEEE Communications Letters*, vol. 17, no. 5, pp. 1020-1023, May 2013 (Corresponding Author).
- J24. Wei Lu and **Zuqing Zhu**, "Dynamic Service Provisioning of Advance Reservation Requests in Elastic Optical Networks," *IEEE/OSA Journal of Lightwave Technology*, vol. 31, no. 10, pp. 1621-1627, May 2013 (Corresponding Author).
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#### 4. Invited Conference Talks

- IC16. **Zuqing Zhu**, Siqu Liu, Baojia Li, and Wei Lu, “AI-Assisted Knowledge-Defined Multilayer Optical Networks,” accepted for presenting in IEEE Summer Topicals Meeting Series (SUM), pp. 1-2, Jul. 2018 (**Invited**).
- IC15. Xiaoliang Chen, **Zuqing Zhu**, Alberto Castro, Roberto Proietti, and S. J. B. Yoo, “Multi-Broker based Software-Defined Optical Networks,” in Proceedings of IEEE Photonics Conference (IPC), pp. 1-2, Oct. 2017 (**Invited**).
- IC14. Siqu Liu, Wei Lu, and **Zuqing Zhu**, “Multi-Layer Restoration to Address IP Router Outages in IP-over-EONs,” in Proceedings of Asia Communications and Photonics Conference (ACP), pp. 1-3, Nov. 2017 (**Invited**)(Corresponding Author).
- IC13. Wei Lu, Lipei Liang, and **Zuqing Zhu**, “On vNF-SC Deployment and Task Scheduling for Bulk-Data Transfers in Inter-DC EONs,” in Proceedings of the IEEE/CIC International Conference on Communications in China (ICCC), pp. 1-4, Oct. 2017 (**Invited**)(Corresponding Author).
- IC12. Wei Lu, Xin Jin, and **Zuqing Zhu**, “Game Theoretical Flexible Service Provisioning in IP over Elastic Optical Networks,” in Proceedings of the 16th IEEE International Conference on Optical Communications and Networks (ICOON), pp. 1-3, Aug. 2017 (**Invited**)(Corresponding Author).
- IC11. Wei Lu, Menglu Zeng, Wenjian Fang, and **Zuqing Zhu**, “Network Function Virtualization in Optical Inter-Datacenter Elastic Optical Networks,” in Proceedings of Opto-Electronics and Communications Conference (OECC), pp. 1-2, Jul./Aug. 2017 (**Invited**)(Corresponding Author).
- IC10. Wei Lu and **Zuqing Zhu**, “IR/AR/MR Service Provisioning in Elastic Optical Networks,” in Proceedings of 15th International Conference on Optical Communications and Networks (ICOON), pp. 1-3, Sept. 2016 (**Invited**)(Corresponding Author).
- IC9. Cen Chen, Xiaoliang Chen, Bin Zhao, and **Zuqing Zhu**, “Service Provisioning in Multi-Domain SD-EONs,” in Proceedings of 14th International Conference on Optical Communications and Networks (ICOON), pp. 1-3, Jul. 2015 (**Invited**)(Corresponding Author).
- IC8. Cen Chen, Xiaoliang Chen, Shoujiang Ma, and **Zuqing Zhu**, “OpenFlow-Controlled Online Spectrum Defragmentation in Software-Defined Elastic Optical Networks,” in Proceedings of 13th International Conference on Optical Communications and Networks (ICOON), pp. 1-4, Dec. 2014 (**Invited**)(Corresponding Author).
- IC7. **Zuqing Zhu**, Wei Lu, and Liang Zhang, “Strategies for Improving the Throughput of Dynamic Service Provisioning in Elastic Optical Networks,” in Proceedings of Asia Communications and Photonics Conference (ACP), paper AS4D.1, Nov. 2012 (**Invited**).
- IC6. Suoheng Li, **Zuqing Zhu**, Houqiang Li, and Weiping Li, “Efficient and Scalable Cloud-Assisted SVC Video Streaming Through Mesh Networks,” in Proceedings of International Conference on Computing, Networking and Communications (ICNC), pp. 944-948, Jan. 2012 (**Invited**)(Corresponding Author).
- IC5. **Zuqing Zhu**, “Mixed Regenerator Placement and Routing and Wavelength Assignment for Energy-Efficient Optical Transport Networks,” in Proceedings of International Conference on Optical Communications and Networks (ICOON), pp. 1-2, Dec. 2011 (**Invited**).
- IC4. **Zuqing Zhu**, Weida Zhong, and Chuanqi Wan, “Joint Optimization of Mixed Regenerator Placement and Wavelength Assignment for Green Translucent Optical Networks,” in Proceedings of SPIE, IEEE/OSA Asia Communications and Photonics Conference (ACP), vol. 8310, 83100G, Nov. 2011 (**Invited**).
- IC3. **Zuqing Zhu**, Wenbo Ma, and Qiao Liang, “Improve Energy-Efficiency of Hybrid Fiber-Coaxial Networks with Traffic-Aware Design,” in Proceedings of SPIE, IEEE/OSA Asia Communications

and Photonics Conference (ACP), vol. 8310, 83100W, Nov. 2011 (**Invited**).

IC2. **Zuqing Zhu**, “Optical Regenerator Placement Strategy to Achieve Green Design of Translucent Optical Networks,” in Proceedings of IEEE Wireless and Optical Communications Conference (WOCC), paper O4-1, Apr. 2011 (**Invited**).

IC1. S. J. Ben Yoo, Zhong Pan, Haijun Yang, and **Zuqing Zhu**, “All-Optical Signal Processing in Photonic Label Switching Routers,” in Proceedings of OSA Information Optical Amplifiers and their Applications Conference, Symposium on All-Optical Signal Processing, Aug. 2005 (**Invited**).

## 5. Referred Conference Papers

C104. Sicheng Zhao, Yao Jin, Kai Han, Jie Yin, and **Zuqing Zhu**, “Make Big Data Applications More Reliable: Hitless vSDN Migration to Avoid TCAM Depletion,” accepted for presenting in IEEE International Conference on Communications (ICC), pp. 1-6, May 2018 (Corresponding Author).

C103. Wei Lu, Lipei Liang, Bingxin Kong, Baojia Li, and **Zuqing Zhu**, “Leveraging Predictive Analytics to Achieve Knowledge-Defined Orchestration in a Hybrid Optical/Electrical DC Network: Collaborative Forecasting and Decision Making,” accepted for presenting in IEEE/OSA Optical Fiber Communication Conference (OFC), paper Th3F.2, Mar. 2018 (Corresponding Author).

C102. Siqi Liu, Baojia Li, and **Zuqing Zhu**, “Realizing AI-Assisted Multi-Layer Restoration in a Software-Defined IP-over-EON with Deep Learning: An Experimental Study,” accepted for presenting in IEEE/OSA Optical Fiber Communication Conference (OFC), paper W4F.1, Mar. 2018 (Corresponding Author).

C101. Xin Jin, Wei Lu, Siqi Liu, and **Zuqing Zhu**, “On Multi-Layer Restoration in Optical Networks with Encryption Solution Deployment,” accepted for presenting in IEEE/OSA Optical Fiber Communication Conference (OFC), paper Th2A.39, Mar. 2018 (Corresponding Author).

C100. Xiaoliang Chen, Jiannan Guo, **Zuqing Zhu**, Roberto Proietti, Alberto Castro, and S. J. B. Yoo, “Deep-RMSA: A Deep-Reinforcement-Learning Routing, Modulation and Spectrum Assignment Agent for Elastic Optical Networks,” accepted for presenting in IEEE/OSA Optical Fiber Communication Conference (OFC), paper W4F.2, Mar. 2018.

C99. Roberto Proietti, Xiaoliang Chen, Alberto Castro, Guangyao Liu, Hongbo Lu, Kaiqi Zhang, Jiannan Guo, **Zuqing Zhu**, Luis Velasco, and S. J. B. Yoo, “Experimental Demonstration of Cognitive Provisioning and Alien Wavelength Monitoring in Multi-domain EON,” accepted for presenting in IEEE/OSA Optical Fiber Communication Conference (OFC), paper W4F.7, Mar. 2018.

C98. Shengru Li, Kai Han, Huibai Huang, and **Zuqing Zhu**, “PVFlow: Flow-Table Virtualization in POF-based vSDN Hypervisor (PVX),” accepted for presenting in IEEE International Conference on Computing, Networking and Communications (ICNC), pp. 1-5, Mar. 2018 (Corresponding Author).

C97. Kai Han, Shengru Li, Junjie Liu, Shaofei Tang, Huibai Huang, Sicheng Zhao, and **Zuqing Zhu**, “Leveraging Protocol-Oblivious Forwarding (POF) to Realize NFV-Assisted Mobility Management,” in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 1-6, Dec. 2017 (Corresponding Author).

C96. Xiaoliang Chen, Jiannan Guo, **Zuqing Zhu**, Alberto Castro, Roberto Proietti, Hongbo Lu, Mohammadsadegh Shamsabardeh, S. J. B. Yoo, “Leveraging Deep Learning to Achieve Knowledge-based Autonomous Service Provisioning in Broker-based Multi-Domain SD-EONs with Proactive and Intelligent Predictions of Multi-Domain Traffic,” in Proceedings of IEEE/OSA European Conference and Exhibition on Optical Communication (ECOC), paper W.3.A.3, Sept. 2017.

C95. Wei Lu, Lipei Liang, and **Zuqing Zhu**, “Orchestrating Data-Intensive vNF Service Chains in Inter-DC Elastic Optical Networks,” in Proceedings of International Conference on Optical Network

Design and Modeling (ONDM), pp. 1-6, May 2017 (Corresponding Author).

C94. Huibai Huang, Shengru Li, Kai Han, Quanying Sun, Daoyun Hu, and **Zuqing Zhu**, “Embedding Virtual Software-Defined Networks over Distributed Hypervisors for vDC Formulation,” in Proceedings of IEEE International Conference on Communications (ICC), pp. 1-6, May 2017 (Corresponding Author).

C93. Xiaokang Xie, Qing Ling, Ping Lu, and **Zuqing Zhu**, “ADMM-based Distributed Algorithm for Emergency Backup in Time-Variant Inter-DC Networks,” in Proceedings of IEEE International Conference on Communications (ICC), pp. 1-6, May 2017 (Corresponding Author).

C92. Jie Yin, Jiannan Guo, Bingxin Kong, and **Zuqing Zhu**, “Demonstration of Survivable vSD-EON Slicing with Automatic Data Plane Restoration to Support Reliable Video Streaming,” in Proceedings of IEEE/OSA Optical Fiber Communication Conference (OFC), paper Tu3E.4, Mar. 2017 (Corresponding Author).

C91. Siqu Liu, Wei Lu, and **Zuqing Zhu**, “Cost-Efficient Multi-Layer Restoration to Address IP Router Outages in IP-over-EONs,” in Proceedings of IEEE/OSA Optical Fiber Communication Conference (OFC), paper W3I.5, Mar. 2017 (Corresponding Author).

C90. Xiaoliang Chen, Lu Sun, **Zuqing Zhu**, Hongbo Lu, and S. J. B. Yoo, “On Efficient Incentive-Driven VNF Service Chain Provisioning with Mixed-Strategy Gaming in Broker-based EO-IDCNs,” in Proceedings of IEEE/OSA Optical Fiber Communication Conference (OFC), paper W4J.5, Mar. 2017.

C89. Wei Lu, Lipei Liang, and **Zuqing Zhu**, “Game-Theoretic Distributed Algorithm for Virtual TDM-PON Formulation to Realize Adaptive Data Transmission in C-RANs,” in Proceedings of Asia Communications and Photonics Conference (ACP), pp. 1-3, Nov. 2016 (Corresponding Author).

C88. Jie Yin, Heqing Yin, Siqu Liu, Zhi Zhou, Xiaoliang Chen, and **Zuqing Zhu**, “On-Demand and Reliable vSD-EON Provisioning with Correlated Data and Control Plane Embedding,” in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 1-6, Dec. 2016 (Corresponding Author).

C87. Quanying Sun, Ping Lu, Wei Lu, and **Zuqing Zhu**, “Forecast-Assisted NFV Service Chain Deployment based on Affiliation-Aware vNF Placement,” in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 1-6, Dec. 2016 (Corresponding Author).

C86. Lu Sun, Xiaoliang Chen, Shilin Zhu, **Zuqing Zhu**, Alberto Castro, and S. J. Ben Yoo, “Broker-based Cooperative Game in Multi-Domain SD-EONs: Nash Bargaining for Agreement on Market-Share Partition” in Proceedings of IEEE/OSA European Conference and Exhibition on Optical Communication (ECOC), paper Tu.3.D.2, Sept. 2016 (Corresponding Author).

C85. Min Ju, Fen Zhou, Shilin Xiao, and **Zuqing Zhu**, “Energy-efficient Protection with Directed p-Cycles for Asymmetric Traffic in Elastic Optical Networks,” in Proceedings of European Conference on Networks and Optical Communications (NOC), pp. 1-6, Jun. 2016.

C84. Haitao Wu, Fen Zhou, **Zuqing Zhu**, and Yaojun Chen, “Interference-and-Security-Aware Distance Spectrum Assignment in Elastic Optical Networks,” in Proceedings of European Conference on Networks and Optical Communications (NOC), pp. 1-6, Jun. 2016.

C83. Menglu Zeng, Wenjian Fang, Joel Rodrigues, and **Zuqing Zhu**, “Orchestrating Multicast-Oriented NFV Trees in Inter-DC Elastic Optical Networks,” in Proceedings of IEEE International Conference on Communications (ICC), pp. 1-6, Jun. 2016 (Corresponding Author).

C82. Shengru Li, Daoyun Hu, Wenjian Fang, and **Zuqing Zhu**, “Source Routing with Protocol-oblivious Forwarding (POF) to Enable Efficient e-Health Data Transfers,” in Proceedings of IEEE



- International Conference on Communications (ICC), pp. 1-6, Jun. 2016 (Corresponding Author).
- C81. Lu Sun, Shilin Zhu, Xiaoliang Chen, **Zuqing Zhu**, Alberto Castro, and S. J. B. Yoo, “Broker-based Multi-Task Gaming to Facilitate Profit-Driven Network Orchestration in Multi-Domain SD-EONs,” in Proceedings of IEEE/OSA Optical Fiber Communication Conference (OFC), paper Th3K.1, Mar. 2016 (Corresponding Author).
- C80. Alberto Castro, Alba Perez, Lluís Gifre, Roberto Proietti, Chen Cen, Yie Jie, Xiaoliang Chen, Zheng Cao, **Zuqing Zhu**, Vinod Mishra, Luis Velasco, and S. J. Ben Yoo, “Experimental Demonstration of Heterogeneous Cross Stratum Broker for Scientific Applications,” in Proceedings of IEEE/OSA Optical Fiber Communication Conference (OFC), paper Th3K.3, Mar. 2016.
- C79. Shilin Zhu, Siyao Meng, Qinkun Bao, Xiaoliang Chen, and **Zuqing Zhu**, “Availability-Aware Service Provisioning in EONs: How Efficient will FIPP-p-Cycles be?,” in Proceedings of IEEE/OSA Optical Fiber Communication Conference (OFC), paper W2A.51, Mar. 2016 (Corresponding Author).
- C78. Lulu Yang, Long Gong, and **Zuqing Zhu**, “Incorporating Network Coding to Formulate Multicast Sessions in Elastic Optical Networks,” in Proceedings of IEEE International Conference on Computing, Networking and Communications (ICNC), pp. 1-5, Feb. 2016 (Corresponding Author).
- C77. Xiaoliang Chen, Cen Chen, Daoyun Hu, Shoujiang Ma, and **Zuqing Zhu**, “Multi-Domain Fragmentation-Aware RSA Operations through Cooperative Hierarchical Controllers in SD-EONs,” in Proceedings of IEEE/OSA Asia Communications and Photonics Conference (ACP), paper AM2E.3, Nov. 2015 (Corresponding Author).
- C76. Jing Zhu, Xiaoliang Chen, Di Chen, Shilin Zhu, and **Zuqing Zhu**, “Service Provisioning with Energy-Aware Regenerator Allocation in Multi-Domain EONs,” in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 1-6, Dec. 2015 (Corresponding Author).
- C75. Daoyun Hu, Shengru Li, Nana Xue, Cen Chen, Shoujiang Ma, Wenjian Fang, and **Zuqing Zhu**, “Design and Demonstration of SDN-based Flexible Flow Converging with Protocol-Oblivious Forwarding (POF),” in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 1-6, Dec. 2015 (Corresponding Author).
- C74. Xiaoliang Chen, Jie Yin, Cen Chen, **Zuqing Zhu**, Alberto Casales, and S. J. B. Yoo, “Multi-Broker based Market-Driven Service Provisioning in Multi-Domain SD-EONs in Noncooperative Game Scenarios,” in Proceedings of IEEE/OSA European Conference and Exhibition on Optical Communication (ECOC), paper #756, Sept. 2015 (Corresponding Author).
- C73. Alberto Casales, Lluís Gifre, Chen Cen, Jie Yin, **Zuqing Zhu**, Luis Velasco, and S. J. Ben Yoo, “Experimental Demonstration of Brokered Orchestration for end-to-end Service Provisioning and Interoperability across Heterogeneous Multi-Operator (Multi-AS) Optical Networks,” in Proceedings of IEEE/OSA European Conference and Exhibition on Optical Communication (ECOC), paper #830, Sept. 2015.
- C72. Min Ju, Fen Zhou, **Zuqing Zhu**, and Shilin Xiao, “P-Cycle Design Without Candidate Cycle Enumeration in Mixed-Line-Rate Optical Networks,” in Proceedings of IEEE 16th International Conference on High Performance Switching and Routing (HPSR), pp. 1-6, Jul. 2015.
- C71. Xiaoliang Chen, Shilin Zhu, Di Chen, Shuguang Hu, Chang Li, and **Zuqing Zhu**, “On Efficient Protection Design for Dynamic Multipath Provisioning in Elastic Optical Networks,” in Proceedings of IEEE Conference on Optical Networking Design and Modeling (ONDM) 2015, pp. 251-256, May 2015 (Corresponding Author).
- C70. Shoujiang Ma, Daoyun Hu, Shengru Li, Nana Xue, Suoheng Li, Yan Shao, and **Zuqing Zhu**, “QoS-Aware Flexible Traffic Engineering with OpenFlow-Assisted Agile IP-Forwarding Interchang-



ing,” in Proceedings of IEEE International Conference on Communications (ICC), pp. 8490-8495, Jun. 2015 (**Best Paper Award**)(Corresponding Author).

C69. Ping Lu, Kaiyue Wu, Quanying Sun, and **Zuqing Zhu**, “Toward Online Profit-Driven Scheduling of Inter-DC Data-Transfers for Cloud Applications,” in Proceedings of IEEE International Conference on Communications (ICC), pp. 7186-7191, Jun. 2015 (Corresponding Author).

C68. Wei Lu, **Zuqing Zhu**, and Biswanath Mukherjee, “Data-Oriented Malleable Reservation to Revitalize Spectrum Fragments in Elastic Optical Networks,” in Proceedings of IEEE/OSA Optical Fiber Communication Conference (OFC), paper W1I.6, Mar. 2015 (Corresponding Author).

C67. Lei Liu, **Zuqing Zhu**, Xiong Wang, Guanghua Song, Cen Chen, Xiaoliang Chen, Shoujiang Ma, Xiaotao Feng, Roberto Proietti, and S. J. B. Yoo, “Field Trial of Broker-based Multi-domain Software-Defined Heterogeneous Wireline-Wireless-Optical Networks,” in Proceedings of IEEE/OSA Optical Fiber Communication Conference (OFC), paper Th3J.5, Mar. 2015.

C66. Shoujiang Ma, Wei Lu, Cen Chen, Xiaoliang Chen, and **Zuqing Zhu**, “OpenFlow-Controlled Revenue-Driven AR Service Provisioning in Software-Defined Elastic Optical Networks,” in Proceedings of IEEE/OSA Asia Communications and Photonics Conference (ACP), paper ATh1AG.3, Nov. 2014 (Corresponding Author).

C65. Huihui Jiang, Long Gong, and **Zuqing Zhu**, “Efficient Joint Approaches for Location-Constrained Survivable Virtual Network Embedding,” in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 1810-1815, Dec. 2014 (Corresponding Author).

C64. Cen Chen, Shoujiang Ma, Xiaoliang Chen, **Zuqing Zhu**, Lei Liu, Xiaotao Feng, and S. J. B. Yoo, “Demonstration of OpenFlow-Controlled Cooperative Resource Allocation in a Multi-Domain SD-EON Testbed across Multiple Nations,” in Proceedings of IEEE/OSA European Conference and Exhibition on Optical Communication (ECOC), paper We.3.2.5, Sept. 2014 (Corresponding Author).

C63. Lei Liu, **Zuqing Zhu**, and S. J. B. Yoo, “3D Elastic Optical Networks in Temporal, Spectral and Spatial Domains with Fragmentation-aware RSSMA Algorithms,” in Proceedings of IEEE/OSA European Conference and Exhibition on Optical Communication (ECOC), paper Th.2.2.5, Sept. 2014.

C62. Jingjing Yao, Ping Lu, and **Zuqing Zhu**, “Minimizing Disaster Backup Window for Geo-Distributed Multi-Datacenter Cloud Systems,” in Proceedings of IEEE International Conference on Communications (ICC), pp. 3631-3635, Jun. 2014 (Corresponding Author).

C61. Xiahe Liu, Liang Zhang, Mingyang Zhang, and **Zuqing Zhu**, “Joint Defragmentation of Spectrum and Computing Resources in Inter-Datacenter Networks over Elastic Optical Infrastructure,” in Proceedings of IEEE International Conference on Communications (ICC), pp. 3289-3294, Jun. 2014 (Corresponding Author).

C60. Shoujiang Ma, Cen Chen, Shengru Li, Mingyang Zhang, Suoheng Li, Yan Shao, **Zuqing Zhu**, Lei Liu, and S. J. B. Yoo, “Demonstration of Online Spectrum Defragmentation Enabled by OpenFlow in Software-Defined Elastic Optical Networks,” in Proceedings of IEEE/OSA Optical Fiber Communication Conference (OFC), paper W4A.2, Mar. 2014 (Corresponding Author).

C59. Changsheng You, Mingyang Zhang, and **Zuqing Zhu**, “Reduce Spectrum Defragmentation Latency in EONs with Effective Parallelization of Connection Reconfigurations,” in Proceedings of IEEE/OSA Optical Fiber Communication Conference (OFC), paper W4A.6, Mar. 2014 (Corresponding Author).

C58. Long Gong, Yonggang Wen, **Zuqing Zhu**, and Tony Lee, “Toward Profit-Seeking Virtual Network Embedding Algorithm via Global Resource Capacity,” in Proceedings of IEEE Interna-

tional Conference on Computer Communications (INFOCOM), pp. 1-9, Apr. 2014 (Corresponding Author).

C57. Liang Zhang and **Zuqing Zhu**, “Dynamic Anycast in Inter-Datacenter Networks over Elastic Optical Infrastructure,” in Proceedings of IEEE International Conference on Computing, Networking and Communications (ICNC), pp. 491-495, Feb. 2014 (**Best Paper Award**)(Corresponding Author).

C56. Xiahe Liu, Long Gong, and **Zuqing Zhu**, “Design Integrated RSA for Multicast in Elastic Optical Networks with a Layered Approach,” in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 2346-2351, Dec. 2013 (**Best Paper Award**)(Corresponding Author).

C55. Fan Ji, Xiaoliang Chen, Wei Lu, Joel J. P. C. Rodrigues, and **Zuqing Zhu**, “Dynamic p-Cycle Configuration in Spectrum-Sliced Elastic Optical Networks,” in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 2170-2175, Dec. 2013 (Corresponding Author).

C54. Long Gong, Yonggang Wen, **Zuqing Zhu**, and Tony Lee, “Revenue-Driven Virtual Network Embedding Based on Global Resource Information,” in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 2294-2299, Dec. 2013 (Corresponding Author).

C53. Fabio Canelo, Bruno Silva, Joel J. P. C. Rodrigues, and **Zuqing Zhu**, “Performance Evaluation of an Enhanced Cryptography Solution for m-Health Applications in Cooperative Environments,” in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 1711-1716, Dec. 2013.

C52. Xiahe Liu, Long Gong, and **Zuqing Zhu**, “Spectrum- and Energy-Efficient Multicasting over Multicast-Incapable EONs with Member-Only Flexible Relay,” in Proceedings of IEEE/OSA Asia Communications and Photonics Conference (ACP), paper AW4H.6, Nov. 2013 (Corresponding Author).

C51. Mingyang Zhang, Changsheng You, Huihui Jiang, **Zuqing Zhu**, Yawei Yin, Lei Liu, and S. J. B. Yoo, “Adaptive Spectrum Defragmentation with Intelligent Timing and Object Selection for Elastic Optical Networks with Time-Varying Traffic,” in Proceedings of IEEE/OSA European Conference and Exhibition on Optical Communication (ECOC), paper Th.1.E.2, Sept. 2013 (Corresponding Author).

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