

Guyue (Grace) Liu

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RESEARCH INTERESTS	Networking, Systems, and Cybersecurity Trustworthy Networks, Cloud & Edge Computing, Internet of Things (IoT) Network Function Virtualization (NFV), Software-defined Networking (SDN)	
CURRENT POSITION	Carnegie Mellon University Postdoctoral Researcher, Cylab Advisor: Vyas Sekar	Jun 2019 - present
EDUCATION	George Washington University Ph.D., Computer Science Advisor: Timothy Wood Thesis: <i>Novel abstractions for high performance network functions</i>	Sept 2013 - May 2019
	Beijing University of Posts and Telecommunications B.S., Electrical Engineering, Rank: 4 / 145 Thesis: <i>Optimizing live migration of virtual machines</i>	Sept 2008 - July 2012
AWARDS & HONORS	2019 Rising Stars in EECS N2Women Rising Stars Best Student Paper Award and Outstanding Paper, IEEE RTAS First Place in 22nd GENI Engineering Conference Competition HP Helion OpenStack Scholarship (4 / 200) Travel Grants: NSF NeTS Early Career'19, Grace Hopper Celebration'18, CPS Week'18, CRA-W Grad Cohort'16, SIGCOMM'16, SOSP'15, NSDI'15, GENI Summer Camp'14	Oct 2019 July 2019 Apr 2018 Mar 2015 Dec 2014
PROFESSIONAL EXPERIENCE	Research Intern, Microsoft Research • Project: A Real-Time Pipeline for a Large-Scale Machine Learning System • Mentor: Dany Fabian, Manager: John Winn	Jun 2018 - Sept 2018
	Research Intern, Hewlett Packard Labs • Project: A Scalable and Predicable NFV Platform for Rack-Scale Architecture • Mentor: Jean Tourrilhes, Manager: Sujata Banerjee	Jun 2016 - May 2017
	Research Intern, BBN Technologies • Project: Real Time Network and Application Performance Monitoring Framework • Mentor: Niky Riga, Manager: Chip Elliott	May 2015 - Aug 2015
	Research Intern, Chinese Academy of Sciences • Project: Optimizing Network Performance of Virtual Machine Live Migration • Mentors: Yuzhong Sun and Ying Song	Sept 2011 - May 2012
	Summer Intern, Queen Mary, University of London • Project: Elastic Message-oriented Middleware System on Top of Cloud Platform • Mentors: Yasir Alfadhil and John Bigham	Summer 2011

**REFEREED
CONFERENCE
PUBLICATIONS**

[**NSDI'21**] **G. Liu**, H. Sadok, A. Kohlbrenner, B. Parno, V. Sekar, J. Sherry, "Don't Yank My Chain: Auditable NF Service Chaining", *USENIX NSDI*, April 2021. (17% acceptance)

[**ATC'20**] Y. Ren, **G. Liu**, V. Nitu, W. Shao, R. Kennedy, G. Parmer, T. Wood, A. Tchana, "Fine-Grained Isolation for Scalable, Dynamic, Multi-tenant Edge Clouds", *USENIX ATC*, July 2020. (18% acceptance)

[**SIGCOMM'18**] **G. Liu**, Y. Ren, M. Yurchenko, K.K. Ramakrishnan, T. Wood, "Microboxes: High Performance NFV with Customizable, Asynchronous TCP Stacks and Dynamic Subscriptions", *ACM SIGCOMM*, August 2018. (18% acceptance)

[**CoNext'18**] S. Kulkarni, **G. Liu**, K.K. Ramakrishnan, M. Arumathurai, T. Wood, X. Fu, "REINFORCE: Achieving Efficient Failure Resiliency for Network Function Virtualization based Services", *ACM CoNEXT*, December 2018. (17% acceptance)

[**RTAS'18**] Y. Ren, **G. Liu**, G. Parmer, B. Brandenburg, "Scalable Memory Reclamation for Multi-Core, Real-Time Systems", *IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)*, April 2018. **Best Student Paper Award and Outstanding Paper**

[**Middleware'16**] **G. Liu**, M. Trotter, Y. Ren, T. Wood, "NetAlytics: Cloud-Scale Application Performance Monitoring with SDN and NFV", *ACM/IFIP/USENIX Middleware*, Dec 2016. (19% acceptance)

[**Middleware'16**] W. Zhang, **G. Liu**, A. Mohammadkhan, J. Hwang, K.K. Ramakrishnan, T. Wood. "SDNFV: Flexible and Dynamic Software Defined Control of an Application- and Flow-Aware Data Plane", *ACM/IFIP/USENIX Middleware*, Dec 2016. (19% acceptance)

[**NFV-SDN'15**] A. Mohammadkhan, **G. Liu**, W. Zhang, K.K. Ramakrishnan, T. Wood, "Protocols to Support Autonomy and Control for NFV in Software Defined Networks", *IEEE Network Function Virtualization & Software Defined Networks (NFV-SDN)*, Nov 2015.

**REFEREED
WORKSHOP
PUBLICATIONS**

[**SPIN'20**] M. Hall, **G. Liu**, R. Durairajan, V. Sekar "Fighting Fire with Light: Tackling Extreme Terabit DDoS Using Programmable Optics", *ACM SPIN Workshop (co-located with SIGCOMM'20)*, August 2020.

[**HotEdge'20**] M. McCormack, A. Vasudevan, **G. Liu**, S. Echeverria, K. O'Meara, G. Lewis, V. Sekar "Towards an Architecture for Trusted Edge IoT Security Gateways", *USENIX Hot-Edge*, July 2020.

[**SafeThings'20**] M. McCormack, S. Chandrasekaran, **G. Liu**, T. Yu, S. Wolf, V. Sekar "Security Analysis of Networked 3D Printers", *IEEE SafeThings (co-located with S&P'20)*, May 2020.

[**LANMAN'19**] Z. Ni, **G. Liu**, D. Afanasev, T. Wood, J. Hwang, "Advancing Network Function Virtualization with Programmable NICs", *IEEE LANMAN Workshop*, April 2019.

[**LANMAN'19**] S. Kulkarni, **G. Liu**, K.K. Ramakrishnan, T. Wood, "Living on the Edge: Serverless Computing and the Cost of Failure Resiliency", *IEEE LANMAN Workshop*, April 2019.

[**KBNets'17**] **G. Liu**, K.K. Ramakrishnan, M. Schlansker, J. Tourrilhes, T. Wood, "Design Challenges for High Performance, Scalable NFV Interconnects", *ACM KBNets Workshop*

(co-located with SIGCOMM'17), August 2017.

[**HotMiddlebox'16**] W. Zhang, **G. Liu**, W. Zhang, N. Shah, P. Lopreiato, G. Todeschi, K.K. Ramakrishnan, T. Wood, "OpenNetVM: A Platform for High Performance Network Service Chains", *ACM HotMiddlebox (co-located with SIGCOMM'16)*, August 2016.

[**Diversity'15**] **G. Liu**, T. Wood, "NetDefense: Scalable, Flexible and Efficient DDoS Prevention with SDN and NFV", *Workshop on Supporting Diversity in Systems Researches (co-located with SOSP'15)*, Oct 2015.

[**LANMAN'15**] A. Mohammadkhan, S. Ghapani, **G. Liu**, W. Zhang, K.K. Ramakrishnan, T. Wood, "Virtual Function Placement and Traffic Steering in Flexible and Dynamic Software Defined Networks", *IEEE LANMAN Workshop*, April 2015.

[**IWCA'15**] **G. Liu**, T. Wood, "Cloud-Scale Application Performance Monitoring with SDN and NFV", *IEEE IWCA (co-located with IC2E'15)*, March 2015.

[**IWCA'14**] J. Hwang, **G. Liu**, S. Zeng, F. Wu, T. Wood, "Topology Discovery & Service Classification for Distributed-Aware Clouds", *IEEE IWCA (co-located with IC2E'14)*, March 2014.

JOURNAL ARTICLES

[**ToN'20**] S. Kulkarni, **G. Liu**, K.K. Ramakrishnan, M. Arumathurai, T. Wood, X. Fu, "REINFORCE: Achieving Efficient Failure Resiliency for Network Function Virtualization-Based Services", *IEEE/ACM Transactions on Networking*, April 2020.

[**ToN'15**] T. Wood, K.K. Ramakrishnan, P. Shenoy, J. Merwe, J. Hwang, **G. Liu**, L. Chaffournier, "CloudNet: Dynamic Pooling of Cloud Resources by Live WAN Migration of Virtual Machines", *IEEE/ACM Transactions on Networking*, Oct 2015.

[**Network'15**] T. Wood, K.K. Ramakrishnan, J. Hwang, **G. Liu**, W. Zhang, "Towards a Software-Based Network: Integrating Software Defined Networking and Network Function Virtualization", *IEEE Network*, May 2015.

[**CJC'13**] S. Liu, Y. Sun, **G. Liu**, "An Adaptive Bandwidth Allocation Algorithm for Live Migration Based on Service Features", *Chinese Journal of Computers*, Sept 2013.

TALKS

Auditable NF Service Chaining

- CyLab Partners Conference (Virtual), Sept 2020
- NSF/VMware SDI-CSCS Annual PI Meeting (Virtual), July 2020

Novel Abstractions for High Performance Network Functions

- University of California, Berkeley (Berkeley, CA), Feb 2019
- College of William Mary (Williamsburg, VA), Feb 2019
- North Carolina State University (Raleigh, NC), Feb 2019
- Carnegie Mellon University (Pittsburgh, PA), Dec 2018

Microboxes: High Performance NFV with Customizable, Asynchronous TCP Stacks and Dynamic Subscriptions

- Conference talk at SIGCOMM (Budapest, Hungary), August 2018
- QMUL Networks Research Seminar (London, UK), August 2018

OpenNetVM: A Platform for High Performance Network Service Chains

- Conference talk at HotMiddlebox Workshop (Florianopolis, Brazil), August 2016
- Hewlett Packard Labs, Networking and Mobility Lab (Palo Alto, CA), April 2016

NetAlytics: Cloud-Scale Application Performance Monitoring with SDN and NFV

- Conference talk at Middleware (Trento, Italy), December 2016
- BBN Technologies (Boston, MA), August 2015

How SDN and NFV are Changing Networks

- GWU Women in CS (Washington DC), October 2014

**TEACHING
EXPERIENCE**

Guest Lecturer, George Washington University

- CS 6421 Distributed Systems Fall 2018
 - Introduction to Network Function Virtualization (NFV)
 - Introduction to Streaming Big Data
- CSci 6907.11: Special Topics - Advanced Network Systems Programming Spring 2015
 - Global Environment for Network Innovations (GENI) Tutorial

Teaching Assistant, George Washington University

- CSCI 2113 Software Engineering Fall 2013 - Spring 2015

Teaching Assistant, Stony Brook University

- ESE 124 Computer Techniques for Electronic Design I Spring 2013
- ESE 123 Introduction to Electrical and Computer Engineering Fall 2012

**PROFESSIONAL
SERVICE**

Service:

- Publication Chair, IEEE LANMAN 2021
- N2Women Mentor, ACM SIGCOMM 2020
- Web Chair, IEEE LANMAN 2018
- Travel Grant Coordinator, ACM/IFIP/USENIX Middleware 2017, 2018
- Web Chair, IEEE IWCA 2015

Program Committee:

- Program Committee, IEEE ICDCS 2021
- Poster Program Committee, SIGCOMM 2020
- Artifact Evaluation Program Committee, USENIX OSDI 2020
- Program Committee, IEEE ACSOS 2020
- Shadow Program Committee & Poster Program Committee, IEEE S&P 2019

Journal Reviewer:

- IEEE Transactions on Cloud Computing, 2020
- IEEE Transactions on Network and Service Management, 2018, 2019, 2020
- SIGCOMM Computer Communication Review, 2019
- IEEE/ACM Transactions on Networking, 2019
- IEEE Journal on Selected Areas in Communications, 2019
- IEEE Transactions on Parallel and Distributed Systems, 2019