[Updated: Aug 2018]

Eric R. Keller

http://ecee.colorado.edu/~ekeller/

RESEARCH INTERESTS

I design and build secure and reliable networked systems using that spans across the entire "systems stack", providing a refactoring of distributed systems, operating systems, networking, and computer architecture.

EDUCATION

Princeton University, **Ph. D.,** Electrical Engineering, 2011
- Dissertation: Refactoring Router Software to Minimize Disruption
- Advisor: Jennifer Rexford
- Award: Intel PhD Fellowship (2010-2011)

University of Massachusetts-Amherst, **M.S.,** Electrical and Computer Engineering, 2005
- Thesis: Programming Model for Network Processing on an FPGA
- Advisor: Russell Tessier

Virginia Tech, **B.S.,** Computer Engineering, 1999

WORK HISTORY

Stateless, Inc., Founder and CTO (2016-present).
Formed out of research at Univ. of Colorado. Raised 1.5M from investors, and received NSF SBIR Phase I (225k) and Phase II (750k) grants. Currently has 13 employees.

University of Colorado, Assistant Professor (2012-present)
Graduated 2 PhD, 5 MS, and currently advising 6 PhD students. While at CU, published at top tier networking, systems, and security conferences, such as NSDI, USENIX ATC, NDSS, Eurosys (best student paper), ACSAC, ANCS, and SoCC.

University of Pennsylvania, Post-doctoral researcher (2011-2012)
With Jonathan Smith.

Princeton University, Graduate researcher (2006-2011)
With Jen Rexford

Xilinx, Inc, Software Engineer (1999-2006)
Worked on advanced product research, where we would create propose new products, create prototypes, and build initial use cases. Highlights: Part of team pioneering run time reconfiguration tools – work led to productization of partial configuration by Xilinx:s. https://www.xilinx.com/products/design-tools/vivado/implementation/partial-reconfiguration.html
Also pioneered efforts to create Domain Specific Tool for Networking on FPGAs – work led to productization of SDNet https://www.xilinx.com/products/design-tools/software-zone/sdnet.html

[Updated: Aug 2018]

ADVISING

Current:
Oliver Michel – PhD CS, expected May 2019
Mohammad Hashemi – PhD CS, expected May 2020
Azzam Alsaudis – PhD CS, expected 2020
Greg Cusack – PhD ECEE, expected 2021
Marcelo Abranches – PhD ECEE, expected 2022
Maziyar Nazari – PhD CS, expected 2023

Alumni:
Michael Coughlin – PhD (2018), ECEE. First Job: Security Engineer at Facebook
Murad Kablan, PhD (2017), CS, First Job: CEO and co-founder Stateless
Edgar Gonzalez Quevedo, MS (2017) (visiting from UPC), First Job: Security Evaluator at Applus
Anurag Dubey, MS (2017) ECEE, First Job: Software engineer at Xilinx
Ali Ismail – M.S., (5/2015), ECEE, First Job: Embedded System Engineer at Syncroness
Ryan Hand – M.S.(4/2014), CS, First Job: Faculty at United States Military Academy
Matthew Monaco –M.S.(4/2014), CS, First Job: Google
Jeffery Lim – B.S., ECEE (Discovery Learning Apprenticeship) AY2016-17
Yiming Wang – B.S., ECEE (Discovery Learning Apprenticeship) AY2016-17
Sean Lambert – B.S. ECEE (Discovery Learning Apprenticeship), AY 2015-16
Ji Hoon Kim – B.S., CS, (for Discovery Learning Apprenticeship) AY 2015 - 16
Alex Tsankov – B.S., CS, (for Discovery Learning Apprenticeship) AY 2014-15
CS Senior Project Team in 2013-14 AY: Brian McWilliams, Scott Pledger, Alexandro Simion, Matthew Peck.
ITP Capstone Team in 2013-14 AY: Srinivas Lakshminarayan, Shankar Shivram, Siddharth Bali, Rohith Vardha

On Committee:
PhD Committee: Bryan Dixson (12/2012), Andy Sayler (4/2016), Ehab Ababneh (2017), Ning Gao (2018).
MS Committee: Matthew Phillips (7/2015), Andy Sayler (12/2013), Amit Gupta (4/2013)
Prelim: as Chair: Mike Coughlin (Apr 2014), Murad Kablan (Dec 2014), Oliver Michel (Dec 2016), Azzam Alsudais (April 2018), Mohammad Hashemi (April 2018) committee: Andy Sayler (Apr 2014), Ehab Ababneh (Oct 2014), Ning Gao (Nov, 2014), Blake Caldwell (May 2015), Zaid Al-Ali (April 2018)
Senior Thesis Committee: Peter Klipfel (CS) (4/2014)

FUNDING

Title: "CAREER: Stateless Network Functions: Building a Better Network Through Disaggregation"
Source of Support: National Science Foundation
Award Amount: $627,999 (sole PI)
Period Covered: 7/2017 – 6/2022

Title: "SDI-CSCS: Collaborative Research: S2OS: Enabling Infrastructure-Wide Programmable Security with SDI"
Source of Support: National Science Foundation and VMWare
Award Amount: $599,489 (co-PI) (total award: $3M)
Period Covered: 9/2017 – 8/2021

Title: "I-Corps: Elastic Network Infrastructure"
Source of Support: National Science Foudnation
Award Amount: $50,000 (sole PI)
Period Covered: 12/1/16 – 5/31/18

[Updated: Aug 2018]

Title: "TWC: Medium: Collaborative: Active Security"
Source of Support: National Science Foundation
Award Amount: $ 746,537. (PI) (total award: $1.2M)
Period Covered: 09/01/14-08/31/18

Title: "XPS: SDA: Elasticizing the Linux Operating System for the Cloud"
Source of Support: National Science Foundation (NSF)
Award Amount: $749,992. (co-PI) (total award 749,992 – both PI all at Colorado)
Period Covered: 09/01/13-08/31/17

Title: "NeTS: Small: Liquid Networking"
Source of Support: National Science Foundation (NSF)
Award Amount: $500,000. (PI)
Period Covered: 10/01/13-9/30/16

Title: gift from Xilinx
Source of Support: Xilinx
Award Amount: $15,000. (PI)
Granted: 09/2012

TEACHING

- University of Colorado: ECEN 5033 – SpTp DevOps in the Cloud (Fall 2018)
- University of Colorado: ECEN 3350 – Programming Digital Systems (Spring 2016, Spring 2017, Spring 2018)
- University of Colorado: ECEN 1310 – Intro to Programming for Engineers (Spring 2015)
- University of Colorado: ECEN / CSCI SpTp - Advanced Computer and Networked System Security (Fall 2013, Fall 2014, Fall 2017).
- University of Colorado: ECEN / CSCI SpTp - Advanced Network Systems (Spring 2013, Spring 2014, Fall 2015, Fall 2016).
- University of Colorado: ECEN 5013: Software-defined networking (Fall 2012)
- Teaching assistant for Princeton COS 109, "Computers in our world"
- Guest lecturer in Princeton COS 561 "Advanced computer networks", University of Colorado ECEN5743 Software Engineering of Distributed Systems, University of Colorado CSCI 5023: Network Systems

PUBLICATIONS

HIGHLY COMPETITIVE CONFERENCES

(Determined by a historical reputation, generally speaking <25% acceptance rate, with many being <20%.)

Scaling Hardware Accelerated Network Monitoring to Concurrent and Dynamic Queries With *Flow
John Sonchack, Oliver Michel, Adam J. Aviv, Eric Keller, Jonathan M. Smith
USENIX Annual Technical Conference (ATC), July, 2018 **(79 / 378, 20%)**

Turboflow: information rich flow record generation on commodity switches
John Sonchack, Adam J. Aviv, Eric Keller, and Jonathan M. Smith
Thirteenth EuroSys Conference (EuroSys '18), April, 2018. **(43 / 262, 16%)**
(awarded best student paper)

[Updated: Aug 2018]

Stateless Network Functions: Breaking the Tight Coupling of State and Processing
Murad Kablan, Azzam Alsudais, and Eric Keller, Franck Le
USENIX Symp. on Networked Systems Design and Implementation (NSDI), Mar. 2017 **(46 / 255, 18%)**

Timing-based reconnaissance and defense in software-defined networks
John Sonchack, Anurag Dubey, Adam J Aviv, Jonathan M Smith, Eric Keller
Proceedings of the 32nd Annual Conference on Computer Security Applications (ACSAC), Dec 2016.
(48 / 210, 22%)

Apps with hardware: enabling run-time architectural customization in smart phones
Michael Coughlin, Ali Ismail, Eric Keller
USENIX Annual Technical Conference (USENIX ATC), June 2016. **(47 / 266, 17%)**

Enabling Practical Software-defined Networking Security Applications with OFX
John Sonchack, Adam J. Aviv, Eric Keller, Jonathan M. Smith
In Proc. Network and Distributed System Security Symposium (NDSS). February, 2016. **(60 / 390, 15%)**

Transparent, Live Migration of a Software-Defined Network
Soudeh Ghorbani, Cole Schlesinger, Matthew Monaco, Eric Keller, Matthew Caesar, Jennifer Rexford, David Walker
ACM Symposium on Cloud Computing (SoCC). Nov., 2014 **(29 / 119, 24%)**

Eliminating the Hypervisor Attack Surface for a More Secure Cloud
Jakub Szefer, Eric Keller, Jennifer Rexford, and Ruby B. Lee
In Proc. ACM Conference on Computer and Communications Security (CCS). Oct., 2011. **(60/429, 14%)**

NoHype: Virtualized cloud infrastructure without the virtualization
Eric Keller, Jakub Szefer, Jennifer Rexford, and Ruby B. Lee
In Proc. International Symposium on Computer Architecture (ISCA). July, 2010. **(44/245, 18%)**

Seamless BGP Migration with Router Grafting
Eric Keller, Jennifer Rexford, and Jacobus van der Merwe
In Proc. Networked Systems Design and Implementation (NSDI). Apr., 2010. **(29/175, 16%)**

Virtually Eliminating Router Bugs
Eric Keller, Minlan Yu, Matthew Caesar, and Jennifer Rexford
In Proc. Conference on emerging Networking EXperiments and Technologies (CoNEXT). Dec., 2009. **(29/170, 17%)**

Better by a HAIR: Hardware-Amenable Internet Routing
Firat Kiyak, Brent Mochizuki, Eric Keller, and Matthew Caesar
In Proc. IEEE International Conference on Network Protocols (ICNP). Oct., 2009. **(36/198, 18%)**

Virtual Routers on the Move: Live Router Migration as a Network-Management Primitive
Yi Wang, Eric Keller, Brian Biskeborn, Jacobus van der Merwe, Jennifer Rexford
In Proc. ACM SIGCOMM. Aug., 2008. **(35/288, 12%)**

MEDIUM COMPETITIVE CONFERENCES

(Journal equivalent papers at venues that generally have 30-35% acceptance rate)

Augmenting cloud architectures to support decentralized applications
Michael Coughlin, Kelly Kaoudis, Eric Keller
IFIP/IEEE Symp. on Integrated Network and Service Management (IM), May, 2017 **(44/154, 29%)**

[Updated: Aug 2018]

SDN in Wide-Area Networks: A Survey
Oliver Michel, Eric Keller
International Conference on Software Defined Systems(SDS), May, 2017 **(est. 30%)**

Policy Routing using Process-Level Identifiers
Oliver Michel, Eric Keller
In Proc. IEEE International Symposium on Software Defined Systems (SDS). April, 2016. **(est. 35%)**

WASP: A Software-Defined Communication Layer for Hybrid Wireless Networks
Murad Kaplan, Chenyu Zheng, Matthew Monaco, Eric Keller, Douglas Sicker
in ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS). Oct., 2014
(est. 30%)

Software-Defined Energy Communication Networks: From Substation Automation to Future Smart Grids
Adam Cahn, Juan Hoyos, Matthew Hulse, Eric Keller
in IEEE Conf. on Smart Grid Communications (SmartGridComm), Oct., 2013. **(135 / 334, 40%)**

Programming a Hyper-Programmable Architectures for Networked Systems
Eric Keller and Gordon Brebner
In Proc. International Conference on Field-Programmable Technology (FPT). Dec., 2004. **(34 / 122, 27%)**

Hyper-Programmable Architectures for Adaptable Networked Systems
Gordon Brebner, Phil James-Roxby, Eric Keller, Chidamber Kulkarni
In Proc. IEEE Conf. on Application-specific Systems, Architectures and Processors (ASAP). Sept., 2004. **(est. 30%)**

Software Decelerators
Eric Keller, Gordon Brebner, Phil James-Roxby
In Proc. 13th International Field Programmable Logic and Applications Conference (FPL). Sept., 2003. **(est. 30%)**

A Self-Reconfiguring Platform
Brandon Blodget, Philip James-Roxby, Eric Keller, Scott McMillan, Prasanna Sundararajaran
In Proc. 13th International Field Programmable Logic and Applications Conference (FPL). Sept., 2003. **(est. 30%)**

Gene Matching Using JBits
Steven A. Guccione and Eric Keller
In Proc. 12th International Field-Programmable Logic and Applications Conference (FPL). Sept., 2002. **(est. 30%)**

Building Asynchronous Circuits With JBits
Eric Keller
In Proc. 11th International Field-Programmable Logic and Applications Conference (FPL). Aug., 2001. **(est. 30%)**

WORKSHOPS

(These are typically 6 pages with novel ideas, preliminary prototype and evaluation.
note: some workshops, such as HotNets, are competitive)

Packet-Level Analytics in Software without Compromises
Oliver Michel, John Sonchack, Eric Keller, Jonathan M. Smith
USENIX Workshop on Hot Topics in Cloud Computing (HotCloud), July 2018 **(22 / 63, 35%)**

NodeFinder: Scalable Search over Highly Dynamic Geo-distributed State
Azzam Alsudais, Zhe Huang, Bharath Balasubramanian, Shankaranarayanan Puzhavakath Narayanan, Eric Keller, Kaustubh Joshi
USENIX Workshop on Hot Topics in Cloud Computing (HotCloud), July 2018 **(22 / 63, 35%)**

[Updated: Aug 2018]

Making Serverless Computing More Serverless
Zaid Al-Ali, Sepideh Goodarzy, Ethan Hunter, Sangtae Ha, Richard Han, Eric Keller, Eric Rozner
International Workshop on Serverless Computing (WoSC), July, 2018

Machine Learning-Based Detection of Ransomware Using SDN
Greg Cusack, Oliver Michel, Eric Keller.
ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Sec). March, 2018 **(est. 35%)**

Building a Security OS With Software Defined Infrastructure
Guofei Gu, Hongxin Hu, Eric Keller, Zhiqiang Lin, Donald E. Porter
ACM Asia-Pacific Workshop on Systems (APSys). Sept. 2017

Hey Network, Can You Understand Me?
Azzam Alsudais, Eric Keller
IEEE Workshop on Software-Driven Flexible and Agile Networking (SWFAN), May, 2017. **(est. 35%)**

CommunityGuard: A Crowdsourced Home Cyber-Security System
Chase E. Steward, Anne Maria Vasu, Eric Keller
ACM International Workshop on Security in Software Defined Networks and Network Function Virtualization (SDN-NFV Security), March 2017 **(est. 35%)**

Trusted Click: Overcoming Security issues of NFV in the Cloud
Michael Coughlin, Eric Keller, Eric Wustrow
ACM International Workshop on Security in Software Defined Networks and Network Function Virtualization (SDN-NFV Security), March 2017 **(est. 35%)**
(awarded best paper)

QoX: quality of service and consumption in the cloud
Murad Kablan, Eric Keller, Hani Jamjoom
USENIX Workshop on Hot Topics in Cloud Computing (HotCloud), June 2016. **(21 / 68, 30%)**

Timing SDN Control Planes to Infer Network Configurations
John Sonchack, Adam J. Aviv, Eric Keller
In Proc. ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Security). March, 2016. **(est. 35%)**

Taking the Surprise out of Changes to a Bro Setup
Matthew Monaco, Alexander Tsankov, Eric Keller
In Proc. ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Security). March, 2016.
(awarded best paper)

Stateless Network Functions
Murad Kablan, Blake Caldwell, Hani Jamjoon, Eric Keller
In Proc. Workshop on Hot Topics in Middleboxes and Network Function Virtualization (HotMiddlebox), Aug. 2015 **(12/32, 37%)**

ClosedFlow: OpenFlow-like Control over Proprietary Devices
Ryan Hand, Eric Keller
in ACM Workshop on Hot topics in SDN (HotSDN), as Full paper. Aug., 2014 **(16 full papers out of 116 submissions (13%), 17 accepted as short (additional 14%))**

Applying Operating System Principles to SDN Controller Design
Matthew Monaco , Oliver Michel , Eric Keller
in ACM Workshop on Hot Topics in Networks (HotNets), Nov., 2013. **(26 / 110, 24%)**

[Updated: Aug 2018]

Active Security
Ryan Hand , Michael Ton, Eric Keller
in ACM Workshop on Hot Topics in Networks (HotNets), Nov., 2013. **(26 / 110, 24%)**

Jobber: Automating Inter-Tenant Trust in The Cloud
Andy Sayler, Eric Keller , Dirk Grunwald
in Workshop on Hot Topics in Cloud Computing (HotCloud), June, 2013. **(21 / 74, 28%)**

Towards Elastic Operating Systems
Amit Gupta, Ehab Ababneh, Richard Han, Eric Keller
in Hot Topics in Operating Systems (HotOS), June, 2013. **(27 / 92, 29%)**

The 'Platform as a Service' model for networking
Eric Keller and Jennifer Rexford
In Proc. INM/WREN workshop. Apr., 2010.
(note: cited 189 times as of Aug 2018 – high for a workshop paper)

Live migration of an entire network (and its hosts)
Eric Keller, Soudeh Ghorbani, Matt Caesar, Jennifer Rexford
October 2012 In Proc. HotNets. **(23 / 120, 19%)**
(note: cited 101 times as of Aug 2018 – high for a workshop paper)

Virtual switching without a hypervisor for a more secure cloud
Xin Jin, Eric Keller, Jennifer Rexford
April 2012 Proceedings of Hot ICE. **(10 / 20, 50%)**

Accountability in hosted virtual networks
Eric Keller, Ruby Lee, and Jennifer Rexford
In Proc. Workshop on Virtualized Infrastructure Systems and Architectures (VISA). Aug., 2009.

Virtualizing the Data Plane Through Source Code Merging
Eric Keller and Evan Green
In Proc. PRESTO workshop. Aug., 2008.

An FPGA Wire Data-Base for Run-Time Routers
Eric Keller and Scott McMillan
In Proc. Military and Aerospace Applications of Programmable Logic Devices (MAPLD). Sept., 2002.

Run-Time Reconfigurable 2D Discrete Wavelet Transform Using JBits
Jonathan Ballagh, Peter Athanas, and Eric Keller
In Proc. Reconfigurable Technology: FPGAs for Computing and Applications II. Aug., 2001.

Java Debug Hardware Models using JBits
Jonathan Ballagh, Peter Athanas, and Eric Keller
In Proc. 8th Reconfigurable Architectures Workshop (RAW 2001). May, 2001.

Dynamic Circuit Specialization of a CORDIC Processor
Eric Keller
In Proc. Reconfigurable Technology: FPGAs for Computing and Applications II. Nov., 2000.

JRoute: A Run-Time Routing API for FPGA Hardware
Eric Keller
In Proc. 7th Reconfigurable Architectures Workshop (RAW 2000). May, 2000.
(note: cited 72 times as of Aug 2018 – high for a workshop paper)

[Updated: Aug 2018]

JOURNALS / ARTICLES

(In my field, these are not a central focus, where instead conference publications are the preferred venue)

Scalable Network Virtualization in Software-Defined Networks
Dmitry Drutskoy, Eric Keller, Jennifer Rexford
in IEEE Internet Computing, March/April 2013.

Rehoming edge links for better traffic engineering
Eric Keller, Michael Schapira, Jennifer Rexford. ACM SIGCOMM Computer Communication Review Volume 42 Issue 2, April 2012

POSTERS / TECH REPORTS

(Posters do go through review, with an extended abstract as the submission. They typically get accepted if in scope. Posters are presented during special sessions at the top tier conferences, getting good, early visibility and feedback from the community)

(poster) Scalable Hardware-Accelerated Network Analytics
Oliver Michel, John Sonchack, Adam J. Aviv, Eric Keller
USENIX Symposium on Networked Systems Design and Implementation (NSDI). April, 2018

(poster) Machine Learning-Based Fingerprinting of Network Traffic Using Programmable Forwarding Engines
Greg Cusack, Oliver Michel, Eric Keller
Network and Distributed System Security Symposium (NDSS). February, 2018. (won best technical poster)

FluidMem: Memory as a Service for the Datacenter
Blake Caldwell, Youngbin Im, Sangtae Ha, Richard Han, and Eric Keller
Tech Report, arXiv:1707.07780 [cs.OS]. July 2017

(poster) TurboFlow: Accelerating Flow Collection on Commodity Switches
John Sonchack, Adam J. Aviv, Eric Keller, Jonathan M. Smith
USENIX Symposium on Networked Systems Design and Implementation (NSDI), March 2017

(poster) Colocation in Stateless Network Functions
Anurag Dubey, Murad Kablan, Eric Keller
USENIX Symposium on Networked Systems Design and Implementation (NSDI), March 2017

(Poster) Defragmenting the Cloud
Oliver Michel, Eric Keller
USENIX Network System Design and Implementation (NSDI), March 2016

(Poster) CoCaching in Named Data Networking
Azzam Alsudais, Eric Keller
USENIX Network System Design and Implementation (NSDI), March 2016

(Poster) Mitigating Network Resource Abuses and DDoS attacks with Client Puzzle based Software-Defined Networks
Zhang Liu, Eric Keller, Sangtae Ha
USENIX Network System Design and Implementation (NSDI), March 2016

(Poster) OFX: Enabling OpenFlow Extensions for Switch-Level Security Applications.
In Proc. ACM SIGSAC Conference on Computer and Communications Security (CCS), 2015.

(poster) Stateless Network Functions
Murad Kablan, Blake Caldwell, Hani Jamjoon, Eric Keller
at USENIX Symp. on Networked Systems Design and Implementation (NSDI), May., 2015.

(poster) Mobile Applications with Reconfigurable Hardware
Michael Coughlin, Ali Ismail, Eric Keller.
USENIX Symposium on Operating System Design and Implementation (OSDI), October 2014.

(poster) Extending the Software-defined Network Boundary
Oliver Michel, Michael Coughlin, Eric Keller
at ACM SIGCOMM. Aug., 2014

(poster) Making the Live Network the Honeypot
Michael Coughlin, Oliver Michel, Eric Keller, and Adam J. Aviv.
at USENIX Symp. on Networked Systems Design and Implementation (NSDI), Apr., 2014.

(poster/demo) Applying Operating System Principles to SDN Controller Design
Oliver Michel, Matthew Monaco, Eric Keller.
The 18th GENI Engineering Conference, Oct., 2013.

(poster) WASP: A Centrally Managed Communication Layer for Smart Phone Networks
Murad Kaplan , Chenyu Zheng, Eric Keller
in USENIX Symposium on Networked Systems Design and Implementation (NSDI), May, 2013.

(poster) yanc: Yet Another Network Controller
Matthew Monaco , Eric Keller
in USENIX Symposium on Networked Systems Design and Implementation (NSDI), May, 2013.

(poster) Jobber: Automating Inter-Tenant Trust in The Cloud
Andy Sayler, Eric Keller
in USENIX Symposium on Networked Systems Design and Implementation (NSDI), May, 2013.

SERVICE

Department / College:

2018-19 AY: CE Search Committee
2017-18 AY: Executive Committee (Fall) / GradComm (Spring)
2016-17 AY: Executive Committee (ExComm)
2015-16 AY: Executive Committee (ExComm)
2014-15 AY: Faculty Search Committee
Spring 2014: Strategic Vision Committee

Organizing Committee:

2018: TPC co-Chair CNERT, Treasurer ANCS
2015: co-Chair CoNEXT Student Workshop, ANCS Publicity Chair

Technical Program Committee (year of conference):

2018: ICNP, CoNEXT, SDN-NFV Security, ANCS
2017: IM, SDN-NFV Security, ANCS, ICDCS, SOSR, ICNP, SWFAN
2016: SDN-NFV Security, NOMS, HotMiddleBox, ICNP, IEEE NFV-SDN, CAN
2015: ICNP, ANCS, EWSDN, PLVNET, IEEE NFV-SDN
2014: CNERT, ANCS, HotSDN, HotCloud, ICCCN (SDN Track), EWSDN, SDN-NGA, SIGCOMM Poster/Demo, Infocomm Poster/Demo, SDN-AA,
2013: ANCS, HotSDN, EWSDN, SIGCOMM Poster/Demo

2010: NetFPGA Developers Workshop
2009: NetFPGA Developers Workshop

Reviewer:
2017: COMNET, CSUR
2016: CCR, TNSM
2015: ToN, COSE, Sensors, CCR
2014: Internet Computing, TRETS, ToN, TNSM, CCR
2013: Internet Computing, TRETS, TNMS, ToN
2012: COMNET, ToN, CCR
2011: ToN

Panelist:
2018: NSF ad-hoc
2017: NSF in person
2016: NSF in person
2015: NSF in person, NSF virtual
2014: NSF in person, NSF ad-hoc

Internet Computing = IEEE Internet Computing
ToN = IEEE Transactions on Networking
TRETS = ACM Transactions on Reconfigurable Technology and Systems
TNSM = IEEE Transactions on Network and Service Management
CCR = ACM SIGCOMM Computer Communication Review
COSE = Elseviewer Computers & Security Journal
Sensors = MDPI Sensors Journal
SIGCOMM = The flagship annual conference of the ACM Special Interest Group on Data Communication (SIGCOMM) on the applications, technologies, architectures, and protocols for computer communication
ICNP = IEEE International Conference on Network Protocols
ANCS = ACM/IEEE Symposium on Architectures for Networking and Communications Systems
NFV-SDN = IEEE Conference on Network Functions Virtualization and Software-defined Networking
EWSDN = European Workshop on Software Defined Networks
HotSDN = ACM SIGCOMM Workshop on Hot Topics in Software Defined Networking
HotCloud = USENIX Workshop on Hot Topics in Cloud Computing
ICCCN = IEEE International Conference on Computer Communication and Networks
CNERT = International Workshop on Computer and Networking Experimental Research using Testbeds
SDN-NGA = International Workshop on Software Defined Networks for a New Generation of Applications and Services
SDN-AA = IEEE Workshop on SDN Architecture and Applications 2014 (SDN-AA
PVLNET = workshop on PL and verification for networking
NOMS = IEEE/IFIP Network Operations and Management Symposium
IM = IFIP/IEEE International Symposium on Integrated Network Management
CAN = ACM Cloud Assisted Networking
SOSR = ACM Symposium on Software-defined Networking Research

INVITED TALKS

Building a better network through disaggregation
- IETF NFVRG (2017)
- GENI Regional Workshop (KEYNOTE) (2017)

Stateless Network Functions
- Broadband Internet Technical Advisory Group (BITAG) (2016)

Software-Defined: The Power of Centralized Control
- Xilinx (2013)

CloudBase: Enabling a dynamically deployable wireless infrastructure
- Microsoft Research (2012)

Secure Virtualization for Dependable Cloud Services
- Georgetown University, University of Maryland, Boston University, University of Colorado, Indiana University, Battelle (2012)

NoHype: Virtualized Cloud Infrastructure without the Virtualization
- University of Pennsylvania (2011), IBM, (2010).

Dynamic Infrastructure for Dependable Cloud Services
- University of Maryland, Northeastern University, Bell Labs,University of Delaware (2011), Rutgers (2010)

Refactoring Router Software to Minimize Disruption
(Earlier title: Migrating and Grafting Routers to Accommodate Change)
- Georgetown University (2011), University of North Carolina, Rutgers University, University of Pennsylvania, North Carolina State University, Duke University, Bell Labs (2010)

Accountability in Hosted Virtual Networks
- Microsoft Research, AT&T Research (2009).

PATENTS

- Pending: CU Internal ID: CU3807B-US1 Stateless Network Functions – Exclusive License Agreement to Stateless, Inc. (Aug 2017).
- *8,806,032* – "Methods and apparatus to migrate border gateway protocol sessions between routers"
- *8,284,772* - "Method for scheduling a network packet processor"
- *8,065,135* - "Method for message processing on a programmable logic device"
- *8,032,874* – "Generation of executable threads having source code specs. that describe network packets"
- *7,990,867* – "Pipeline for processing network packets"
- *7,823,162* – "Thread circuits and a broadcast channel in programmable logic"
- *7,792,117* – "Method for simulating a processor of network packets"
- *7,788,402* – "Circuit for modification of a network packet by insertion or removal of a data segment"
- *7,784,014* – "Generation of a specification of a network packet processor"
- *7,770,179* – "Method and apparatus for multithreading on a programmable logic device"
- *7,698,449* – "Method and apparatus for configuring a processor embedded in an integrated circuit for use as a logic element"
- 7,689,726 – "Bootable integrated circuit device for readback encoding of configuration data"
- *7,653,895* – "Memory arrangement for message processing by a plurality of threads"
- *7,574,680* – "Method and apparatus for application-specific programmable memory architecture and interconnection network on a chip"
- *7,552,042* – "Method for message processing on a programmable logic device"
- *7,386,826* – "Using redundant routing to reduce susceptibility to single event upsets in PLD designs"
- *7,328,335* – "Bootable programmable logic device for internal decoding of encoded configuration data"
- *7,228,520* – "Method and apparatus for a programmable interface of a soft platform on a programmable logic device"

[Updated: Aug 2018]

- *7,227,378* – “Reconfiguration of a programmable logic device using internal control”
- *7,185,309* – “Method and apparatus for application-specific programmable memory architecture and interconnection network on a chip”
- *7,131,077* – “Using an embedded processor to implement a finite state machine”
- *7,111,215* – “Methods of reducing the susceptibility of PLD designs to single event upsets”
- *7,076,596* – “Method of and apparatus for enabling a hardware module to interact with a data structure”
- *7,028,283* – “Method of using a hardware library in a programmable logic device”
- *7,010,664* – “Configurable address generator and circuit using same”
- *6,920,627* – “Reconfiguration of a programmable logic device using internal control”
- *6,883,147* – “Method and system for generating a circuit design including a peripheral component connected to a bus”
- *6,725,441* – “Method and apparatus for defining and modifying connections between logic cores implemented on programmable logic devices”
- *6,487,709* – “Run-Time Routing for Programmable Logic Devices”