

Aaron Gember-Jacobson
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———— **CONTACT INFORMATION** ————

Department of Computer Science, Colgate University
13 Oak Drive, Hamilton, NY 13346

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———— **EDUCATION** ————

Ph.D. in Computer Science May 2016
University of Wisconsin-Madison, Madison, WI

Master of Science in Computer Science May 2011
University of Wisconsin-Madison, Madison, WI

Bachelor of Science in Computer Science May 2009
Marquette University, Milwaukee, WI

———— **PROFESSIONAL EXPERIENCE** ————

Assistant Professor, Colgate University July 2016 – Present

Lecturer, University of Wisconsin-Madison Spring 2015, Spring 2014

Research Assistant/Fellow, University of Wisconsin-Madison January 2010 – May 2016

Student Intern, AT&T Research May 2011 – July 2011

———— **TEACHING** ————

COLGATE UNIVERSITY

- **Intro to Computing I (COSC 101):** Spring 2018
- **Operating Systems (COSC 301):** Fall 2017, Spring 2017, Fall 2016
- **Computer Networks (COSC 465):** Spring 2017

UNIVERSITY OF WISCONSIN-MADISON

- **Introduction to Networks (CS 640):** Spring 2015, Spring 2014
- **Software-Defined Networking Bootcamp:** Spring 2013, Fall 2012

———— **GRANTS** ————

AitF: Collaborative Research: Foundations of Intent-based Networking. National Science Foundation (NSF), 2016-2018, \$60K.

———— **PUBLICATIONS** ————

(* indicates undergraduate student author)

REFERRED CONFERENCE PUBLICATIONS

1. [Aaron Gember-Jacobson](#), Aditya Akella, Ratul Mahajan, and Hongqiang Liu. “Automatically Repairing Network Control Planes Using an Abstract Representation.” *ACM Symposium on Operating System Principles (SOSP)*, 2017.

2. [Aaron Gember-Jacobson](#), Raajay Viswanathan, Aditya Akella, and Ratul Mahajan. “Fast Control Plane Analysis Using an Abstract Representation.” *ACM SIGCOMM*, 2016.
3. Junaid Kahlid, [Aaron Gember-Jacobson](#), Roney Michael, Anubhavnidhi Abhashkumar, and Aditya Akella. “Paving the Way for NFV: Simplifying Middlebox Modifications using StateAlyzr.” *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2016.
4. [Aaron Gember-Jacobson](#), Wenfei Wu, Xiujun Li, Aditya Akella, and Ratul Mahajan. “Management Plane Analytics.” *ACM Internet Measurement Conference (IMC)*, 2015.
5. Keqiang He, Junaid Khalid, [Aaron Gember-Jacobson](#), Sourav Das, Chaithan Prakash, Aditya Akella, Li Erran Li, and Marina Thottan. “Measuring Control Plane Latency in SDN-enabled Switches.” *ACM SIGCOMM Symposium on SDN Research (SOSR)*, 2015.
6. Ashok Anand, [Aaron Gember-Jacobson](#), Collin Engstrom, and Aditya Akella. “Design Patterns for Tunable and Efficient SSD-based Indexes.” *ACM/IEEE Symposium on Architectures for Networking and Communication Systems (ANCS)*, 2014.
7. [Aaron Gember-Jacobson](#), Raajay Viswanathan, Chaithan Prakash, Robert Grandl, Junaid Khalid, Sourav Das, and Aditya Akella. “OpenNF: Enabling Innovation in Network Function Control.” *ACM SIGCOMM*, 2014.
8. Thomas Ball, Nikolaj Bjorner, [Aaron Gember](#), Shachar Itzhaky, Aleksandr Karbyshev, Mooly Sagiv, Michael Schapira, Asaf Valadarsky. “VeriCon: Towards Verifying Controller Programs in Software-Defined Networks.” *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, 2014.
9. Keqiang He, Alexis Fisher, Liang Wang, [Aaron Gember](#), Aditya Akella, and Thomas Ristenpart. “Next Stop, the Cloud: Understanding Modern Web Service Deployment in EC2 and Azure.” *ACM Internet Measurement Conference (IMC)*, 2013.
10. [Aaron Gember](#), Aditya Akella, Jeffrey Pang, Alexander Varshavsky, and Ramon Caceres. “Obtaining Representative Measurements of Cellular Network Performance.” *ACM Internet Measurement Conference (IMC)*, 2012.
11. [Aaron Gember](#), Christopher Dragga, and Aditya Akella. “ECOS: Leveraging Software-Defined Networks to Support Mobile Application Offloading.” *ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS)*, 2012.
12. Shan-Hsiang Shen, [Aaron Gember](#), Ashok Anand, and Aditya Akella. “Refactoring Content Overhearing to Improve Wireless Performance.” *Annual International Conference on Mobile Computing and Networking (MobiCom)*, 2011.
13. [Aaron Gember](#), Ashok Anand, and Aditya Akella. “A Comparative Study of Handheld and Non-Handheld Traffic in Campus WiFi Networks.” *International Conference on Passive and Active Measurements (PAM)*, 2011.

REFERRED WORKSHOP PUBLICATIONS

1. [Aaron Gember-Jacobson](#), Costin Raiciu, Laurent Vanbever. “Integrating Verification and Repair into the Control Plane.” *ACM Workshop on Hot Topics in Networks (HotNets)*, 2017.
2. Junaid Kahlid, Mark Coatsworth, [Aaron Gember-Jacobson](#), and Aditya Akella. “A Standardized Southbound API for VNF Management.” *ACM SIGCOMM Workshop on Hot Topics in Middleboxes and Network Function Virtualization (HotMiddlebox)*, 2016.
3. [Aaron Gember-Jacobson](#) and Aditya Akella. “Improving the Safety, Scalability, and Efficiency of Network Function State Transfers.” *ACM SIGCOMM Workshop on Hot Topics in Middleboxes and Network Function Virtualization (HotMiddlebox)*, 2015.

4. Anand Krishnamurthy, Shoban P. Chandrabose, and Aaron Gember-Jacobson. “Pratyaaatha: An Efficient Elastic Distributed SDN Control Plane.” *ACM SIGCOMM Workshop on Hot Topics in Software Defined Networking (HotSDN)*, 2014.
5. Aaron Gember, Prathmesh Prabhu, Zainab Ghadiyali, and Aditya Akella. “Toward Software-Defined Middlebox Networking.” *ACM Workshop on Hot Topics in Networks (HotNets)*, 2012.
6. Aaron Gember, Theophilus Benson, and Aditya Akella. “Challenges in Unifying Control of Middlebox Traversals and Functionality.” *ACM SIGOPS/SIGACT Workshop Large-Scale Distributed Systems and Middleware (LADIS)*, 2012.
7. Aaron Gember, Chris Dragga, and Aditya Akella. “ECOS: Practical Mobile Application Offloading for Enterprises.” *USENIX Workshop on Hot Topics in Management of Internet, Cloud, and Enterprise Networks and Services (Hot-ICE)*, 2012.
8. Ashok Anand, Aaron Gember, Vyas Sekar and Aditya Akella. “Tracking Semantic Relationships for Effective Content Management in Home Networks.” *ACM SIGCOMM HomeNets Workshop*, 2010.

REFERRED POSTERS

1. Ashsan Mahmood*, Aaron Gember-Jacobson. “Auto-completion for Network Configurations.” *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2018.
2. Keqiang He, Junaid Khalid, Sourav Das, Aaron Gember-Jacobson, Chaithan Prakash, Aditya Akella, Li Erran Li, and Marina Thottan. “Latency in Software Defined Networks: Measurements and Mitigation Techniques.” *ACM SIGMETRICS*, 2015.
3. Aaron Gember, Robert Grandl, and Junaid Khalid. “Design and Implementation of a Framework for Software-Defined Middlebox Networking.” *ACM SIGCOMM*, 2013.
4. Aaron Gember, Anand Krishnamurthy, and Saul St. John. “Virtual Middleboxes as First-Class Entities in the Cloud.” *Open Networking Summit*, 2013.
5. Aaron Gember, Robert Grandl, Junaid Khalid, and Shan-Hsiang Shen. “Towards Software-Defined Middlebox Networking.” *Open Networking Summit*, 2013.
6. Aaron Gember and Dennis Brylow. “Real-Time TCP for Embedded Devices.” *ACM Student Research Competition Poster Session, ACM SIGCSE*, 2009.

TECHNICAL REPORTS

1. Aaron Gember, Robert Grandl, Junaid Khalid, Shan-Hsiang Shen, and Aditya Akella. “Design and Implementation of a Framework for Software-Defined Middlebox Networking.” University of Wisconsin-Madison, Technical Report TR1794, 2013.
2. Aaron Gember, Anand Krishnamurthy, Saul St. John, Robert Grandl, Xiaoyang Gao, Ashok Anand, Theophilus Benson, Aditya Akella, and Vyas Sekar. “Stratos: A Network-Aware Orchestration Layer for Middleboxes in the Cloud.” Technical Report arXiv:1305.0209, 2013.
3. Ashok Anand, Aaron Gember, and Aditya Akella. “Generic Design Patterns for Tunable and High-Performance SSD-based Indexes.” University of Wisconsin-Madison, Technical Report TR1778, 2012.
4. Aaron Gember, Robert Grandl, Ashok Anand, Theophilus Benson, and Aditya Akella. “Stratos: Virtual Middleboxes as First-Class Entities.” University of Wisconsin-Madison, Technical Report TR1771, 2012.
5. Aaron Gember, Ashok Anand, and Aditya Akella. “Handheld vs. Non-Handheld Traffic: Implications for Campus WiFi Networks.” University of Wisconsin-Madison, TR1679, 2010.

PATENTS

1. [Aaron Gember-Jacobson](#), Chaithan Prakash, Raajay Viswanathan, Robert Grandl, Junaid Kahlid, Sourav Das, and Aditya Akella. “Cloud Architecture with State-Saving Middlebox Scaling.” US Patent # 9,705,785. Issued July 11, 2017.
2. Ashok Anand, [Aaron Gember](#), and Aditya Akella. “High-Performance Indexing for Data-Intensive Systems.” US Patent # 9,612,955. Issued April 4, 2017.
3. [Aaron Gember](#), Robert Grandl, Theophilus Benson, Ashok Anand, and Aditya Akella. “Cloud-Based Middlebox Management System.” US Patent # 9,104,492. Issued August 11, 2105.

HONORS AND AWARDS

- Internet Engineering Task Force (IETF) Applied Networking Research Prize (2015)
- Department of Computer Sciences Graduate Student Instructor Award (2014)
- IBM Ph.D. Fellowship (2013-2015)
- Wisconsin Alumni Research Foundation (WARF) Innovation Award Finalist (2012)
- National Science Foundation Graduate Research Fellowship Honorable Mention (2011)
- University of Wisconsin—Madison, Computer Science Summer Graduate Fellowship (2010)
- Third Place in the ACM Student Research Competition at SIGCSE 2009

SERVICE

RESEARCH COMMUNITY

- *Program committee member*, ACM SIGMETRICS: 2018
- *Poster and Demo committee member*, Symposium on SDN Research (SOSR): 2018
- *Program committee member*, Asia-Pacific Workshop on Networking (APNet): 2017
- *Program committee member*, International Symposium on Local and Metropolitan Area Networks (LANMAN): 2017
- *Reviewer*, ACM New York Celebration of Women in Computing (NYCWIC): 2017
- *Reviewer*, IEEE/ACM Transactions on Networking (TON): 2016, 2014
- *External reviewer*, International Journal of Network Measurement (IJNM): 2016, 2014
- *External reviewer*, Symposium on Principles of Programming Languages (POPL): 2016
- *External reviewer*, Computer Communications Review (CCR): 2016, 2015
- *External reviewer*, IEEE Transactions on Wireless Communications (TWC): 2015
- *Poster committee member*, ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS): 2014

UNIVERSITY

- *Appointed member*, Goldwater Committee: 2017-18
- *Search committee member*, Information Technology Services (ITS): Spring 2017

DEPARTMENT

- *Organizer*, weekly department symposium: Spring 2017-present

- *Search committee member*: Spring 2017, Fall 2018, Spring 2018

OUTREACH

- *Volunteer*, Wisconsin Science Festival (2013)
- *Presenter*, Computer Science for High School (CS4HS) Workshop, Marquette University (2012)
- *President*, ACM student chapter, University of Wisconsin–Madison (2012 – 2014)
- *Vice President*, ACM student chapter, University of Wisconsin–Madison (2011 – 2012)

———— **RESEARCH MENTORING** ————

BACHELOR'S THESES

- Ahsan Mahmood: “Autocompletion for Network Configurations” (2017-18)

UNDERGRADUATE RESEARCH STUDENTS

- Ruchit Shrestha (Summer 2017-present)
- Ahsan Mahmood (Summer 2017-Spring 2018)
- Eliza Lucas (Spring 2018)
- Amanda Milberg (Spring 2018)
- Alex Thomas (Spring 2018)
- Danielle Zegelstein (Spring 2018)
- Lindsey Derbyshire (Summer 2017)
- Franklin van Nes (Summer 2017)
- Francisco Flores (Spring 2017)
- Alec Glassman (Spring 2017)
- Saw Lin (Spring 2017)
- Pam Needle (Spring 2017)