

Aaron Gember-Jacobson
<http://aaron.gember-jacobson.com>

———— **CONTACT INFORMATION** ————

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

✉ agemberjacobson@colgate.edu
☎ (315) 228-6298

———— **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** ————

([†] indicates course includes a weekly 2 hour laboratory in addition to lecture)

COLGATE UNIVERSITY — *undergraduate liberal arts institution with a 5 course teaching load*

- **Intro to Computing I (COSC 101)[†]**: Spring 2018
- **Operating Systems (COSC 301)[†]**: Fall 2018, Fall 2017, Spring 2017, Fall 2016 (2 sections)
- **Computer Networks (COSC 465)**: Spring 2017
- **The Unreliable Internet (FSEM 136)**: Fall 2018

UNIVERSITY OF WISCONSIN-MADISON — *courses taught as a lecturer during PhD program*

- **Introduction to Networks (CS 640)**: Spring 2015, Spring 2014

———— **GRANTS** ————

- G1. *NeTS: Medium: Collaborative Research: Automatic Network Repair*. National Science Foundation (NSF), 2018-2022, \$170K.
- G2. *AitF: Collaborative Research: Foundations of Intent-based Networking*. National Science Foundation (NSF), 2016-2019, \$60K.

PUBLICATIONS

(* indicates undergraduate student author)

REFEREED CONFERENCE PUBLICATIONS

- C1. Aaron Gember-Jacobson, Aditya Akella, Ratul Mahajan, and Hongqiang Harry Liu. Automatically repairing network control planes using an abstract representation. In *Proceedings of the 26th Symposium on Operating Systems Principles (SOSP)*, pages 359–373. ACM, 2017
- C2. Aaron Gember-Jacobson, Raajay Viswanathan, Aditya Akella, and Ratul Mahajan. Fast control plane analysis using an abstract representation. In *Proceedings of the ACM SIGCOMM 2016 Conference (SIGCOMM)*, pages 300–313. ACM, 2016
- C3. Junaid Khalid, Aaron Gember-Jacobson, Roney Michael, Anubhavnidhi Abhashkumar, and Aditya Akella. Paving the way for NFV: Simplifying middlebox modifications using StateAlyzr. In *13th USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, pages 239–253. USENIX Association, 2016
- C4. Aaron Gember-Jacobson, Wenfei Wu, Xiujun Li, Aditya Akella, and Ratul Mahajan. Management plane analytics. In *Proceedings of the 2015 ACM Internet Measurement Conference (IMC)*, pages 395–408. ACM, 2015
- C5. 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. In *Proceedings of the 1st ACM SIGCOMM Symposium on Software Defined Networking Research (SOSR)*, pages 25:1–25:6. ACM, 2015
- C6. Ashok Anand, Aaron Gember-Jacobson, Collin Engstrom, and Aditya Akella. Design patterns for tunable and efficient SSD-based indexes. In *Proceedings of the tenth ACM/IEEE symposium on Architectures for networking and communications systems (ANCS)*, pages 149–160. ACM, 2014
- C7. Aaron Gember-Jacobson, Raajay Viswanathan, Chaithan Prakash, Robert Grandl, Junaid Khalid, Sourav Das, and Aditya Akella. OpenNF: enabling innovation in network function control. In *ACM SIGCOMM 2014 Conference (SIGCOMM)*, pages 163–174. ACM, 2014
- C8. Thomas Ball, Nikolaj Bjørner, Aaron Gember, Shachar Itzhaky, Aleksandr Karbyshev, Mooly Sagiv, Michael Schapira, and Asaf Valadarsky. VeriCon: towards verifying controller programs in software-defined networks. In *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, pages 282–293. ACM, 2014
- C9. 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. In *Proceedings of the 2013 Internet Measurement Conference (IMC)*, pages 177–190. ACM, 2013
- C10. Aaron Gember, Aditya Akella, Jeffrey Pang, Alexander Varshavsky, and Ramón Cáceres. Obtaining in-context measurements of cellular network performance. In *Proceedings of the 12th ACM SIGCOMM Internet Measurement Conference (IMC)*, pages 287–300. ACM, 2012
- C11. Aaron Gember, Christopher Dragga, and Aditya Akella. ECOS: leveraging software-defined networks to support mobile application offloading. In *Symposium on Architecture for Networking and Communications Systems (ANCS)*, pages 199–210. ACM, 2012
- C12. Shan-Hsiang Shen, Aaron Gember, Ashok Anand, and Aditya Akella. Refactor-ing content overhearing to improve wireless performance. In *Proceedings of the 17th Annual International Conference on Mobile Computing and Networking (MobiCom)*, pages 217–228. ACM, 2011

- C13. Aaron Gember, Ashok Anand, and Aditya Akella. A comparative study of handheld and non-handheld traffic in campus Wi-Fi networks. In *Proceedings of the 12th International Passive and Active Measurement Conference (PAM)*, pages 173–183. Springer, 2011

REFEREED WORKSHOP PUBLICATIONS

- W1. Aaron Gember-Jacobson, Costin Raiciu, and Laurent Vanbever. Integrating verification and repair into the control plane. In *Proceedings of the 16th ACM Workshop on Hot Topics in Networks (HotNets)*, pages 129–135. ACM, 2017
- W2. Junaid Khalid, Mark Coatsworth, Aaron Gember-Jacobson, and Aditya Akella. A standardized southbound API for VNF management. In *Proceedings of the ACM SIGCOMM Workshop on Hot topics in Middleboxes and Network Function Virtualization (HotMiddlebox)*, pages 38–43. ACM, 2016
- W3. Aaron Gember-Jacobson and Aditya Akella. Improving the safety, scalability, and efficiency of network function state transfers. In *Proceedings of the 2015 ACM SIGCOMM Workshop on Hot Topics in Middleboxes and Network Function Virtualization (HotMiddlebox)*, pages 43–48. ACM, 2015
- W4. Anand Krishnamurthy, Shoban P. Chandrabose, and Aaron Gember-Jacobson. Pratyaaastha: an efficient elastic distributed SDN control plane. In *Proceedings of the third workshop on Hot topics in software defined networking (HotSDN)*, pages 133–138. ACM, 2014
- W5. Aaron Gember, Prathmesh Prabhu, Zainab Ghadiyali, and Aditya Akella. Toward software-defined middlebox networking. In *11th ACM Workshop on Hot Topics in Networks (HotNets)*, pages 7–12. ACM, 2012
- W6. Aaron Gember, Chris Dragga, and Aditya Akella. ECOS: practical mobile application offloading for enterprises. In *2nd USENIX Workshop on Hot Topics in Management of Internet, Cloud, and Enterprise Networks and Services (Hot-ICE)*. USENIX Association, 2012
- W7. Ashok Anand, Aaron Gember, Aditya Akella, and Vyas Sekar. Tracking semantic relationships for effective data management in home networks. In *Proceedings of the 2010 ACM SIGCOMM Workshop on Home Networks (HomeNets)*, pages 49–54. ACM, 2010

REFEREED POSTERS

- P1. Ashsan Mahmood*, Aaron Gember-Jacobson. Auto-completion for Network Configurations. *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2018.
- P2. 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. In *Proceedings of the 2015 ACM SIGMETRICS International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS)*, pages 435–436. ACM, 2015
- P3. Aaron Gember, Robert Grandl, Junaid Khalid, and Aditya Akella. Design and implementation of a framework for software-defined middlebox networking. In *ACM SIGCOMM 2013 Conference (SIGCOMM)*, pages 467–468. ACM, 2013
- P4. Aaron Gember and Dennis Brylow. Real-Time TCP for Embedded Devices. *ACM Student Research Competition Poster Session, 40th ACM Technical Symposium on Computer Science Education (SIGCSE)*, 2009.

TECHNICAL REPORTS

- T1. [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.
- T2. [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. *CoRR*, abs/1305.0209, 2013
- T3. 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.
- T4. [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.
- T5. [Aaron Gember](#), Ashok Anand, and Aditya Akella. “Handheld vs. Non-Handheld Traffic: Implications for Campus WiFi Networks.” University of Wisconsin-Madison, TR1679, 2010.

PATENTS

- U1. [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.
- U2. Ashok Anand, [Aaron Gember](#), and Aditya Akella. “High-Performance Indexing for Data-Intensive Systems.” US Patent # 9,612,955. Issued April 4, 2017.
- U3. [Aaron Gember](#), Robert Grandl, Theophilus Benson, Ashok Anand, and Aditya Akella. “Cloud-Based Middlebox Management System.” US Patent # 9,104,492. Issued August 11, 2015.

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 co-chair*, ACM Symposium on SDN Research (SOSR): 2019
- *Panelist*, National Science Foundation (NSF): 2018
- *Program committee member*, International Conference on emerging Networking EXperiments and Technologies (CoNEXT): 2018

- *Program committee member*, ACM SIGMETRICS: 2018
- *Poster and Demo committee member*, ACM 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

- *Ex officio representative*, Committee on Information Technology (CIT): 2018-19
- *Appointed member*, Fellowships Committee: Fall 2017-present
- *Search committee member*, Information Technology Services (ITS): Spring 2017

DEPARTMENT

- *Organizer*, weekly department symposium: Spring 2017-present
- *Search committee member*: Spring 2017, Fall 2017, Spring 2018, Fall 2018

RESEARCH MENTORING

BACHELOR'S THESES

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

UNDERGRADUATE RESEARCH STUDENTS

- Yasooob Khalid (Summer 2018-present)
- Xiaolin Sun (Summer 2018-present)
- Eliza Lucas (Spring 2018-present)
- Ruchit Shrestha (Summer 2017-present)
- Ahsan Mahmood (Summer 2017-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)