Matthew Caesar

Professor

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Research interests: Simplifying management and improving reliability of distributed systems and networks through principles of self-organization and self-diagnosis, with an emphasis on network security, wide-area networks, and networked systems.

Educational Background

Degree	Year	Field	University
Ph.D.	2007	Computer Science	University of California at Berkeley Dissertation: Identity-based Routing Advisors: Randy H. Katz, Ion Stoica Minors: Machine Learning, CS Theory
M.S.	2004	Computer Science	University of California at Berkeley Root Cause Analysis of BGP Dynamics Advisor: Randy H. Katz
B.S.	2000	Computer Science	University of California at Davis

Professional Experience

I co-founded Veriflow (www.veriflow.net), a company bringing rigorous and verifiable formal security to a number of fortune-500 firms and US military agencies. Our company has branches in Champaign, IL and San Jose, CA; and employs over 30 people as of 2019. Our company was sold to VMware, Inc in September 2019.

Title	Organization	Years
Professor	Department of Computer Science University of Illinois at Urbana-Champaign	2021-Present
Professor (affiliate)	National Center for Supercomputing Applications	2020-Present
Fellow and Professor (affiliate)	Center for Digital Agriculture University of Illinois at Urbana-Champaign	2020-Present
Professor (affiliate)	Department of Informatics University of Illinois at Urbana-Champaign	2019-Present
Co-Founder and Chief Science Officer	Veriflow, Inc.	2016-2019
Security Advisory Board Member	Kohl's	2016-2018
Associate Professor	Department of Computer Science University of Illinois at Urbana-Champaign	2014-2021
Professor (affiliate)	Department of Electrical and Computer Engineering University of Illinois at Urbana-Champaign	2012-Present
Professor (affiliate)	Coordinated Science Laboratory University of Illinois at Urbana-Champaign	2012-Present
Professor (affiliate)	Information Trust Institute University of Illinois at Urbana-Champaign	2012-Present
Co-Founder and President	Veriflow, Inc.	2012-2016
Assistant Professor	University of Illinois at Urbana-Champaign	2008-2014
Postdoctoral Fellow	Princeton University	2007-2008
Research Intern/Consultant	AT&T Labs - Research Network Management and Engineering Group	2004-2005, 2008
Research Intern/Consultant	Microsoft Research Systems and Networking Group	2003, 2005
Research Assistant	University of California at Berkeley	2001-2007
Member of Technical Staff	iScale Inc.	2000-2001
Software Engineering Intern	Hewlett-Packard	1999
Software Engineering Intern	Nokia	1998

Research Intern	Center for Neuroscience University of California at Davis	1998
Software Engineering Intern	Diamond Lane Communications	1997
Laboratory Assistant	Computer Science Department Santa Rosa Junior College	1995-1997

Teaching Experience

I consider "building things for real" to be a highly important part of the educational experience. A number of my courses expose students to the inner workings of the real communications protocols and server software implementations that make modern cloud/compute/network infrastructures, from Cisco IOS to AWS to the Zigbee protocol stack. By linking theory with practice, I aim to not only build knowledge, but to give students confidence to carry out tasks they will commonly encounter in industry.

Here are some sample links to my course content:
http://caesar.cs.illinois.edu/courses/cs436.f18/
http://iot.cs.illinois.edu/
http://caesar.cs.illinois.edu/aoa

I have also developed an extended version of my Internet of Things MOOC which is slated for an entire specialization sequence and which will result in an Illinois CS certificate. This MOOC was launched in Spring 2021 and over ten thousand students across the world have taken it.

Quarter/Year	Course Number and Title	Comments
Fall 2008	CS 598 - Advanced Internetworking	New Syllabus
Fall 2008	Networks Reading Group	
Spring 2009	CS 438 - Communication Networks	I2CS Course
Fall 2009	CS 498 - Networks and Systems Laboratory	New Syllabus
Fall 2009	CS 591SN - Systems and Networking Seminar	
Spring 2010	CS 591SN - Systems and Networking Seminar	
Spring 2010	CS 438 - Communication Networks	I2CS Course
Fall 2010	CS 591SN - Systems and Networking Seminar	
Spring 2011	CS 591SN - Systems and Networking Seminar	
Fall 2011	CS 241 - System Programming	

Spring 2012	CS 498 - Systems and Networking Laboratory	
Spring 2012	CS 591SN - Systems and Networking Seminar	
Fall 2012	CS 591SN - Systems and Networking Seminar	
Spring 2013	CS 598 - Network Security	New Syllabus
Spring 2013	CS 591AA - Acting out Algorithms	New Syllabus
Fall 2013	CS 591AA - Acting out Algorithms	
Spring 2014	CS 438 - Communication Networks	Online Course
Fall 2014	CS 591SN - Systems and Networking Seminar	
Fall 2017	CS 436/ECE 435 - Systems and Networking Laboratory	New Syllabus
Spring 2018	CS 436/ECE 435 - Systems and Networking Laboratory	
Fall 2018	CS 436/ECE 435 - Systems and Networking Laboratory	URL:
Spring 2019	CS 498 IT - Internet of Things	New Syllabus
Spring 2019	Internet of Things (Coursera MOOC)	New Syllabus
Fall 2019	CS 498 IT - Internet of Things	
Spring 2020	Internet of Things (Coursera MOOC)	
Fall 2020 (planned)	CS 498 IT - Internet of Things	
Fall 2020	CS 591AA - Acting out Algorithms	
Spring 2021	CS 437: Internet of Things	New Syllabus
Fall 2021	Internet of Things (Coursera MOOC)	
Fall 2021	CS 437: Internet of Things	
Spring 2022	Internet of Things (Coursera MOOC)	
Spring 2022	CS 437: Internet of Things	
Fall 2022	Internet of Things (Coursera MOOC)	
Fall 2022	CS 437: Internet of Things	
Spring 2023	Internet of Things (Coursera MOOC)	
Spring 2023	CS 437: Internet of Things	
Fall 2023	Internet of Things (Coursera MOOC)	

Fall 2023	CS 437: Internet of Things	
Spring 2024	Internet of Things (Coursera MOOC)	
Spring 2024	CS 437: Internet of Things	
Fall 2024	Internet of Things (Coursera MOOC)	
Fall 2024	CS 437: Internet of Things	

Teaching Outreach:

I try to think about ways I can make my teaching more inclusive and reach out to students who might not otherwise have the opportunity to learn about the concepts I work with. As such, I have made several efforts to design and teach summer camps to underrepresented high schoolers, designed and taught in-person boot camp classes in geodiverse areas, as well as taught open online classes accessible to students across the world.

- Internet of Things Summer Camp (2022, 2023). Summer camp offered in-person through UIUC WYSE program for disadvantaged and minority high school students.
- East Asia Summer Camp (2023 (twice), 2024). Two-week in-person summer camp for high school and college students. I run two parallel camps, one on the topic of Internet of Things, another on the topic of Network Security. I traveled to and ran two instances of this camp at East China Normal University, and another at Beihang University.
- Online outreach classes (Fall 2021, Spring 2022, Fall 2022, Spring 2023, Fall 2023, Spring 2024). I designed and run an online "boot camp" for college students on the topics of Internet of Things and Network Security. I run these classes online to allow me to reach students across the world.

Students Advised

Postdoctoral Researchers Supervised:

1. Kevin (Dong) Jin, Department of Computer Science, Summer 2013-Spring 2014. Now an Associate Professor at the University of Arkansas.
2. Anduo Wang, Department of Computer Science, Fall 2013-Fall 2015. Now an Assistant Professor at Temple University.

Ph.D. Students Supervised:

1. Mubashir Anwar, Department of Computer Science, Spring 2021-Present

2. Kuan-Yen Chou, Department of Computer Science, Fall 2019-Present.
3. Santhosh Prabhu, Department of Computer Science, Fall 2014 - 2019. Now a software engineer at VMware, working on network verification.
4. Fred Douglas, Department of Computer Science, Spring 2012 - 2017. Now a software engineer at Google, working on Internet censorship.
5. Rashid Tahir, Department of Computer Science, Spring 2012 - 2018. Now an Associate Professor at University of Prince Mugrin, Saudi Arabia.
6. Wenxuan Zhou, Department of Computer Science, Fall 2010 - 2017. Now a software engineer at Veriflow.
7. Jason Croft, Department of Computer Science, Fall 2010 - 2017. Now a software engineer at Forward Networks.
8. Virajith Jalaparti, Department of Computer Science, Fall 2009 - 2016.
9. Chi-Yao Hong, Department of Computer Science, Fall 2009 - 2016. Now in the core network architectures group at Google.
10. Rachit Agarwal, Department of Electrical and Computer Engineering, Summer 2009-2013. Graduated December 2013. Now an Assistant Professor at Cornell University.
11. Chia-Chi Lin, Department of Computer Science, Spring 2009 - 2014. Preliminary exam passed December 6, 2012. Thesis defense passed August 7, 2013. Now researcher at Facebook Research.
12. Ahmed Khurshid, Department of Computer Science, Spring 2009 - 2015. Co-founder of Veriflow, now a software engineer at VMWare working on network verification.

M.S. Students Supervised:

1. Shilan He, Department of Computer Science, Fall 2023-Present
2. Tianhao Yu, Department of Computer Science, Fall 2023-Present
3. Yuantao Lu, Department of Computer Science, Fall 2023-Present
4. Yu-Ju Chang, Department of Computer Science, Fall 2023-Present
5. Zihan Shan, Department of Computer Science, Fall 2023-Present
6. Otto Piramuthu, Department of Computer Science, Fall 2022-Present
7. Eashan Gupta, Department of Computer Science, Fall 2021-Spring 2023
8. Gregory Lee, Department of Computer Science, Spring 2022-Spring 2023
9. Yu-Ju Chang, Department of Computer Science, Spring 2022-Present
10. Deepti Kalasapura, Department of Computer Science, Spring 2022-Spring 2023
11. Xin Jin, Department of Computer Science, Spring 2022-Spring 2023
12. Arpitha Raghunandan, Department of Computer Science, Spring 2022-Present
13. Shivram Gowtham, Department of Computer Science, Spring 2022-Present
14. Qingyu Li, Department of Computer Science, Fall 2021-Present
15. Jiaxuan Liu, Department of Computer Science, Fall 2021-Present
16. Yuantao Lu, Department of Computer Science, Fall 2021-Present
17. Hongshuo Zhang, Department of Computer Science, Fall 2021-Present
18. Yifan Chen, Department of Computer Science, Spring 2021-Present
19. Pradeep Senthil, Department of Computer Science, Spring 2021-Spring 2023

20. Lu Wang, Department of Computer Science, Spring 2021-Present
21. Aniket Shirke, Department of Computer Science, (MS 2021, Google/YouTube)
22. Bella Lee, Department of Computer Science, Spring 2019-Fall 2020. (MS 2020, Google)
23. Umar Farooq, Department of Computer Science, Spring 2019-Fall 2020. (MS 2020, Amazon Web Services)
24. Zhichun Wan (MS 2019, Core Development Team, Marklogic)
25. Gohar Irfan Chaudhry (MS 2018, Windows Audio Group, Microsoft)
26. Yongli Chen (MS 2017, Azure Cloud Core Networking Team, Microsoft)
27. Hassan Shahid Khan (MS 2017, Software Engineer, Amazon)
28. Bobby Zhongbo Chen (MS 2015, Software Engineer, Growth Infrastructure Team, Dropbox)
29. Ailing Zhang, Department of Computer Science, Fall 2015 - Spring 2016.
30. Yongli Chen, Department of Computer Science, Fall 2015 - Spring 2017.
31. Hassan Khan, Department of Computer Science, Fall 2015 - Spring 2017.
32. Jereme Lamps, Department of Computer Science, Fall 2013 - Spring 2015 (expected). Now at Sandia National Labs.
33. Rohan Sharma, Department of Computer Science, Fall 2012 - Fall 2013.
34. Yiwei Yang, Spring 2013 - Spring 2014. Now at Yahoo! Labs, Champaign.
35. Joseph Leong, Department of Computer Science, Fall 2008 - Fall 2009. Now at Microsoft, in the Windows Core Networking Team.
36. Brent Mochizuki, Department of Electrical and Computer Engineering, Fall 2008 - Summer 2010. Now at UC Berkeley Space Sciences Laboratory.
37. Firat Kiyak, Department of Computer Science, Fall 2008 - Fall 2009. Now at Microsoft, in the Windows Core Networking Team.
38. Fatih Boyaci, Department of Computer Science, Fall 2008 - Fall 2009. Now at Microsoft.

Undergraduate Students Supervised:

I believe strongly in the power of exposing students to research early in their careers, as I know personally the great impact that can have on your life. I have advised over 100 undergraduate students in my career, a number of whom were from other schools (e.g., BUET, IIT Kharagpur, Tsinghua, etc.) My advisees often continue to top graduate programs (Princeton, UC Berkeley, Stanford, University of Washington, etc.). My advisees in 2020 include:
1. Shamiul Hasan (BUET, SP20)
2. Raihan Rasheed Apurbo (BUET, SP20)
3. Syeda Nahida Akter (BUET, SP20)
4. Mahbub Hossain Raton (BUET, SP20)
5. Nick Husin (UIUC, SP20)
6. Greg Kim (UIUC, SP20)
7. Sidiq Kaddo (UIUC, SP20)
8. Jenny Yao (UIUC, SP20)
9. Qiaoqian Li (UIUC, SP20)
10. Zehua Chen (UIUC, SP20)
11. Joo Young Daniel Chung (UIUC, SP20)

12. Siyu Niu (UIUC, SP20)
13. Andy Chang (UIUC, SP20)
14. Michael Chen (UIUC, SP20)
15. Bryant Zhao (UIUC, SP20)
16. Chen Lin (UIUC, SP20)
17. Howard (Haoxiang) Li (UIUC, SP20)
18. Andre He (UIUC, SP20)

Publications

According to Google Scholar, I have received over 8000 citations, I have an h-index of 36, and an i-10 index of 74 (as of 2021). My Google Scholar page may be found [at this link](#).

Journal Publications:

1. Otto Piramuthu, Matthew Caesar, Drone-hosted Computation for Emergency Response, IEEE Internet of Things Journal, January 2024.
2. Otto Piramuthu, Matthew Caesar, VANET Authentication Protocols: Security Analysis and a Proposal, Journal of Supercomputing, Springer, December 2022.
3. Bruce Davie, Matthew Caesar, Great Educators in Computer Networking: Bruce Davie, ACM SIGCOMM Computer Communication Review, Volume 51, Issue 2, April 2021.
4. Ralph Holz, Marco Mellia, Olivier Bonaventure, Hamed Haddadi, Matthew Caesar, Sergey Gorinsky, Gianni Antichi, Joseph Camp, kc Klaffy, Bhaskaran Raman, Anna Sperotto, Aline Viana, Steve Uhlig, Update on ACM SIGCOMM CCR Reviewing Process: Towards a More Open Review Process, ACM SIGCOMM Computer Communication Review, Volume 50, Issue 3, July 2020.
5. Amir Houmansadr, Wenxuan Zhou, Matthew Caesar, Nikita Borisov, SWEET: Serving the Web by Exploiting Email Tunnels, IEEE/ACM Transactions on Networking, Volume 25, Issue 3, pp 99-110, February 2017.
6. Tom Anderson, Ken Birman, Robert Broberg, Matthew Caesar, Douglas Comer, Chase Cotton, Michael J. Freedman, Andreas Haeberlen, Zachary G. Ives, Arvind Krishnamurthy, William Lehr, Boon Loo, David Mazires, Antonio Nicolosi, Jonathan M. Smith, Ion Stoica, Robbert van Renesse, Michael Walfish, Hakim Weatherspoon, Christopher S. Yoo, A Brief Overview of the NEBULA Future Internet Architecture. ACM SIGCOMM Computer Communication Review, Volume 44, Issue 5, October 2014.
7. Brighten Godfrey, Matthew Caesar, Yaron Singer, Ian Haken, Scott Shenker, Ion Stoica, Stable Internet Route Selection, IEEE/ACM Transactions on Networking, Volume 22, Issue 2, April 2014.
8. Ahmed Khurshid, Wenxuan Zhou, Matthew Caesar, P. Brighten Godfrey, VeriFlow: Verifying Network-Wide Invariants in Real Time, ACM SIGCOMM Computer Communications Review, Volume 42, Issue 4, October 2012.

9. Elliott Karpilovsky, Matthew Caesar, Jennifer Rexford, Kobus van der Merwe, Aman Shaikh, Practical Network-wide Compression of IP Routing Tables, IEEE Transactions on Network and Service Management, Volume 9, Issue 3, November 2012.
10. Brent Mochizuki, Firat Kiyak, Eric Keller, Matthew Caesar, Better by a HAIR: Hardware Amenable Interdomain Routing, Elsevier Communication Networks, Special Issue on Architectures and Protocols for the Future Internet, February 2011.
11. Changhoon Kim, Matthew Caesar, Jennifer Rexford, Floodless in SEATTLE: A Scalable Ethernet Architecture for Large Enterprises, IEEE/ACM Transactions on Networking, Volume 18, Issue 4 , August 2010.
12. Zuoning Yin, Matthew Caesar, Yuanyuan Zhou, Towards Understanding Bugs in Open Source Router Software, ACM SIGCOMM Computer Communications Review, Volume 40, Issue 3, June 2010.
13. Matthew Caesar, Martin Casado, Teemu Koponen, Jennifer Rexford, Scott Shenker, Dynamic Route Computation Considered Harmful, ACM SIGCOMM Computer Communications Review, Volume 40, Issue 2, April 2010.

Conference Publications:

1. Enguang Fan, Anfeng Peng, Matthew Caesar, Jae Kim, Josh Eckhardt, Greg Kimberly, Denis Osipychev, "Towards Effective Swarm-Based GPS Spoofing Detection in Disadvantaged Platforms," IEEE MILCOM, October 2023.
2. Mubashir Anwar, Fangping Lin, Anduo Wang, Matthew Caesar, "Indirect Network Troubleshooting with The Chase," APNET '23: Proceedings of the 7th Asia-Pacific Workshop on Networking, June 2023.
3. Otto Piramuthu, Matthew Caesar, Towards Efficient Charging Schemes for Free-Floating Rental BEVs, IEEE COINS, June 2023.
4. T. Abdelzaher, M. Caesar, C. Mendis, K. Nahrstedt, M. Srivastava, M. Yu, Challenges in Metaverse Research: An Internet of Things Perspective, IEEE MetaCom, June 2023.
5. A. Raghunandan, D. Kalaspura, M. Caesar, Digital Twinning for Microservice Architectures, IEEE International Conference on Communications (ICC), June 2023.
6. K. Y. Chou, S. Prabhu, G. Subramanian, W. Zhou, A. Nayyar, B. Godfrey, M. Caesar, Scaling data plane verification with intent-based provisioning, VMware RADIO Technical Conference, April 2023.
7. U. Farooq, M. Anwar, H. Noor, R. Tahir, S. Prabhu, A. Kheradmand, M. Caesar, F. Zaffar, FORTIFY: Software Defined Data Plane Resilience, IEEE NFV-SDN, November 2022. (Best Paper Award)
8. D. Liu, T. Abdelzaher, T. Wang, Y. Hu, J. Li, S. Liu, M. Caesar, D. Kalaspura, J. Bhattacharyya, N. Srour, M. Wigness, J. Kim, G. Wang, G. Kimberly, D. Osipychev, IoBT-OS: Optimizing the Sensing-to-Decision Pipeline for the Internet of Things, International Conference on Computer Communications and Networks (ICCCN), July 2022.
9. Otto Piramuthu, Matthew Caesar, Towards a Lightweight VANET Authentication Protocol, ACM SIGAPP Symposium on Applied Computing, April 2022.
10. Otto Piramuthu, Matthew Caesar, Ling Ren, UAV/VANET Authentication for Real Time Highway Surveillance, ACM SIGAPP Symposium on Applied Computing, April 2022.

11. Otto Piramuthu, Matthew Caesar, How Effective are Identification Technologies in Autonomous Self-Driving Vehicles?, IEEE CommNet, December 2021.
12. Aniket Shirke, Aziz Saifuddin, Angela Green-Miller, Isabella Condotta, Achleshwar Luthra, Jiangong Li, Xiaodan Hu, Tawni Williams, Aneesh Kotnana, Okan Kocabalkanli, Narendra Ahuja, Ryan N. Dilger, Matthew Caesar, Tracking Grow-Finish Pigs Across Large Pens Using Multiple Cameras, AgEng, July 2021.
13. Isabella Lee, Vignesh Babu, Matthew Caesar, David Nicol, Deep Reinforcement Learning for UAV-Assisted Emergency Response, MobiQuitous, December 2020.
14. Santhosh Prabhu, Kuan Yen Chou, Ali Kheradmand, Brighten Godfrey, Matthew Caesar, Plankton: Scalable Network Configuration Verification Through Model Checking, USENIX Symposium on Networked Systems Design and Implementation (NSDI), February 2020. (acceptance rate=14%)
15. Mohammad Noureddine, Amanda Hsu, Matthew Caesar, Fadi A. Zaraket, William H. Sanders, P4 AIG: Circuit-Level Verification of P4 Programs, Dependable Systems and Networks (DSN), June 2019.
16. Rashid Tahir, Ali Raza, Faizan Ahmad, Jehangir Kazi, Fareed Zaffar, Chris Kanich and Matthew Caesar, It's All In the Name: Why Some URLs are More Vulnerable to Typosquatting, IEEE International Conference on Computer Communications (INFOCOM), April 2018. (acceptance rate=19%)
17. Rashid Tahir, Ali Raza, Mazhar Naqvi, Fareed Zaffar and Matthew Caesar, An Anomaly Detection Fabric for Clouds Based on Collaborative VM Communities, 17th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGrid), May 2017. (acceptance rate=23%)
18. Rashid Tahir, Muhammad Huzaifa, Anupam Das, Mohammad Ahmad, Carl Gunter, Fareed Zaffar, Matthew Caesar, Nikita Borisov, Mining on Someone Else's Dime? Mitigating Covert Mining Operations in Clouds and Enterprises, 20th International Symposium on Research in Attacks, Intrusions, and Defense (RAID), September 2017. (acceptance rate=20%)
19. Wenxuan Zhou, Jason Croft, Bingzhe Liu, Matthew Caesar, NEAt: Network Error AutoCorrect, Symposium on SDN Research (SOSR), April 2017. (acceptance rate=23%)
20. Santhosh Prabhu, Mo Dong, Tong Meng, Brighten Godfrey, Matthew Caesar, Let Me Rephrase That: Transparent Optimization in SDNs, Symposium on SDN Research (SOSR), April 2017. (acceptance rate=23%)
21. Frederick Douglas, Weiyang Pan, Matthew Caesar, Salmon: Robust Proxy Distribution for Censorship Circumvention. Privacy Enhancing Technologies Symposium (PETS), July 2016.
22. Rashid Tahir, Mohammad Taha Khan, Xun Gong, Adnan Ahmed, Amiremad Ghassami, Hasanat Kazmi, Matthew Caesar, Fareed Zaffar, Negar Kiyavash, Sneak-Peek: High Speed Covert Channels in Data Center Networks, IEEE International Conference on Computer Communications (INFOCOM), April 2016. (acceptance rate=18%)
23. Joshua Juen, Aaron Johnson, Anupam Das, Nikita Borisov, Matthew Caesar Defending Tor from Network Adversaries: A Case Study of Network Path Prediction, Network and Distributed System Security Symposium (NDSS), February 2016. (acceptance rate=15%)
24. Jason Croft, Ratul Mahajan, Matthew Caesar, Madan Musuvathi, Systematically Exploring the Behavior of Control Programs, USENIX Annual Technical Conference, July 2015.
25. Anupam Das, Nikita Borisov, Matthew Caesar, Tracking Mobile Web Users Through Motion Sensors: Attacks and Defenses, Privacy Enhancing Technologies Symposium (PETS), June 2015.

26. Wenxuan Zhou, Dong Jin, Jason Croft, Matthew Caesar, Brighten Godfrey, Enforcing Customizable Consistency Properties in Software-Defined Networks, USENIX Symposium on Networked Systems Design and Implementation (NSDI), May 2015.
27. Soudeh Ghorbani, Eric Keller, Matthew Monaco, Matthew Caesar, Jennifer Rexford, David Walker, Transparent, Live Migration of a Software-Defined Network, ACM Symposium on Cloud Computing (SOCC), November 2014. (acceptance rate=24%)
28. Jereme Lamps, David M. Nicol, Matthew Caesar, TimeKeeper: A Lightweight Virtual Time System for Linux, ACM Principles of Advanced and Distributed Simulation (PADS), November 2014.
29. Anupam Das, Nikita Borisov, Matthew Caesar, Do You Hear What I Hear? Fingerprinting Smart Devices Through Embedded Acoustic Components, ACM Conference on Computer and Communications Security (CCS), November 2014. (acceptance rate=19%)
30. Soudeh Ghorbani, Eric Keller, Matthew Monaco, Matthew Caesar, Jennifer Rexford, David Walker, Transparent, Live Migration of a Software-Defined Network, ACM Symposium on Cloud Computing (SOCC), November 2014.
31. Anupam Das, Nikita Borisov, Matthew Caesar, Analyzing an Adaptive Reputation Metric for Anonymity Systems, Hot Topics in the Science of Security (HotSoS), April 2014.
32. Anupam Das, Nikita Borisov, Prateek Mittal, Matthew Caesar, RE3: Relay Reliability Reputation for Anonymity Systems, ACM Symposium on Information, Computer and Communications Security (ASIACCS), June 2014. Received Best Paper Award. (acceptance rate=20%)
33. Anupam Das, Joseph Bonneau, Matthew Caesar, Nikita Borisov, Xiaofeng Wang, The Tangled Web of Password Reuse, Network and Distributed System Security Symposium (NDSS), February 2014. (acceptance rate=18%)
34. Chi-Yao Hong, Matthew Caesar, Brighten Godfrey, Software-Defined Transport: Flexible and Deployable Flow Rate Control, Open Networking Summit (ONS), March 2014.
35. Anduo Wang, Brighten Godfrey, Matthew Caesar, Software-Defined Networks as Databases, Open Networking Summit (ONS), March 2014.
36. Chia-Chi Lin, Virajith Jalaparti, Matthew Caesar, Kobus van der Merwe, DEFINED: Deterministic Execution for Interactive Control-Plane Debugging, USENIX Annual Technical Conference (ATC), June 2013. (acceptance rate=15%)
37. Ahmed Khurshid, Kelvin Zou, Wenxuan Zhou, Matthew Caesar, Brighten Godfrey, VeriFlow: Verifying Network-Wide Invariants in Real Time, Open Networking Summit (ONS'13), April 2013. (acceptance rate=22%)
38. Ahmed Khurshid, Kelvin Zou, Wenxuan Zhou, Matthew Caesar, Brighten Godfrey, VeriFlow: Verifying Network-Wide Invariants in Real Time, USENIX Symposium on Networked Systems Design and Implementation (NSDI), April 2013. (acceptance rate=22%)
39. Chi-Yao Hong, Matthew Caesar, Brighten Godfrey, Finishing Flows Quickly with Preemptive Scheduling, ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM), August 2012. (acceptance rate=13%)
40. Chi-Yao Hong, Matthew Caesar, Nick Duffield, Jia Wang, Tiresias: Online Anomaly Detection for Hierarchical Operational Network Data, IEEE International Conference on Distributed Computing Systems (ICDCS), June 2012. (acceptance rate=13%)

41. Prateek Mittal, Matthew Caesar, Nikita Borisov, X-Vine: Secure and Pseudonymous Routing in DHTs Using Social Networks, Network and IT Security Conference (NDSS), February 2012. (acceptance rate=17.8%)

42. Wenxuan Zhou, Qingxi Li, Matthew Caesar, Brighten Godfrey, ASAP: A Low Latency Transport Layer, ACM International Conference on Emerging Networking Experiments and Technologies (CoNEXT), December 2011. (acceptance rate=18.8%)

43. Ahmed Khurshid, Firat Kiyak, Matthew Caesar, Improving Robustness of DNS to Software Vulnerabilities, Annual Computer Security Applications Conference (ACSAC), December 2011. (acceptance rate=16.3%)

44. Amir Houmansadr, Giang Ngyuen, Matthew Caesar, Nikita Borisov, Stealth: Achieving usage stealthiness of secure communication services, ACM Conference on Computer and Communications Security (CCS), December 2011. (acceptance rate=13.9%)

45. Prateek Mittal, Ahmed Khurshid, Joshua Juen, Matthew Caesar, Nikita Borisov, Stealthy Traffic Analysis of Low-Latency Anonymous Communication Using Throughput Fingerprinting, ACM Conference on Computer and Communications Security (CCS), December 2011. (acceptance rate=13.9%)

46. Ahsan Arefin, Ahmed Khurshid, Matthew Caesar, Klara Nahrstedt, Scaling Data-Plane Logging in Large Scale Networks, IEEE Military Communications Conference (MILCOM), November 2011.

47. Haohui Mai, Ahmed Khurshid, Rachit Agarwal, Matthew Caesar, Brighten Godfrey, Samuel T. King, Debugging the Data Plane with Anteater, ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM), August 2011. (acceptance rate=14.3%)

48. Shishir Nagaraja, Virajith Jalaparti, Matthew Caesar, Nikita Borisov, P3CA: Privacy Preserving Traffic Anomaly Detection for ISP Networks, Privacy Enhancing Technologies Symposium (PETS), July 2011. (acceptance rate=24.5%)

49. Md Yusuf Uddin, Ahmed Khurshid, Hee Dong Jung, Carl Gunter, Matthew Caesar, Tarek Abdelzaher, Making DTNs Robust Against Spoofing Attacks with Localized Countermeasures, IEEE Conference on Sensor, Mesh, and Ad Hoc Communications and Networks (SECON), June 2011. (acceptance rate=22.0%)

50. Giang Nguyen, Rachit Agarwal, Matthew Caesar, Brighten Godfrey, Junda Liu, Scott Shenker, SlickPackets, ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS), June 2011. (acceptance rate=14.7%)

51. Chi-Yao Hong, Chia-Chi Lin, Matthew Caesar, Clockscalpel: Understanding root causes of Internet clock synchronization inaccuracy, Passive and Active Measurement Conference, March 2011. (Received Best Paper Award)

52. Shishir Nagaraja, Prateek Mittal, Chi-Yao Hong, Matthew Caesar, Nikita Borisov, BotGrep: Finding P2P Bots with Structured Graph Analysis, USENIX Security Symposium, August 2010. (acceptance rate=14%)

53. Benny Applebaum, Haakon Ringberg, Michael Freedman, Matthew Caesar, Jennifer Rexford, Collaborative, Privacy-Preserving Data Aggregation at Scale, Privacy Enhancing Technologies Symposium (PETS), July 2010. (acceptance rate=28%)

54. Rachit Agarwal, Virajith Jalaparti, Matthew Caesar, Brighten Godfrey, Stable Path(s) Assignment for Inter-domain Routing, IEEE International Conference on Distributed Computing Systems (ICDCS), June 2010. (acceptance rate=14%)
55. Dong Jin, David Nicol, Matthew Caesar, Efficient Gigabit Ethernet Switch Models for Large-scale Simulation, ACM SIGSIM Principles of Advanced and Distributed Simulation (PADS), May 2010.
56. Firat Kiyak, Brent Mochizuki, Eric Keller, Matthew Caesar, Better by a HAIR: Hardware Amenable Interdomain Routing, IEEE International Conference on Network Protocols (ICNP), October 2009. (acceptance rate=18%)
57. Eric Keller, Minlan Yu, Matthew Caesar, Jennifer Rexford, Virtually Eliminating Router Bugs, ACM International Conference on Emerging Networking Experiments and Technologies (CoNEXT), December 2009. (acceptance rate=17%)
58. Shameem Ahmed, Thadpong Pongthawornkamol, GuijunWang, Klara Nahrstedt, Matthew Caesar, Topology Aware Optimal Task Allocation for Publish/Subscribe Based Mission Critical Environments, IEEE Military Communications Conference (MILCOM), October 2009.
59. Vijay Raman, Matthew Caesar, A Practical Approach for Providing QoS in Multichannel Ad-Hoc Networks using Spectrum Width Adaptation, IEEE Global Communications Conference (GLOBECOM), December 2009. (acceptance rate=34.8%)
60. Changhoon Kim, Matthew Caesar, Alex Gerber, Jennifer Rexford, Revisiting Route Caching: The World Should Be Flat, Passive and Active Measurement Conference, April 2009. (acceptance rate=28%)
61. Changhoon Kim, Matthew Caesar, Jennifer Rexford, Floodless in SEATTLE: A Scalable Ethernet Architecture for Large Enterprises, ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM), August 2008. (acceptance rate=12.5%)
62. Karthik Lakshminaryanan, Matthew Caesar, Murali Rangan, Thomas Anderson, Scott Shenker, Ion Stoica, Achieving Convergence-Free Routing using Failure-Carrying Packets, ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM), August 2007. (acceptance rate=13.6%)
63. P. Brighten Godfrey, Matthew Caesar, Ian Haken, Scott Shenker, Ion Stoica, Stable Internet Route Selection, North American Network Operators Group (NANOG) 40, June 2007.
64. Matthew Caesar, Tyson Condie, Jayanthkumar Kannan, Karthik Lakshminarayanan, Ion Stoica, Scott Shenker, ROFL: Routing on Flat Labels, ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM), September 2006. (acceptance rate=12.4%)
65. Matthew Caesar, Miguel Castro, Edmund Nightingale, Greg O Shea, Antony Rowstron, Virtual Ring Routing: Network routing inspired by DHTs, ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM), September 2006. (acceptance rate=12.4%)
66. Matthew Caesar, Jennifer Rexford, BGP Routing Policies in ISP Networks, IEEE Network Magazine, special issue on Interdomain Routing, Nov/Dec 2005.
67. Lakshminarayanan Subramanian, Matthew Caesar, Cheng Tien Ee, Mark Handley, Morley Mao, Scott Shenker, Ion Stoica, HLP: A Next-generation Interdomain Routing Protocol, ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM), August 2005. (acceptance rate=10.6%)

68. Matthew Caesar, Donald Caldwell, Nick Feamster, Jennifer Rexford, Aman Shaikh, Kobus van der Merwe, Design and Implementation of a Routing Control Platform, USENIX Symposium on Networked Systems Design and Implementation (NSDI), April 2005. (acceptance rate=22%)
69. Matthew Caesar, Lakshminarayanan Subramanian and Randy H. Katz, Root-cause Analysis of Internet Dynamics, North American Network Operators Group (NANOG) 30, Miami Beach, Florida, February 8-10, 2004.
70. Bhaskaran Raman, Sharad Agarwal, Yan Chen, Matthew Caesar, Weidong Cui, Per Johansson, Kevin Lai, Tal Lavian, Sridhar Machiraju, Z. Morley Mao, George Porter, Timothy Roscoe, Mukund Seshadri, Jimmy Shih, Keith Sklower, Lakshminarayanan Subramanian, Takashi Suzuki, Shelley Zhuang, Anthony D. Joseph, Randy H. Katz, Ion Stoica, The SAHARA Model for Service Composition Across Multiple Providers, Invited Paper, International Conference on Pervasive Computing (Pervasive 2002), August 2002.
71. Matthew Caesar and Dipak Ghosal, IP Telephony, Encyclopedia of Telecommunications, John Wiley & Sons (Invited Paper).
72. Matthew Caesar, Sujatha Balaraman and Dipak Ghosal, A Comparative Study of Pricing Strategies for IP Telephony, IEEE Global Communications Conference (GLOBECOM) November 2000, Global Internet Symposium, San Francisco, USA. (acceptance rate=35%)

Workshop Publications:

1. Mubashir Anwar, Anduo Wang, Matthew Caesar, Structural Semantics Management: an Application of the Chase in Networking, IEEE MASCOTS, October 2023.
2. Jeni Bushman, Isabella C. F. S. Condotta, Robert Knox, Matthew Caesar, Angela Green-Miller, I-SEEDS: Illinois System for Electronic Estrus Detection and Stimulation, 2nd U.S. Precision Livestock Farming Conference, May 2023.
3. Bingzhe Liu, Kuan-Yen Chou, Pramod Jamkhedkar, Bilal Anwer, Rakesh Sinha, Kostas Oikonomou, Matthew Caesar, Brighten Godfrey, Practical Automation for Management Planes of Service Provider Infrastructure, Workshop on Flexible Networks (FlexNets), August 2021.
4. Aniket Shirke, Rebecca Golden, Mrinal Gautam, Angela Green-Miller, Matthew Caesar, Ryan N. Dilger, Vision-based Behavioral Recognition of Novelty Preference in Pigs, CVPR CV4Animals workshop, July 2021.
5. Bingzhe Liu, Ali Kheradmand, Matthew Caesar, Brighten Godfrey, Towards Verified Self-Driving Infrastructure, ACM Workshop on Hot Topics in Networks (HotNets), November 2020.
6. Santhosh Prabhu, Gohar Irfan Chaudhry, Brighten Godfrey, Matthew Caesar, High Coverage Testing of Softwarized Networks, ACM SIGCOMM 2018 Workshop on Security in Softwarized Networks: Prospects and Challenges, August 2018.
7. Santhosh Prabhu, Ali Kheradmand, Brighten Godfrey, Matthew Caesar, Predicting Network Futures with Plankton, First Asia-Pacific Workshop on Networking, August 2017.
8. Wenxuan Zhou, Amir Houmansadr, Matthew Caesar, SWEET: Serving the Web by Exploiting Email Tunnels, 6th Workshop on Hot Topics in Privacy Enhancing Technologies (HotPETs 2013)
9. Ahmed Khurshid, Wenxuan Zhou, Matthew Caesar, P. Brighten Godfrey, VeriFlow: Verifying Network-Wide Invariants in Real Time, ACM SIGCOMM Workshop on Hot Topics in Software Defined Networking (HotSDN), August 2012. (Received Best Paper Award)

10. Soudeh Ghorbani, Matthew Caesar, Walk the Line: Consistent Network Updates with Bandwidth Guarantees, ACM SIGCOMM Workshop on Hot Topics in Software Defined Networking (HotSDN), August 2012.
11. Virajith Jalaparti, Matthew Caesar, Seungjoon Lee, Jeffrey Pang, Kobus van der Merwe, OGRE: A Cloud Platform for Seamless Wide area Migration of Networked Games, ACM/IEEE 11th Annual Workshop on Network and Systems Support for Games (NetGames) 2012. (acceptance rate=20%)
12. Eric Keller, Soudeh Ghorbani, Matthew Caesar, Jennifer Rexford, Live Migration of an Entire Network (and its Hosts), ACM HotNets, October 2012. (acceptance rate=19%)
13. Frank Li, Prateek Mittal, Matthew Caesar, Nikita Borisov, SybilControl: Practical Sybil Defense with Computational Puzzles, ACM Workshop on Scalable Trusted Computing (STC), October 2012.
14. Chia-Chi Lin, Matthew Caesar, A Future Internet Design for Securing Cloud Computing, Future Internet Workshop, June 2011.
15. Jason Croft, Matthew Caesar, Towards Practical Avoidance of Information Leakage in Enterprise Networks, USENIX Workshop on Hot Topics in Security (HotSec), August 2011. (acceptance rate=20%)
16. Shishir Nagaraja, Nikita Borisov, Matthew Caesar, GraphSlicer: Localizing bots using community detection algorithms, IEEE Second Annual Workshop on Simplifying Complex Networks for Practitioners (IEEE Simplex), June 2010.
17. Matthew Caesar, A Substrate for Wide-Area Network Debugging, Workshop on Future Router Design, January 2010.
18. Chia-Chi Lin, Matthew Caesar, Kobus van der Merwe, Towards Interactive Debugging for ISP Networks, ACM Workshop on Hot Topics in Networks (HotNets), October 2009. (acceptance rate=16%)
19. Matthew Caesar, Jennifer Rexford, Building Bug-Tolerant Routers with Virtualization, ACM SIGCOMM Workshop on Programmable Routers for the Extensible Services of Tomorrow (PRESTO), August 2008. (acceptance rate=46%)
20. Matthew Caesar, Jiawei Han, Leveraging Data Mining to Improve Internet Security, NSF workshop on Data and Applications Security, February 2009.
21. Matthew Caesar, Lakshminarayanan Subramanian, Randy H. Katz, A Case for an Internet Health Monitoring System, Hot Topics in System Dependability (HotDep), June 2005. (acceptance rate=26%)
22. Lakshminarayanan Subramanian, Matthew Caesar, Cheng Tien Ee, Mark Handley, Morley Mao, Scott Shenker and Ion Stoica, HLP: A Next-generation Interdomain Routing Protocol, ACM Workshop on Hot Topics in Networks (HotNets), November 2004. (acceptance rate=16%)
23. Matthew Caesar, Dipak Ghosal and Randy H. Katz, Resource Management for IP Telephony Networks, IEEE/ACM International Workshop on QoS (IWQoS), Miami Beach, Florida, May 15-17, 2002. (acceptance rate=18.9%)

Posters and Extended Abstracts

1. Ahmed Khurshid, Kelvin Zou, Wenxuan Zhou, Matthew Caesar, Brighten Godfrey, VeriFlow: Verifying Network-Wide Invariants in Real Time, Poster at USENIX Symposium on Network Design and Implementation, April 2013.

2. Chi-Yao Hong, Matthew Caesar, A Low Cost Data Center Network, Poster at USENIX Symposium on Network Design and Implementation, April 2010.
3. Virajith Jalaparti, Shishir Nagaraja, Matthew Caesar and Nikita Borisov, P3CA: Privacy Preserving Traffic Anomaly Detection for ISP Networks, Poster at USENIX Symposium on Network Design and Implementation, April 2010.
4. Wenxuan Zhou, Qingxi Li, Matthew Caesar, Brighten Godfrey, ASAP: A Low-Latency Transport Layer, Poster at ACM Sigcomm August 2011.

Book Chapters:

1. Tom Anderson, Ken Birman, Robert Broberg, Matthew Caesar, Douglas Comer, Chase Cotton, Michael Freedman, Andreas Haeberlen, Zack Ives, Arvind Krishnamurthy, William Lehr, Boon Thau Loo, David Mazieres, Antonio Nicolosi, Jonathan Smith, Ion Stoica, Robbert van Renesse, Michael Walfish, Hakim Weatherspoon, and Christopher S. Yoo, The NEBULA Future Internet Architecture: A Mid-Course Report, Book Chapter, Future Internet Assembly, Springer Lecture Notes in Computer Science (LNCS), May 2013.
2. Abhishek Verma, Shivaram Venkataraman, Matthew Caesar, Roy H. Campbell, Scalable Storage for Data-Intensive Computing, Book Chapter, Handbook of Data Intensive Computing, Springer, Ed. Borko Furht.

Software and Platforms:

1. Illinois Internet Laboratory, 2017-Present. The Illinois Internet Laboratory is a facility housing over a million dollars of donated equipment covering a broad spectrum of technologies. It is organized as a "maker-lab" like environment where students are free to build and experiment. http://caesar.web.engr.illinois.edu/iil/
2. IoT Playground, 2019-Present (in development). Status: I am developing an online platform for students to build IoT systems in the cloud. The platform enables students to draw circuits, then run and compile them. I have formed a partnership with the Bangladesh University of Engineering and Technology (BUET), a top university of Bangladesh, who have agreed to pilot my software. It is my hope my platform can bring IoT education to the world in a fun and user-friendly environment.
3. Veriflow (Network verification software). My work on Veriflow has led to the creation of a company (Veriflow Systems, Inc.), which was sold to VMWare in September 2019. While at Veriflow, I led a number of initiatives and created multiple software products, including CloudPredict, a platform for formally analyzing security of cloud systems. Released 2015 and 2019. URL: https://www.veriflow.net/ .
4. Routing Control Platform (ISP operations software). Status: under license by AT&T. This system has been deployed in, and remains in daily use in, core operations of AT&T's North American IP backbone, one of the largest ISP networks in the world, which forwards petabytes of traffic daily. Released 2008. URL: https://www.business.att.com/learn/tech-advice/how-at-t-netbond-was-created.html.
5. X-Vine (Secure communications system), 2010. Status: this work is being considered by Freenet (one of the largest online communications systems) as a potential replacement for their insecure

routing algorithm (https://wiki.freenetproject.org/X-Vine, https://emu.freenetproject.org/pipermail/devl/2013-January/036765.html). Released 2013.

6. Virtual Ring Routing (Wireless routing protocol software). Status: under license by Microsoft. This technology is being incorporated into the MS Windows operating system, and has been downloaded and used by a number of universities. Released 2008.
7. iQ (Teaching software to interactively collect feedback from classroom lectures). Status: open-source software release, awarded Computing Habitat Programming Competition award. Released 2010.
8. Interactive Network Debugger (NDB) (Debugger for distributed software). Status: pending license by AT&T. Released 2011.
9. Router Hypervisor (Virtualization environment for router software). Status: open-source software release. I am working with a major router vendor to incorporate my work into their mainline router operating system. Released 2011.
10. Deterministic Execution Environment for Network Software, open-source software release. Released 2009.
11. LIME (Platform for virtual network migration)," open-source software release. Used by Intelligent Automation, Inc. in a platform for network security being developed for DoD use. Released 2017.
12. OGRE (Platform for network game hosting)," Developed jointly with AT&T. Released 2013.
13. OCEAN (Platform for experimental research on network architectures), http://ocean.cs.illinois.edu
14. Tiresias (Algorithm for Hierarchical Anomaly Detection)", under license by AT&T. This system was incorporated to form one of AT&T's core network monitoring systems. Released 2012.

Patents:

1. 2024 Matthew Caesar et al. "Method and System for Determining an Inferred Location of a Device Spoof Detection", U.S. Patent Application No.: 18/608,305.
2. 2016 Alexandre Gerber, Changhoon Kim, Jennifer Rexford, Matthew Caesar, "Systems and methods for optimized route caching," US9559955. Status: Granted. Filing date: May 26, 2016.
3. 2013 Ahmed Khurshid, Matthew Caesar, Brighten Godfrey, "Network-wide verification of invariants," US9225601 B2. Status: Granted. Filing date: Jun 17, 2013.
4. 2012 Chia-Chi Lin, Matthew Caesar, J. van der Merwe, "Systems, Methods, and Apparatus to Debug a Network Application," US Patent 8245083. Status: Granted.
5. 2011 Elliott Karpilovsky, Matthew Caesar, Alex Gerber, Jennifer Rexford, "Systems and Methods for Optimized Route Caching," US Patent 12207166. Status: Granted.
6. 2010 Matthew Caesar, Miguel Castro, Antony Rowstron, "Network Routing," US7715396. Status: Granted. Filing date: Apr 28, 2005.

Grants

I have received grants totaling in value of over $26M. I have served as the principal investigator for grants totaling in value of over $5M. The grants I led have had major impact on both academia and industry.

Title: A Trustworthy and Secure Cyber-Plexus for Digital Communities
Sponsor: Singapore Government
Investigators: David Nicol (PI), Matthew Caesar (co-PI), Demeng Chen (co-PI), Zbigniew Kalbarczyk (co-PI)
Total Amount: $18,702,635
Awarded: August 2023

Title: Enabling a Secure and Resilient Energy System with AI-Assisted Programmable Networks
Sponsor: Center for Infrastructure Trustworthiness in Energy Systems
Investigators: Kevin Jin (PI), Matthew Caesar (co-PI)
Total Amount:$199,778
My Share: $99,889
Awarded: January 2023

Title: Towards a Secure and Resilient Energy System Cyberinfrastructure Using Software-Defined Networks
Sponsor: Center for Infrastructure Trustworthiness in Energy Systems
Investigators: Kevin Jin (PI), Matthew Caesar (co-PI)
Total Amount:$96,855
My Share: $48,427
Awarded: July 2022

Cyber Protected Secure Communications for Distributed Air Launch Effects Platforms
Sponsor: Boeing
Investigators: Matthew Caesar (PI)
Total Amount:$450,000
My Share: $450,000
Awarded: January 2022

Energy Management in Large Scale Telecommunications Networks
Sponsor: AT&T Labs
Program: AT&T Virtual University Research Initiative (VURI) program.
Investigator: Matthew Caesar (PI)
Amount (my share): $20,000 (unrestricted gift)
Awarded: November 2021

I-SEEDS: Illinois System for Electronic Estrus Detection and Stimulation
Sponsor: ACES Office of Research
Investigators: Isabella Condotta (PI), Robert Knox (co-PI), Matthew Caesar (co-PI)
Total Amount: $60,000
Awarded: July 2021

Energy Management in Large Scale Telecommunications Networks
Sponsor: AT&T Labs
Program: AT&T Virtual University Research Initiative (VURI) program.
Investigator: Matthew Caesar (PI)
Amount (my share): $20,000 (unrestricted gift)
Awarded: November 2020

Towards an Efficient and Programmable Computer Vision System for High Throughput Livestock Monitoring
Sponsor: University of Illinois, Center for Digital Agriculture
Investigators: Narendra Ahuja, Matthew Caesar, Ryan Dilger, Angela Green-Miller
Total Amount: $25,000
Awarded: April 2020

Science of Security: Resilient Systems
Sponsor: National Security Agency
Investigators: Sayan Mitra (PI), Matthew Caesar (co-PI), David Nicol (co-PI), William Sanders (co-PI)
Total Amount: $5,846,050
My Share: $750,000
Awarded: February 2020

Deep-Learning-Based Tactical IOT Networking in Contested Environments
Sponsor: Boeing
Investigators: Matthew Caesar (PI), David Nicol (co-PI)
Total Amount:$267,681
My Share: $267,681
Awarded: January 2020

Title: Towards a Knowledge Plane for Coordinating Network Policies
Sponsor: National Science Foundation
Investigators: Anduo Wang (PI), Matthew Caesar (co-PI)
Total Amount: $478,900
My Share: $76,054
Awarded: October 2019

Cisco ACI (hardware grant)
Sponsor: Cisco Systems, Inc.
Investigators: Matthew Caesar (PI)
Amount (my share): This hardware has a list price of $400,000.
Awarded: September 2019

Science of Security: Resilient Systems
Sponsor: National Security Agency

Investigators: Sayan Mitra (PI), Matthew Caesar (co-PI), David Nicol (co-PI), William Sanders (co-PI)
Total Amount: $5,846,050
My share: $750,000
Awarded: January 2019

Deep-Learning-Based Tactical IOT Networking in Contested Environments
Sponsor: Boeing
Investigators: Matthew Caesar (PI), David Nicol (co-PI)
Total Amount:$100,000
My Share: $50,000
Awarded: January 2019

Juniper T1600 (hardware grant)
Sponsor: Terabit Systems
Investigators: Matthew Caesar (PI)
Amount (my share): This hardware has a list price of $350,000.
Awarded: April 2018

Decoy Routing: Internet Freedom in the Network's Core
United States Department of State
Investigators: Matthew Caesar (site co-PI)
Total Amount: $2,500,000
My share: $300,000
Awarded: September 2016

Research in Trusted Hypervisors
Sponsor: Northrop Grumman
Investigators: Matthew Caesar (PI)
Amount (my share): $10,000 (unrestricted gift)
Awarded: September 2015

NeTS: Medium: From Verification to Synthesis in Software Defined Networks
Sponsor: National Science Foundation
Investigators: Brighten Godfrey (PI), Matthew Caesar (co-PI)
Amount (shared): $1,200,000 for 4 years
Awarded: August 2015

Data-Plane Verification in Heterogeneous Networks (NSF SBIR, Phase II)
Sponsor: National Science Foundation
Investigators: Serena Chan (PI), Matthew Caesar (co-PI), Brighten Godfrey (co-PI)
Amount (shared): $750,000 for 2 years
Awarded: October 2014

Research in Trusted Hypervisors
Sponsor: Northrop Grumman
Investigators: Matthew Caesar (PI)
Amount (my share): $20,000 for 1 year (unrestricted gift)
Awarded: September 2014

Towards a Science of Securing Network Forwarding
Sponsor: National Security Agency
Investigators: Brighten Godfrey (PI), Matthew Caesar (co-PI), Kevin Jin (co-PI)
Amount (my share): $150,000 for 3 years
Awarded: March 2014

Research in Trusted Hypervisors (Phase III)
Sponsor: Northrop Grumman
Investigators: Matthew Caesar (PI)
Amount (my share): $20,000 for 1 year (unrestricted gift)
Awarded: September 2013

FIA: Collaborative Research: NEBULA: A Future Internet that Supports Trustworthy Cloud Computing:
Supplemental Funding
Sponsor: National Science Foundation
Investigators: Matthew Caesar (PI)
Amount (my share): $78,594 for 1 year
Awarded: August 2013

CyberShield: Network Virtualization for Cyber Defense (Phase III)
Sponsor: DARPA
Investigators: Matthew Caesar (PI)
Amount (my share): $200,000 for 1 year
Awarded: July 2013

Data-Plane Verification in Heterogeneous Networks (NSF SBIR, Phase I)
Sponsor: National Science Foundation
Investigators: Matthew Caesar (PI), Brighten Godfrey (co-PI), Serena Chan (co-PI)
Amount (shared): $150,000 for 1 year
Awarded: July 2013

Dynamic Data-Plane Verification in Heterogeneous Networks (Navy SBIR, Phase I)
Sponsor: US Navy
Investigators: Matthew Caesar (co-PI), Brighten Godfrey (co-PI), Serena Chan (PI)
Amount (my share): $142,877.47 for 1 year
Amount (shared): $72,877.47 for 1 year

Awarded: May 2013

Research in Trusted Hypervisors (Phase II)
Sponsor: Northrop Grumman
Investigators: Matthew Caesar (PI)
Amount (my share): $30,000 for 1 year (unrestricted gift)
Awarded: September 2012

Cyclone: Dynamic Virtualization for Cloud Security
Sponsor: DARPA
Investigators: Matthew Caesar (PI), Jennifer Rexford (co-PI)
Amount (my share): $1,200,000 for 4 years
Awarded: January 2012

Towards a Science of Securing Network Forwarding
Sponsor: National Security Agency (NSA)
Investigators: Brighten Godfrey (PI), Matthew Caesar (co-PI)
Amount (my share): $98,199 for 1 year
Awarded: January 2012

Research in Trusted Hypervisors
Sponsor: Northrop Grumman
Investigators: Matthew Caesar (PI)
Amount (my share): $15,000 for 1 year (unrestricted gift)
Awarded: October 2011

CyberShield: Network Virtualization for Cyber Defense
Sponsor: DARPA
Investigators: Matthew Caesar (PI)
Amount (my share): $400,000 for 2 years
Awarded: April 2011

CAREER: Getting RID of Bugs: Realizing Interactive Debugging of Networked Systems
Sponsor: National Science Foundation
Investigators: Matthew Caesar (PI)
Amount (my share): $472,179 for 5 years
Awarded: February 2011

Simplifying Attribution in Modern Networked Software with Virtual Networks
Sponsor: Boeing
Investigators: David Nicol (PI), Matthew Caesar (co-PI)
Amount (my share): $75,000 for 1 year
Awarded: January 2011

FIA: Collaborative Research: NEBULA: A Future Internet that Supports Trustworthy Cloud Computing
Sponsor: National Science Foundation Future Internet Architectures (FIA) Program
Investigators: Thomas Anderson - University of Washington, Ken Birman - Cornell University, Matthew Caesar - University of Illinois, Doug Comer - Purdue University, Charles Cotton - U Delaware, Michael Freedman - Princeton University, William Lehr - MIT, David Mazieres - Stanford, Antonio Nicolosi - Stevens Inst. Technology, Jonathan Smith - U Pennsylvania (PI), Ion Stoica - UC Berkeley, Michael Walfish - UT Austin
Amount (my share): $502,602 for 3 years
Awarded: August 2010

Research in Network Virtualization
Sponsor: AT&T Labs
Program: AT&T Virtual University Research Initiative (VURI) program.
Investigator: Matthew Caesar (PI)
Amount (my share): Two internship slots for students, plus $25,000 for 1 year (unrestricted gift)
Awarded: March 2010

Network Software Reliability
Sponsor: Defense Advanced Research Projects Agency (DARPA), TCTO program
Program: Computer Science Study Panel (Program to educate early-career Computer Science faculty on DoD needs. Included four week-long visits to military and industrial installations. I was selected as one out of twelve junior faculty in the United States).
Investigator: Matthew Caesar (PI)
Amount (my share): $100,000 for 1 year (unrestricted gift)
Awarded: April 2010

Towards bug-tolerant Internet routers
Sponsor: Cisco Research
Investigator: Matthew Caesar (PI)
Amount (my share): $100,000 for 1 year (unrestricted gift)
Awarded: May 2010

Fixing the Reliability Problem in Network Software from its Root
Sponsor: National Science Foundation NeTS-NECO Program
Investigators: Matthew Caesar (PI), Jennifer Rexford (co-PI), Yuanyuan Zhou (co-PI)
Amount (my share): $350,000 for 4 years
Awarded: August 2008

Stabilizing BGP, Safely
Sponsor: Cisco Systems University Research Program
Investigators: P. Brighten Godfrey (co-PI), Matthew Caesar (co-PI), Ion Stoica (PI)
Amount (my share): $98,700 for 1 year

Awarded: January 2008

Service

I serve on the College of Engineering Executive Committee (2024-Present) where I advise the Dean on policies and budget matters.

External Service

- Invited Panelist, Asian Internet Engineering Conference (AINTEC) 2024.
- Chair, ACM SIGCOMM (2023-Present)
- I was a visiting scholar at International Media Communication University (ICUC) in October, 2023, where I conducted outreach and research activities.
- I was a visiting scholar at East China Normal University in August 2023, where I conducted outreach and research activities.
- I moderated the January 24 2024 ACM TechTalk with JP Vasseur, Cisco Fellow, on the topic of "The Impact of ML/AI on Networking and the Internet Over the Last Decade," sharing how AI and Machine Learning have changed the way we network and use the internet. This event had over 1000 attendees.
- I delivered a keynote speech at IEEE MILCOM, a top conference in military communications, in October 2023 in Boston, Massachusetts.
- I served on a panel on Challenges in Defense IoTs at the IEEE MILCOM Workshop on IoT for Adversarial Environments, in October 2023 in Boston, Massachusetts.
- I will serve as the national reviewer for the Computer Science major at the University of California at Davis. (2024)
- Along with Jim Kurose (UMass) and Larry Peterson (Princeton/ONF), I was an invited panelist on the March 16, 2022 Panel on Open Educational Resources for Teaching and Learning Networking, on the Networking Channel (https://networkingchannel.eu/).
- I delivered a keynote speech at ACM Mobisys, a top conference in mobile systems, in June 2022 in Portland, Oregon.
- I served as a consultant to the Antitrust Division of the Department of Justice, invited by the Assistant Attorney General. My work entailed providing educational services to support the DoJ's ability to analyze data and answer technical questions. (2023)
- Vice Chair of ACM SIGCOMM (2021-2023)
- I run a "Computer Science: Internet of Things" summer camp for high school students through the WYSE program at UIUC (2022 and 2023). The camp led approximately 30 high school students from a variety of diverse backgrounds through a set of IoT exercises where they learned concepts and also they gained confidence and learned that they were good at computer science.
- I was an invited panelist in the 39th Brazilian Symposium on Computer Networks and Distributed Systems (2021)

- Director of Education for ACM SIGCOMM (2019-2021)
- Editor for IEEE/ACM Transactions on Networking (2020-2024)
- Editor for ACM SIGCOMM CCR Series on Networking Education (2020-2023)
- I created and run the ACM SIGCOMM Slack workspace, which now has over 3500 participants across the world (about 450 active weekly) who engage in discussions related to computer networking research and education. (2020-Present)
- I created and run the ACM SIGCOMM Education web site (http://education.sigcomm.org/).
- I created a web site for indexing and dissemination of educational resources for computer networking (http://openlibrary.cs.illinois.edu/).
- I worked with Providence St. Joseph hospital in Burbank, CA on building a network-enabled medical device to be used for home monitoring of their COVID-19 patients for rapid de-escalation events. Our first order for 10 units has been shipped on May 19, 2020. (2020-2021)

Conference and Other Committee Activities:

1. 2025 Program Committee, USENIX Symposium on Networked Systems Design and Implementation (NSDI)
2. 2024 Program Committee, USENIX Symposium on Networked Systems Design and Implementation (NSDI)
3. 2023 Best Paper Award Committee, Program Committee, USENIX Symposium on Networked Systems Design and Implementation (NSDI)
4. 2023 Program Committee, ACM International Conference on Emerging Networking EXperiments and Technologies, Student Workshop (CoNEXT)
5. 2023 Sponsor Chair, ACM/IEEE Internet of Things Design and Implementation (IoTDI)
6. 2023 Mentor, HackIllinois 2023.
7. 2022 Sponsor Chair, ACM Special Interest Group on Data Communication (SIGCOMM)
8. 2022 Registration Chair, ACM Special Interest Group on Data Communication (SIGCOMM)
9. 2022 Juror, ACM SIGCOMM Student Research Competition
10. 2021-2024, Steering Committee, ACM International Conference on Emerging Network Experiments and Technologies (CoNEXT)
11. 2021-Present, Steering Committee, ACM Symposium on SDN Research (SOSR)
12. 2022 Program Committee, USENIX Symposium on Networked Systems Design and Implementation (NSDI)
13. 2021 Juror, ACM SIGCOMM Student Research Competition
14. 2021-Present co-founder and member of Steering Committee, EMPOWER/SIGCOMM Networking Channel (http://networkingchannel.eu).
15. 2021 General Chair, ACM Special Interest Group on Data Communication (SIGCOMM).
16. 2021 Program Committee, ACM Special Interest Group on Data Communication (SIGCOMM).
17. 2021 Program Committee, USENIX Symposium on Networked Systems Design and Implementation (NSDI)
18. 2021 Program Committee, ACM Conference on Computer and Communications Security (CCS)
19. 2021 Judge, HackThis 2021.
20. 2020 Mentoring Chair, ACM Special Interest Group on Data Communication (SIGCOMM)

21. 2020 Co-Chair, Networking Education in a Time of Change, ACM SIGCOMM Workshop - http://gaia.cs.umass.edu/sigcomm_education_workshop_2020/index.html - this new workshop, which I created with Jim Kurose (UMass), had over 200 registrations from 35 countries, and a highly diverse array of teaching backgrounds and institutions.
22. 2020 Reviewer, ACM SIGCOMM, Computer Communication Review (CCR)
23. 2020 Judge, HackIllinois 2020.
24. 2014 Program Committee, ACM Special Interest Group on Data Communication (SIG-
25. COMM)
26. 2014 Tutorial Co-Chair, ACM Special Interest Group on Data Communication (SIGCOMM)
27. 2013 Program Committee, ACM Symposium on Cloud Computing (SOCC)
28. 2013 Selection Committee, ACM Sigcomm Dissertation Award
29. 2013 Program Chair, Poster and Demo Session, USENIX Symposium on Networked Systems Design and Implementation (NSDI)
30. 2013 Judge, ACM Student Research Competition, Grand Finals
31. 2013 Program Committee, ACM Special Interest Group on Data Communication (SIGCOMM)
32. 2013 Program Committee, USENIX Symposium on Networked Systems Design and Implementation (NSDI)
33. 2012 Program Committee, Hot Topics in Networks (HotNets-XI)
34. 2012 Program Committee, IEEE International Conference on Network Protocols (ICNP)
35. 2012 Panelist, National Science Foundation CNS Program Panel
36. 2012 Judge, ACM Student Research Competition, Grand Finals
37. 2012 Program Committee, ACM Special Interest Group on Data Communication (SIGCOMM). Winner of Best Reviewer Award.
38. 2012 Program Committee, Passive and Active Measurements Conference (PAM)
39. 2011 Program Committee, ACM International Conference on Emerging Networking EXperiments and Technologies (CoNEXT)
40. 2011 Judge, Student Research Competition, ACM Special Interest Group on Data Communication (SIGCOMM)
41. 2011 Program Committee, IEEE International Conference on Network Protocols (ICNP)
42. 2011 Program Committee, IEEE International Workshop on Quality of Service (IWQoS)
43. 2010 Program Committee, Programmable Routers and Extensible Services of Tomorrow (PRESTO)
44. 2010 Program Committee, IEEE International Conference on Network Protocols (ICNP)
45. 2010 Program Committee, IEEE International Workshop on Quality of Service (IWQoS)
46. 2010 Program Committee, Passive and Active Measurements Conference (PAM)
47. 2009 Program Co-Chair, ACM International Conference on Emerging Networking EXperiments and Technologies, Student Workshop (CoNEXT)
48. 2009 Program Committee, ACM International Conference on Emerging Networking EXperiments and Technologies (CoNEXT)
49. 2009 Program Committee, IEEE International Workshop on Quality of Service (IWQoS)
50. 2008 Program Committee, Second ACM SIGCOMM Workshop on Networked Systems for Developing Regions (NSDR)
51. 2008 Program Committee, 16th IEEE Workshop on Local and Metropolitan Area Networks (LANMAN)

52. 2008 Panelist, National Science Foundation Expeditions Program Panel

Nomination and tenure letter writer for multiple young professionals in industry and academia. External reviewer for ACM SIGCOMM (2003,2004,2005,2006,2007), ANCS 2005, IEEE/ACM Transactions on Networking (2005, 2009), Elsevier Computer Networks Journal (2006, 2007, 2008), Infocom (2003, 2004, 2009) IEEE International Conference on Communications (ICC) 2007. IEEE Journal on Selected Areas in Communications (JSAC), 2009. ACM SIGCOMM Computer Communication Review (2008, 2009) Computer Networks Journal 2008, IEEE Network Magazine 2008, USENIX Symposium on Networked Systems Design and Implementation (NSDI) NSDI 2009. Organized Systems/Networking reading group, Spring 2009.

Case History:

I have provided service as an expert witness helping to protect and advocate for safety of users of networking technologies, including:

1. Trio v. Turing Video, Inc. (2024-Present)

2. Johnson v. NCR, Northern District of Illinois. (2023-Present)

3. Heard v. Becton Dickinson, Northern District of Illinois. This class action involved a claimed violation of the Illinois Biometric Information Policy Act by a major medical equipment manufacturer that provided critical care equipment to numerous hospitals and healthcare institutions. Case is currently ongoing litigation as of 2023. (2023-Present)

4. Anderson, et al. v. Apple Inc., No. 3:20-cv-02328-WHO, Northern District of California. This class action lawsuit pertained to Apple's design of the networking substrate of the iPhone XR cell phone, which was claimed to have known design faults, incurring serious degradation in service for millions of users. This case was settled in 2023. (2021-2023)

Memberships in Professional Organizations:

Chair and Member, Association for Computing Machinery (ACM)
Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
Member, ACM Special Interest Group on Data Communications (SIGCOMM)
Member, USENIX Technical Association

Press coverage (Selected):

I served as a technical investigator for MSNBC where I was responsible for investigating and performing technical analyses of multiple Amazon Web Service outages in 2018. The results of my work were reported on here:
https://www.cnbc.com/2018/07/19/amazon-internal-documents-what-caused-prime-day-crash-company-scramble.html

https://www.pymnts.com/amazon/2018/prime-day-glitches-server-error/

I also served as a technical investigator for Business Insider during 2020 where I was responsible for investigating Amazon's AWS Thor project. The results of my work was reported on here: https://www.businessinsider.com/amazon-working-on-aws-thor-a-new-industrial-monitoring-service-2020-9 (mirror: https://drive.google.com/file/d/1HebWsWpA14A22iM4NDFYXrDgr7LbSq0n/)

My company Veriflow has been widely covered in the press (google "Veriflow"). Some examples of press coverage on Veriflow and my other technologies are provided below.

1. https://www.sdxcentral.com/articles/news/vmware-buys-veriflow-for-network-monitoring-verification/2019/08/ (August 2019)
2. http://www.fastcompany.com/3048458/elasticity/three-real-online-dangers-you-need-to-worry-about (July 2015)
3. "Wired In: Matt Caesar", https://www.news-gazette.com/news/wired-in-matt-caesar/article_8d7884bc-1f2d-54fe-aae2-ae01215b349b.html
4. http://www.news-gazette.com/news/business/2016-04-24/wired-brighten-godfrey.html (April 2016)
5. https://www.networkworld.com/article/3060237/veriflow-systems-applies-formal-verification-to-prevent-network-outages-and-breaches.html (April 2016)
6. https://www.socpub.com/articles/tech-trailblazers-security-award-winning-startups-achieve-great-things-analysis-shows-16940 (February 2020)
7. https://nysenewstimes.com/network-automation-market-trends-growth-factors-emerging-market-regions-and-trends-2026/ (March 2020)
8. https://www.nojitter.com/veriflow-yields-better-network-management (February 2018)
9. http://packetpushers.net/startup-radar-veriflow-uses-math-prevent-network-outages/ (April 2016)
10. http://www.crn.com/news/networking/300080292/crn-exclusive-fortuneteller-network-security-startup-veriflow-backed-by-dod-seeking-channel-partners.htm (March 2017)
11. http://www.fierceenterprisecommunications.com/story/veriflow-applies-mathematical-verification-network-changes/2016-04-06 (April 2016)
12. http://www.networkworld.com/article/3048484/security/veriflow-promises-to-bulletproof-networks.html (April 2016)
13. If you think just because you use different passwords for different services you're safe, think again, ZDNet, December 18, 2013. http://www.zdnet.com/if-you-think-just-because-you-use-different-passwords-for-different-services-youre-safe-think-again-7000024435/
14. Researchers unsheathe new tool to battle botnets, Network World, June 12, 2010.
15. http://www.networkworld.com/community/node/63586
16. New Weapon in War on Botnets, IEEE Computer, October, 2010. http://www.computer.org/portal/web/computingnow/archive/news071
17. Re-thinking the Internet with security and mobility in mind, Scientific American (Observations), April, 2010.

http://www.scientificamerican.com/blog/post.cfm?id=re-thinking-the-internet-with-secur-2010-08-31

I have also been invited to give a number of talks to people from academia and industry, including at Cisco Tech Field Day (June 2018), DARPA Mission Resilient Cloud (2013, 2014, 2015, 2016), NSA Science of Security Summit (2016, 2018). I also created a production demo video for Cloud Predict, a product I led development on at Veriflow, which was widely disseminated as part of the product's official release.

Reading lists (Selected):

My papers also appear in reading lists in a number of courses at top universities. Here are some examples:

- MIT: https://people.csail.mit.edu/alizadeh/courses/6.888/schedule.html
- UC Berkeley: https://security.cs.berkeley.edu/srg/su11.html
- Stanford: https://web.stanford.edu/class/cs244e/papers/vrr.pdf
- CMU: http://www.cs.cmu.edu/~srini/15-849/S07/readings.html
- Cornell: https://www.systems.cs.cornell.edu/syslunch/sp12/
- Princeton: https://www.cs.princeton.edu/courses/archive/fall13/cos597E/syllabus.html
- UT Austin: http://www.cs.utexas.edu/users/lam/395t/list2011.html
- Columbia: http://www.cs.columbia.edu/~lierranli/schedule.html
- Virginia (as part of a class called "Great Works in Computer Science"): https://www.cs.virginia.edu/~evans/greatworks/
- Multiple international universities, including Tsinghua University: http://jjcweb.jjay.cuny.edu/pji/tsinghua13.html

Internal Service

- I have served on a number of committees within the Department of Computer Science.
- Coordinated Sciences Laboratory PhD Thesis Awards Committee (2024-Present)
- Policy and Planning Committee, Coordinated Sciences Laboratory (2023-Present)
- Area Chair of Systems and Networking in the Department of Computer Science at the University of Illinois at Urbana-Champaign (2019-2022).
- I run the UIUC Internet of Things Discord server, which contains over 400 members who regularly engage in ongoing discussions related to research and development of Internet of Things.
- I serve as an advisor for the University of Illinois Men's Tennis team where I am assisting them in using the PlaySight video analysis platform to perform analytics on their players and uncover new strategies in improving their performance. (2019-2021)
- I am working with the Department of Animal Sciences to apply computer-vision-based IoT technologies we developed to help monitor welfare and behavior of our school's farm animals. We are conducting an initial deployment in the Imported Swine Research Laboratory (ISRL, 201 Hazelwood Drive, Champaign).

- I maintain the systems and networks mailing list (sys-net@cs.illinois.edu), a list with over 400 subscribers, including students across multiple departments and industry surrounding UIUC, where I regularly disseminate advertisements for talks and job opportunities.
- I have also been participating in the ECE Faculty Recruiting Committee (Spring 2012).
- Since 2013, I have served as the University of Illinois site PI for Planetlab (a global research network of over 1000 participating institutions).

Preliminary Examination and Thesis Defense Committees (selected):

1. Beomyeol Jeon (Advisor: Indranil Gupta, CS), "Machine Learning Systems in Constrained Environments", July 2024.
2. Vignesh Babu (Advisor: David Nicol, ECE), "High Fidelity Network Modeling with Virtual Time Systems", April 2020.
3. Mohammad Noureddine (Advisor: William H. Sanders, ECE), "Achieving Network Resiliency using Sound Theoretical and Practical Methods", December 2019.
4. Atul Bohara (Advisor: William H. Sanders, ECE) , "Information-Fusion-Based Methods to Improve Cyber-Resilience in Networked Systems," December 2019.
5. John Bambenek (Advisor: Roy Campbell, CS), title to be determined, scheduled December 2019.
6. Santhosh Prabhu (Advisor: Matthew Caesar, CS), title to be determined, to be scheduled, 2020.
7. Wenxuan Zhou (Advisor: Matthew Caesar, CS), "Network Error Autocorrect," May 2017.
8. Qingxi Li (Advisor: Brighten Godfrey, CS), "Reducing Short Flows' Latency in the Internet," August 2015.
9. Anupam Das (Advisor: Nikita Borisov, ECE), "Privacy Risks of Smartphone Sensors and Their Mitigation," May 2015.
10. Joshua Juen (Advisor: Nikita Borisov, ECE), "Maintaining Privacy during Continuous Motion Sensing," January 2015.
11. Xun Gong (Advisor: Negar Kiyavash, ECE), "A Fast and Robust Watermarking Scheme," August 2013.
12. Ahmed Khurshid (Advisor: Matthew Caesar, CS), "Monitoring and Verifying Network Behavior Using Data-Plane State," May 2013.
13. Chia-Chi Lin (Advisor: Matthew Caesar, CS), "Deterministic Network Execution," March 2013.
14. Ghazale Hosseinabadi (Advisor: Nitin Vaidya, ECE), "MAC Layer Protocols for Wireless Networks," November 2012.
15. Haohui Mai (Advisor: Sam King, CS), "Secure Web Operating Systems," September 2012.
16. Kevin Jin (Advisor: David Nicol, ECE), "Simulation-based Evaluation of Smart Grid Applications," September 2012.
17. Shehla Rana (Advisor: Nitin Vaidya, ECE), "Content Security in Advanced Metering Infrastructure and Location Privacy in Wireless Sensor Networks: Threats and Solutions," May 2012.
18. Rachit Agarwal (Advisors: Matthew Caesar and Brighten Godfrey, CS), "Design of Low Latency Systems and Networks with Limited Memory," April 2012.
19. Md Ahsan Arefin (Advisor: Klara Nahrstedt, CS), "Tele-Immersive Environments," April 2012.
20. Ravinder Shankesi (Advisor: Carl Gunter, CS), "Friendsourcing to Detect Network Manipulation," January 2012.

21. Wucherl Yoo (Advisor: Roy Campbell, CS), "Automated Performance Characterization of Applications Using Hardware Monitoring Events," December 2011.
22. Jihyuk Choi (Advisor: Yih-Chun Hu, ECE), "Security Threats of the MAC-Layer in Wireless Networks," October 2011.
23. Zuoning Yin (Advisor: Yuanyuan Zhou, UC San Diego), "Characterizing System Failures in Commercial and Open Source Systems," May 2011.
24. Eric Keller (Advisor: Jennifer Rexford, Princeton University), "Refactoring Router Software to Minimize Disruption," May 2011.
25. Prateek Mittal (Advisor: Nikita Borisov, ECE), "Scalable and Secure Anonymous Routing," April 2011.
26. Dongho Kim (Advisor: Yih-Chun Hu, ECE), "Scalable and Secure Network Protocols" March 2011.
27. Hossein Ahmadi (Advisor: Tarek Abdelzaher, CS), "Cyber-physical Data Distillation in a Sensor-rich World," November 2010.
28. Yan Gao (Advisor: P. R. Kumar, ECE), "Cross layer design for random access wireless networks," November 2010.
29. Sam Nelson (Advisor: Robin Kravets, CS), "Leveraging Structure for Communication in Human-Centric DTNs," July 2010.
30. Zheng Zeng (Advisor: P. R. Kumar, ECE), "Design and Evaluation of new cooperative PHY-MAC schemes for WLANs," May 2010.
31. Vijay Raman (Advisor: Nitin Vaidya, ECE), "Traffic-Aware Resource Assignment In Multichannel, Multi-Radio Wireless Networks," April 2010.
32. Nabil Schear (Advisor: Nikita Borisov, ECE), "Preventing Encrypted Traffic Analysis," April 2009.
33. Luchuan Kung (Advisor: Nitin Vaidya, ECE), "Application Programming Interfaces for Wireless Networks," September 2009.
34. Thadpong Pongthawornkamol (Advisor: Klara Nahrstedt, CS), "Probabilistic QoS Modelling for Prediction and Admission Control in Distributed Best Effort Content-based Publish/Subscribe Systems," November 2009.
35. Jin Heo (Advisor: Tarek Abdelzaher, CS), "Performance Composability: An Emerging Challenge in Performance-Adaptive Systems," December 2009.
36. Fariba Khan (Advisor: Carl Gunter, CS), "Assuring Network service with Integrity Based Queuing," December 2009.

Other Selected Committees:

Fall 2019-Present: Instructional Faculty Recruiting Committee
Fall 2019-Present: Appeals Committee
Fall 2018-2019: Graduate Program Committee
Fall 2009-2015: Student Awards Committee
Fall 2009-2015: Program of Study Committee
Fall 2010-2015: Capricious Grading Committee
Fall 2010-2015: Undergraduate Study Committee
Fall 2009-Present: Undergraduate Advising Committee
Spring 2010-2015: Illinois Cyber Security Scholars Program (ICSSP) Admissions Committee and Faculty Advisor

Fall 2012-2014: ITI Distinguished Lecture Series Speaker Selection Committee (Chair)
Spring 2013: CS Faculty Recruiting Committee
Spring 2013: Andrew T. Yang Faculty Research Award Committee
Fall 2008-2015: I have served on over 40 qualifying examination committees.

Research Honors and Awards:

1. ACM SIGSIM PADS Test of Time Award, 2024. Paper: "TimeKeeper: a Lightweight Virtual Time System for Linux".
2. IEEE Communications Society Fellow, 2024.
3. International Institute for Engineering Psychology (IIEP) Fellow, 2024 (Elected)
4. IEEE Fellow, 2023. (IEEE's highest honor)
5. Asia-Pacific Artificial Intelligence Association (AAIA) Fellow, 2023. (Elected)
6. CRA Leadership Academy, 2023.
7. Research.com, Best Scientists in the field of Computer Science, 2023.
8. IEEE NFV-SDN Best Paper Award, 2022. Paper: "FORTIFY: Software Defined Data Plane Resilience."
9. Engineering Faculty Leadership Forum (EFLF), Participant, 2021-2022.
10. AT&T Virtual University Research Initiative (VURI) Award, 2021, 2022.
11. Invited Mentor, N^2Women (as part of ACM Mobisys conference), 2022.
12. Center for Innovation in Teaching and Learning, Teacher Ranked as Excellent, At Highest Rank of Outstanding, 2020
13. Engineering Council Outstanding Advisor, 2014-2015, 2019.
14. USENIX NSDI 2015 Test of Time Award, 2015. Paper: "Design and Implementation of a Routing Control Platform"
15. ASIACCS 2014 Best Paper Award, 2014. Paper title: "RE3: Relay Reliability Reputation for Anonymity Systems."
16. Center for Advanced Study (CAS) Fellowship, 2013.
17. ACM SIGCOMM Outstanding Reviewer Award, 2012.
18. C.W. Gear Outstanding Junior Faculty Award, 2012.
19. Nominee, National Center for Women & Information Technology REU Faculty Award, 2012.
20. Academy for Excellence in Engineering Education, Participant, 2011.
21. AT&T Virtual University Research Initiative (VURI) Award, 2011.
22. DARPA Computer Science Study Group Program to educate early-career Computer Science faculty on DoD needs. Included four week-long visits to military and industrial installations. I was selected as one out of twelve junior faculty in the United States.
23. National Science Foundation CAREER Award, 2011.
24. Passive and Active Measurement Conference, Best Paper Award, 2011.
25. UC Berkeley Institute for Preparing Future Faculty, Fellow, 2007.
26. National Science Foundation (NSF) Graduate Research Fellowship, 2003-2006.
27. Department of Defense National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2001-2003.

28. US Department of Education Graduate Assistance in Areas of National Need (GAANN) Program Fellowship, 2000.
29. Computer Science Department Citation Award, 2000. Highest GPA among 150+ computer science majors in undergraduate program. Rotary Club scholarship, Doyle scholarship.