Hongxin Hu

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RESEARCH INTERESTS

- Emerging Network Technologies and Security (NFV, SDN, 5G/Next-G, Edge, etc.)
- Security and Privacy in IoT and CPS
- Machine Learning for Security, Privacy, and Networking
- Security and Privacy in Social Networks
- Usable Privacy and Security
- Security in Cloud and Mobile Computing

ACHIEVEMENT HIGHLIGHTS

- Received **11 NSF** awards (7 as PI and 4 as Co-PI) including an NSF **CAREER** Award, a **$3M** large-size NSF grant, a **$2.7M** large-size NSF grant, and a **$1M** medium-size NSF grant within 6 years
- Secured grants **$12.12M** total as PI or Co-PI
- Over 100 publications (citations=**5,000**+, h-index=**36**), some of which appeared in top-tier conferences such as CCS, USENIX Security, NDSS, SIGCOMM, INFOCOM, ICNP, CHI, and CSCW, and top journals such as IEEE TDSC, IEEE TIFS, IEEE/ACM TON, JSAC, and IEEE TKDE
- **Eight** papers received or nominated for Best Paper Award
- Research received **50**+ media coverage
- Advising/co-advising 6 Ph.D. students. They have recently authored top-tier security conference papers (NDSS'21 [1], CCS'20 [2], NDSS'20 [7], CCS'18 [11][12], and NDSS'17 [20]), top-tier networking conference papers (SIGCOMM'20 [4], SIGCOMM'17 [18], ICNP'20 [5], INFOCOM'19 [10], and ICNP'18 [14]), and top-tier HCI conference papers (CHI'20 [8], CSCW'18 [13])
- Early promotion to Associate Professor with tenure (2019)
- Received NSF CAREER Award (2019)
- Received Dean's Faculty Fellows Award (2017)
- One Ph.D. student received Outstanding Ph.D. Student Award (2019)
- Led the effort to enable Clemson University to be designated as a National Center of Academic Excellence in Research (CAE-R)
- Helped establish a Cybersecurity Minor at Clemson University and make Clemson University to be designated as a National Center of Academic Excellence in Cyber Defense Education (CAE-CDE)
- Founded ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Security), and served as program co-chairs of SDN-NFV Security 2016-2019

- Served in several conference organizing roles, such as program committees of AAAI 2021, WWW 2021, 2019, ACSAC 2018-2020, ASIACCS 2018-2021, WiSec 2020, CODASPY 2018, SACMAT 2013-2015/2018-2021, and CNS 2017-2020, proceedings chairs of SACMAT 2014/2016-2021 and CODASPY 2017, the poster chair of CODASPY 2018-2021, and the web chair and session chair of CCS 2014
- Gave several talks about NFV security research at NFV World Congress

EDUCATION

Ph.D. in Computer Science and Engineering, Arizona State University, 2012
M.S. in Computer Science, China University of Geosciences, 2002
B.S. in Computer Science, China University of Geosciences, 1997

PROFESSIONAL EXPERIENCE

Associate Professor   January 2021 - Present
Computer Science and Engineering Department, University at Buffalo, SUNY, NY

Director of Cybersecurity Center   August 2020 - January 2021
Associate Professor, School of Computing   August 2019 - January 2021
Assistant Professor, School of Computing   July 2014 - August 2019
Dean's Faculty Fellow of Computer Science   January 2017 - January 2021
Clemson University, SC

Assistant Professor   August 2012 - June 2014
Department of Computer and Information Sciences, Delaware State University, DE

Graduate Student Researcher & Lead Graduate Student   August 2008 - July 2012
Laboratory of Security Engineering for Future Computing (SEFCOM), Arizona State University, AZ

Graduate Student Researcher   January 2006 - July 2008
Laboratory of Information Integration, Security and Privacy (LIISP), University of North Carolina at Charlotte, NC

Visiting Scholar   January 2005 - December 2005
Laboratory of Information Integration, Security and Privacy (LIISP), University of North Carolina at Charlotte, NC

Lecturer   August 2002 - December 2004
College of Computing, China University of Geosciences, China

HONORS AND AWARDS

- **Best Paper Award**, IEEE International Conference on Communications (ICC), 2020
- **NSF CAREER Award**, 2019
- **First Place**, Student Research Competition (SRC) in ACM SIGCOMM, 2018
- **Best Paper Award**, ACM Technical Symposium on Computer Science Education (SIGCSE), 2018
- **Dean's Faculty Fellows Award**, College of Engineering, Computing and Applied Sciences, Clemson University, 2017
- **Best Paper Honorable Mention Award**, ACM Symposium on Access Control Models and Technologies (SACMAT), 2016
- **Best Paper Award Nominee**, IEEE International Conference on Network Protocols (ICNP), 2015

- **Top-10 Finalist for Best Applied Security Paper Award**, New York University Cyber Security Awareness Week (CSAW), 2015
- **Spotlight Paper**, IEEE Transactions on Dependable and Secure Computing (TDSC), 2015
- **Front Page News**, Post and Courier, 2015
- **Third Place Award**, Extreme SDN Innovation Challenge, 2015
- **Best Paper Award**, ACM Conference on Data and Application Security and Privacy (CODASPY), 2014
- **Spotlight Paper**, IEEE Transactions on Dependable and Secure Computing (TDSC), 2014
- **Featured Research Paper**, IEEE Special Technical Community on Social Networking (STCSN), 2013
- **First Place Award**, Delaware U.S. Cyber Challenge Competition, "My Little Pwnies" (60% of female students), 2013
- Applied Security Research Best Paper Award Nominee, New York University Cyber Security Awareness Week (CSAW), 2013
- **Outstanding Ph.D. Student Finalist** in Computer Science, Arizona State University, 2012
- **Best Paper Award Nominee**, ACM Symposium on Access Control Models and Technologies (SACMAT), 2011
- **Best Paper Award Nominee**, International Conference on Collaborative Computing: Networking, Applications and Worksharing (CollaborateCom), 2011
- Applied Security Research Best Paper Award Nominee, New York University Cyber Security Awareness Week (CSAW), 2011
- NSF Travel Grant, NSF CAREER Proposal Writing Workshop, 2013
- ACSAC Conferenceship Award, Annual Computer Security Applications Conference (ACSAC), 2011
- NSF Travel Grant, ACM Conference on Computer and Communications Security (CCS), 2010
- IBM PhD Fellowship Nominee, UNCC, 2008
- **Outstanding Teaching Award**, China University of Geosciences, 2004

GRANTS

Funding Summary:

- **Eleven** NSF grants (including an NSF **CAREER** award, a **\$3M** large-size NSF grant, a **\$2.7M** large-size NSF grant, and a **\$1M** medium-size NSF grant)
- Total funding: **\$12,120,718** (\$2,285,965 as PI)
- Grants from NSF (SaTC, CNS, IIS, OAC, SOC, and DGE), USDOT, U.S. Army, VMware, Google, Amazon, Dell, etc

External Grants:

1. **Co-PI**, **NSF**, "RAPID: Cyber-Hostility and COVID-19", (PI: Matthew Costello; other Co-PIs: Feng Luo, Yin Yang, Long Cheng), \$199,996, 06/15/2020 - 05/31/2021.

2. **Co-PI**, **NSF**, "CloudLab Phase III: Expanding the Frontiers of Cloud Computing Through World-Class Community Infrastructure", (Clemson PI: Kuang-Ching Wang; other Co-PI: Amy Apon), $2,699,985 (total: $10M), subcontracting from University of Utah, 10/01/2020 - 09/30/2024.

3. **Co-PI**, **U.S. Army**, "Cross Cutting Autonomy Enablers", (PI: Richard Brooks; other Co-PIs: Pierluigi Pisu, Linke Guo, Jerome McLendon), $860,488, subcontracting from Army GVSC, 09/01/2020 - 08/31/2022.

4. **PI**, **NSF**, "CAREER: Towards Elastic Security with Safe and Efficient Network Security Function Virtualization", $500,000, 10/01/2019 - 09/30/2024.

5. **PI**, **NSF** & **VMware**, "SDI-CSCS: Collaborative Research: S^{2}OS: Enabling Infrastructure-Wide Programmable Security with SDI", $600,000 (total: $2,999,489), collaborative project with Guifei Gu (Texas A&M University), Donald Porter (University of North Carolina at Chapel Hill), Eric Keller (University of Colorado at Boulder), and Zhiqiang Lin (Ohio State University), 09/01/2017 - 08/31/2021.

6. **Lead PI**, **NSF**, "Collaborative Research: CICI: Secure and Resilient Architecture: SciGuard: Building a Security Architecture for Science DMZ based on SDN and NFV Technologies", $499,805 (total: $999,189), collaborative project with Gail-Joon Ahn (Arizona State University), 01/01/2017 - 12/31/2020.

7. **PI**, **NSF**, "SaTC: EDU: Collaborative: Enhancing Security Education through Transiting Research on Security in Emerging Network Technologies", $79,999 (total: $299,998), collaborative project with Younghee Park (San Jose State University) and Xiaohong Yuan (North Carolina A&T State University), 09/01/2017 - 08/31/2020.

8. **Lead PI**, **NSF**, "III: Small: Collaborative Research: Privacy-aware Collaborative Data Sharing in Human-centered Social Networks", $299,767 (total: $523,767), collaborative project with Gail-Joon Ahn (Arizona State University), 09/01/2015 - 08/31/2019.

   - Additional $16,000 awarded May 2017 for Research Experiences for Undergraduates (REU) supplement.
   - Additional $8,000 awarded May 2016 for Research Experiences for Undergraduates (REU) supplement.

9. **PI**, **NSF**, "EAGER: Defending Against Visual Cyberbullying Attacks in Emerging Mobile Social Networks", $239,680, 09/01/2015 - 08/31/2018.

   - Additional $16,000 awarded May 2016 for Research Experiences for Undergraduates (REU) supplement.

10. **PI**, **NSF**, "NSF Student Travel Grant for 2018 ACM International Workshop on Security in Software Defined Networks and Network Function Virtualization (SDN-NFV Security)", $5,600, 03/01/2018 - 02/28/2020.

11. **Co-PI**, **NSF**, "Collaborative Research: CICI: Regional: SouthEast SciEntific Cybersecurity for University Research (SouthEast SECURE)", (PI: Jill Gemmill; other Co-PIs: Jan Holmevik, Nuyun Zhang), $158,004 (total: $452,464), 10/01/2016 - 09/30/2019.

12. **Co-PI**, **NSF**, "US Ignite: Track 1: Enabling Connected Vehicle Applications through Advanced Network Technology", (PI: James Martin; other Co-PIs: Mashrur Chowdhury, Kuang-Ching Wang), $614,582, 09/01/2015 - 08/31/2020.

13. **Co-PI**, **USDOT** (U.S. Department of Transportation), "University Transportation Center - Center for Connected Multimodal Mobility (C^{2}M^2)", (PI:

Mashrur Chowdhury; other Co-PIs: Amy Apon, Jim Martin, etc.), $1,402,200, 11/30/2016 - 09/30/2022.

14. **Co-PI**, **USDOT** (through University of Tennessee/Southeastern Transportation Center), "Development of a Security Platform for Vehicle to Infrastructure Network", (PI: Mashrur Chowdhury), $77,287, 05/02/2016 - 08/31/2017.

15. **PI**, **Google**, "Cyber-Hostility and COVID-19", $4,637, 08/27/2020 - 08/26/2021.

16. **PI**, **Amazon**, "Secure Sharing of Electronic Health Records with AWS", $5,000, 07/07/2015 - 07/06/2016.

17. **Co-PI**, **Dell**, "Dasein Connector - NFV Extensions", (PI: Amy W. Apon), $107,843, 09/01/2014 - 12/31/2015.

Internal Grants:

19. **Co-PI**, Clemson University CBSHS/IMPACT grant, "Understanding and Combatting Cyberhate on Social Media", (PI: Matthew John Costello; other Co-PIs: Joseph P Maer, Feng Luo, Long Cheng), $20,000, 09/01/2019 - 08/30/2020.

20. **Co-PI**, Clemson University SUCCEEDS, "Next Generation IoT Hardware Security for Resilient Smart Grid and ICT Infrastructures", (PI: Kumar Venayagamoorthy; other Co-PIs: Yingjie Lao, Kuangching Wang, Michal Jermanowski), $37,036, 07/01/2018 - 06/30/2019.

21. **Co-PI**, Clemson University/One-Year Accelerate (OYA) Grant, "Alleviating the Negative Consequences of Habitual Trust on Collaborative Privacy Control in Online Social Networks", (PI: Heshan Sun), $20,000, 09/01/2016 - 08/31/2018.

22. **PI**, NSF-funded HBCU-UP SMILE Minigrant, "Security-Enhanced Mobile Platforms", $5,487, 09/01/2013 - 06/30/2014.

23. **PI**, DSU/Academic Enrichment Program Award, "Secure Data Sharing in Online Social Networks", $5,990, 12/15/2012 - 06/15/2013.

PUBLICATIONS *Publication Summary*:

- Given the inter-disciplinary nature of my work, I have published across a wide range of conferences, including **security** (CCS, USENIX Security, NDSS, AC-SAC, ESORICS, ASIACCS), **networking** (SIGCOMM, INFOCOM, ICNP, HotSDN, IWQoS), **human-computer interaction** (CHI, CSCW, HFES), **system** (APSys), and **computer science education** (SIGCSE).

- My work has been cited a total of **5,198** times with an h-index of **36** and an i10-index of **80** (according to Google Scholar as of October 2020).

- I have **8** papers received or nominated for Best Paper Award, as well as **2** spotlight papers and **1** featured paper.

Representative Conference/Workshop Publications:

1. Wenbo Ding, Hongxin Hu and Long Cheng, "IoTSafe: Enforcing Safety and Security Policy with Real IoT Physical Interaction Discovery", In *Proceedings of the 28th Network and Distributed System Security Symposium* (**NDSS 2021**), February 21-24, 2021. (Under Minor Revisions)

2. Long Cheng, Christin Wilson, Song Liao, Jeffrey Young, Daniel Dong, Hongxin Hu, "Dangerous Skills Got Certified: Measuring the Trustworthiness of Skill Certification in Voice Personal Assistant Platforms", In *Proceedings of the ACM*

Conference on Computer and Communications Security (**CCS 2020**), November 9-13, 2020. [Acceptance rate: 121/715 = 16.9%]

3. Song Liao, Christin Wilson, Long Cheng, Hongxin Hu and Huixing Deng, "Measuring the Effectiveness of Privacy Policies for Voice Assistant Applications", In *Proceedings of the 2020 Annual Computer Security Applications Conference* (**ACSAC 2020**), December 7-11, 2020. [Acceptance rate: 70/302 = 23.2%]

4. Zili Meng, Minhu Wang, Jiasong Bai, Mingwei Xu, Hongzi Mao and Hongxin Hu, "Interpreting Deep Learning-Based Networking Systems", In *Proceedings of the ACM SIGCOMM Conference* (**SIGCOMM 2020**), August 10-14, 2020.

5. Shuhe Wang, Chen Sun, Zili Meng, Minhu Wang, Jiamin Cao, Mingwei Xu, Jun Bi, Qun Huang, Masoud Moshref, Tong Yang, Hongxin Hu and Gong Zhang, "Martini: Bridging the Gap between Network Measurement and Control Using Switching ASICs", In *Proceedings of the 26th IEEE International Conference on Network Protocols* (**ICNP 2020**), Madrid, Spain, October 13-16, 2020. [Acceptance rate: 16.84%]

6. Fei Ding, Hongda Li, Feng Luo, Hongxin Hu, ong Cheng, Hai Xiao and Rong Ge, "DeepPower: Early Detection of IoT Malware through Fine-grained Activity Recognition using Power Side Channels", In *Proceedings of the 15th ACM ASIA Conference on Computer and Communications Security* (**ASIACCS 2020**), Taipei, Taiwan, June 1-5, 2020. [Acceptance rate: 67/308 = 21.7%]

7. Menghao Zhang, Guanyu Li, Shicheng Wang, Chang Liu, Ang Chen, Hongxin Hu, Guofei Gu, Qi Li, Mingwei Xu and Jianping Wu, "Poseidon: Enabling Cost-efficient and Agile DDoS Defense with Programmable Switches", In *Proceedings of the 27th Network and Distributed System Security Symposium* (**NDSS 2020**), San Diego, CA, USA, February 23-26, 2020. [Acceptance rate: 88/506 = 17.4%]

8. Yifang Li, Nishant Vishwamitra, Hongxin Hu and Kelly Caine, "Towards A Taxonomy of Content Sensitivity and Sharing Preferences for Photos", In *Proceedings of the 2020 ACM Conference on Human Factors in Computing Systems* (**CHI 2020**), Honolulu, Hawaii, USA, April 25-30, 2020. [Acceptance rate: 760/3126 = 24.3%]

9. Zili Meng, Jing Chen, Yaning Guo, Chen Sun, Hongxin Hu and Mingwei Xu, "PiTree: Practical Implementation of ABR Algorithms Using Decision Trees", In *Proceedings of the 27th ACM International Conference on Multimedia* (**MM 2019**), Nice, France, October 21-25, 2019. [Oral paper acceptance rate: 88/936 = 9.4%]

10. Zhilong Zheng, Jun Bi, Heng Yu, Haiping Wang, Chen Sun, Hongxin Hu and Jianping Wu, "Octans: Optimal Placement of Service Function Chains in Many-Core Systems", In *Proceedings of the 37th IEEE International Conference on Computer Communications* (**INFOCOM 2019**), Paris, France, April 29-May 2, 2019. [Acceptance rate: 288/1464 = 19.7%]

11. Wenbo Ding and Hongxin Hu, "On the Safety of IoT Device Physical Interaction Control", In *Proceedings of the 25th ACM Conference on Computer and Communications Security* (**CCS 2018**), Toronto, Canada, October 15-19, 2018. [Acceptance rate: 134/809 = 16.6%]

12. Hongda Li, Hongxin Hu, Guofei Gu, Gail-Joon Ahn and Fuqiang Zhang, "vNIDS: Towards Elastic Security with Safe and Efficient Virtualization of Network Intrusion Detection Systems", In *Proceedings of the 25th ACM Conference on Computer and Communications Security* (**CCS 2018**), Toronto, Canada, October 15-19, 2018. [Acceptance rate: 134/809 = 16.6%]

13. Yifang Li, Nishant Vishwamitra, Bart P. Knijnenburg, Hongxin Hu and Kelly Caine, "Effectiveness and Users' Experience of Obfuscation as a Privacy-Enhancing Technology for Sharing Photos", In *Proceedings of the 21st ACM Conference on Computer-Supported Cooperative Work and Social Computing* (**CSCW 2018**), Jersey City, NJ, USA, November 3-7, 2018. [Acceptance rate: 105/384 = 27.3%]

14. Zhilong Zheng, Jun Bi, Haiping Wang, Chen Sun, Heng Yu, Hongxin Hu, Kai Gao and Jianping Wu, "Grus: Enabling Latency SLOs for GPU-Accelerated NFV Systems", In *Proceedings of 26th IEEE International Conference on Network Protocols* (**ICNP 2018**), Cambridge, UK, September 24-27, 2018. [Acceptance rate: 35/196 = 17.9%]

15. Chen Sun, Jun Bi, Zili Meng, Xiao Zhang and Hongxin Hu, "OFM: Optimized Flow Migration for NFV Elasticity Control", In *Proceedings of the 26th IEEE/ACM International Symposium on Quality of Service* (**IWQoS 2018**), Banff, Alberta, Canada, June 4-6, 2018. [Acceptance rate: 26/125 = 20.8%]

16. Younghee Park, Hongxin Hu, Xiaohong Yuan and Hongda Li, "Enhancing Security Education Through Designing SDN Security Labs in CloudLab", In *Proceedings of the 49th ACM Technical Symposium on Computer Science Education* (**SIGCSE 2018**), Baltimore, Maryland, USA, February 21-24, 2018. (**Best Paper Award**)

17. Guofei Gu, Hongxin Hu, Eric Keller, Zhiqiang Lin and Donald Porter, "Building a Security OS with Software Defined Infrastructure", In *Proceedings of the 8th ACM SIGOPS Asia-Pacific Workshop on Systems* (**APSys 2017**), IIT, Bombay, Indian, September 2-3, 2017.

18. Chen Sun, Jun Bi, Zhilong Zheng, Heng Yu and Hongxin Hu, "NFP: Enabling Network Function Parallelism in NFV", In *Proceedings of the ACM SIGCOMM Conference* (**SIGCOMM 2017**), Los Angeles, CA, USA, August 21-25, 2017. [Acceptance rate: 36/250 = 14.4%]

19. Nishant Vishwamitra, Yifang Li, Kevin Wang, Hongxin Hu, Kelly Caine and Gail-Joon Ahn, "Towards PII-based Multiparty Access Control for Photo Sharing in Online Social Networks", In *Proceedings of the 22nd ACM Symposium on Access Control Models And Technologies* (**SACMAT 2017**), Indianapolis, IN, USA, June 21-23, 2017. [Acceptance rate: 14/50 = 28.0%]

20. Juan Deng*, Hongda Li*, Hongxin Hu, Kuang-Ching Wang, Gail-Joon Ahn, Ziming Zhao and Wonkyu Han, "On the Safety and Efficiency of Virtual Firewall Elasticity Control", In *Proceedings of the 24th Network and Distributed System Security Symposium* (**NDSS 2017**), San Diego, California, February 26 - March 1, 2017 (*co-first author). [Acceptance rate: 68/423 = 16.1%]

21. Kang Chen, Ryan Izard, Hongxin Hu, Kuangching Wang and James Martin, "HetSDN: Exploiting SDN for Intelligent Network Usage in Heterogeneous Wireless Networks", In *Proceedings of IEEE/ACM International Symposium on Quality of Service* (**IWQoS 2016**), Beijing, China, June 20-21, 2016.

22. Hitesh Padekar, Younghee Park, Hongxin Hu and Sang-Yoon Chang, "Enabling Dynamic Access Control for Controller Applications in Software-Defined Networks", In *Proceedings of the 21st ACM Symposium on Access Control Models And Technologies* (**SACMAT 2016**), Shanghai, China, June 5-8, 2016. (**Best Paper Honorable Mention Award**)

23. Wonkyu Han, Hongxin Hu, Ziming Zhao, Adam Doupé, Gail-Joon Ahn, Kuang-Ching Wang and Juan Deng, "State-aware Network Access Management for Software-Defined Networks", In *Proceedings of the 21st ACM Symposium on Access Control Models And Technologies* (**SACMAT 2016**), Shanghai, China, June 5-8, 2016.

24. Shuyong Zhu, Jun Bi, Chen Sun, Chenghui Wu and Hongxin Hu, "SDPA: Enhancing Stateful Forwarding for Software-Defined Networking", In *Proceedings of the 23rd IEEE International Conference on Network Protocols* (**ICNP 2015**), San Francisco, USA, November 10-13, 2015. [Acceptance rate: 38/187 = 20.3%] (**Best Paper Nominee**)

25. Yiming Jing, Ziming Zhao, Gail-Joon Ahn and Hongxin Hu, "Morpheus: Automatically Generating Heuristics to Detect Android Emulators", In *Proceedings ofthe 30th Annual Computer Security Applications Conference* (**ACSAC 2014**), New Orleans, LA, USA, December 8-12, 2014. [Acceptance rate: 47/236 = 19.9%] (**Finalist for CSAW 2015 Best Applied Security Paper Award**)

26. Hongxin Hu, Wonkyu Han, Gail-Joon AhnandZiming Zhao, "FlowGuard: Building Robust Firewalls for Software-Defined Networks", In *Proceedings of ACM SIGCOMM Workshop on Hot Topics in Software Defined Networking* (**HotSDN 2014**), Chicago, IL, USA, August 22, 2014. [Acceptance rate for full paper with long presentation: 16/114 = 14.0%]

27. Hongxin Hu, Gail-Joon Ahn, Ziming Zhao and Dejun Yang, "Game Theoretic Analysis of Multiparty Access Control in Online Social Networks", In *Proceedings of the 19th ACM Symposium on Access Control Models And Technologies* (**SACMAT 2014**), London, Ontario, Canada, June 25-27, 2014.

28. Yiming Jing, Gail-Joon Ahn, Ziming Zhao and Hongxin Hu, "RiskMon: Continuous and Automated Risk Assessment for Mobile Applications", In *Proceedings of the 4th ACM Conference on Data and Application Security and Privacy* (**CODASPY 2014**), San Antonio, TX, USA, March 3-5, 2014. [Acceptance rate: 19/119 = 16.0%] (**Best Paper Award**)

29. Ziming Zhao, Gail-Joon Ahn, Jeong-Jin Seo and Hongxin Hu, "On the Security of Picture Gesture Authentication", In *Proceedings of the 22nd USENIX Security Symposium* (**USENIX Security 2013**), Washington DC, August 2013. [Acceptance rate: 44/277 = 15.9%] (**Media Coverage**: *ACM TechNews, InformationWeek, WeLiveSecurity, NetworkWorld, SlashDot, SoftPedia, TechEYE, PCInfoSite, PCWorld, TechRadar, TechDigest, ThreatPost, WebRoot, TechNewzie, SiloBreaker,Topix, Neowin, ITSecureSite, CreativeGroups, Sysnative, LifeattheMoment, ParityNews, etc*)

30. Ziming Zhao, Gail-Joon Ahn, Hongxin Hu and Deepinder Mahi, "SocialImpact: Systematic Analysis of Underground Social Dynamics", In *Proceedings of the 17th European Symposium on Research in Computer Security* (**ESORICS 2012**), Pisa, Italy, September 10-14, 2012. [Acceptance rate: 50/248 = 20.1%]

31. Yan Zhu, Hongxin Hu, Gail-Joon Ahn and Mengyan Yu, "Comparison-Based Encryption for Fine-grained Access Control in Clouds", In *Proceedings of the 2nd ACM Conference on Data and Application Security and Privacy* (**CODASPY 2012**), San Antonio, Texas, USA, February 7-9, 2012. [Acceptance rate: 21/113 = 18.6%]

32. Yan Zhu, Hongxin Hu, Gail-Joon Ahn, Dijiang Huang and Shanbiao Wang, "Towards Temporal Access Control in Cloud Computing", In *Proceedings of the 31st IEEE International Conference on Computer Communications* (**INFOCOM 2012**), Mini-conference, Orlando, Florida, USA, March 25-30, 2012. [Acceptance rate: 378/1547 = 24.4%]

33. Ruoyu Wu, Gail-Joon Ahn, and Hongxin Hu "Towards HIPPA-compliant Healthcare Systems", In *Proceedings of the 2nd ACM SIGHIT International Health Informatics Symposium* (**IHI 2012**), Miami, Florida, USA, January 28-30, 2012. [Acceptance rate for oral presentation: 48/269 = 17.8%]

34. Hongxin Hu, Gail-Joon Ahn and Jan Jorgensen, "Detecting and Resolving Privacy Conflicts for Collaborative Data Sharing in Online Social Networks", In *Proceedings of the 27th Annual Computer Security Applications Conference* (**ACSAC 2011**), Orlando, Florida, USA, December 5-9, 2011. [Acceptance rate: 39/195 = 20.0%]

35. Hongxin Hu, Gail-Joon Ahn and Ketan Kulkarni, "Anomaly Discovery and Resolution in Web Access Control Policies", In *Proceedings of the 16th ACM Symposium on Access Control Models And Technologies* (**SACMAT 2011**), Innsbruck, Austria, June 15-17, 2011. (**Best Paper Award Candidate**; CSAW AT&T Applied Security Research Best Paper Award Nominee).

36. Wenjuan Xu, Gail-Joon Ahn, Hongxin Hu, Xinwen Zhang and Jean-Pierre Seifert, "DRFT: Efficient Remote Attestation Framework for Dynamic Systems", In *Proceedings of the 15th European Symposium on Research in Computer Security* (**ESORICS 2010**), Athens, Greece, September 20-22, 2010. [Acceptance rate: 42/201 = 20.8%]

37. Yan Zhu, Gail-Joon Ahn, Hongxin Hu and Huaixi Wang, "Cryptographic Role-based Security Mechanisms based on Role-Key Hierarchy", In *Proceedings of the 5th ACM Symposium on Information, Computer and Communications Security* (**ASIACCS 2010**), Beijing, China, April 13-16, 2010. [Acceptance rate: 35/166 = 21%]

38. Jing Jin, Gail-Joon Ahn, Hongxin Hu, Michael Covington and Xinwen Zhang, "Patient-centric Authorization Framework for Sharing Electronic Health Records", In *Proceedings of the 14th ACM Symposium on Access Control Models And Technologies* (**SACMAT 2009**), Stresa, Italy, June 3-5, 2009.

39. Hongxin Hu and Gail-Joon Ahn, "Enabling Verification and Conformance Testing for Access Control Model", In *Proceedings of the 13th ACM Symposium on Access Control Models And Technologies* (**SACMAT 2008**), Estes Park, Colorado, USA, June 11-12, 2008. [Acceptance rate: 20/79 = 25%]

40. Gail-Joon Ahn and Hongxin Hu, "Towards Realizing a Formal RBAC Model in Real Systems", In *Proceedings of the 12th ACM Symposium on Access Control Models And Technologies* (**SACMAT 2007**), Sophia Antipolis, France, June 20-22, 2007. [Acceptance rate: 19/79 = 24%]

Representative Journal Publications:

42. Xincai Fei, Fangming Liu, Qixia Zhang, Hai Jin and Hongxin Hu, "Paving the Way for NFV Acceleration: A Taxonomy, Survey and Future Directions", *ACM Computing Surveys* (**CSUR**), Vol.53, August 2020.

43. Yuan Luo, Long Cheng, Hongxin Hu, Guojun Peng and Danfeng Yao, "Context-rich Privacy Leakage Analysis through Inferring Apps in Smart Home IoT", *IEEE Internet of Things Journal* (**IoTJ**), 2020.

44. Juan Wang, Shirong Hao, Ru Wen, Boxian Zhang, Hongxin Hu and Rongxin Lu, "IoT-Praetor: Undesired Behaviors Detection for IoT Devices", *IEEE Internet of Things Journal* (**IoTJ**), 2020.

45. Juan Wang, Shirong Hao, Hongxin Hu, Hongda Li, Wenhui Zhang, Jun Xu and Peng Liu, "S-Blocks: Lightweight and Trusted Virtual Security Function with SGX", *IEEE Transactions on Cloud Computing* (**TCC**), 2020.

46. Zili Meng, Jun Bi, Haiping Wang, Chen Sun and Hongxin Hu, "MicroNF: An Efficient Framework for Enabling Modularized Service Chains in NFV", *IEEE Journal of Selected Areas in Communications* (**JSAC**), 2019.

47. Menghao Zhang, Jun Bi, Kai Gao, Yi Qiao, Guanyu Li, Xiao Kong, Zhaogeng Li and Hongxin Hu, "Tripod: Towards a Scalable, Efficient and Resilient Cloud Gateway", *IEEE Journal of Selected Areas in Communications* (**JSAC**), Vol.37, No.3, 2019.

48. Chen Sun, Jun Bi, Zili Meng, Tong Yang, Xiao Zhang and Hongxin Hu, "Enabling NFV Elasticity Control with Optimized Flow Migration", *IEEE Journal of Selected Areas in Communications* (**JSAC**), Vol.36, No.10, 2018.

49. Chen Sun, Jun Bi, Zhilong Zheng and Hongxin Hu, "HYPER: A Hybrid High-Performance Framework for Network Function Virtualization", *IEEE Journal of Selected Areas in Communications* (**JSAC**), Vol. 35, No. 11, 2017.

50. Chen Sun, Jun Bi, Haoxian Chen, Hongxin Hu, Zhilong Zheng, Shuyong Zhu and Chenghui Wu, "SDPA: Towards a Stateful Data Plane in Software-Defined Networking", *IEEE/ACM Transactions on Networking* (**TON**), 2017.

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2. "Rethinking Security for the Internet of Things (IoT)", *University of Delaware*, 2020.

3. "Dynamic Defense of IoT Malware", *VMWare*, 2019.

4. "Rethinking Security for the Internet of Things (IoT)", *Wuhan University*, 2019.

5. "Rethinking Security for the Internet of Things (IoT)", *University of Texas at Dallas*, 2019.

6. "vNIDS: Safe and Efficient Virtualization of Network Intrusion Detection Systems", *VMWare*, 2018.

7. "Safety Control on IoT Device Physical Interaction", *Tsinghua University*, 2018.

8. "Enabling Reliable Access Control in Modern Network and Information Systems", *University of Texas at Arlington*, 2018.

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30. "Ontology-based Policy Anomaly Management for Autonomic Computing", *CollaborateCom 2011*.

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SELECTED MEDIA COVERAGE

- "Protecting privacy, preventing cyberbullying, and detecting hate speech with artificial intelligence", *News Standard, Clemson University*, March 11, 2020. (Link)

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- "Clemson University cybersecurity research to be highlighted at top-tier security conference", *News Standard, Clemson University*, July 30, 2018. (Link)

- "Researchers Land \$3 Million to Build Cyberattack Defenses", *News Standard, Clemson University*, June 6, 2017. (Link)

- "Researchers Land \$3 Million to Build Cyberattack Defenses", *ACM TechNews*, June 12, 2017. (Link)

- "High schooler to assist Clemson professor in \$3M data security research project this summer", *Independent Mail*, June 9, 2017. (Link)

- "Clemson Professor to Research Cyberattack Defenses", *GSA Business Report*, June 6, 2017. (Link)

- "Clemson Researchers Land \$3 Million to Build Cyberattack Defenses", *WSNW Radio*, June 7, 2017. (Link)

- "Clemson University Computer Scientist to Present Research at Esteemed Security Conference", *News Standard, Clemson University*, November 3, 2016. (Link)

- "Clemson University app could help fight cyberbullying", *News Standard, Clemson University*, August 19, 2015. (Link)

- "Clemson developing app to take on bullies", *The Post and Courier*, September 5, 2015. (Link)

- "App could identify cyberbullying as it happens", *Greenville (SC) News*, August 19, 2015.(Link)

- "Clemson Team Making App to Fight Cyber Bullies", *WSPA-TV*, August 19, 2015.(Link)

- "Clemson developing app to combat cyberbullying", *WHNS-TV*, August 19, 2015.(Link)

- "App in the works at Clemson to fight cyberbullying", *WYFF4*, August 19, 2015.(Link)

- "Innovation Challenge Winners Demonstrate SDN Applications to Secure and Simplify Networks", *Extreme Blog*, June 2, 2015.(Link)

- "Windows 8 Picture Passwords Easily Cracked", *ACM TechNews*, September 4, 2013 (Link)

- "Windows 8 Picture Passwords Easily Cracked", *InformationWeek Dark Reading*, August 29, 2013. (Link)

- "Researchers develop attack framework for cracking Windows 8 picture passwords", *NetworkWorld*, September 5, 2013. (Link)

- "Windows 8's Picture Passwords Weaker Than Users Might Hope", *Slashdot*, September 5, 2013. (Link)

- "Windows Picture Passwords – are they really as 'easily crackable' as everyone's saying?", *NakedSecurity*, September 9, 2013. (Link)

- "Windows 8 picture passwords 'can be cracked', researchers warn", *WeLiveSecurity*, August 30, 2013. (Link)

- "Picture passwords promising, security researcher says", *PCWorld*, September 15, 2013.(Link)

TEACHING EXPERIENCE

Instructor for Courses   July 2014 - Present
School of Computing, Clemson University

- Undergraduate/graduate Course: CPSC 4200/6200 - Computer Security Principles

- Graduate Course: CPSC 8570 - Security in Advanced Networking Technologies (**newly developed course**)

- Graduate Course: CPSC 8810 - Advanced Networking and Security

- Graduate Course: CPSC 8810/CPSC 8580 - Security in Emerging Computing and Networking Systems (**newly developed course**)

Instructor for Courses   August 2012 - June 2014
Department of Computer and Information Sciences, Delaware State University

- Undergraduate Course: INFO-385 - Network Security

- Undergraduate Course: INFO-350 - Operating Systems

- Graduate Course: CSCI-510 - Advanced Operating Systems (**newly developed course**)

- Graduate Course: CSCI-520 - Advanced Computer Networking and Communications (**newly developed course**)

POST-DOCTORAL RESEARCHERS

- Kang Chen   Sep 2014 - Aug 2015
  First employment: **Assistant Professor**, Southern Illinois University

- Juan Deng   Sep 2014 - Jul 2016
  First employment: Senior Researcher, Huawei

STUDENT ADVISING

Current Ph.D. Students:

- Nishant Vishwamitra   since May 2016

  – First-authored a **SACMAT'17** paper

  – Co-authored a **CHI'20** paper

  – Co-authored a **CSCW'18** paper

  – Received Talford Annual Fellowship award for 2018-2019

- Wenbo Ding   since Jan 2017

  – First-authored an **NDSS'21** paper

  – First-authored a **CCS'18** paper

- Zhilong Zheng (Tsinghua University, co-advised)   since May 2016

  – First-authored an **INFOCOM'19** paper

  – First-authored an **ICNP'18** paper

- Co-authored a **SIGCOMM'17** paper
- Co-authored an IEEE **JSAC** paper and an IEEE/ACM **TON** paper

- Zili Meng (Tsinghua University, co-advised)   since May 2017
  - First-authored a **SIGCOMM'20** paper
  - First-authored an **ACM MM'19** paper
  - First-authored a **ICC'18** paper
  - Won the First Place in **SIGCOMM 2018** Student Research Competition (**SRC**).
  - First-authored an IEEE **JSAC** paper
  - Co-authored a **IWQoS'18** paper
  - Co-authored an IEEE **JSAC** paper

- Menghao Zhang (Tsinghua University, co-advised)   since May 2018
  - First-authored an **NDSS'20** paper
  - First-authored an IEEE **JSAC** paper

- Feng Wei   since May 2018
- Qiqing Huang   since May 2020

Previous Ph.D. Students:

- Hongda Li   May 2015 - Aug 2020
  - First-authored a **CCS'18** paper
  - First-authored an **NDSS'17** paper
  - Co-authored an **ASIACCS'20** paper
  - Co-authored a SIGCSE'18 paper (**Best Paper Award**)
  - Received **Outstanding Ph.D. Student Award** in computer science
  - Received Talford Annual Fellowship award for 2018-2019

- Chen Sun (Tsinghua University, co-advised)   May 2015 - Aug 2019
  - First-authored a **SIGCOMM'17** paper
  - First-authored a **IWQoS'18** paper
  - First-authored two IEEE **JSAC** papers and an IEEE/ACM **TON** paper
  - Co-authored an **ICNP'18** paper
  - Co-authored an **ICNP'15** paper (**Best Paper Nominee**)
  - Received **Google PhD Fellowship** in Systems and Networking   2018

- Wonkyu Han (Arizona State University, co-advised)   May 2013 - Aug 2016
  - First-authored a **SACMAT'16** paper and a DBSec'14 paper
  - Co-authored an **NDSS'17** paper and a HotSDN'14 paper

- Shuyong Zhu (Tsinghua University, co-advised)   May 2014 - Aug 2016
  - First-authored an **ICNP'15** paper (**Best Paper Nominee**)
  - Co-authored an IEEE/ACM **TON** paper and an IEEE Network paper

Current Undergraduate Students:

- Martha Newton (REU Student)   Apr 2018 - Present
- Tyreek Wilson (REU Student)   Apr 2018 - Present

Previous Undergraduate Students:

- Maxwell Harley (REU Student)   Aug 2017 - Feb 2018
- Nick Castro (REU Student)   Sep 2017 - Feb 2018
- Wesley Knight (REU Student)   Sep 2017 - Feb 2018
- Kevin Wang (REU Student)   May 2016 - May 2017
    - Co-authored a SACMAT'17 paper
- Alexander Sferrella (REU Student)   May 2016 - Apr 2017
- Jan Jorgensen (Arizona State University)   May 2010 - May 2012
    - Co-authored an **ACSAC'11** paper and a GLOBECOM'12 paper
    - Co-authored an IEEE **TKDE** paper featured by the IEEE Special Technical Community on Social Networking

High School Students:

- Wyatt Dorris (D. W. Daniel High School, Central, SC)   May 2019 - Present
- Jonathan Tong (D. W. Daniel High School, Central, SC) May 2016 - Apr 2017
    - Co-authored an IWSPA'17 paper and an ICMLA'17 paper
    - Studying in Computer Science at Cornell University
- Charlie Cao (Wootton High School, Rockville, MD)   May 2017 - Jul 2017
- Kevin Feng (D. W. Daniel High School, Central, SC)   Jun 2017 - Jul 2017

Middle School Student:

- Roger Hu (R C Edwards Middle School, Central, SC)   Jun 2017 - Jul 2017

INSTITUTIONAL SERVICE

- Search Committee for the C. Tycho Howle Endowed Chair of Collaborative Computing   2015 - 2017
- Clemson Cybersecurity Research Task Force   2016 - Present
- Faculty Search Committee for School of Computing   2015 - Present
- Equipment Committee for School of Computing   2014 - 2015
- Website Committee for School of Computing   2017 - Present
- PhD Thesis Committee
    - Adil Alsuhaim (Advisor: Dr. Jim Martin)
    - Jason Anderson (Advisor: Dr. Amy W. Apon)
    - Oluwakemi Hambolu (Advisor: Richard R. Brooks)
    - William Clay Moody (Advisor: Dr. Amy W. Apon)
    - Fan Yang (Advisor: Dr. Richard R. Brooks)
- Master's Thesis Committee
    - Emmanuel John (Advisor: Dr. Ilya Safro)
    - Udit Agarwal (Advisor: Dr. Amy W. Apon)

PROFESSIONAL SERVICE

Associate Editor:

- Computers Security (COSE)   2020 - Present
- Cybersecurity & Privacy. *Frontiers in Big Data*   2018 - Present

Guest Editor:

- Special Issue of Security in Emerging Networking Technologies. *IEEE Transactions on Dependable and Secure Computing (TDSC)*   2017/2018
- Special Issue of Advances in Network Function Virtualization. *China Communications*   2018
- Special Issue of Adaptive Mobile Crowd Sensing Security for BYOD Convergence in Mobile Creative Research. *Mobile Information System*   2016
- Special Issue of Security & Privacy Mechanisms for Sensor Middleware and Application in Internet of Things (IoT). *International Journal of Distributed Sensor Networks*   2015
- Special Issue of TrustCol2014. *EAI Endorsed Transactions on Collaborative Computing*   2015

Proposal Panelist/Reviewer:

- National Science Foundation (NSF)   2015, 2016, 2017, 2018, 2020
- Army Research Office (ARO)   2019
- Maryland Industrial Partnerships Program (MIPStrack)   2014

Conference/Workshop (Co-)Founder:

- ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Security)
- IEEE International Workshop Big Data Security and Services (BigDataService)

Program (Co-)Chair:

- ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Security), 2016, 2017, 2018, 2019
- IEEE International Workshop Big Data Security and Services (BigDataService), 2017, 2018, 2019
- IEEE International Workshop on Trusted Collaboration (TrustCol), 2014, 2015, 2016

Poster Chair:

- ACM Conference on Data and Application Security and Privacy (CODASPY), 2018 - 2021

Proceedings Chair:

- ACM Conference on Data and Application Security and Privacy (CODASPY), 2017
- ACM Symposium on Access Control Models and Technologies (SACMAT), 2014, 2016, 2017, 2018, 2019, 2021

Publicity Chair:

- ACM Symposium on Access Control Models and Technologies (SACMAT), 2015

Session Chair:

- ACM Conference on Data and Application Security and Privacy (CODASPY), 2018
- ACM Symposium on Access Control Models and Technologies (SACMAT), 2017
- ACM Conference on Computer and Communications Security (CCS), 2014
- IEEE International Workshop on Trusted Collaboration (TrustCol), 2011

Web Chair:

- ACM Conference on Computer and Communications Security (CCS), 2014

Technical Program Committee:

- The AAAI Conference on Artificial Intelligence (AAAI), 2021
- The Web Conference (WWW), 2019, 2021
- Annual Computer Security Applications Conference (ACSAC), 2018, 2019, 2020
- ACM Symposium on Information, Computer and Communications Security (AsiaCCS), 2018, 2019, 2021
- ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec), 2020
- ACM Conference on Data and Application Security and Privacy (CODASPY), 2018, 2021
- ACM Symposium on Access ControlModels and Technologies (SACMAT), 2013, 2014, 2015, 2018, 2019, 2020
- IEEE Conference on Communications and Network Security (CNS), 2017, 2018, 2019, 2020
- IFIP Networking Conference (NETWORKING), 2019
- ACM SIGCOMM Workshop on Security in Softwarized Networks: Prospects and Challenges (SecSoN), 2018
- ACM SIGCOMM Workshop on Internet of Things Security and Privacy (IoT S&P), 2018
- ACM Symposium on Applied Computing (SAC), Internet of Things (IoT) track, 2018, 2019, 2020
- ACM International Workshop on Multimedia Privacy and Security (MPS), 2017, 2018
- International Conference on Privacy, Security and Trust (PST), 2017, 2018, 2019
- IEEE International Conference on Advanced and Trusted Computing (ATC), 2016, 2017, 2018
- International Conference on Information and Communications Security (ICICS), 2018
- IEEE International Conference on Cloud Networking (CloudNet), 2018, 2019, 2020
- IEEE International Conference on Smart City Innovations (SCI), 2018
- Workshop on Security and Privacy-Enhanced Big Data (SPEBD), 2018

- IEEE International Conference on Computer Communications and Networks (ICCCN), 2015, 2016, 2017, 2018, 2019
- IEEE INFOCOM CrossCloud Workshop (CrossCloud), 2014, 2016, 2017, 2018
- ACM Workshop on Internet of Things Security and Privacy (IoT S&P), 2017
- IEEE International Conference on Parallel and Distributed Systems (ICPADS), 2016
- IEEE Global Communications Conference (GLOBECOM), 2015
- International Conference on Computing and Network Communications (Co-CoNet), 2015
- Workshop on Action Languages, Process Modeling, and Policy Reasoning (ALPP), 2015
- IEEE ICNP CoolSDN Workshop (CoolSDN), 2014, 2015, 2016
- International Workshop on Access Control Policies, Models and Mechanisms (ACPM), 2014
- IEEE International Workshop on Trusted Collaboration (TrustCol), 2013
- International Symposium on Cyberspace Safety and Security (CSS), 2013
- International Conference on Mobile, Ubiquitous, and Intelligent Computing (MUSIC), 2013
- FTRA International Symposium on Advances in Cryptography, Security and Applications for Future Computing (ACSA-Summer), 2012

Conference Paper Reviewer:
- ACM Conference on Computer and Communications Security (CCS), 2005-2007, 2013, 2016, 2017, 2018, 2019, 2020
- ACM CHI Conference on Human Factors in Computing Systems (CHI), 2018
- European Symposium on Research in Computer Security (ESORICS), 2018
- ACM Symposium on Access Control Models And Technologies (SACMAT), 2005- 2013
- ACM Conference on Data and Application Security and Privacy (CODASPY), 2011 - 2013
- International World Wide Web Conferences (WWW)–Security and Privacy Track, 2009-2011
- ACM Symposium on Applied Computing (SAC)–Computer Security Track. 2006-2011
- ACM Symposium on InformAtion, Computer and Communications Security (AsiaCCS), 2006-2008

Journal Paper Reviewer:
- ACM Transactions on Privacy and Security
- ACM Transactions on Information and System Security
- ACM Transactions on Software Engineering and Methodology
- ACM Transactions on Internet Technology
- IEEE Transactions on Dependable and Secure Computing
- IEEE Transactions on Knowledge and Data Engineering
- IEEE/ACM Transactions on Networking

- IEEE Transactions on Information Forensics and Security
- IEEE Transactions on Services Computing
- IEEE Transactions on Network and Service Management
- IEEE Internet Computing
- Journal of Computer Security
- Computers & Security
- Security and Communication Networks
- IBM Journal of Research and Development
- International Journal of Information Security
- International Journal of Network Management
- Journal of Systems and Software
- Journal of Data & Knowledge Engineering
- Journal of Biomedical Informatics
- Journal of Organizational Computing and Electronic Commerce
- International Journal of Computer Systems Science and Engineering
- Security and Communication Networks
- IET Information Security
- Wireless Networks
- Cluster Computing
- Sensors
- Journal of Network and Computer Applications
- Journal of Computer Science and Technology