

Patrick Tague

Carnegie Mellon University
NASA Research Park, Building 23, Room 218
Moffett Field, CA 94035

Email: tague@cmu.edu
Phone: (650) 335-2827
<http://mews.sv.cmu.edu/people/tague/>

Summary of Current Roles and Interests

Patrick is currently an Associate Teaching Professor in INI, Associate Research Professor in ECE by courtesy, and the Associate Director of the INI at Carnegie Mellon University, roles which include research, teaching, service, and administration. On the research side, Patrick directs the Mobile, Embedded, & Wireless Security (MEWS) research group, comprising PhD and MS students, studying various aspects of security and privacy in wireless communications, networking, computing, control, and data management. Primary topics of research interest include secure computing and data management in sensing systems and the Internet of Things, reliable and secure networking for intelligent mobile devices and cyber-physical systems; and secure and privacy-preserving services for mobile and embedded computing platforms. These same topics are reflected in Patrick's teaching, which includes graduate-level courses on *Mobile & IoT Security*, *Wireless Security*, and *Embedded Systems*. In his administrative role, Patrick has been deeply involved in curriculum design, strategic planning, supporting scholarship programs and funding proposals, and collaborating with academic affairs staff.

Education

- **University of Washington**

- Doctor of Philosophy in Electrical and Computer Engineering, August 2009, Dissertation: *Identifying, Modeling, and Mitigating Attacks in Wireless Ad-Hoc and Sensor Networks*, Advisor: Prof. Radha Poovendran
- Master of Science in Electrical Engineering, March 2007, Thesis: *Modeling Adaptive Node Capture Attacks in Multi-hop Wireless Networks*, Advisor: Prof. Radha Poovendran

- **University of Minnesota**

- Bachelor of Computer Engineering (cum laude), August 2003
- Bachelor of Science in Mathematics, August 2003

Employment & Academic Appointments

- *Associate Teaching Professor*, Information Networking Institute, Carnegie Mellon University; August 2020 to present
- *Associate Research Professor*, Electrical and Computer Engineering, by courtesy; August 2020 to present
- *Associate Research Professor*, Electrical and Computer Engineering / Information Networking Institute, Carnegie Mellon University; July 2014 to August 2020
- *Associate Director*, Information Networking Institute, Carnegie Mellon University; September 2013 to present
- *Chief Scientist*, BitClave; January 2017 to present
- *Assistant Research Professor*, Electrical and Computer Engineering / Information Networking Institute, Carnegie Mellon University; August 2009 to June 2014

- *Research Assistant*, Network Security Lab, University of Washington; June 2004 to July 2009
- *Instructor*, Electrical Engineering, University of Washington; EE 565 Computer-Communication Networks I; Winter 2008
- *Teaching Assistant*, Electrical Engineering, University of Washington; EE 215 Fundamentals of Electrical Engineering (Fall 2003), EE 271 Digital Circuits and Systems (Winter 2004), EE 461 Introduction to Computer-Communication Networks (Spring 2004)
- *Teaching Assistant & Instructor*, ITCEP/UMTYMP, University of Minnesota; Fall 1999 to Summer 2003

Primary Teaching Responsibilities

- *14-829/18-638: Mobile & IoT Security*
 - Offered at CMU jointly by ECE and INI departments during Fall semesters 2010-2019, including students at Pittsburgh and Silicon Valley campuses via real-time broadcast
 - Hands-on, project-driven course with twice-weekly lectures, multiple development and analysis assignments, and team projects focusing on problems of current commercial or research interest
 - Designed the course structure and content from scratch, updated annually to reflect new technologies and recent research
- *14-814/18-637: Wireless Security*
 - Offered at CMU jointly by ECE and INI departments during Spring semesters 2011-2017 and 2019-2020, including students at Pittsburgh and Silicon Valley campuses via real-time broadcast
 - Hands-on, project-driven course with twice-weekly lectures, testbed design and implementation assignments, and team projects focusing on problems of current research interest
 - Designed the course structure and content from scratch, updated annually to reflect new technologies and recent research
- *14-850: INSuRE Cybersecurity Research*
 - Offered at CMU by INI during Fall semesters 2015-2019
 - Course operates via coordination with several other universities/colleges through the INSuRE program (<https://insurehub.org/>), facilitated previously by Purdue University and currently by CSU San Bernadino
 - Lecture content focuses on research methodology (i.e., “research soft skills”) and project management

Graduate Advising

- Current and Former PhDs as Primary/Sole Advisor:
 - Dr. Yu Seung Kim, CMU ECE PhD, Fall 2014, current position: Automotive Cybersecurity Research Engineer at Ford Greenfield Labs
 - Prof. Bruce DeBruhl, CMU ECE PhD, Spring 2015, current position: Assistant Professor in Computer Science and Software Engineering at California Polytechnic State University San Luis Obispo
 - Dr. Eric Chen (co-advised w/ Prof. Collin Jackson), CMU ECE PhD, Spring 2015, current position: Search Query Monitization Researcher at Google
 - Dr. Le T. Nguyen (co-advised w/ Prof. Joy Zhang), CMU ECE PhD, Spring 2016, current position: Data Scientist at Uber

- Dr. Xiao Wang, CMU ECE PhD, Spring 2017, current position: Research Scientist at Facebook
- Prof. Yuan Tian, CMU ECE PhD, Fall 2017, current position: Assistant Professor in Computer Science at University of Virginia
- Prof. Jun Han, CMU ECE PhD, Summer 2018, current position: Assistant Professor in Computer Science at National University of Singapore
- Dr. Emmanuel Owusu, CMU EPP PhD, Fall 2019, current position: Search Team Researcher at Thermo Fisher Scientific
- Dimitrios-Georgios Akestoridis, current CMU ECE PhD student
- Madhumitha Harishankar, current CMU ECE PhD student
- Manisha Mukherjee, current CMU ECE PhD student
- Brian Ricks, current PhD student in Computer Science at University of Texas at Dallas (co-advised w/ Prof. Bhavani Thuraisingham)
- Mike Weber, current CMU ECE PhD student
- Member of PhD Committee:
 - CMU ECE PhD graduates: Dr. Jonathan Becker, Dr. Irina Brinster, Dr. Lin-Shung Huang, Dr. Faisal Luqman, Dr. Luis Pinto, Dr. Tim Vidas, Dr. Ming Zeng, Dr. Jiang Zhu
 - External PhD graduates: Dr. Aanjhan Ranganathan (ETH, Computer Science)
- MS Student Advising:
 - Academic advisor for INI MS students (~15-30 students per annual cohort, for two years each), 2010 to present
 - Faculty mentor/advisor for ECE MS students (~3-5 students per twice-annual cohort, for two years each), 2010 to present
 - Advised/mentored 60+ students in research assistant or independent study project positions

Major Research Projects & Funding

- Design and implementation of cross-layer, interactive, and adaptive jamming and anti-jamming mechanisms: our research demonstrated multiple techniques for incorporating cross-layer information sharing, adaptive algorithms, and observation-based learning into jamming attack and anti-jamming defense mechanisms for wireless communication systems. This project was funded in part by grants from CMU CyLab, Northrop Grumman, and an NSF CAREER Award, totaling over \$1M.
- Integrating statistical analysis for attack and misbehavior detection in mobile and wireless networks: our research studied and demonstrated the use of network, application, and collaborative network-application analytics to detect a variety of attacks and misbehaviors in commercial and military wireless networks. This project was funded in part by grants from Northrop Grumman, totaling approximately \$400k.
- Leveraging and managing sensor data for Internet-of-Things and Cyber-physical system security: our research addressed both secure/privacy-preserving management of sensor data in IoT/CPS scenarios and how such data can be highly beneficial to IoT/CPS security. In particular, we demonstrated how sensor data from multiple sources can be used to protect against man-in-the-middle and impersonation attacks in IoT/CPS operations such as key establishment and pairing. This project was funded in part by grants from NSF CPS, Northrop Grumman, Samsung, and CMU CyLab, totaling over \$875k.
- Various other projects were sponsored by gifts from industry partners totaling over \$600k.

Publications

- *Journal Articles*

- Madhumitha Harishankar, Sireesha Pilaka, Pragya Sharma, Nagarjun Srinivasan, Carlee Joe-Wong, and Patrick Tague, “Procuring Spontaneous Session-level Resource Guarantees for Real-time Applications: An Auction Approach”, *IEEE Journal on Selected Areas of Communications (JSAC)*, Jul 2019.
- Jun Han, Shijia Pan, Manal Kumar Sinha, Hae Young Noh, Pei Zhang, and Patrick Tague, “Smart Home Occupant Identification via Sensor Fusion Across On-Object Devices”, *ACM Transactions on Sensor Networks (ToSN)*, Dec 2018.
- Xinlei Chen, Aveek Purohit, Shijia Pan, Carlos Ruiz, Jun Han, Zheng Sun, Frank Mokaya, Patrick Tague, and Pei Zhang, “Design Experiences in Minimalistic Flying Sensor Node Platform through SensorFly”, *ACM Transactions on Sensor Networks (ToSN)*, Dec 2017.
- Xiao Wang, Tong Yu, Ming Zeng, and Patrick Tague, “XRec: Behavior-Based User Recognition Across Mobile Devices”, *Proc. ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, Sep 2017.
- Yu Seung Kim, Patrick Tague, Heejo Lee, and Hyogon Kim, “A Jamming Approach to Enhance Enterprise Wi-Fi Secrecy through Spatial Access Control”, *Wireless Networks*, Apr 2015.
- Bruce DeBruhl and Patrick Tague, “Keeping up with the Jammers: Observe-and-Adapt Algorithms for Studying Mutually Adaptive Opponents”, *Elsevier Pervasive and Mobile Computing*, June 2014.
- Patrick Tague, Sidharth Nabar, James A. Ritcey, and Radha Poovendran, “Jamming-Aware Traffic Allocation for Multiple-Path Routing Using Portfolio Selection”, *IEEE/ACM Transactions on Networking (ToN)*, February 2011.
- Patrick Tague, Mingyan Li, and Radha Poovendran, “Mitigation of Control Channel Jamming under Node Capture Attacks”, *IEEE Transactions on Mobile Computing (TMC)*, September 2009.
- David Slater, Radha Poovendran, Patrick Tague, and Brian J. Matt, “Tradeoffs Between Jamming Resilience and Communication Efficiency in Key Establishment”, *ACM Mobile Computing and Communications Review (MC2R)*, April 2009.
- Patrick Tague, David Slater, Jason Rogers, and Radha Poovendran, “Evaluating the Vulnerability of Network Traffic Using Joint Security and Routing Analysis”, *IEEE Transactions on Dependable and Secure Computing (TDSC)*, Apr-Jun 2009.
- Patrick Tague and Radha Poovendran, “A Canonical Seed Assignment Model for Key Predistribution in Wireless Sensor Networks”, *ACM Transactions on Sensor Networks (ToSN)*, October 2007.
- Patrick Tague and Radha Poovendran, “Modeling Adaptive Node Capture Attacks in Multi-hop Wireless Networks”, *Ad Hoc Networks*, August 2007.

- *Conference/Workshop Papers*

- Dimitrios-Georgios Akestoridis, Madhumitha Harishankar, Michael Weber, and Patrick Tague, “Zigator: Analyzing the Security of Zigbee-Enabled Smart Homes”, *ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec)*, Jul 2020.
- Brian Ricks, Bhavani Thuraisingham, and Patrick Tague, “Mimicking Human Behavior in Shared-Resource Computer Networks”, *IEEE International Conference on Information Reuse and Integration for Data Science (IRI)*, Jul 2019.
- Madhumitha Harishankar, Patrick Tague, and Carlee Joe-Wong, “Network Slicing as an Ad-Hoc Service: Opportunities and Challenges in Enabling User-Driven Resource Management in 5G”, *Workshop on Trustworthy & Real-time Edge Computing for Cyber-Physical Systems*

- (TREC4CPS), Dec 2018.
- Brian Ricks, Bhavani Thuraisingham, and Patrick Tague, “Lifting the Smokescreen: Detecting Underlying Anomalies During a DDoS Attack”, IEEE Intelligence and Security Informatics (ISI), Nov 2018, (**best paper**).
 - Jianfeng Chi, Emmanuel Owusu, Xuwang Yin, Tong Yu, William Chan, Yiming Liu, Haodong Liu, Jiasen Chen, Swee Sim, Vibha Iyengar, Patrick Tague, and Yuan Tian, “Privacy Partition: A Privacy-Preserving Framework for Deep Neural Networks in Edge Networks”, Workshop on Computing Architecture for Edge Computing (ArchEdge), Oct 2018.
 - Bruce DeBruhl and Patrick Tague, “Optimizing a Misinformation and Misbehavior (MIB) Attack Targeting Connected Cars”, IEEE Connected and Automated Vehicles Symposium (CAVS), Aug 2018.
 - Brian Ricks, Patrick Tague, and Bhavani Thuraisingham, “Large-Scale Realistic Network Data Generation on a Budget”, IEEE International Conference on Information Reuse and Integration for Data Science (IRI), Jul 2018, (**best paper award**).
 - Jun Han, Albert Jin Chung, Manal Kumar Sinha, Madhumitha Harishankar, Shijia Pan, Hae Young Noh, Pei Zhang, and Patrick Tague, “Do You Feel What I Hear? Enabling Autonomous IoT Device Pairing using Different Sensor Types”, 39th IEEE Symposium on Security and Privacy (Oakland), May 2018.
 - Madhumitha Harishankar, Nagarjun Srinivasan, Carlee Joe-Wong, and Patrick Tague, “To Accept or Not to Accept: The Question of Supplemental Discount Offers in Mobile Data Plans”, IEEE International Conference on Computer Communications (INFOCOM), Apr 2018.
 - Shijia Pan, Carlos Ruiz, Jun Han, Adeola Bannis, Patrick Tague, Hae Young Noe, and Pei Zhang, “UniverSense: IoT Device Pairing Using Heterogeneous Sensing Signals”, 19th Intl Workshop on Mobile Computing Systems and Applications (HotMobile), Feb 2018.
 - Jun Han, Shijia Pan, Manal Kumar Sinha, Hae Young Noh, Pei Zhang, and Patrick Tague, “SenseTribute: Smart Home Occupant Identification via Fusion Across On-Object Sensing Devices”, 4th ACM International Conference on Systems for Energy-Efficient Built Environments (BuildSys) , Nov 2017.
 - Yuan Tian, Nan Zhang, Yueh-Hsun Lin, Xiaofeng Wang, Blase Ur, Xianzheng Guo, and Patrick Tague, “SmartAuth: User-Centered Authorization for the Internet of Things”, 26th USENIX Security Symposium, Aug 2017.
 - Xiao Wang, Tong Yu, Ole Mengshoel, and Patrick Tague, “Towards Continuous and Passive Identification Across Mobile Devices: An Empirical Study”, 10th ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec), Jul 2017.
 - Paul Dan Marinescu, Chad Parry, Marjori Pomarole, Yuan Tian, Patrick Tague, and Ioannis Papagiannis, “IVD: Automatic Learning and Enforcement of Authorization Rules in Online Social Networks”, IEEE Symposium on Security and Privacy (Oakland), May 2017.
 - Jun Han, Albert Jin Chung, and Patrick Tague, “PitchIn: Eavesdropping via Intelligible Speech Reconstruction using Non-Acoustic Sensor Fusion”, 16th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN), Apr 2017.
 - Jun Han, Madhumitha Harishankar, Xiao Wang, Albert Jin Chung, and Patrick Tague, “Convoy: Physical Context Verification for Vehicle Platoon Admission”, 18th International Workshop on Mobile Computing Systems and Applications (HotMobile), Feb 2017.
 - Yuan Tian, Shuo Chen, Eric Chen, Xiaojun Ma, Xiao Wang, and Patrick Tague, “Swords and Shields - A Study of Mobile Game Hacks and Existing Defenses”, 2016 Annual Computer Security Applications Conference (ACSAC), Dec 2016.

- Brian Ricks and Patrick Tague, “Isolation of Multiple Anonymous Attackers in Mobile Networks”, 9th International Conference on Network and System Security, Nov 2015.
- Yuan Tian, Bin Liu, Weisi Dai, Blase Ur, Patrick Tague, and Lorrie Faith Cranor, “Supporting Privacy-Conscious App Update Decisions with User Reviews”, 5th Annual ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM), Oct 2015.
- Le T. Nguyen, Ming Zeng, Patrick Tague, and Joy Zhang, “I Did Not Smoke 100 Cigarettes Today! Avoiding False Positives in Real-World Activity Recognition”, ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp), Sep 2015.
- Le T. Nguyen, Ming Zeng, Patrick Tague, and Joy Zhang, “Recognizing New Activities with Limited Training Data”, 19th International Symposium on Wearable Computers (ISWC), Sep 2015.
- Le T. Nguyen, Ming Zeng, Patrick Tague, and Joy Zhang, “SuperAD: Supervised Activity Discovery”, 3rd International Workshop on Human Activity Sensing Corpus and its Application (HASCA), Sep 2015.
- Bruce DeBruhl, Sean Weerakkody, Bruno Sinopoli, and Patrick Tague, “Is Your Commute Driving you Crazy? A Study of Misbehavior in Vehicular Platoons”, ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec), Jun 2015.
- Xiao Wang and Patrick Tague, “Non-Invasive User Tracking via Passive Sensing: Privacy Risks of Time-Series Occupancy Measurement”, ACM CCS Workshop on Artificial Intelligence and Security (AISec), Nov 2014.
- Timothy Vidas, Jiaqi Tan, Jay Nahata, Chaur-Lih Tan, Nicolas Christin, and Patrick Tague, “A5: Automated Analysis of Adversarial Android Applications”, ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM), Nov 2014.
- Eric Chen, Yutong Pei, Shuo Chen, Yuan Tian, Robert Kotcher, and Patrick Tague, “OAuth Demystified for Mobile Application Developers”, ACM Conference on Computer and Communications Security (CCS), Nov 2014.
- Yu Seung Kim, Yuan Tian, Le T. Nguyen, and Patrick Tague, “LAPWiN: Location-Aided Probing for Protecting User Privacy in Wi-Fi Networks”, IEEE Conference on Communications and Network Security (CNS), Oct 2014.
- Yu Seung Kim, Bruce DeBruhl, and Patrick Tague, “JADE: Jamming-Averse Routing on Cognitive Radio Mesh Networks”, IEEE CNS Workshop on Cognitive Radio and Electromagnetic Spectrum Security (CRESS), Oct 2014.
- Su Mon Kywe, Christopher Landis, Yutong Pei, Justin Satterfield, Yuan Tian, and Patrick Tague, “PrivateDroid: Private Browsing Mode for Android”, IEEE International Conference on Trust, Security and Privacy in Computing and Communications (TrustCom), Sep 2014.
- Le T. Nguyen, Yu Seung Kim, Patrick Tague, and Joy Zhang, “IdentityLink: User-Device Linking through Visual and RF-Signal Cues”, ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp), Sep 2014.
- Yu Seung Kim and Patrick Tague, “Proximity-Based Wireless Access Control through Considerate Jamming”, ACM Mobicom Workshop on Security and Privacy Aspects of Mobile Environments (SPME), Sep 2014.
- Bruce DeBruhl, Christian Kroer, Anupam Datta, Tuomas Sandholm, and Patrick Tague, “Power Napping with Loud Neighbors: Optimal Energy-Constrained Jamming and Anti-Jamming”, ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec), Jul 2014.
- Yuan Tian, Ying-Chuan Liu, Amar Bhosale, Lin-Shung Huang, Patrick Tague, and Collin Jackson, “All Your Screens Are Belong to Us: Attacks Exploiting the HTML5 Screen Sharing API”,

- 35th IEEE Symposium on Security and Privacy (Oakland), May 2014.
- Arjun Athreya, Harry Chan-Maestas, Edward Katz, Patrick Tague, and Bob Iannucci, “Energy-Governed Resilient Networked Systems”, 11th Annual IEEE Consumer Communications and Networking Conference, Jan 2014, (**best paper award**).
 - Arjun Athreya, Bruce DeBruhl, and Patrick Tague, “Designing for Self-Configuration and Self-Adaptation in the Internet of Things”, CollaborateCom First International Workshop on Internet of Things (C-IOT), Oct 2013.
 - Yu Seung Kim, Bruce DeBruhl, and Patrick Tague, “MeshJam: Intelligent Jamming Attack and Defense in IEEE 802.11s Wireless Mesh Networks”, 10th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), Oct 2013.
 - Arjun Athreya, Xiao Wang, Yu Seung Kim, Yuan Tian, and Patrick Tague, “Resistance is Not Futile: Detecting DDoS Attacks without Packet Inspection”, International Workshop on Information Security Applications (WISA), Aug 2013.
 - Le T. Nguyen, Yuan Tian, Sungho Cho, Wookjong Kwak, Sanjay Parab, Yu Seung Kim, Patrick Tague, and Joy Zhang, “UnLocIn: Unauthorized Location Inference on Smartphones without Being Caught”, International Conference on Security and Privacy in Mobile Information and Communication Systems (PRISMS), Jun 2013.
 - Arjun Athreya and Patrick Tague, “Network Self-Organization in the Internet of Things”, IEEE International Workshop on Internet-of-Things Networking and Control (IoT-NC), Jun 2013.
 - Bruce DeBruhl and Patrick Tague, “How to Jam Without Getting Caught: Analysis and Empirical Study of Stealthy Periodic Jamming”, IEEE International Conference on Sensing, Communication, and Networking (SECON), Jun 2013.
 - Xiao Wang and Patrick Tague, “ASIA: Accelerated Secure In-network Aggregation in Vehicular Sensing Networks”, IEEE International Conference on Sensing, Communication, and Networking (SECON), Jun 2013.
 - Yu Seung Kim, Bruce DeBruhl, and Patrick Tague, “Stochastic Optimization of Flow-Jamming Attacks in Multichannel Wireless Networks”, IEEE International Conference on Communications (ICC), Jun 2013.
 - Shrikant Adhikarla, Min Suk Kang, and Patrick Tague, “Selfish Manipulation of Cooperative Cellular Communications via Channel Fabrication”, 6th ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec), Apr 2013.
 - Arjun Athreya and Patrick Tague, “Self-Organization of a Mesh Hierarchy for Smart Grid Monitoring in Outage Scenarios”, 4th IEEE PES Innovative Smart Grid Technologies Conference (ISGT), Feb 2013.
 - Bruce DeBruhl, Yu Seung Kim, Zachary Weinberg, and Patrick Tague, “STIR-ing the Wireless Medium with Self-Tuned, Inference-Based, Real-Time Jamming”, 9th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), Oct 2012.
 - Bruce DeBruhl and Patrick Tague, “Living with Boisterous Neighbors: Studying the Interaction of Adaptive Jamming and Anti-Jamming”, 3rd International Workshop on Data Security and Privacy in Wireless Networks (D-SPAN), Jun 2012.
 - Yu Seung Kim, Frank Mokaya, Eric Chen, and Patrick Tague, “All Your Jammers Belong to Us - Localization of Wireless Sensors Under Jamming Attack”, IEEE International Conference on Communications (ICC), Jun 2012.
 - Yu Seung Kim, Patrick Tague, Heejo Lee, and Hyogon Kim, “Carving Secure Wi-Fi Zones with Defensive Jamming”, 7th ACM Symposium on Information, Computer, and Communications Security (AsiaCCS), May 2012.

- Bruce DeBruhl and Patrick Tague, “Mitigation of Periodic Jamming in a Spread Spectrum System by Adaptive Filter Selection”, 2nd International Conference on Pervasive and Embedded Computing and Communication Systems (PECCS), Feb 2012.
- Xin Zhang, Zongwei Zhou, Hsu-Chun Hsiao, Tiffany Hyun-Jin Kim, Adrian Perrig, and Patrick Tague, “ShortMAC: Efficient Data-Plane Fault Localization”, 19th Annual Network and Distributed System Security Symposium (NDSS), Feb 2012.
- Arjun Athreya and Patrick Tague, “Survivable Smart Grid Communication: Smart-Meters Meshes to the Rescue”, 1st International Workshop on Communication Technologies Support for the Smart Grid (SGCom), Jan 2012.
- Bruce DeBruhl and Patrick Tague, “Digital Filter Design for Jamming Mitigation in 802.15.4 Communication”, IEEE International Conference on Computer Communication Networks (ICCCN), Aug 2011.
- Senaka Buthpitiya, Feng-Tso Sun, Heng-Tze Cheng, Patrick Tague, Martin Griss, and Anind K. Dey, “Anubis: An Attestation Protocol for Distributed Context-Aware Applications”, 6th International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), Dec 2010.
- Patrick Tague, “Improving Anti-Jamming Capability and Increasing Jamming Impact with Mobility Control”, 6th IEEE International Workshop on Wireless and Sensor Networks Security (WSNS), Nov 2010.
- David Slater, Patrick Tague, Mingyan Li, and Radha Poovendran, “A Game-Theoretic Framework for Jamming Attacks and Mitigation in Commercial Aircraft Wireless Networks”, AIAA Infotech@Aerospace Conference, Apr 2009.
- David Slater, Patrick Tague, Radha Poovendran, and Brian J. Matt, “A Coding-Theoretic Approach for Efficient Message Verification Over Insecure Channels”, Second ACM Conference on Wireless Network Security (WiSec), Mar 2009.
- Patrick Tague and Radha Poovendran, “Modeling Node Capture Attacks in Wireless Sensor Networks”, 46th Annual Allerton Conference on Communication, Control, and Computing, Sep 2008.
- Patrick Tague, Sidharth Nabar, James A. Ritcey, David Slater, and Radha Poovendran, “Throughput Optimization for Multipath Unicast Routing Under Probabilistic Jamming”, 19th Annual IEEE International Symposium on Personal, Indoor, and Mobile Radio Communication (PIMRC), Sep 2008.
- Patrick Tague, David Slater, Jason Rogers, and Radha Poovendran, “Vulnerability of Network Traffic under Node Capture Attacks using Circuit Theoretic Analysis”, 27th IEEE Conference on Computer Communications (INFOCOM), Apr 2008.
- Patrick Tague, David Slater, Guevara Noubir, and Radha Poovendran, “Linear Programming Models for Jamming Attacks on Network Traffic Flows”, 6th Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), Apr 2008.
- Patrick Tague, Mingyan Li, and Radha Poovendran, “Probabilistic Mitigation of Control Channel Jamming via Random Key Distribution”, 18th Annual IEEE International Symposium on Personal, Indoor, and Mobile Radio Communication (PIMRC), Sep 2007, (**best paper award**).
- Patrick Tague and Radha Poovendran, “A General Probabilistic Model for Improving Key Assignment in Wireless Networks”, 4th International Symposium on Modeling and Optimization in Mobile, Ad-hoc, and Wireless Networks (WiOpt), Apr 2006.
- Patrick Tague, Jooyoung Lee, and Radha Poovendran, “A Set-Covering Approach for Modeling Attacks on Key Predistribution in Wireless Sensor Networks”, 3rd International Conference on

Intelligent Sensing and Information Processing (ICISIP-Bangalore), Dec 2005.

- *Posters/Demos in Conference Proceedings*

- Christopher Hensler and Patrick Tague, “Using Bluetooth Low Energy Spoofing to Dispute Device Details”, ACM Conference on Security and Privacy in Wireless and Mobile Networks, May 2019.
- Yu Seung Kim and Patrick Tague, “Wireless Mesh Network Simulator for Studying Cross-Layer Jamming Effects”, 10th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), Oct 2013.
- Jason Wu, Lin Qi, Nishant Kumar, Ram Shankar Siva Kumar, and Patrick Tague, “S-SPAN: Secure Smart Posters in Android using NFC”, 13th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM), Jun 2012.
- Bruce DeBruhl, Yu Seung Kim, and Patrick Tague, “A Toolbox to Explore the Interaction of Adaptive Jamming and Anti-Jamming”, 31st IEEE Conference on Computer Communications (INFOCOM), Mar 2012.
- Yu Seung Kim and Patrick Tague, “Jamming-resistant Distributed Path Selection on Wireless Mesh Networks”, 31st IEEE Conference on Computer Communications (INFOCOM), Mar 2012.
- Arjun Athreya and Patrick Tague, “Towards Secure Multi-path Routing for Wireless Mobile Ad-Hoc Networks: A Cross-layer Strategy”, IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), Jun 2011.

- *Technical Reports*

- Bob Iannucci, Patrick Tague, Ole Mengshoel, and Jason Lohn, “CROSSMobile: A Cross-Layer Architecture for Next-Generation Wireless Systems”, Carnegie Mellon University Silicon Valley, Technical Report CMU-SV-14-001, 2014.
- Ryan Caney, Christopher Dorros, Stuart Kennedy, Gregory Owens, and Patrick Tague, “Mobile Pickpocketing: Exfiltration of Sensitive Data through NFC-enabled Mobile Devices”, Carnegie Mellon University CyLab, Technical Report CMU-CyLab-13-015, 2013.
- Yu Seung Kim, Patrick Tague, Heejo Lee, and Hyogon Kim, “Carving Secure Wi-Fi Zones with Defensive Jamming (Extended Version)”, Carnegie Mellon University, MEWS Technical Report TR-DefJam, 2012.
- Patrick Tague, David Slater, Guevara Noubir, and Radha Poovendran, “Quantifying the Impact of Efficient Cross-Layer Jamming Attacks via Network Traffic Flows”, Network Security Lab (NSL) Technical Report #005, 2009.

- *Patents*

- Thanh Le Nguyen, Yu Seung Kim, Patrick Tague, and Joy Zhang, “Associating a user identity with a mobile device identity”, US Patent Number 10,354,145, issued July 2019.
- Yu Seung Kim, Jun Han, and Patrick Tague, “Inter-Vehicle Authentication using Visual Contextual Information”, US Patent Number 9,842,263, issued December 2017.
- Mingyan Li, Patrick Tague, and Radha Poovendran, Probabilistic Mitigation of Control Channel Jamming Via Random Key Distribution in Wireless Communications Networks, US Patent 8,391,493, issued March 2013.

Service

- *Committees and Events at CMU*

- CMU Committee on Cybersecurity and Privacy Education and Research (CAPER), 2015.

- ECE Department: ECE Graduate Studies Committee (GSC) from August 2014 to May 2016, ECE Graduate Admissions Committee from August 2016 to present, member of 1-2 PhD qualifying exam committees per semester since Fall 2009.
- INI representative on various committees at the CMU Silicon Valley campus (e.g., curriculum, IT/AV, space, events) from 2010 to present.
- Instructor for two sessions during the NSF-sponsored Information Assurance Capacity Building Program in 2011.
- *Conference/Journal Activities*
 - Associate Editor, IEEE Transactions on Mobile Computing, 2017-2020.
 - Technical Program Committee Co-Chair, Workshop on the Internet of Safe Things, 2020.
 - General Co-Chair, Workshop on the Internet of Safe Things, 2017 and 2018.
 - General Co-Chair, ACM Workshop on Privacy-Aware Mobile Computing, 2016.
 - General Co-Chair, MobiCASE Workshop on Mobile Security, 2010 and 2011.
 - Finance and Local Chair, IEEE ICNP, 2015.
 - Tutorial Chair, ACM CCS, 2014 and 2015.
 - Local Arrangements Chair, IEEE CNS, 2014.
 - Registration Chair, ACM Mobicom, 2014.
 - Demo Session Co-Chair, IEEE SECON, 2014.
 - Student Travel Grant Chair, IEEE SECON, 2012.
 - Demo Session Co-Chair, IEEE WoWMoM, 2012.
 - Conference Publicity Chair, ACM WiSec, 2012.
 - Program Committee Member:
 - * IEEE International Conference on Computer Communications (Infocom), 2015-2020.
 - * IEEE Conference on Communication and Network Security (CNS), 2017-2020.
 - * ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec), 2014-2020.
 - * IEEE Wireless Communications and Networking Conference (WCNC), 2012-2020.
 - * USENIX Security Symposium, 2018.
 - * ACM Conference on Information Processing in Sensor Networks (IPSN), 2018.
 - * ACM Asia Conference on Computer and Communications Security (ASIACCS), 2014-2017.
 - * IEEE International Conference on Sensing, Communication, and Networking (SECON), 2012-2017.
 - * IEEE Global Communications Conference (Globecom), 2013-2017.
 - * Annual Computer Security Applications Conference (ACSAC), 2013-2015.
 - * Network and Distributed System Security Symposium (NDSS), 2014.
 - * ACM Conference on Computer and Communications Security (CCS), 2013-2014.
 - * IEEE Vehicular Technology Conference (VTC), 2010-2014.
 - * International Conference on Security and Privacy in Communication Networks (SecureComm), 2010-2013.
 - * IEEE International Workshop on Data Security and Privacy in Wireless Networks (D-SPAN), 2013.
 - * International Conference on Security of Internet of Things (SecurIT), 2012.
 - * IEEE International Workshop on Wireless and Sensor Networks Security (WSNS), 2011.