

Endadul Hoque

Curriculum Vitae

Assistant Professor
Department of Electrical Engineering and Computer Science
College of Engineering and Computer Science
Syracuse University
4-206 Center for Science and Technology, Syracuse, NY 13244

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Research Interests

Network and systems security; protocol analysis; vulnerability detection; program analysis; automated testing and verification; IoT systems security

Education

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|---|-----------------|
| PhD in Computer Science Purdue University , West Lafayette, IN, USA | Dec 2015 |
| MS in Computer Science Marquette University , Milwaukee, WI, USA | Aug 2010 |
| BSc in Computer Science and Engineering Bangladesh University of Engineering and Technology (BUET) , Dhaka, Bangladesh | Jan 2008 |

Academic Position

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|---|----------------------------|
| Assistant Professor Syracuse University , Department of Electrical Engineering and Computer Science, Syracuse NY | Aug 2019 – present |
| Assistant Professor Florida International University , School of Computing and Information Sciences, Miami FL | Aug 2017 – Jul 2019 |
| Postdoctoral Research Associate Northeastern University , College of Computer and Information Science, Boston MA | Jan 2016 – Dec 2016 |

Fellowships and Awards

- **Cisco Network Security Distinguished Paper Award** at NDSS 2018 (*Network and Distributed System Security Symposium*)
- **Bilsland Dissertation Fellowship** Award in 2015 from the Graduate School at Purdue University
- **Graduate Teaching Fellowship** Award in 2014 from Dept. of Computer Science at Purdue University
- **Dean's Merit List Award** in 2006 and 2007 during my undergraduate at BUET

Publications

Refereed Conference Papers

- M. Yahyazadeh, P. Podder, E. Hoque, and O. Chowdhury. “EXPAT: Expectation-based Policy Analysis and Enforcement for Appified Smart-Home Platforms,” in *24th ACM Symposium on Access Control Models and Technologies (SACMAT 2019)*, Toronto, ON, Canada, June 2019.
- S. Jero, **E. Hoque**, D. Choffnes, A. Mislove, and C. Nita-Rotaru. “Automated Attack Discovery in TCP Congestion Control Using a Model-guided Approach,” in *25th Network and Distributed System Security Symposiums (NDSS 2018)*, San Diego, CA, Feb 2018. [**Distinguished Paper Award**]
- **E. Hoque**, O. Chowdhury, S. Chau, C. Nita-Rotaru, and N. Li. “Analyzing Operational Behavior of Stateful Protocol Implementations for Detecting Semantic Bugs,” in *IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2017)*, Denver, CO, June 2017.
- S. Chau, O. Chowdhury, **E. Hoque**, H. Ge, A. Kate, C. Nita-Rotaru, and N. Li. “SymCerts: Practical Symbolic Execution For Exposing Noncompliance in X.509 Certificate Validation Implementations,” in Proc. of *IEEE Symposium on Security and Privacy (S&P 2017)*, San Jose, CA, May 2017.
- **E. Hoque** and C. Nita-Rotaru. “Building Robust Distributed Systems and Network Protocols by Using Adversarial Testing and Behavioral Analysis,” in Proc. of *IEEE Cybersecurity Development Conference (SecDev 2016)*, Boston, MA, Nov 2016.
- D. Obenshain, T. Tantillo, A. Babay, J. Schultz, A. Newell, **E. Hoque**, Y. Amir, C. Nita-Rotaru. “Practical Intrusion-Tolerant Networks,” in Proc. of *IEEE International Conference on Distributed Computing Systems (ICDCS 2016)*, Japan, Jun 2016.
- H. Lee, J. Seibert, **E. Hoque**, C. Killian and C. Nita-Rotaru. “Turret: A Platform for Automated Attack Finding in Unmodified Distributed System Implementations,” in Proc. of *IEEE International Conference on Distributed Computing Systems (ICDCS 2014)*, Spain, Jul 2014.
- **E. Hoque**, H. Lee, R. Potharaju, C. Killian and C. Nita-Rotaru. “Adversarial Testing of Wireless Routing Implementations,” in Proc. of *ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec 2013)*, Hungary, Apr 2013.
- R. Potharaju, **E. Hoque**, C. Nita-Rotaru, S. Venkatesh, and S. Sarkar. “Closing the Pandora’s Box: Defenses for Thwarting Epidemic Outbreaks in Mobile Adhoc Networks,” in Proc. of *IEEE International Conference on Mobile Ad hoc and Sensor Systems (MASS 2012)*, NV, USA, Oct 2012.
- **E. Hoque**, F. Rahman, and S. Ahamed. “AnonPri: An Efficient Anonymous Private Authentication Protocol,” in Proc. of *IEEE International Conference on Pervasive Computing and Communications (PerCom 2011)*, WA, USA, Mar 2011.
- F. Rahman, **E. Hoque**, F. Kawsar, and S. Ahamed. “Preserve Your Privacy with PCO: A Privacy Sensitive Architecture for Context Obfuscation for Pervasive E-Community based applications,” in Proc. of *IEEE International Conference on Social Computing (SocialCom 2010)*, MN, USA, Aug 2010.
- **E. Hoque**, F. Rahman, and S. Ahamed. “Supporting Recovery, Privacy and Security in RFID Systems

Using a Robust Authentication Protocol,” in Proc. of *ACM Symposium on Applied Computing (SAC 2009)*, Mar 2009.

Refereed Journal Papers

- **E. Hoque**, H. Lee, R. Potharaju, C. Killian, and C. Nita-Rotaru. “Automated Adversarial Testing of Unmodified Wireless Routing Implementations,” *IEEE/ACM Transactions on Networking (ToN)*, vol 24, issue 6, Dec 2016..
- **E. Hoque**, R. Potharaju, C. Nita-Rotaru, S. Venkatesh, and S. Sarkar. “Taming Epidemic Outbreaks in Mobile Adhoc Networks”, *Ad Hoc Networks*, Elsevier, Vol. 24, part A, pp. 57-72, Jan 2015.
- **E. Hoque**, F. Rahman, S. Ahamed, and J. Park. “Enhancing Privacy and Security of RFID System with Serverless Authentication and Search Protocols in Pervasive Environments”, *Wireless Personal Communication*, Springer, 55(1), pp. 65-79, 2009.

Workshop Papers and Posters

- Anthony Peterson, Samuel Jero, Endadul Hoque, Cristina Nita-Rotaru, and David Choffnes. “aB-BRate: Automating BBR Attack Exploration Using a Model-Based Approach,” Poster in *5th New England Network and Systems Day (NENS 2019)*, Cambridge, MA, Apr 2019.
<https://systems.cs.brown.edu/nens/2019/>
- S. Jero, **E. Hoque**, D. Choffnes, A. Mislove, and C. Nita-Rotaru. “Automated Attack Discovery in TCP Congestion Control Using a Model-guided Approach”, Poster in *Applied Networking Research Workshop (ANRW 2018)*, Quebec, Canada, Jul 2018.
- **E. Hoque**, O. Chowdhury, S. Y. Chau, C. Nita-Rotaru, and N. Li. “Detecting specification non-compliance in network protocol implementations,” Poster in *USENIX Annual Technical Conference (USENIX ATC 2016)*, CO, USA, Jun 2016.
- **E. Hoque**, H. Lee, R. Potharaju, C. Killian, and C. Nita-Rotaru. “Adversarial Testing of Wireless Routing Implementations,” Poster in *CERIAS Annual Information Security Symposium*, West Lafayette, IN, 2013.
- **E. Hoque**, F. Rahman, S. Ahamed, and L. Liu. “Trust Based Security Auto-Configuration for Smart Assisted Living Environments,” in *ACM Workshop on Assurable & Usable Security Configuration (SafeConfig 2009)* held with *ACM CCS 2009*, IL, USA, Nov 2009.

Technical Report

- **E. Hoque**, H. Lee, C. Killian, and C. Nita-Rotaru. “A Testing Platform for Teaching Secure Distributed Systems Programming,” Department of Computer Science, Purdue University, TR 16-002, 2016. <http://docs.lib.purdue.edu/cstech/1779>.

Other Professional Experience

Research Assistant
Purdue University, Dept. of Computer Science

Aug 2010 - Dec 2015

Dependable and Secure Distributed Systems Lab

Graduate Teaching Fellow

Purdue University, Dept. of Computer Science

Aug 2014 - Dec 2014

Graduate Teaching Assistant

Purdue University, Dept. of Computer Science

Jan 2013 - May 2013, Aug 2011 - Dec 2011

Graduate Software Engineer Intern

Intel Corporation, California

May 2014 - Aug 2014

Graduate Assistant

Marquette University, Milwaukee, WI

Aug 2008 - May 2010

Teaching

Courses at *Syracuse University*

- CIS 657: **Principles of Operating Systems** (Graduate): Spring 2020
- CSE 791: **Security of Systems, Networking, and IoT** (Graduate): Fall 2019

Courses taught at *Florida International University*

- FIU CIS 5373: **Systems Security** (Graduate): Fall 2017, Fall 2018, Spring 2019
- FIU COT 5428: **Formal Foundations for Cybersecurity** (Graduate): Spring 2018

Student Guidance

- **PhD Advisees**
 - Li Li (at Syracuse University)
 - Proyash Podder (till July 2019 at FIU)
- **MS Advisees**
 - Bohdan Dovhan
 - MS (graduated on April 2019) from FIU
 - Currently doing PhD at University of Manitoba, Winnipeg MB, Canada
- **MS Thesis Committee Member**
 - Anthony Peterson (*Northeastern University*)
 - MS (graduated on May 2019) from *Northeastern University*
- **PhD Dissertation Committee Member**
 - Rajender Kumar (till July 2019 at FIU)
 - Sanjeev Kaushik Ramani (till July 2019 at FIU)
 - Sai Chaithra Allala (till July 2019 at FIU)
 - Labiba Jahan (till July 2019 at FIU)

Service

- **Program committee member**
 - Network and Distributed System Security Symposium (**NDSS 2019, 2018**)
 - The Web Conference (**WebConference/WWW 2019**)
 - IEEE International Conference on Network Protocols (**ICNP 2018, 2019**)
 - IEEE International Conference on Distributed Computing Systems (**ICDCS 2018**)
 - European Dependable Computing Conference (**EDCC 2018**)
- **Proposal Reviewer**
 - Ad Hoc Reviewer for **NSF NeTS Medium 2018**
- **Program Co-chair**
 - International Workshop on Mobile and Pervasive Internet of Things (**PerIoT 2020, 2019, 2018, 2017**) co-located with **IEEE PerCom 2020, 2019, 2018, 2017**
- **External reviewer** for conferences
 - USENIX Security Symposium [2016, 2015, 2014]
 - IEEE Symposium on Security and Privacy (Oakland S&P) [2013, 2012, 2011]
 - Network and Distributed System Security Symposium (NDSS) [2013, 2012, 2011]
 - ACM Conference on Computer and Communication (ACM CCS) [2013]
 - IEEE/IFIP International Conference on Dependable Systems and Networks (DSN) [2015, 2012]
 - International World Wide Web Conference (WWW) [2013]
 - International Conference on Distributed Computing Systems (ICDCS) [2015, 2011]
 - IEEE World of Wireless Mobile and Multimedia Networks (WOWMOM) [2011]
 - IEEE International Conference on Sensing, Communications and Networks (SECON) [2011]
- **Journal reviewer**
 - IEEE/ACM Transactions on Networking (**ToN**) [2018]
 - ACM Transactions on the Web (**TWEB**) [2016]
 - IEEE Transactions on Dependable and Secure Computing (**TDSC**) [2015, 2014]
 - IEEE Wireless Communication Magazine (**WCM**) [2013]
 - IEEE Transactions on Mobile Computing (**TMC**) [2012]

Talks and Presentations

- Security of Systems, Networking and IoT.
ECS Lightning Talks, Syracuse University, Oct 2019.
- Security of Systems, Networking and IoT.
PhD Student recruitment, Syracuse University, Aug 2019.
- Security of Networked Systems.
ECS College Retreat, Syracuse University, Aug 2019.

- EXPAT: Expectation-based Policy Analysis and Enforcement for Appified Smart-Home Platforms. Conference Talk at ACM SACMAT, Toronto ON Canada, June 2019.
- Securing Networks Using Protocol Semantics-guided Approaches. Department of Electrical Engineering and Computer Science, Syracuse University, April 2019.
- Automated Detection of Specification Bugs in Network Protocol Implementations. Faculty Lecture Series, Florida International University, Miami FL, Nov 2017.
- Automated Detection of Specification Bugs in Network Protocol Implementations. Invited Speaker at International Conference on Networking, Systems and Security (4th NSysS 2017), Bangladesh, 2017.
- Analyzing Operational Behavior of Stateful Protocol Implementations for Detecting Semantic Bugs. Conference talk at IEEE/IFIP DSN, Denver CO, Jun 2017.
- Securing Networks by Detecting Logical Flaws in Protocol Implementations CS Seminar, University of Maryland Baltimore County, Baltimore MD, Feb 2017.
- Securing Networks by Detecting Logical Flaws in Protocol Implementations SCIS Seminar, Florida International University, Miami FL, Feb 2017.
- Securing Networks by Detecting Logical Flaws in Protocol Implementations CS Seminar, New Jersey Institute of Technology, Newark NJ, Jan 2017.
- Automated Compliance Checking and Adversarial Testing of Network Protocol Implementations Graduate Seminar Series, Old Dominion University, Norfolk, VA, Oct 2016
- Detecting Specification Noncompliance in Network Protocol Implementations Northeastern University, Boston, MA, April 2016
- Finding Specification Noncompliance and Attacks in Wireless Network Protocol Implementations CERIAS Security Seminar, Purdue University, West Lafayette, IN, April 2016
- Closing the Pandora's Box: Defenses for Thwarting Epidemic Outbreaks in Mobile Adhoc Networks Conference talk at MASS, Las Vegas, NV, Oct 2012

Other Scholarly and Creative Accomplishments

- *SymCerts: Practical Symbolic Execution For Exposing Noncompliance in X.509 Certificate Validation Implementations* (S&P'17) selected as a CSAW North America **finalist** in the **CSAW'17 Applied Research Competition**

Research Coverage in Technology Media

- *Automated Attack Discovery in TCP Congestion Control Using a Model-guided Approach* (NDSS'18)
 - Internet Society (02/2018) [[link](#)]
 - School of Computing and Information Sciences @ FIU (02/2018) [[link](#)]
- *SymCerts: Practical Symbolic Execution For Exposing Noncompliance in X.509 Certificate Validation Implementations* (S&P'17)

- Bug reports included in National Vulnerability Database (NVD) [Common Vulnerabilities and Exposures – MITRE]
CVE-2017-1000415 [link], CVE-2017-1000416 [link], CVE-2017-1000417 [link]

Software Artifacts

- **TCPwn**, A tool for automated discovery of congestion control attacks on TCP implementations
<https://github.com/samueljero/TCPwn>
 - **Turret**, A tool to automatically find performance attacks in implementations of distributed systems
<https://nds2.ccs.neu.edu/autoattack.html#software>
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