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Monowar Hasan

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Current Appointment

- **Assistant Professor** **January 2021 – Present**
  Electrical Engineering and Computer Science
  Wichita State University (WSU), KS, United States

Education

- **Ph.D. [Computer Science]** **December 2020**
  University of Illinois at Urbana-Champaign (UIUC), Illinois, United States
  Dissertation: *Integrating Security Into Real-Time Cyber-Physical Systems*
- **M.Sc. [Electrical and Computer Engineering]** **May 2015**
  University of Manitoba (U of M), Manitoba, Canada
  Thesis: *Radio resource management for relay-aided device-to-device communication*
  (URI: http://hdl.handle.net/1993/30531)
- **B.Sc. [Computer Science and Engineering]** **April 2012**
  Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

Research Interests – Systems, Security, and Networking

Embedded, Real-Time and Cyber-Physical Systems (CPS) Security, Internet-of-Things (IoT), Autonomous and Industrial Control Systems, Wireless Communications and Software-defined Networking (SDN), Security and Management of Vehicle-to-Vehicle (V2X) Communications

My main contributions have, so far, been in the real-time systems and cellular wireless communities. Significant contributions include *(a)* methods to improve the resiliency of such systems and *(b)* design, implementation, and testing of novel security and scheduling frameworks to create robust cyber-physical and wireless communication platforms.

Teaching Interests

Real-Time Systems, Embedded Systems, Secure Cyber-Physical Systems and Internet-of-Things,
Wireless Communications, Operating Systems

Highlights

- **Publications:** 20+ peer-reviewed papers in top conferences and journals (RTSS, ECRTS, DATE, ICCPS, INFOCOM, IoT, TWC, TC, Network, Comm. Mag.)
- **Awards:** Best student paper and outstanding paper awards at a premier real-time conference, C.L. and Jane W.-S. Liu Award, University of Manitoba Graduate Fellowship
- **Impact:** 1500+ citations with h-index=14
- **Service:** Reviewer for multiple top-tier IEEE journals and conferences (IoT, TCAD, Access, TMC, TWC, ICCPS, RTAS, RTAS, ICC, GlOBECOM, etc.)
- **Collaborations:** Multiple ongoing and past collaborations with industry (Toyota Research, SRI International, Visa Research) and universities (University of Waterloo, Oregon State University, University of Colorado-Colorado Springs, Nanyang Technological University, Sungkyunkwan University, Tampere University of Technology)

Industrial Experience

- **Research Intern** **June – August 2019**
  R&D Info Tech Labs, Toyota Motor North America, California, United States **May – August 2018**
  Research topic: *Performance evaluation of cellular vehicle-to-vehicle (C-V2X) communications*
- **Student Research Associate** **May – August 2017**
  IoT Security and Privacy Center, SRI International, California, United States
  Research topic: *Security and privacy issues in Internet-of-things (IoT)*

Publications

Note:

a. Citation statistics are obtained from Google Scholar (as of January 2021).
b. Asterisk (*) represents authors contributed equally to the work.

Total citations	**1787**
h-index	**16**
i10-index	**19**

- ***Book Chapter:***

33. **M. Hasan** and E. Hossain, "Distributed resource allocation in 5G cellular networks," book chapter in *Towards 5G: Applications, Requirements & Candidate Technologies*, Wiley, 2016. [cited **48** times]

- ***Journals and Magazines:***

32. **M. Hasan**, S. Mohan, T. Shimizu, H. Lu, "Securing vehicle-to-everything (V2X) communication platforms," *IEEE Transactions on Intelligent Vehicles*, vol. 5, no. 4, pp. 693-713, Dec. 2020. [cited **4** times]
31. F. Abdi, C. Chen, **M. Hasan**, S. Liu, S. Mohan, and M. Caccamo, "Preserving physical safety under cyber attacks," *IEEE Internet of Things Journal*, vol. 6, no. 4, pp. 6285-6300, Aug. 2019. [cited **14** times]
30. C. Chen*, **M. Hasan***, and S. Mohan, "Securing real-time Internet-of-things," *Sensors*, vol. 18, no. 12, Dec. 2018. [cited **21** times]
29. **M. Hasan** and E. Hossain, "Distributed resource allocation for relay-aided device-to-device communication under channel uncertainties: A stable matching approach," *IEEE Transactions on Communications*, vol. 63, no. 10, pp. 3882-3897, Oct. 2015. [cited **81** times]
28. E. Hossain and **M. Hasan**, "5G cellular: Enabling technologies and research challenges," *IEEE Instrumentation & Measurement Magazine*, vol. 18, no. 3, pp. 11-21, Jun. 2015. *(top **most frequently downloaded document** from IEEE Xplore for IM Magazine in June 2015-June 2016)* [cited **531** times]
27. M. Rasti, **M. Hasan**, L. Le, and E. Hossain, "Distributed uplink power control for multi-cell cognitive radio networks," *IEEE Transactions on Communications*, vol. 63, no. 3, pp. 628-642, Mar. 2015. [cited **31** times]
26. **M. Hasan**, E. Hossain, S. Balasubramaniam, and Y. Koucheryavy, "Social behavior in bacterial nanonetworks: Challenges and opportunities," *IEEE Network*, vol. 29, no. 1, pp. 26-34, Jan. 2015. [cited **12** times]
25. **M. Hasan** and E. Hossain, "Distributed resource allocation for relay-aided device-to-device communication: A message passing approach," *IEEE Transactions on Wireless Communications*, vol. 13, no. 11, pp. 6326-6341, Nov. 2014. [cited **99** times]
24. **M. Hasan**, E. Hossain, and D. I. Kim, "Resource allocation under channel uncertainties for relay-aided device-to-device communications underlaying LTE-A cellular networks," *IEEE Transactions on Wireless Communications*, vol. 13, no. 4, pp. 2322-2338, Apr. 2014. [cited **144** times]
23. **M. Hasan**, E. Hossain, and D. Niyato, "Random access for machine-to-machine communication in LTE-Advanced networks: Issues and approaches," *IEEE Communications Magazine*, vol. 51, no. 6, pp. 86-93, Jun. 2013. [cited **519** times]

- ***Refereed Conferences:***

22. A. Kashinath*, **M. Hasan***, R. Kumar, S. Mohan, R. Bobba, and S. Padhy, "Safety critical networks using commodity SDNs," in Proc. of *IEEE International Conference on Computer Communications (INFOCOM)*, May 2021.
21. **M. Hasan**, S. Mohan, R. Pellizzoni, and R. Bobba, "Period adaptation for continuous security monitoring in multicore systems," in Proc. of *Design, Automation and Test in Europe (DATE)*, pp. 430-435, Mar. 2020.
20. F. Abdi, C. Chen, **M. Hasan**, S. Liu, S. Mohan, and M. Caccamo, "Guaranteed physical security with restart-based design for cyber-physical systems," in Proc. of *ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)*, pp. 10-21, Apr. 2018. [cited **29** times]
19. **M. Hasan**, S. Mohan, R. Pellizzoni, and R. Bobba, "A design-space exploration for allocating security tasks in multicore real-time systems," in Proc. of *Design, Automation and Test in Europe (DATE)*, pp. 225-230, Mar. 2018. [cited **22** times]
18. R. Kumar, **M. Hasan**, S. Padhy, K. Evchenko, L. Piramanayagam, S. Mohan, and R. Bobba, "End-to-end network delay guarantees for real-time systems using SDN," in Proc. of *IEEE Real-Time Systems Symposium (RTSS)*, pp. 231-242, Dec. 2017. [cited **41** times]
17. **M. Hasan**, S. Mohan, R. Pellizzoni, and R. Bobba, "Contego: An adaptive framework for integrating security tasks in real-time systems," in Proc. of *Euromicro Conference on Real-Time Systems (ECRTS)*, vol. 76, pp. 23:1-23:22, Jun. 2017. [cited **11** times]
16. **M. Hasan**, S. Mohan, R. Bobba, and R. Pellizzoni, "Exploring opportunistic execution for integrating security into legacy hard real-time systems," in Proc. of *IEEE Real-Time Systems Symposium (RTSS)*, pp. 123-134, Nov. 2016. *(received **Outstanding Paper** and **Best Student Paper** award)* [cited **25** times]
15. **M. Hasan** and E. Hossain, "Distributed resource allocation in D2D-enabled multi-tier cellular networks: An auction approach," in Proc. of *IEEE International Conference on Communications (ICC)*, pp. 4552-4557, Jun. 2015. [cited **58** times]

- ***Refereed Workshops:***

14. A. Kashinath, **M. Hasan**, S. Mohan, R. Bobba, and R. Mittal, "Improving dependability via deadline guarantees in commodity real-time networks," in Proc. of *IEEE GLOBECOM Workshop on Secure and Dependable Software-defined Networking for Sustainable Smart Communities (SecSDN)*, Dec. 2020.
13. **M. Hasan** and S. Mohan, "Protecting actuators in safety-critical IoT systems from control spoofing attacks," in Proc. of *ACM Workshop on the Internet of Things Security and Privacy (IoT S&P)*, pp. 8-14, Nov. 2019. [cited **5** times]
12. I. Agadakos, C. Chen, M. Campanelli, P. Anantharaman, **M. Hasan**, B. Copos, T. Lepoint, M. Locasto, G. Ciocarlie, and U. Lindqvist, "Jumping the air gap: Modeling cyber-physical attack paths in the Internet-of-Things," in Proc. of *ACM Workshop on Cyber-Physical Systems Security & Privacy (CPS-SPC)*, pp. 37-48, Nov. 2017. [cited **25** times]
11. R. Kumar, **M. Hasan**, S. Padhy, K. Evchenko, L. Piramanayagam, S. Mohan, and R. Bobba, "Dependable end-to-end delay constraints for real-time systems using SDN," in Proc. of *International Workshop on Real-Time Networks (RTN)*, Jun. 2017. [cited **5** times]
10. **M. Hasan**, S. Mohan, R. Bobba, and R. Pellizzoni, "A server model to integrate security tasks into fixed-priority real-time systems," in Proc. of *Workshop on Security and Dependability of Critical Embedded Real-Time Systems (CERTS)*, pp. 61-68, Nov. 2016. [cited **2** times]
9. F. Abdi*, **M. Hasan***, S. Mohan, D. Agarwal, and M. Caccamo, "ReSecure: A restart-based security protocol for tightly actuated hard real-time systems," in Proc. of *Workshop on Security and Dependability of Critical Embedded Real-Time Systems (CERTS)*, pp. 47-53, Nov. 2016. [cited **18** times]
8. **M. Hasan** and E. Hossain, "Resource allocation for network-integrated device-to-device communications using smart relays," in Proc. of *IEEE Globecom Workshop on Device-to-Device (D2D) Communication With and Without Infrastructure*, pp. 597-602, Dec. 2013. [cited **31** times]

- ***Posters:***

7. A. Kashinath, **M. Hasan**, S. Mohan, R. Bobba, "Advanced networking for resilient energy delivery systems", *CREDC Industry Workshop*, Feb. 2020.
6. R. Kumar, **M. Hasan**, A. Kashinath, S. Mohan, R. Bobba, and S. Padhy, "Delay-aware SDNs: Improved management of networks in energy delivery systems," *CREDC Industry Workshop*, Sep. 2018.
5. **M. Hasan**, C. Chen, A. Ghassami, S. Mohan, and N. Kiyavash, "Securing dynamic-priority real-time systems using schedule obfuscation," *Midwest Security Workshop*, Apr. 2018.
4. R. Kumar, **M. Hasan**, K. Evchenko, S. Padhy, S. Mohan, and R. Bobba, "Dependable end-to-end delay constraints for EDS control networks using SDNs," *CREDC Industry Workshop*, Mar. 2017.
3. D. Agarwala, **M. Hasan**, F. Abdi, and S. Mohan, "Restart and secure: An approach to enhance security in real-time cyber-physical systems," *Illinois Science of Security (SoS) Summer Poster Session*, Jul. 2016.
2. L. Piramanayagam, S. Padhy, **M. Hasan**, and S. Mohan, "Precise timing analysis of Open vSwitch for hard real-time applications," *Illinois Science of Security (SoS) Summer Poster Session*, Jul. 2016.

- ***Patent:***

1. G. Ciocarlie, I. Agadakos, C. Chen, M. Campanelli, P. Anantharaman, **M. Hasan**, U. Lindqvist, M. Locasto, B. Copos, T. Lepoint, and M. Filippone, "Modeling cyber-physical attack paths in the Internet-of-things," U.S. Patent Application 16/634,591, May 21, 2020.

Awards and Honors

- ***Research and Scholarly Awards:***

– C.L. and Jane W.-S. Liu Award **April 2017**
Dept. of Computer Science, University of Illinois at Urbana-Champaign

– Feng Chen Memorial Award **April 2017**
Dept. of Computer Science, University of Illinois at Urbana-Champaign

– Best Student Paper Award **December 2016**
2016 IEEE Real-Time Systems Symposium (RTSS)

– Outstanding Paper Award **December 2016**
2016 IEEE Real-Time Systems Symposium (RTSS)

– Finalist, Symantec Research Labs Graduate Fellowship **December 2016**
Symantec Corporation, USA

– Research and Teaching Assistantship **August 2015 – December 2020**
Dept. of Computer Science, University of Illinois at Urbana-Champaign

– University of Manitoba General Award **November 2014**
University of Manitoba

– University of Manitoba Graduate Fellowship (UMGF) **July 2013 – June 2014**
Faculty of Graduate Studies, University of Manitoba

– International Graduate Student Entrance Scholarship (IGSES) **September 2012 – April 2013**
Faculty of Graduate Studies, University of Manitoba

– Research Assistantship **July 2012 – June 2015**
Wireless Communications, Networks, and Services Research Group, University of Manitoba

– Professor Dr. Ahmad Ullah and Chemanara Ahmed Ullah Trust Fund Scholarship **2010**
Bangladesh University of Engineering and Technology

– Dean's List Award for academic excellence in Level-2, 3, and 4 **2009 – 2011**
Bangladesh University of Engineering and Technology

– University Merit Scholarship **2009 – 2011**
Bangladesh University of Engineering and Technology

- Dhaka Education Board Scholarship **2007 – 2010**
  Ministry of Education, Dhaka, Bangladesh

- ***Travel Awards:***
  - Conference Travel Grant **October 2019**
    Graduate College, University of Illinois at Urbana-Champaign
  - NSF/IEEE Student Travel Grant **November 2016**
    Sponsored by NSF and IEEE
  - UMGSA Conference Grant **June 2015**
    University of Manitoba Graduate Students' Association
  - Graduate Student Travel Award **September 2013**
    Faculty of Graduate Studies, University of Manitoba
  - Swedish-Bangladesh Trust Fund Travel Grant **December 2013**
    Economic Relations Division, Ministry of Finance, Bangladesh

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Teaching and Curriculum Development

- **Wichita State University**
  - CS 898CC: Security for Real-Time Internet-of-Things **Spring 2021**
    New course developed in 2021

- **University of Illinois at Urbana-Champaign**
  - **Teaching Assistant** **Fall 2019**
    Computer Architecture (CS233)
  - **Co-Instructor, Programming** **Fall 2017–Spring 2018**
    CS@ILLINOIS Outreach Program, Urbana Middle School, Illinois, US
    * Co-taught programming using the *Scratch* programming language to middle school students

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Media Coverage

- *Inspiring future programmers* **October 2018**
  (Article about teaching middle school students as part of CS@ILLINOIS outreach program)
  CSL Uplink newsletter, University of Illinois at Urbana-Champaign
  Link: https://tinyurl.com/inspiringfutureprogrammers
- *Featured student (Celebration of Excellence student awards recipient)* **November 2017**
  CLICK! Magazine, Vol. 2, 2017, Dept. of Computer Science, University of Illinois at Urbana-Champaign
- *Newly developed security mechanism aims to guard existing real-time systems against cyberattacks* **April 2017**
  Dept. of Computer Science, University of Illinois at Urbana-Champaign newsletter
  Link: https://tinyurl.com/guard-rts

Service

Service to the Community

- **Technical Program Committee**
  IEEE Real-Time Systems Symposium (RTSS), 2021
  IEEE Workshop on Artificial Intelligence based Security for Internet of Things (AiS-IoT), 2021

- **Editorial Board Member**
  Real-time and Cyber-physical Systems Track, Journal of Systems Research (JSys) **January 2021 – Present**
- **Reviewer** **September 2013 – Present**
  - ***Journals***
    IEEE Internet of Things Journal
    IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems
    IEEE Access
    IEEE Transactions on Mobile Computing
    IEEE Transactions on Communications
    IEEE Transactions on Signal Processing
    IEEE Transactions on Wireless Communications
    IEEE Communications Surveys and Tutorials
    IEEE Wireless Communications Magazine
    IEEE Transactions on Vehicular Technology
  - ***Conferences***

    Primary Reviewer

    IEEE International Symposium on Information Theory (ISIT), 2021
    IEEE Vehicular Networking Conference (VNC), 2020
    IEEE Global Communications Conference (GLOBECOM), 2019
    AACC American Control Conference (ACC), 2019
    IEEE Vehicular Technology Conference (VTC-Fall), 2018
    IEEE International Conference on Communications (ICC), 2015
    IEEE Vehicular Technology Society Asia Pacific Wireless Communications Symposium (VTS-APWCS), 2014
    IEEE Conference on Local Computer Networks (LCN), 2014

    Secondary Reviewer

    ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS), 2019, 2018
    IEEE Real-Time Systems Symposium (RTSS), 2018
    IEEE International Symposium on Real-Time Distributed Computing (ISORC), 2018
    IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), 2018, 2017

- **Web Chair**
  ACM Workshop on CPS & IoT Security and Privacy (CPSIoTSec), 2020
  ACM/IEEE Workshop on Security and Privacy for the Internet-of-Things (IoTSec), 2019
  ACM/IEEE Workshop on Security and Privacy for the Internet-of-Things (IoTSec), 2018
- **Artifact Evaluation Committee**
  IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), 2020

University Service

- **Committee Member, Electrical Engineering and Computer Science, Wichita State University**
  - EECS Nominee Selection, College of Engineering Wallace Awards, 2021
  - EECS Nominee Selection, University Faculty Awards, 2021

Invited Talks

- *Security and Resiliency for Real-Time Cyber-Physical Systems* **April 2020**
  Dept. of Electrical and Computer Engineering Seminar, Wichita State University, Kansas, USA
- *Attack-Resilient Platforms for Real-Time Systems* **February 2020**
  Collins-UIUC Workshop, Collins Aerospace, Iowa, USA

- *Integrating Security into Legacy Hard Real-Time Systems* **June 2017**
  Community of Practice for Real-Time Systems Seminar, Rockwell Collins, Iowa, USA
- *Exploring Opportunistic Execution for Integrating Security into Legacy Hard Real-Time Systems* **November 2016**
  ITI Trust and Security Seminar, Information Trust Institute, University of Illinois at Urbana-Champaign

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Technical Society Memberships

- IEEE
- IEEE Computer Society
- IEEE Communication Society

References

Available upon request.