Md Salman Ahmed

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Education

- **Virginia Tech (VT)** — Blacksburg, VA
  PhD Student (3rd Year) in Computer Science, GPA: 3.85 (excluding transferred courses) — Aug 2017 – Present
  Thesis: Quantitative Measurements and Methodologies for Attack Surface Reduction (tentative)
  Advisor: Dr. Danfeng (Daphne) Yao, Professor

  PhD Committee Members
  1. Danfeng (Daphne) Yao (Chair), Professor, Turner Fellow and CACI Fellow, Computer Science, Virginia Tech
  2. Gang Wang, Assistant Professor (External member), Computer Science, University of Illinois at Urbana-Champaign
  3. Matthew Hicks, Assistant Professor (member), Computer Science, Virginia Tech
  4. Patrick R. Schaumont (Member), Professor, Electrical and Computer Engineering, Virginia Tech
  5. Fabian Monrose (External Member), Kenan Distinguished Professor, Computer Science, UNC at Chapel Hill

- **East Tennessee State University (ETSU)** — Johnson City, TN
  Master of Science in Computer Science; GPA: 3.89 — Aug 2015 – Dec 2017
  Thesis: An Investigation into the Performance Evaluation of Connected Vehicle Applications: From Real-World Experiment to Parallel Simulation Paradigm
  Advisor: Dr. Mohammad A. Hoque, Associate Professor

- **Bangladesh University of Engineering & Technology (BUET)** — Dhaka, Bangladesh
  Bachelor of Science in Computer Science and Engineering; GPA: 3.51 — Jan 2008 – Feb 2013
  Thesis: Audio Steganography with Quantum Key Cryptography
  Advisor: Dr. Mohammad Kaykobad, Professor

Professional Appointments

- **Virginia Tech** — Blacksburg, VA
  Research and Teaching Assistant — Aug 2017 - Present
- **East Tennessee State University** — Johnson City, TN
  Research and Teaching Assistant — Aug 2015 - May 2016
- **Banc Intranets** — Johnson City, TN
  Software Developer Intern — Summer 2016 and 2017
- **Samsung R&D** — Suwon, South Korea & Dhaka, Bangladesh
  Software and Senior Software Engineer — Mar 2013 - Aug 2015

Research Interests

Identification of Security Metrics and Methodologies for Large-scale Security Evaluation; Threat Intelligence Analysis; Program Analysis; Data-driven Security; Security in Connected Vehicle Technology.

Awards

- ETSU School of Graduate Studies Outstanding Thesis in Science, Math, Technology, and Computer Science (**2018)**
- Tennessee Conference of Graduate Schools Outstanding Master's Thesis (**2018)**
- Outstanding Computing Graduate Student Award, Department of Computing, East Tennessee State University (**2017)**
- Best Paper Award (3rd Place), Graduate Student Competition of the ACM-Mid Southeast Conference, TN (**2016)**
- Samsung R&D Icon of the Month Award, Samsung R&D Institute Bangladesh (**2015)**
- IEEEXtreme Programming Contest 10.0 (18th Place in USA) (**2016)**
- IEEEXtreme Programming Contest 9.0 (51st Place in USA) (**2015)**
- Dean's List for outstanding result in the 4th year at BUET (**2012)**

Publications

Refereed Conference Proceedings

1. [**Under Review**] **Md Salman Ahmed**, Ya Xiao, Gang Tan, Kevin Snow, Fabian Monrose, and Danfeng (Daphne) Yao. "Methodologies for Quantifying (Re-)randomization Security and Timing under JIT-ROP." [ArXiv Link].
2. [**SecDev'19**] Long Cheng, Hans Liljestrand, **Md Salman Ahmed**, Thomas Nyman, Trent Jaeger, N. Asokan, and Danfeng (Daphne) Yao. "Exploitation Techniques and Defenses for Data-Oriented Attacks. *IEEE Secure Development Conference (SecDev)*. McLean, VA. Sept. 2019.
3. [**VNC'16**] **Md Salman Ahmed** and Mohammad A Hoque. "Partitioning of Urban Transportation Networks Utilizing Real-world Traffic Parameters for Distributed Simulation in SUMO," In Proceedings of *IEEE Vehicular Network Conference (VNC)*, Columbus, OH, USA, 2016.
4. [**SoutheastCon'16**] **Md Salman Ahmed**, Mohammad A Hoque, and Phil Pfeiffer. "Comparative Study of Connected Vehicle Simulator," In Proceedings of *IEEE Southeast Conference (SoutheastCon)*, pp. 1-7, Norfolk, VA, 2016.

Journal Articles

1. **Md Salman Ahmed**, Mohammad A Hoque, Jackeline Rios-Torres, Asad Khattak, and Brian Bennett. "A Decentralized Cooperative Freeway Merge Assistance System using Connected Vehicles," IEEE *Transactions on Intelligent Transportation Systems* (Impact factor 3.724) (Under review).
2. Mohammad A Hoque, Xiaoyan Hong, and **Md Salman Ahmed**. "Parallel Closedloop Connected Vehicle Simulator for Large-scale Management of Transportation Networks: Challenges, Issues, and Solution Approaches," IEEE *Intelligent Transportation Systems Magazine* (Impact Factor: 3.65) (in press).
3. **Md Salman Ahmed**, Jennifer Houser, Mohammad A Hoque, Rezaul Raju, Phil Pfeiffer. "Reducing Inter-process Communication Overhead in Parallel Sparse Matrix-Matrix Multiplication," International Journal of *Grid and High-Performance Computing*, Vol. 9, No. 3, 2017. (Impact Factor: 0.57).

Refereed Conference Posters and Demos

1. [**SecDev'19**] **Md Salman Ahmed**, Ya Xiao, Gang Tan, Kevin Snow, Fabian Monrose, and Danfeng (Daphne) Yao. "POSTER: Quantifying the Impact of Fine-grained Code Randomization on Attack Surface Reduction." *IEEE Secure Development Conference (SecDev)*. McLean, VA. Sept. 2019.
2. [**SecDev'18**] **Md Salman Ahmed**, Danfeng (Daphne) Yao, and Haipeng Cai. "POSTER: Extracting Anti-specifications from Vulnerabilities for Program Hardening." *IEEE Secure Development Conference (SecDev)*. Cambridge, MA. Sept. 2018.
3. [**CarSys'17**] **Md Salman Ahmed**, Mohammad A Hoque, Jackeline Rios-Torres, and Asad Khattak. "Demo: Freeway Merge Assistance System using DSRC," In Proceedings of the *2nd ACM International Workshop on Smart, Autonomous, and Connected Vehicular Systems and Services*, pp. 83-84, Snowbird, Utah, USA, October, 2017.
4. [**VNC'16**] **Md Salman Ahmed** and Mohammad A Hoque. "Demo: Real-time Vehicle Movement Tracking on Android Devices Through Bluetooth Communication with DSRC Devices," In Proceedings of *IEEE Vehicular Network Conference (VNC)*, Columbus, OH, USA, 2016

Presentation

- Importance of Information Leakage to Bypass ASLR. DARPA Cyber Assured Systems Engineering (CASE) program. Final report meeting. August 31, 2018.

Press Coverage & Leadership Activities

- Alumnus Md Salman Ahmed receives outstanding thesis award, ETSU News (**2018). Link**
- Team leader for IEEEXtreme Programming Contest 9.0 and 10.0 (**2016 & 2017)**

Selected Academic Projects

- **Automatic Commit Generator**: Generates commit messages from source code differences between two version of a software. The source code differences are described using a natural language description and then the natural language description is translated into commit messages using a pre-trained neutral machine translation model.
- **Compiler**: A compiler capable of generating intermediate code (assembly x86) from Pascal program.
- **Blinds' Eye**: A navigation tool for blind people using Ultrasonic sensor, MicroSD card and Micro-controller. The interfacing language was C.
- **4-bit CPU**: A navigation tool for blind people using Ultrasonic sensor, MicroSD card and Micro-controller. The interfacing language was C.

References

Available upon request.