Shahrear Iqbal

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Objective To obtain research and teaching position in the areas of Cybersecurity and Privacy

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VISA Status Permanent Resident of Canada

Research Interests My general research interests are in Security and Privacy of Smart Devices. They encompass following specific areas:

- Usable security for smart hand-held devices
- In-vehicle security and intrusion detection for connected/autonomous cars
- Self-aware operating systems for mobiles and smart cars
- Software engineering for ensuring application security
- Security of the communication between smart/IoT devices and cloud/fog networks
- Using machine learning techniques for security analytics and automation

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Teaching Interests I am interested to teach both graduate and undergraduate in a range of topics including Operating Systems, Distributed Systems, Secure Software Engineering, and Software Security and Reliability. However, I am open to teach basic and introductory Computer Science courses.

Education

Queen's University Kingston, Canada
Ph.D. in Computing Dec. 2017
Queen's Computing Ph.D. Research Achievement Award 2018

Bangladesh University of Engineering & Technology Dhaka, Bangladesh
M.Sc. in Computer Science and Engineering (GPA: 3.75/4.00) Feb. 2011

Bangladesh University of Engineering & Technology Dhaka, Bangladesh
B.Sc. in Computer Science and Engineering (GPA: 3.87/4.00, ranked 6^{th}) Jan. 2008

Employment

SecurityCompass — Toronto, Canada
Application Security Researcher — Dec. 2018 - Now

Queen's University — Kingston, Canada
Postdoctoral Fellow — Jan. 2018 - Nov. 2018

Bangladesh University of Engineering & Technology — Dhaka, Bangladesh
Lecturer — Aug. 2008 - Jul. 2013

Brac University — Dhaka, Bangladesh
Lecturer — Jan. 2008 - Jul. 2008

Academic Research Experience

Queen's University — Kingston, Canada
Postdoctoral Fellow — Jan. 2018 -

- **Projects**: Connected/Autonomous Vehicle Security and IoT/Mobile Security
  - Security of the communication between in-vehicle engine control units (ECU)
  - Intrusion detection in connected vehicles
  - Anti-malware components for Android cars
  - Developing and detecting security patterns for IoT software
  - Security and privacy of smart cities with Unmanned Aerial Vehicles (UAV)

Queen's University — Kingston, Canada
Graduate Research Assistant — Sep. 2013 - Dec. 2017

- **Project**: Towards A Security Framework for Smartphone Operating Systems
  - Proposed an intelligent mal-aware security framework for smartphone operating systems based on the concept of modern smart cities
  - Implemented the proposed framework for Android
  - Implemented a zoning concept for smartphones
  - Implemented automatic detection of security modes that apply fine-grained access control based on the context
  - Developed an architecture to improve the power profile of sensor-based techniques in smartphones
  - Developed an architecture to monitor application activities
  - Implemented several machine learning classification techniques to detect malware based on the monitored information
- **Project**: Protecting Devices from Becoming Victimized Attackers of Click-fraud
  - Developed a click-fraud prevention method from the user side. I implemented a detection component that monitors and analyzes the HTTP traffic to identify applications performing click-fraud.
- Projects in graduate courses:
  - Detecting repackaged Android applications with malware
  - Comparison of semantic clone detection tools

University of British Columbia Kelowna, Canada
Visiting Research Assistant Sep. 2015 - Aug. 2016

- **Project**: Software for Collecting Field Data and Creating Reports for the Employees of an Engineering Company (Amec Foster Wheeler)
  - Developed a windows application and multiple server components

Bangladesh University of Engineering & Technology Dhaka, Bangladesh
Graduate Research Assistant Jan. 2008 - Feb. 2011

- **Project**: Metaheuristic Algorithms for Some Knapsack Variants
  - Studied combinatorial optimization problems and different metaheuristic algorithms
  - Used ant colony optimization and artificial immune system to solve the multi-dimensional multi-choice knapsack problem (MMKP)

Industrial Research Experience

SecurityCompass Toronto, Canada
Application Security Researcher Dec. 2018 - Now

- **Project**: Autonomous Vehicle Security
- **Project**: Web and Desktop Application Security

ir.deto Ottawa, Canada
Research Intern Aug. 2014 - Nov. 2014

- **Project**: Protecting Web Application Source Code
  - Using software protection technologies (data/control flow transformation, white-box cryptography, integrity verification) to protect web application source code

Bureau of Research, Testing and Consultation (BRTC) Dhaka, Bangladesh
Senior Software Engineer Jun. 2008 - Aug. 2013

- **Projects**:
  - **Back Office Management Software**, Dhaka Stock Exchange (DSE). (Accounting, Stock Update, Trading, Data Migration, Merchant Banking)
  - **Initial Public Offering (IPO) Lottery Distribution Software**, Dhaka Stock Exchange (DSE)
  - **Network Design and Development**, Bangladesh House Building Finance Corporation
  - **IT and Infrastructure Development**, Bangladesh Television (BTV)

Journal Publications

J1. **S. Iqbal**, M. Zulkernine, F. Jaafar and Y. Gu. Protecting Internet Users from Becoming Victimized Attackers of Click-Fraud, in **Journal of Software: Evolution and Process**, e1871-n/a, 2017, e1871 smr.1871, issn: 2047-7481. doi: 10.1002/smr.1871.

Conference Publications

C12. **S. Iqbal** and M. Zulkernine. Towards A Security Architecture for Protecting Connected Vehicles from Malware, in **Proceedings of the IEEE 89th Vehicular Technology Conference: VTC2019-Spring**, [Accepted], IEEE, 2019.

C11. M. S. Alam, **S. Iqbal**, M. Zulkernine, and Clifford Liem. Securing Vehicle ECU Communications and Protecting ECU Data Using Blockchain, in **Proceedings of the IEEE International Conference on Communications (ICC)**, [Accepted], IEEE 2019.

C10. **S. Iqbal** and M. Zulkernine. SpyDroid: A Framework for Employing Multiple Malware Detectors on Android, in **Proceedings of the IEEE Conference on Malicious and Unwanted Software (Malware)**, [Accepted], IEEE, 2018.

C9. A. Anis, M. Zulkernine, **S. Iqbal**, C. Liem, and C. Chambers. Securing web applications with secure coding practices and integrity verification, in **Proceedings of the 16th IEEE Conference on Dependable, Autonomic and Secure Computing (DASC)**, pages 618-625, IEEE, 2018.

C8. O. Hreirati, **S. Iqbal**, and M. Zulkernine. An Adaptive Dataset for the Evaluation of Android Malware Detection Techniques, in **Proceedings of the 4th International Conference on Software Security and Assurance (ICSSA)**, [Accepted], IEEE, 2018.

C7. **S. Iqbal** and M. Zulkernine. Droid Mood Swing (DMS): Automatic Security Modes based on Contexts, in **Proceedings of the 20th Information Security Conference (ISC)**, pages 329-347, Springer, 2017 (Acceptance Rate: 25.7%).

C6. **S. Iqbal** and M. Zulkernine. Flamingo: A Framework for Smartphone Security Context Management, in **Proceedings of the 32nd ACM Symposium on Applied Computing (ACM SAC)**. pages 563-568, ACM, 2017 (Acceptance Rate: 23.43%).

C5. **S. Iqbal** and M. Zulkernine. ZoneDroid: Control your Droid through Application Zoning, in **Proceedings of the 11th International Conference on Malicious and Unwanted Software (MALCON)**, pages 113-120, IEEE, 2016 (Acceptance Rate: 32%).

C4. **S. Iqbal** and M. Zulkernine. SAM: A Secure Anti-Malware Framework for the Smartphone Operating Systems, in **Proceedings of the Wireless Communications and Networking Conference (WCNC)**, pages 1-6, IEEE, 2016.

C3. **S. Iqbal**, M. Zulkernine, F. Jaafar and Y. Gu. FCFraud: Fighting Click-Fraud from the User Side, in **Proceedings of the 16th International Symposium on High Assurance Systems Engineering (HASE)**, pages 157-164, IEEE, 2016.

C2. **S. Iqbal**, F. Bari, and M. S. Rahman. Solving the Multi-dimensional Multi- choice Knapsack Problem with the Help of Ants, in **Proceedings of the 7th International Conference on Swarm Intelligence (ANTS)**, pages 312-323, Springer LNCS, 2010.

C1. **S. Iqbal**, F. Bari, and M. S. Rahman. A Novel ACO Technique for Fast and Near Optimal Solutions for the Multi-dimensional Multi-choice Knapsack Problem, in **Proceedings of the 13th International Conference on Computer and Information Technology (ICCIT)**, pages 33-38, IEEE, 2010.

Books

B1. M. M. Akbar, M. S. Rahman, H. Kabir, and **S. Iqbal**. **Information and Communication Technology (ICT)**, Board Of Intermediate And Secondary Education, Dhaka, Bangladesh, Natundhara Publications, 2013.

Theses

T3. **S. Iqbal**. Towards A Security Framework for Smartphone Operating Systems. Ph.D. thesis, School of Computing, Queen's University, Kingston, Ontario, Canada, 2017.

T2. **S. Iqbal**. Metaheuristic Algorithms for Some Knapsack Variants. M.Sc. thesis, Department of Computer Science and Engineering, Bangladesh University of Engineering and Technology, 2011.

T1. **S. Iqbal**. A Comprehensive Study on Meta-Learning using Modified Bagging. B.Sc. thesis, Department of Computer Science and Engineering, Bangladesh University of Engineering and Technology, 2008.

Technical Reports

R3. O. Hreirati, **S. Iqbal**, M. Zulkernine. How to Easily Create an Android Malware Dataset from Millions of Applications, Technical Report, Queen's University, 2018.

R2. **S. Iqbal**, M. N. Huda. Detecting Repackaged Android Applications with Malware, Technical Report, Queen's University, 2014.

R1. **S. Iqbal**. Comparison of Semantic Clone Detection Techniques, Technical Report, Queen's University, 2013.

Papers In-Preparation

IP1. J. Sun, N. Seifollahpour, **S. Iqbal**, M. Zulkernine. A Comprehensive Survey on Connected Vehicle Security Issues, 2019.

Grant Writing Experience

- **Queen's University:** I've helped the primary investigator in preparing multiple grant applications (industry and government).

Academic Distinctions

- I was given the 2018 PhD Research Achievement Award from the School of Computing, Queen's University.
- I was awarded the Ontario Government Domestic Tuition Award. The award is given annually to 10 international PhD graduate students. The applicants were ranked based on the Research and Academic Excellence as well as Interpersonal, Communication and Leadership Skills.
- I was ranked 6^{th} among one hundred and twenty five students in my Graduating Class, Department of Computer Science and Engineering, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.
- I was ranked 16^{th} among around one hundred thousand students in the Secondary School Certificate (SSC) examination, Science Group, Dhaka Education Board, Dhaka, Bangladesh.

Honors and Awards

- Queen's Graduate Award, Queen's University 2013 - 2016
- Dean's List Award, Bangladesh Univ. of Engg. & Technol. 2003 - 2007
- University Merit Scholarship, Bangladesh Univ. of Engg. & Technol. 2003 - 2007

Teaching Experience

Queen's University Kingston, Ontario, Canada
Teaching Adjunct, School of Computing Sep. 2018 - Dec. 2018

- **Courses Taught**: Cybersecurity

Bangladesh University of Engineering & Technology Dhaka, Bangladesh
Lecturer, Dept. of Computer Science and Engg. Aug. 2008 - Aug. 2013

- **Courses Taught**: Operating Systems, Computer Networks, Structured Programming Language, Data Structures

University of Asia Pacific Dhaka, Bangladesh
Part-time Lecturer, Dept. of Computer Science and Engg., Winter Term 2013

- **Courses Taught**: Numerical Methods

Bangladesh University of Professionals Dhaka, Bangladesh
Part-time Lecturer, Dept. of Computer Science and Engg., Fall Term 2012

- **Courses Taught**: Structured Programming Language

Ahsan-Ullah University of Science & Technology Dhaka, Bangladesh
Part-time Lecturer, Dept. of Computer Science and Engg., Winter Term 2009, 2010

- **Courses Taught**: Operating Systems

Brac University Dhaka, Bangladesh
Lecturer, Dept. of Computer Science and Engg. Jan. 2008 - Jul. 2008

- **Courses Taught**: Operating Systems, Object-Oriented Programming Language

CISCO Regional Academy Dhaka, Bangladesh
Instructor Aug. 2008 - Aug. 2013

- Instruction and evaluation of Cisco Certified Network Associate (CCNA) courses

Bangladesh Korea Information Access Center (IAC) Dhaka, Bangladesh
Instructor Aug. 2008 - Aug. 2013

- **Courses Taught**: C# .NET, Android Application Programming

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Mentoring Experience

- **Masters Students**
  - Joey Sun, School of Computing, Queen's University, 2018
  - Najme Seifollahpour Arabi, School of Computing, Queen's University, 2018
  - Hasheem Ilyas, School of Computing, Queen's University, 2018
  - Lovleen Cheema, Electrical and Computer Engineering, Queen's University, 2018
  - Pushpanjali Chauhan, Electrical and Computer Engineering, Queen's University, 2018
  - Md Swawibe Ul Alam, School of Computing, Queen's University, 2018
  - Omar Hreirati, Electrical and Computer Engineering, Queen's University, 2018
- **Undergraduate Students**
  - Colin MacLeod, Physics, Queen's University, 2018
  - Andrew Kalymon, School of Computing, Queen's University, 2018
  - Jordan Handy, School of Computing, Queen's University, 2017

Conference Presentations

- The 13th IEEE Conference on Malicious and Unwanted Software (Malware), **Nantucket, Massachusetts, USA**, Oct. 2018
- The 16th IEEE Conference on Dependable, Autonomic and Secure Computing (DASC), **Athens, Greece**, Aug. 2018
- The 4th IEEE International Conference on Big Data Security on Cloud, **Omaha, Nebraska, USA**, May 2018
- The 20th Information Security Conference (ISC), **Ho Chi Minh City, Vietnam**, Nov. 2017
- The 32nd ACM Symposium on Applied Computing (ACM SAC), **Marrakech, Morocco**, Apr. 2017
- The 11th International Conference on Malicious and Unwanted Software (MALCON), **San Juan, Puerto Rico, USA**, Oct. 2016
- The Wireless Communications and Networking Conference (WCNC), **Doha, Qatar**, Apr. 2016
- The 16th International Symposium on High Assurance Systems Engineering (HASE), **Florida, USA**, Jan. 2016
- The 7th International Conference on Swarm Intelligence (ANTS), **Brussels, Belgium**, Sep. 2010
- The 13th International Conference on Computer and Information Technology (ICCIT), **Dhaka, Bangladesh**, Dec. 2010

Invited Talks

- **Securing Smart Cities**, University of Regina, Canada
- **Security Context Detection in Smartphones**, IEEE Okanagan Subsection - Canada, University of British Columbia, Canada
- **Operating System Security & Smartphones**, CISC 324 (Operating Systems), School of Computing, Queen's University, Canada
- **Towards a Secure Anti-Malware Framework for Smartphones**, IEEE Okanagan Subsection - Canada, University of British Columbia, Canada
- **Secure Software Engineering**, Department of Computer Science and Engineering, Bangladesh University of Engineering and Technology, Bangladesh

Media Coverage

- **Queen's Gazette** featured my PhD work on "Securing Smartphones". (Link)

Professional Activities

Reviewer for Journals and Conferences

- IEEE Transactions on Mobile Computing, 2018
- **PLOS one** Journal, 2017
- International Symposium on Software Reliability Engineering (**ISSRE**), 2018, 2017, 2015
- IEEE International Conference on Software Quality, Reliability & Security (**QRS**), 2018, 2017
- IEEE/IFIP International Conference on Dependable Systems and Networks (**DSN**), 2018
- International Conference on Malicious and Unwanted Software (**Malcon**), 2018
- International Workshop on Secure Software Engineering in DevOps and Agile Development (**SecSE**), 2017
- IEEE **GLOBECOM**, 2016
- International Symposium on Foundations & Practice of Security (**FPS**), 2018, 2016, 2015
- International Conference on Networking, Systems and Security (**NSysS**), 2018
- International Conference on Computer and Information Technology (**ICCIT**), 2017, 2016, 2015, 2013

Conference Organizing

- Member of the organizing committee, Workshop on Algorithms and Computation (WALCOM), Feb. 2012, Dhaka, Bangladesh

University Service

- **Member**, Undergraduate Admission Committee, Bangladesh University of Engineering & Technology, 2010-2013
- **Secretary**, Bureau of Research, Testing and Consultation (BRTC), Dept. of Computer Science and Technology, Bangladesh University of Engineering & Technology, 2012
- **Secretary**, Board of Undergraduate Studies (BUGS), Bangladesh University of Engineering & Technology, 2012

Synergetic & Leadership Activities

- **Vice President**, Queen's Bangladeshi Student Association (QBSA), Queen's University, Canada
- **Lab Administrator**, Queen's Reliable Software Technology Group (QRST), School of Computing, Queen's University, Canada
- **Research Administrator**, Algorithm Engineering and Design Research Group (Aℓeda), Dept. of Computer Science and Engg., Bangladesh University of Engineering & Technology
- **Research Administrator**, Samsung Innovation Lab (SIℓ), Dept. of Computer Science and Engg., Bangladesh University of Engineering & Technology
- **Organizing Chair**, Bangladesh University of Engineering & Technology Inter-Department ICT Project Show, 2011, Bangladesh
- **Training high school students**, Kingston, Canada
- **Training underrepresented students**, Bangladesh Korea Information Access Center, Bangladesh

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Professional Development

Courses

- **SGS 901: Teaching and Learning in Higher Education** Sep. 2013 - Dec. 2013
  Centre for Teaching and Learning, Queen's University, Canada

- **CISC 885: Professional Development in Ultra Large-scale Software Systems**
  School of Computing, Queen's University, Canada Sep. 2013 - Dec. 2013
  - Communication Through Writing
  - Presenting to Multiple Audiences
  - Public Relations & Message Development
  - Corporate and Social Responsibility
  - Issues in Global Development and Deployment

Expanding Horizons Professional Development Workshop Series, Queen's University

- **Communication: Storytelling**

  - 3 Minute Thesis Presentation
  - Effective Communication with your Supervisor
  - Presentation Skills for Graduate Students
- **Leadership & Management**
  - Foundations of Project Management I (Mitacs)
  - Time Management: Avoiding Procrastination & Maintaining Momentum
  - Reading Fast & Effectively
- **Research**
  - Avoiding Plagiarism - Tips on Good Citation Practices
  - Poster Boards - Tips Tricks
- **Health, Wellness & Community**
  - Integrity In Research and Academics
  - Intellectual Property - Publications and Patents
- **Career Building**
  - Creating a Teaching Dossier
  - Using LinkedIn to help with the Job Search

Professional Membership ACM, IEEE

References

Prof. **Mohammad Zulkernine**
School of Computing, Queen's University
Kingston, Ontario, Canada
Email: mzulker@cs.queensu.ca

Prof. **Dorothea Blostein**
School of Computing, Queen's University
Kingston, Ontario, Canada
Email: blostein@cs.queensu.ca

Yuan Xiang Gu
Chief Architect and Co-founder of Cloakware of Irdeto
Guest Professor at Northwest University
Ottawa, Ontario, Canada
Email: yuan.gu@irdeto.com