M. G. SARWAR MURSHED

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EDUCATION

Clarkson University, New York **August 2022 (expected)**

- **Doctor of Philosophy (Ongoing)**, Department of Electrical and Computer Engineering
- Dissertation: Efficient Deep Learning in resource-constrained settings

Clarkson University, New York **August 2018 - 2020**

- **Master of Science**, Department of Electrical and Computer Engineering
- Dissertation: Machine Learning at the network edge

Chittagong University of Engineering & Technology(CUET) **August 2009 - 2013**

- **B.Sc. (Honours)**, Department of Computer Science & Engineering
- Dissertation: Webpage Classification through Text Summarization.

PUBLICATIONS

Google Scholar statistics total of 70 citations as of Nov 04, 2021.

1. M. G. Sarwar Murshed Christopher Murphy Daqing Hou Nazar Khan Ganesh Ananthanarayanan Faraz Hussain, "Machine Learning at the Network Edge: A Survey", ACM Computing Surveys, vol. 54, no. 8, Oct. 2021. https://doi.org/10.1145/3469029.
2. M. G. Sarwar Murshed, J. J. Carroll, N. Khan and F. Hussain, "Resource-aware On-device Deep Learning for Supermarket Hazard Detection," 2020 19th IEEE International Conference on Machine Learning and Applications (ICMLA), 2020, pp. 871-876, https://doi.org/10.1109/ICMLA51294.2020.00142.
3. B. Zhang, M. G. S. Murshed, F. Hussain and R. Ewetz, "Fast Resilient-Aware Data Layout Organization for Resistive Computing Systems," 2020 IEEE Computer Society Annual Symposium on VLSI (ISVLSI), 2020, pp. 72-77, https://doi.org/10.1109/ISVLSI49217.2020.00023.
4. Edward Verenich, Alvaro Velasquez, M.G. Sarwar Murshed, Faraz Hussain, "FlexServe: Deployment of PyTorch Models as Flexible REST Endpoints", 2020 USENIX Conference on Operational Machine Learning (OpML 2020), https://www.usenix.org/conference/opml20/presentation/verenich
5. M.G. Sarwar Murshed, Edward Verenich, Conrad Gende, James J. Carroll, Nazar Khan, Faraz Hussain, "Hazard Detection in Supermarkets using Deep Learning on the Edge", 3rd USENIX Workshop on Hot Topics in Edge Computing (HotEdge 2020) [poster]
6. Edward Verenich, Alvaro Velasquez, M.G. Sarwar Murshed, Faraz Hussain, "The Utility of Feature Reuse: Transfer Learning in Data-Starved Regimes", https://arxiv.org/abs/2003.04117

BOOK CHAPTERS

1. M. G. Sarwar Murshed, James J. Carroll, Nazar Khan, Faraz Hussain, "Efficient deployment of deep learning models on autonomous robots in the ROS environment", Springer, Advances in Intelligent Systems and Computing, 2021, "In Press"
2. Edward Verenich, M. G. Sarwar Murshed, Nazar Khan, Alvaro Velasquez, Faraz Hussain, "Mitigating the Class Overlap Problem in Discriminative Localization: COVID-19 and Pneumonia Case Study", Springer, Explainable AI Within the Digital Transformation and Cyber Physical Systems, 08 May 2021, https://doi.org/10.1007/978-3-030-76409-8_7.

TEACHING EXPERIENCE

- Spring 2019: Teaching Assistant for EE 260/360: Embedded Systems/Microprocessors at Clarkson University
- Fall 2018, 2020: Teaching Assistant for EE 262: Introduction to Object-Oriented Programming and Software Design at Clarkson University

RESEARCH EXPERIENCE

Fall 2020- Present — **Fingerprint Segmentation for Juveniles and Adults.**
Developed new fingerprint segmentation models capable of effectively processing both adults and juvenile fingerprints using deep learning.
Solving object over-rotation problem related to object recognition.

Fall 2021 - Present — **Robust biometrics recognition and template security with multiple modalities.**
Update existing bio-metrics algorithms and develop software for the selected template security schemes.

Fall 2020 - Spring 2021 — **Fingerprint Template Security.**
Developed an evaluation test harness for assessing a template security scheme
Evaluated software for a large database of fingerprints and improved up 20% recognition accuracy.

Fall 2019 - Spring 2020 — **Marty Robot.**
Developed test harness for testing the Marty OS (ROS-based).
Evaluated the current performance of the OS and improved localization and proposed deep-learning based grocery hazard recognition system.

Fall 2013 - Spring 2018 — **Samsung SHealth and Iotivity project.**
Improved a machine learning technique (K-means) to categorize apps for user recommendations. Designed and developed the Device to Device (D2D) communication, cloud communication, and security test system of the IoTivity framework. Designed, and implemented a build system for IoTivity test project.

PROFESSIONAL EXPERIENCE

Samsung R&D Institute, Bangladesh **2013-2018**
Lead Engineer
Project: IoTivity (www.IoTivity.org - An open Linux Foundation Project for the Internet of Things)

- Design and develop the build system of IoTivity test project
- Open source contributor & developer of IoTivity Project.
- Worked on Device to Device (D2D) Communication, Cloud Communication, and Security system of the IoTivity project
- Design and develop background API for IoT automatic test software, different web application and robot automation framework.
- Develop test app (C++, Java) based on IoTivity device communication and security protocol.
- Design and implement auto code coverage framework for quality assurance of IoTivity project.

- Design and implement memory leak tool for IoTivity project.

ACADEMIC SERVICES AND APPOINTMENTS

- Reviewer AI Conferences and Journal: CODS-COMAD, 2021, IEEE SERVICES, 2021
- PhD researcher at Center for Identification Technology Research - CITeR
- Collaborating: Verizon and Badger Technologies as a research assistance

RESEARCH FUND

My research works was funded by the following institutes:

- Badger Technologies
- Verizon
- CITer

SOFTWARE SKILL HIGHLIGHTS

- **Languages:** Python, C, C++, JAVA, UNIX shell scripting
- **Version Control System:** Git
- **Project Management:** JIRA, Agile Project Management system
- **Build Automation Tools:** SCons, Gradle, Maven, Ant
- **Database:** MYSQL, oracal 11g, MongoDB
- **Web Tools:** HTML, CSS, JavaScript, Jquery, PHP

RESEARCH INTERESTS

1. Machine Learning and Deep Learning
2. Biometrics
3. Edge computing

AWARDS AND HONORS

Programming

- Samsung internal programming contest- got advanced level
- Inter university programming contest(Chittagong Zone) - runner up
- Inter department programming contest (CUET) – runner up

Academic

- University Merit Scholarship: Each year of Undergraduate Level, Chittagong University of Engineering and Technology, 2009-2013, Bangladesh

Professional

- Achieved Advanced Level in Software Capability Test arranged by Samsung Electronics Co Ltd.
- Achieved top 20% annual performance evaluation grade in 2 consecutive years 2014 & 2015 at Samsung Electronics Co Ltd

Co-curricular

- Champion in inter school and college debate competition
- Intra-Hall carrom and badminton doubles runner up.
- Participate in math Olympiad arranged by local government.

LEADERSHIP AND VOLUNTARY ACTIVITIES

IoTivit project, Samsung R&D Bangladesh

- Lead Engineer

Others

- Organized inter university Programming contest in CUET, 2012
- Event organizing committee member of CUET debating society
- Event organizing committee member of Green for Peach CUET

INTERNSHIP EXPERIENCE

Badger Technologies
July 2020- August 2020
Working Area: Deep learning on autonomous robots in the ROS environment.

Semicon PVT. LTD
January 2013-February 2013
Working Area: Mobile App Development, IT system Management.

LANGUAGE SKILL

- English
- Bengali

COUNTRY OF BIRTH

Bangladesh (Citizen of Bangladesh)

REFERENCE

Faraz Hussain
Assistant Professor
Electrical & Computer Engineering
Email: fhussain@clarkson.edu