

SHEIKH RABIUL ISLAM

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Department of Computer Science, Tennessee Tech University, Cookeville, TN 38501, USA.

EDUCATION

- **Tennessee Tech University**, TN, USA
Ph.D. in Engineering, with a concentration in Computer Science 2015-present
Dissertation: Domain Knowledge Aided Explainable Artificial Intelligence.
Advisors: William Eberle, Sheikh K. Ghafoor
MS in Computer Science. 2015 - 2018
- **Islamic University of Technology**, Bangladesh
BSc in Computer Science. 2007 - 2010

RESEARCH INTERESTS

- Interpretable and explainable Artificial Intelligence
- Data Mining and Big Data
- Cyber Security
- Predictive Modeling
- Anomaly or Fraud Detection

RESEARCH EXPERIENCE

- **Graduate Research Assistant**, Tennessee Tech University, USA 2018-present
Currently working on Explainable Artificial Intelligence (XAI) with a focus on uncovering and incorporating useful domain knowledge from an application domain (e.g., Finance, Security) that will enhance the explainability and interpretability of AI-based complex models.
- **Advanced Short-Term Research Intern**, Oak Ridge National Laboratory (ORNL), USA Summer 2018
Worked on an automated and generalized malware detection tool to avoid manual investigations of host logs and a reconfiguration of detector tool.

TEACHING AND MENTORING EXPERIENCE

- **Instructor**, Tennessee Tech University 2019
Data Structures and Algorithms: Taught advanced data structures and applications, problem-solving strategies, and algorithm complexities.
- **Graduate Teaching Assistant**, Tennessee Tech University, USA 2015 - 2019
Instructed, graded, and tutored following course labs:
Data Structures and Algorithms Lab
Introduction to Problem Solving - Computer Programming Lab
Database Management Systems lab
- **Substitute Mentor**, Tennessee Tech University, USA 2017
Worked as a volunteer and substitute mentor in summer boot camp—Governor's School for Emerging Technologies to stimulate STEM education in high school students.

INDUSTRY EXPERIENCE

- **Assistant Manager**, Teletalk Bangladesh Ltd.: Worked independently and collaboratively on multiple software development projects for internal and commercial use. 2011 – 2015
- **Specialist**, Robi Axiata Ltd.: Worked collaboratively on a telecommunication network performance monitoring software for analyzing network performance from a dashboard. 2011

AWARDS AND FELLOWSHIPS

- Student Travel Award, ACM SIGKDD, 2019 2019
- GRA from College of Engineering grants recognizing Carnegie classification 2019 - 2020
- GRA from Cybersecurity Education, Research & Outreach Center (CEROC), Tennessee Tech 2018 - 2019
- Ivanhoe Foundation Fellowship 2017

PUBLICATIONS

1. **Sheikh Rabiul Islam**, William Eberle, Sid Bundy, and Sheikh Khaled Ghafoor, "Infusing domain knowledge in AI-based "black box" models for better explainability with application in bankruptcy prediction", *25th ACM SIGKDD, Workshop: Anomaly Detection in Finance*, 2019. 2019
2. Qian Chen, **Sheikh Rabiul Islam**, Henry Haswell, and Robert A. Bridges, Automated Ransomware Behavior Analysis: Pattern Extraction and Early Detection, *The 2nd International Conference on Science of Cyber Security (SciSec)*, 2019. 2019
3. **Sheikh Rabiul Islam**, William Eberle, Sheikh K. Ghafoor, Ambareen Siraj, and Mike Rogers, "Domain Knowledge Aided Explainable Artificial Intelligence for Intrusion Detection and Response", **Under review** in *IEEE Big Data* 2019. 2019
4. **Sheikh Rabiul Islam**, William Eberle, Sheikh K. Ghafoor, Sid C. Bundy, Douglas A. Talbert, and Ambareen Siraj. "Investigating bankruptcy prediction models in the presence of extreme class imbalance and multiple stages of economy", **Under review** in *Elsevier Journal: Expert Systems with Applications*, 2019. 2019
5. **Sheikh Rabiul Islam**, Sheikh Khaled Ghafoor, and William Eberle, "Mining Illegal Insider Trading of Stocks: A Proactive Approach", *IEEE Big Data*, 2018. 2018
6. Md Mosharaf Hossain, Thomas M. Hines, **Sheikh Rabiul Islam**, Sheikh K. Ghafoor, and Ramakrishnan Kannan, "A Flexible-blocking Based Approach for Performance Tuning of Matrix Multiplication Routines for Large Matrices with Edge Cases", *The 2nd Workshop on Benchmarking, Performance Tuning and Optimization for Big Data Applications (BPOD), IEEE Big Data*, 2018. 2018
7. **Sheikh Rabiul Islam**, William Eberle, and Sheikh Khaled Ghafoor, "Credit Default Mining Using Combined Machine Learning and Heuristic Approach", *14th Int. Conference on Data Science (ICDATA'18)*, 2018. 2018
8. **Sheikh Rabiul Islam**, William Eberle, and Sheikh Khaled Ghafoor, "Mining Bad Credit Card Accounts from OLAP and OLTP", *ACM International Conference on Compute and Data Analysis (ICCCA'17)*, 2017. 2017
9. Tanzeem Bin Noor, Md Rounok Salehin, **Sheikh Rabiul Islam**, "A clustering scheme for peer-to-peer file searching in mobile ad hoc networks", *International Journal of Advanced Research in Computer and Communication Engineering*, 2012. 2012

POSTERS AND ABSTRACTS

1. **Sheikh Rabiul Islam**, William Eberle, Sid Bundy, and Sheikh Khaled Ghafoor, "Infusing domain knowledge in AI-based "black box" models for better explainability with application in bankruptcy prediction", *25th ACM SIGKDD, Workshop: Anomaly Detection in Finance*, 2019.
2. Tigstu Dullo, Sudershan Gangrade, Ryan Marshall, **Sheikh R. Islam**, Sheikh Ghafoor, ShihChieh Kao, and Alfred J. Kalyanapu, "The Vulnerability of Critical Energy Infrastructures to Climate Change induced Flooding: A Case Study for the Conasauga River basin", *27th Tennessee Water Resources Symposium*, 2018.
3. AJ Kalyanapu, TT Dullo, S Gangrade, SC Kao, R Marshall, **SR Islam**, and SK Ghafoor, "Hurricane Harvey Riverine Flooding: Part 1-Reconstruction of Hurricane Harvey Flooding for Harris County, TX using a GPU-accelerated 2D flood model for post-flood hazard analysis", *American Geophysical Union (AGU) Fall Meeting*, 2017.
4. Tigstu TSIGE Dullo, Sudershan Gangrade, Ryan Marshall, **Sheikh R Islam**, Sheikh K Ghafoor, Shih-Chieh Kao, and Alfred J Kalyanapu, "A large-scale simulation of climate change effects on flood regime-A case study for the Alabama-Coosa-Tallapoosa River Basin", *American Geophysical Union (AGU) Fall Meeting*, 2017.
5. TT Dullo, AJ Kalyanapu, S Gangrade, R Marshall, **SR Islam**, SK Ghafoor, SC Kao, and BL Preston, "Development of an Integrated DHSVM-Flood2D-GPU modeling framework - A Case Study for the Alabama-Coosa-Tallapoosa River Basin", *American Geophysical Union (AGU) Fall Meeting*, 2016.

SERVICES

- **Student Volunteer**, 25th ACM SIGKDD Conference 2019
- **Ad hoc Reviewer**, International Conference on Computer Science and Application Engineering (CSAE, 2019) 2019
- **President**, Computer Science Graduate Students Club 2018 - 2019
- **Member**, Computer Science Student Advisory Council 2018 - 2019
- **Member**, IEEE 2018 - 2019
- **Participant**, Keep Putnam County Beautiful – Clean Commission 2018
- **Volunteer and Substitute Mentor**, The Governor's School for Emerging Technologies 2017
- **Volunteer**, Integrating Parallel and Distributed Computing in Introductory Programming Classes (iPDC) 2016

TECHNICAL SKILLS

- Programming: Python, C++, Java, PHP, MPI, OpenMP, CUDA, Javascript, and R.
- Data Science: Proficient in Scikit-learn, NLTK, Pandas, and Flask; Familiar with Tensorflow, Keras, D3.js, Highchart, Matlab, and Weka.
- Database: Oracle, MySQL, PostgreSQL, and Sqlite3.
- Certification & Training:
 - High-Performance Computing Workshop at ORNL
 - Oracle Database SQL Certified Expert (2013)
 - Red Hat Certified Engineer (RHCE) training course at Base Ltd

REFERENCES

William Eberle

Professor, Department of Computer Science, Tennessee Tech University

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Sheikh K. Ghafoor

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