

SAIKAT DAS

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Education

Ph.D. , Computer Science, University of Memphis, TN	Expected: December 2020
M.Sc. , Computer Science, University of Memphis, TN	December 2016
B.Sc. , Khulna University of Engineering and Technology (KUET), Bangladesh	May 2011
Training on Cisco Network Academy Program, KUET, Bangladesh	April 2011

Employment

Research and Teaching Assistant, January 2013 - present
[Game Theory and Cyber Security Lab](#), University of Memphis.

- Improved feature selection and designed explainer models using Interpretable Machine Learning.
- Implemented ensemble supervised and unsupervised ML frameworks and analyzed their performances in detecting DDoS attack; Improved detection accuracy with reducing false alarms.
- Mentored, instructed, and graded for TA courses: Artificial Intelligence, Data Information Knowledge, Computer Organization & Architecture, Programming Language, and Cryptography

Cyber Defense Instructor, Southwest TN Community College, TN August 2018 - July 2019

- Prepared and designed courses & laboratory materials for the courses: Computer Security, Principle of Info Assurance, Cyber Defense, Tactical Parameter Def., and Cloud Applications.
- Designed online materials like quiz, grading, discussions, etc. in eCourseware for these

Web Developer Intern, Pannin Technology LLC, TN May 2016 - August 2016

- Modified existing [e-Commerce website](#) to correct errors and improved performances.
- Implemented features like car rotating, merging carts, etc. for FleetSafety3D in Ruby on Rails.

Senior Software Engineer, Samsung Electronics, Bangladesh March 2013 - August 2014

- Analyzed and fixed >300 critical problems for existing Samsung mobile java application.
- Developed features like push message, timeout lock, wallpaper picker, etc. for java applications.
- Performed post managerial role to ensure high level software solutions.

Software Engineer, Evatix Ltd, Bangladesh May 2011 - February 2013

- Implemented [eCommerce](#) solutions like product search, list, and mgmt.; related products, frequently bought items, cart, and checkout mgmt.; user, admin and merchant panel, etc.
- Developed several websites for dating, management, and eCommerce in PHP, Zend, JavaScript.

Projects

DDoS Explainer and Feature Selector (IMLFS)

- Implemented a feature selection process from Interpretable Machine Learning explainer model.
- The test F1-score of IMLFS (0.940), which is 5.60% higher than a classical feature selection.

SCADA, IDS, and IPS in Smart Grid

- Designed SCADA and developed IDS & IPS in a simulated smart grid.
- Detected and prevented DDoS, Packet Drop and Bad Data Injection attacks in Simulink.

Ensemble Machine Learning (ML) Frameworks

- Developed ensemble frameworks with supervised and unsupervised ML models.
- Detected and analyzed DDoS attacks using NSL-KDD, CICIDS2017, and UNSW-15 datasets.
- Implemented ensemble feature selection which increases the accuracy of 5% than LASSO.

NLP and GA based IDS

- Implemented Doc2Vec and SVM model to detect anomalous traffic with HTTP CSIC 2010 dataset.
- Improved rule-based IDS and detected SQL injection attacks using Genetic Algorithm.

Stealth Migration Protocol

- Designed a stealth migration protocol to migrate VM in cloud using OpenStack.
- Prevented Man-in-the middle attacks during VM migration.

Skills

Languages: Python, PHP, SQL, Java, Ruby on Rails, MATLAB, JavaScript, C++, C and C.

Machine learning Tools: scikit-learn, Keras, TensorFlow, nltk, pandas, etc.

Technologies: MySQL, PostgreSQL, SQLite, NoSQL, Hadoop, Spark, Weka, Git, SVN, etc.

Activities

- Event Supervisor**, “Codebusters, Science Olympiad”, Memphis, TN 2nd March 2019
- Executive Officer**, “Bangladesh Student Association at UofM”, Memphis, TN July-December 2016
- Volunteer**, “Cyber Security Summit”, CfIA, University of Memphis 16th October 2015

Publications

- Das, Saikat, et al., “Empirical Evaluation of the Ensemble Framework for Feature Selection in DDoS Attack.”, IEEE International Conference on Cyber Security and Cloud Computing, August 2020.
- Ashrafuzzaman, Mohammad, Saikat Das, et al. “Detecting Stealthy False Data Injection Attacks in the Smart Grid using Ensemble-based Machine Learning.”, Computers Security (2020): 101994.
- Das, Saikat, et al., “A Holistic Approach for Detecting DDoS Attacks by Using Ensemble Unsupervised Machine Learning.”, Future of Information and Communication Conference, Springer, Cham, 2020.
- Das, Saikat, et al., ”DDoS intrusion detection through machine learning ensemble.”, 19th International Conference on Software Quality, Reliability and Security Companion (QRS-C), IEEE, 2019.
- Das, Saikat, et al., “A Stealth Migration Approach to Moving Target Defense in Cloud Computing.”, Proceedings of the Future Technologies Conference, Springer, Cham, 2019.
- Das, Saikat, and Sajjan Shiva, “CoRuM: collaborative runtime monitor framework for application security., 2018 IEEE/ACM International Conference on Utility and Cloud Computing Companion (UCC Companion), IEEE, 2018.