

Naima Khan

Education

- 2018–2023 **University of Maryland Baltimore County (UMBC)**,
Information Systems, Doctor of Philosophy,
Expected Graduation: October 2023.
GPA – 3.84/4.0
- 2008–2013 **Bangladesh University of Engineering and Technology (BUET)**,
Computer Science and Engineering, Bachelor of Science.

Key Skills

- Programming Languages Python, R, C, C++, Java, Matlab
- Database PostgreSQL, SQL, Oracle 10g and 11g
- Frameworks /Libraries Keras, PyTorch, Tensorflow, SciPy, Sk-learn, Pandas, Matplotlib
- Cloud AWS, Google Cloud Platform
- DevOps Docker
- Technical Writing LaTeX, Beamer
- Tools/Softwares Anaconda, Git, Bitbucket, Eclipse, Jupyter Notebook, PyCharm, Tableau, Excel, Weka
- Machine learning ML libraries and algorithms, deep learning, data modeling and evaluation, data analysis and interpretation
- Communication English (LSRW), Bengali (LSRW)

Experience

- Jan 2018– Ongoing **Graduate Research/ Teaching Assistant**, UNIVERSITY OF MARYLAND BALTIMORE COUNTY.
- Developed novel thermal anomaly detection model to find the location and time of abnormal thermal variation over different indoor surfaces of building from longitudinal thermal images.
 - Implemented a unsupervised temporal clustering model which provides customized thermal profile built surfaces and improves the cluster consistency for slowly evolving temperature data.
 - Proposed LSTM-based approach to detect thermal condition changing events in inside built environment from temperature sensor data.
 - Unsupervised multi-modal learning for thermal and humidity images (in progress).
 - Conducted discussion classes for programming language courses with Java, C.
- May 2022– Aug 2022 **Data Science Intern**, FINRA.
- Worked on unsupervised anomaly detection in the VPC flowlog data from AWS services
 - Developed unit tests for machine learning pipeline and explored data parallelism for faster training of deep learning model
 - Proposed clustering based anomaly inference in the network flow data
- Aug 2016–Dec 2017 **Graduate Research Assistant**, FLORIDA ATLANTIC UNIVERSITY.
- Comprehensive study on feature selection for network intrusion detection
 - Studied data mining algorithms for evacuation route planning using high performance computing
 - Analyzed EEG and acoustic signals for detecting early diagnosis of dementia
 - Investigated learning vector representations for medical objects of Electronic Medical Records (EHS)
 - Comprehensive survey on the content caching for Vehicular Ad-hoc network (VANET)

- May **Software Engineer**, [EATL, POLYGON BYTES, APPDRAGON].
- 2012–Dec
 - o Developed API testing tool for web-based application
- 2013
 - o Designed backend database for web-based application
 - o Designed frontend user interface for web-based application
- Jan 2012–Jan 2013 **Undergraduate Research Assistant**, BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY.
 - o Developed a new algorithm for orthogonal grid pointset embeddings for maximal outerplanar graphs
 - o Explored the graph-theory algorithms for planar graphs

Certifications

Introduction to Machine Learning on AWS, Python and Pandas for Data Engineering, Automation Scripts Using Bash

Work Authorization

Lawful Permanent Resident of US

Publications

- 2023 **Khan, Naima**, Md Abdullah Al Hafiz Khan, Nirmalya Roy. "Unsupervised spatio-temporal anomalous thermal behavior monitoring of inside-built environments." In *2023 Annual International Conference on Distributed Computing in Smart Systems and the Internet of Things (DCOSS-IoT 2023)*. IEEE, 2023. (Best paper award)
- Albargi, Fatimah, **Naima Khan**, Indrajeet Ghosh, Ahana Roy. "BeautyNet: A Makeup Activity Recognition Framework using Wrist-worn Sensor." In *2023 IEEE International Conference on Smart Computing (SmartComp)*. IEEE, 2023. (appearing)
- Anwar, Mohammad Saeid, Emon Dey, Maloy Kumar Devnath, Indrajeet Ghosh, **Naima Khan**, Jade Freeman, Timothy Gregory, Niranjani Suri, Kasthuri Jayarajah, Sreenivasan Ramasamy Ramamurthy, Nirmalya Roy. "HeteroEdge: Addressing Asymmetry in Heterogeneous Collaborative Autonomous Systems", In *2023 IEEE International Conference on Mobile Ad-Hoc and Smart Systems (IMASS)*. IEEE, 2023. (accepted)
- Khan, Naima**, and Nirmalya Roy. "Towards IoT-assisted Non-Intrusive Monitoring of Thermal Variation on Building Envelope." In *2023 IEEE International Conference on Pervasive Computing and Communications Workshops and other Affiliated Events (PerCom Workshops)*, pp. 270-271. IEEE, 2023.
- 2022 Ahmed, Masud, Zahid Hasan, **Naima Khan**, Nirmalya Roy, Sanjay Purushotham, Aryya Gangopadhyay, and Suya You. "Benchmarking domain adaptation for semantic segmentation." In *Unmanned Systems Technology XXIV, vol. 12124*, pp. 151-162. SPIE, 2022.
- Ahmed, Masud, **Naima Khan**, Pretom Roy Ovi, Nirmalya Roy, Sanjay Purushotham, Aryya Gangopadhyay, Suya You "GADAN: Generative Adversarial Domain Adaptation Network For Debris Detection Using Drone." In *2022 18th International Conference on Distributed Computing in Sensor Systems (DCOSS)*. IEEE, 2022.
- 2021 **Khan, Naima**, and Nirmalya Roy. "BuiltNet: Graph based Spatio-Temporal Indoor Thermal Variation Detection." In *2021 20th IEEE International Conference on Machine Learning and Applications (ICMLA)*. IEEE, 2021.
- 2020 **Khan, Naima**, Masud Ahmed, and Nirmalya Roy. "Temporal Clustering Based Thermal Condition Monitoring in Building." *Sustainable Computing: Informatics and Systems* 29 (2021): 100441. (Best paper award)
- Khan, Naima**, and Nirmalya Roy. "Water Quality Assessment with Thermal Images." In *2020 IEEE International Conference on Smart Computing (SMARTCOMP)*. IEEE, 2020.
- Khan, Naima**, and Nirmalya Roy. "Cooking Event Detection from Temporal Thermal Condition of Residential Home." In *2020 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops)*. IEEE, 2020.

- 2019 **Khan, Naima**, Nilavra Pathak, Nirmalya Roy. "Detecting common insulation problems in built environments using thermal images." In *2019 IEEE International Conference on Smart Computing (SMARTCOMP)*. IEEE, 2019.
- 2014 **Khan, Naima**, Nazifa Karima, Nirmalya Roy. "Orthogonal grid pointset embeddings of maximal outerplanar graphs." In *2014 International Conference on Electrical Engineering and Information & Communication Technology*. IEEE, 2014.

Awards

- 2023 **Best Paper Award**, *Distributed Computing in Smart Systems and the Internet of Things (DCOSS-IoT)*.
- 2020 **Best Paper Award**, *International Green and Sustainable Computing Conference (IGSC)*.
- 2023 **Dissertation Fellowship**, *University of Maryland Baltimore County*.
- 2023, 2020 **NSF Travel Grant**, *Pervasive Computing and Communications (PerCom)*.
- 2020, 2019 **NSF Travel Grant**, *International Conference on Smart Computing (SMARTCOMP)*.
- 2020 **NSF Travel Grant**, *International Green and Sustainable Computing Conference (IGSC)*.
- 2016 **Bangladesh Sweden Trust Fund**, *Travel fund for obtaining higher study scholarship*.
- 2008 - 2012 **Bangladesh Education Board Scholarship**, *Undergraduate study at BUET*.
- 2008 - 2012 **Dhaka Education Board Scholarship**, *Higher Secondary Certificate (H.S.C)*.
- 2005 - 2007 **Dhaka Education Board Scholarship**, *Secondary School Certificate (S.S.C)*.

Relevant Courses

- Online Exploratory Data Analysis, AWS machine Learning
- Classroom Analysis of Algorithms, Computer Simulation, Operating Systems, Theory and Implemental Database, Cryptography and Data Security, Data Mining and Machine Learning, Deep Learning, Information Retrieval, Natural Language Processing, Smart Home Health Analytics, Probabilistic Machine Learning, Computational Methods for IS Research, Advanced Quantitative Methods in IS Research

Services

- June 2021 **NSF-REU in Smart Computing and Communications at UMBC**, *Student Mentor*.
Implemented state-of-the art methods for detecting travel modes with open-source Microsoft Geo-life dataset. Improved the existing convolutional neural network based method for detecting unseen travel modes from our collected dataset obtained by Strava mobile application.