

MOHAMMAD AMINUL HOQUE

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[Website](#) ◊ [LinkedIn](#) ◊ [GitHub](#)

SUMMARY

- PhD student and Research Assistant - Computer Science
- Research interest: Machine learning, connected autonomous vehicles, internet of things, and mobile health.
- Industry experience in android development, software design, debugging, and issue fixing.
- Expertise in machine learning, autonomous driving, algorithms, and data structures.

EDUCATION

University of Alabama at Birmingham PhD in Computer Science Department of Computer Science	August 2018 - December 2022 (Expected)
Bangladesh University of Engineering and Technology Bachelor of Science in Computer Science and Engineering Department of Computer Science and Engineering.	GPA: 4.00 March 2016 GPA: 3.38

RESEARCH EXPERIENCE

Graduate Research Assistant August 2018 - Present
SECRETLab, University of Alabama at Birmingham

- Working on improving autonomous driving security using machine learning and cryptography. The research explores new attack vectors on autonomous driving algorithms and ML models and proposes solutions.
- Working on designing a framework for providing timely alerts to distracted pedestrians using bluetooth beacons. The research work also focuses on user activity recognition through the sensor data using ML algorithms.
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PROFESSIONAL EXPERIENCE

Software Engineer April 2016 - July 2018
Therap BD Ltd, Dhaka, Bangladesh

- Developed and maintained [Therap android app](#) which is a collection of modules that enables healthcare professionals to document the support provided to people with developmental disabilities.
- Implemented "Scheduling" module that increased the android application usage by 22%.
- Improved UI/UX of the application with material design that improved the play store rating by 1.0.
- Implemented automated UI testing using Espresso that eased the application testing.

TECHNICAL SKILLS

Methods

Machine Learning: Decision Tree, kNN Classifier, Naive Bayes Classifier
Support Vector Machine, Hierarchical Clustering, K-Means Clustering
Deep Learning: Multi-layer Perceptron, Convolutional Neural Network (CNN),
Recurrent Neural Network (RNN), Long Short Term Memory (LSTM)
NLP: Bag of Words, TF-IDF

Languages

Statistics: Chi-square Test, Correlation Analysis, Non-parametric and
Parametric Hypothesis Tests, Principal Component Analysis (PCA)

Database

Java (over 40,000 lines), Python (over 10000 lines), C, PHP, Shell Programming
MySQL, PostGreSQL, SQLite

Machine learning libraries

Scikit-learn, Keras, Tensorflow, WEKA, Sagemaker, OpenCV, PCL

Cloud

AWS EC2, RDS, S3

Mobile App Programming

Android, iOS (swift)

Version Control

Git

SELECTED PUBLICATIONS

Aminul Hoque, and Ragib Hasan, "AVGuard: A Forensic Investigation Framework for Autonomous Vehicles", published in the proceedings of the IEEE International Conference on Communications, 2021.

Aminul Hoque, Mahmud Hossain, and Ragib Hasan, "BenchAV: A Security Benchmarking Framework for Autonomous Driving", in IEEE CCNC, 2022. [Under Submission]

Aminul Hoque, Mahmud Hossain, and Ragib Hasan, "An Interaction Provenance-based Trust Management Scheme For Connected Vehicles", in IEEE CCNC, 2022. [Under Submission]

David Schwebel, Ragib Hasan, Russell Griffin, Raiful Hasan, **Aminul Hoque**, Yasser Karim, Kevin Luo, and Anna Johnston, "Reducing distracted pedestrian behavior using bluetooth beacon technology: a crossover trial", in Accident Analysis & Prevention, 2021.

Raiful Hasan, **Aminul Hoque**, Yasser Karim, Russell Griffin, David Schwebel, and Ragib Hasan, "StreetBit: A Bluetooth Beacon-based Personal Safety Application for Distracted Pedestrians", published in the Proceedings of IEEE CCNC, 2021.

Aminul Hoque, and Ragib Hasan, "R-CAV: On-Demand Edge Computing Platform for Connected Autonomous Vehicles", in IEEE 7th World Forum on Internet of Things, 2021.

Aminul Hoque, Mahmud Hossain, and Ragib Hasan, "IGaaS: an IoT Gateway As a Service for On-Demand Provisioning of IoT Gateways", published in the IEEE 6th World Forum on Internet of Things, 2020, New Orleans, Louisiana.

SELECTED PROJECTS

Multimodal deep learning based road surface detection for autonomous driving.

- A deep learning model with combination of Siamese Network and U-Net to detect road surface for autonomous driving from RGB and depth camera image.
- Achieved 88% accuracy in KITTI benchmark dataset. Collected training images from simulator that eliminates the requirements of explicitly labeled training image.

StreetBit: Context-aware Road Safety Service for Distracted Pedestrians Using Bluetooth Beacon [Application] [Poster]

- Mobile applications that can provide timely alerts to distracted pedestrians and record their responses.
- Developed the iOS app, a portion of the android app, and backend using PHP, MySQL, Amazon EC2, and RDS.
- Identified the user activity from sensor data using k-Means Clustering algorithm.

Classifying Pediatric Pneumonia From Chest X-Ray By Deep Learning

- Developed an automated pediatric pneumonia detection tool using VGG-16 and Resnet models that achieved 84% accuracy.

Sentiment Analysis Using Twitter Data [Github]

- Analyzed the positive and negative sentiment of the people of Los Angeles regarding COVID-19 from twitter data using bidirectional LSTM, CNN-LSTM, and Resnet.

CloudBox: A Cloud-Based Storage System [Github]

- A cloud based file storage service having login, registration, upload, share, and delete files.
- Used amazon EC2, S3 bucket, RDS, and PHP for backend development and file storage.
- Developed the desktop client using Java, AWS java SDK, OkHttp, JAVA NIO.

ACADEMIC ACHIEVEMENTS AND ACCOMPLISHMENTS

- Udacity deep learning nanodegree ([Certificate](#))
- Won the best poster award in undergraduate thesis poster presentation.
- Full tuition award at UAB.
- Travel grant to USA from Bangladesh awarded by Bangladesh Sweden Trust Fund.