Nazmus Shakib Sayom

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OBJECTIVE

A PhD student at the University of Utah studying safety and security of autonomous vehicles and robotic systems.

EDUCATION

PhD. in Computer Science 2024 - Present
University of Utah
Research Area: Cyber-Physical System Security

Bachelor of Computer Science and Engineering 2017 - 2020
American International University-Bangladesh
Summa Cum Laude
CGPA: 3.96

EXPERIENCE

University of Utah *Salt Lake City, Utah, USA*
Graduate Research Assistant Aug 2024 - Present

- Developing a fuzzing framework to test automotive vehicles and robotic systems.

meldCX *Dhaka, Bangladesh*
Linux Developer Jan 2023 - July, 2024

- Developed application-specific embedded Linux distribution for ARM-based SoC and SoMs.
- Researched and implemented optimized solutions for OS-agnostic device driver access over the network.
- Enhanced system performance and maintainability by creating network interfaces for Device Drivers.

Daffodil International University *Dhaka, Bangladesh*
Lecturer, Department of ETE/ICE January 2022 - Dec 2022

- Instructed courses on Operating Systems, Embedded Systems, and Computer Fundamentals.
- Contributed to 2 conference papers in the field of Deep Learning.
- Secured university funding to research cost-effective technology integration in elementary classrooms, aiming to bridge the education gap between rural and urban schools in Bangladesh.

HelloTask Platform Ltd. *Dhaka, Bangladesh*

- *Senior Software Engineer* Apr 2021 - Dec 2021
  - Led a team of developers in designing and developing a robust job platform for blue-collar workers, significantly enhancing accessibility and usability.
  - Developed an IVR-based call broadcasting and input collection system, enabling individuals without internet access to effectively utilize digital job portals.
- *Embedded Systems Engineer* Jun 2020 - Mar 2021
  - Designed and prototyped a self-checkout store network, enhancing customer experience and security.
  - Developed a centralized out-of-home advertisement delivery platform using IoT and Computer Vision Analytics.

PUBLICATIONS

1. Alfaz, N., Hasnat, A., Khan, A. M. R. N., **Sayom, N. S.**, & Bhowmik, A. (2022). Bridge Crack Detection Using Dense Convolutional Network (DenseNet). In *Proceedings of the 2nd International Conference on Computing Advancements* (pp. 509–515). Association for Computing Machinery. DOI: 10.1145/3542954.3543027
2. Alfaz, N., Hasnat, A., Khan, A. M. R. N., & **Sayom, N. S.** (2022). A Deep Convolutional Neural Network Based Approach to Classify and Detect Crack in Concrete Surface Using Xception. In *Proceedings of International Conference on Fourth Industrial Revolution and Beyond 2021* (pp. 29–43). Springer Nature Singapore. ISBN: 978-981-19-2445-3

HONORS & AWARDS

- Awarded Summa Cum Laude for outstanding academic excellence during undergraduate studies.
- Recognized on the Dean's List for exceptional academic performance in Spring and Fall 2019.
- Emerged as Champion in the App Development category at the AIUB CS Fest 2017.

RESEARCH PROJECTS

Unavailing the oceanic fronts in the northern Bay of Bengal: A CNN-based binary semantic segmentation approach. Developed and curated a large dataset based on satellite data to identify oceanic fronts in the Bay of Bengal. Developed a robust deep learning model using modern machine learning methods to improve the detection and analysis of oceanographic features. Code available on GitHub. (manuscript in preparation)

Disaster Victim Tracking and Rescue Support System with Failsafe Multilayer Communication Networks: Undergraduate thesis focusing on designing and implementing a multilayer communication network for efficient disaster victim tracking and rescue support. Utilized technologies such as ESP32, Node.js, LoRaWAN, BLE, and GSM to ensure reliable and failsafe communication during emergencies. Available on ResearchGate (May 2020).

R&D PROJECTS

Voice Remote Designed and prototyped a voice command-enabled remote controller for Android Open-Source Project (AOSP) TV using Arduino and nRF24 technology. Integrated IBM Watson speech-to-text API to enable voice recognition and control. Project available on GitHub.

Depen Developed a handheld device providing on-the-go OCR and word definitions as a Tangible User Interface project at university. Utilized Raspberry Pi Zero, Python, OpenCV, and WordNet. Project code and demo available on GitHub and YouTube.

TALK-E Crafted 'TALK-E', a long-range unlicensed frequency digital walkie-talkie, using nRF24L01+, Arduino, and audio pre-amps and drivers. Codes available on GitHub.

Dancing Bees Developed a data visualization application in Python and OpenCV, to plot and animate honey bee flight paths from annotated JSON frame data. Demonstrated output via video. Project available on GitHub.

EXPERTISE

Programming Languages	C/C++, Python, JavaScript, TypeScript, Bash
Frameworks	Yocto Project, Node.js, NestJS, FastAPI, oclif, PyTorch, TensorFlow
Tools	Git, CMake, OpenCV, Docker, SQL, MongoDB, InfluxDB
Communication Protocols	UART, I2C, SPI, nRF24 RF, LoRaWAN, BLE RESTful API, MQTT, Redis, WebSocket, GraphQL
Boards, SoCs and SoMs	Raspberry Pi 3\4\CM4, Firefly Core-3566JD4, Toradex Verdin iMX8M Mini, ESP32, STM32, Arduino