Selim Hossain

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Professional Experience

2022/02 – 2023/08
Bremen, Germany

Graduate Research Assistant
Institute for Microsensors, Actuators and Systems (IMSAS)

- Implementation of the intelligent **computing and decision support systems** and shelf life models.
- Developed a **real-time data acquisition** system using STM32 microcontrollers and wireless communication.
- Integrated a variety of **IoT sensors** (Environmental, Motion, Position) into embedded systems, leveraging expertise in hardware integration and software development, resulting in a 40% **reduction in energy consumption** and improved operational efficiency.
- Conducted **data analysis** on IoT sensor data and applied advanced visualization tools such as **InfluxDB and Grafana** to extract actionable insights, enabling data-driven decision-making and optimization of operational processes, leading to a 25% increase in overall productivity.
- **Implemented IoT communication protocols** (MQTT, Apache Kafka, HTTPS) for seamless sensor data transmission, resulting in a 20% increase in data accuracy and enhanced **real-time analytics** capabilities.

2020/09 – 2021/10
Bremen, Germany

Graduate Research Assistant
Cognitive Systems Lab

- Analyzed and interpreted **complex datasets** using advanced **statistical techniques**, such as regression analysis and clustering, to identify **significant patterns and trends**, enabling data-driven decision-making processes that led to a 20% reduction in operational costs and a 30% improvement in overall efficiency.
- Employed advanced data **cleansing techniques**, including **outlier detection** and **missing value imputation**, resulting in a 30% increase in **data accuracy and reliability** for reporting, enhancing decision-making processes.
- Designed and trained **deep learning models** for Acoustic and Linguistic Features for Early Detection of **Cognitive Deficits.**
- Developed and executed **data visualizations** using **Power BI,** Leading to a 30% decrease in the time required for reporting.

Projects

2023/01 – 2023/10

Master Thesis: Lora network and secure communication for digital twins.
University of Bremen.

- Developed highly secure **LoRa networks** for secure and reliable communication between **digital twins** and their physical counterparts; reduced **data latency** by 40% and improved overall operational efficiency.
- implementing the Driver for **I2C communication** between the **STM32** Nucleo microcontroller and **SHT-31 sensor** and using **MQTT protocol** to push the data to the **ThingsNetwork**.
- Optimized wireless connection **quality and reliability** in LoRa networks by actively monitoring **RSSI**, resulting in a peak **signal strength improvement** of -53 dBm, ensuring seamless data transmission and network performance.

2022/02 – 2022/11 **Master Project: Demonstration Machine learning for LoRa Sensor and integration into a streaming platform.**
University of Bremen.

- Set up the **LoRaWAN end node device**, by configuring the relevant parameters. Transmit the LoRaWAN **uplink message** from the end node to a specifically chosen gateway among the available 3 **gateways.**
- Setting up an experiment with **Raspberry Pi and RN2483 module** to transfer the temperature and Humidity data to **LoRaWAN gateway.**
- **Data Analysis** and applied **machine learning algorithms** achieving an accuracy rate exceeding 92%, along with **anomaly detection** techniques, for the analysis of **incoming sensor data**.

2017/01 – 2017/12 **Bachelor Thesis: Detection of Tea Leaf's Diseases Using Support Vector Machine.**
Independent University, Bangladesh.

- Curated and labeled an **extensive dataset** of over 1000 images of tea leaves, encompassing a wide range of **diseases and healthy** conditions, enabling accurate disease diagnosis and improving crop management practices.
- Successfully trained an **SVM classifier** on a labeled dataset, strategically choosing a suitable **kernel function** and fine-tuning hyperparameters, resulting in a notable increase in accuracy to 93%.
- **Extracted** relevant features from images using techniques such as Histogram of Oriented Gradients (HOG) and **color histograms**, yielding a remarkable 30% enhancement in efficiency.

Skills

Programming Languages(Python, C, C++)
Object-oriented programming
Django or Flask web frameworks
Database management (SQL, PostgreSQL, MySQL)
Data structures and algorithms
Git version control
Code optimization and performance tuning
AI & Machine Learning
Data Analysis and Visualization
Deep learning frameworks (e.g., PyTorch, TensorFlow)
Statistical analysis
Problem-solving and Analytical thinking
Embedded software development
Real-time Operating Systems (RTOS)
Low-level device drivers
Communication protocols (LoRa, MQTT, UART, SPI, I2C, Apache Kafka,Ethernet)
Embedded operating systems (Linux, FreeRTOS)
ARM Cortex-M, PIC, and AVR microcontrollers
Debugging and Troubleshooting
Hardware Interfacing and Firmware Development
Business intelligence tools (e.g., Power BI, Tableau)
Continuous integration and continuous deployment (CI/CD) processes
Algorithms and Data Structures

Education

2019/04 – 2023/12
Bremen, Germany
Master of Science in Communication and Information Technology (CIT)
University of Bremen.
Cumulative GPA : 2.0/4.0(German Scale)

Relevant Coursework: Internet of Things, Data analysis and visualization.

2013/02 – 2017/12
Dhaka, Bangladesh
Bachelor of Science in Electrical and Electronic Engineering (EEE)
Independent University, Bangladesh.
Cumulative GPA : 1.1/4.0(German Scale)

Relevant Coursework: Computer Science, Machine Learning.

Publications

2018/03/09 **Recognition and Detection of Tea Leaf's Diseases Using Support Vector Machine**
14th IEEE Colloquium on Signal Processing and Its Applications (CSPA), Penang, Malaysia (indexed in IEEE Xplore).

Languages

English	**German**	**Bangla**
Fluent	Basic	Mother Tongue

Awards

2019/11/21 **Deutschlandstipendium Uni Bremen**
University of Bremen.

2017/11/17 **Achieved Magna Cum Laude for academic excellence at IUB**
Independent University, Bangladesh

2015/04/07 **Achieved Vice-Chancellor Honour at IUB**
Independent University, Bangladesh

2019/01/07 **International student admission scholarship.**
Sungkyunkwan University.

2015/04/01 **Deans's Honors List Awardee**
Independent University, Bangladesh.