BIPIN SAHA

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EDUCATION

University of Rajshahi *January 2017 - September 2022*
BSc in Electrical and Electronic Engineering *Academic session delayed due to COVID-19*
CGPA - 3.38/4.00 (3.68 in last 60 Credits)
Coursework: Control System, Digital Signal Processing, Microprocessor and Embedded System, Power Electronics, Biomedical Engineering, Computational Methods and MATLAB Programming. [Statement of Courses and Grades]

TECHNICAL SKILLS

Languages	Python, C/C++, MATLAB
ML Frameworks	PyTorch, Tensorflow, HuggingFace Transformers, Scikit-Learn
Modules	Pandas, OpenCV, Pillow, Numpy, NLTK, Spacy, Matplotlib, Seaborn, Flask
Software & Tools	Coppeliasim, Simulink, Proteus, Easy-EDA, Git
Platforms	Arduino, STM32(BluePill), ESP32/8266/TTGo(MQTT,REST-API), Raspberry Pi, Linux
Documentation	Origin Pro, LaTeX, Adobe Photoshop, Premier Pro

RESEARCH

Saha B, Islam MJ, Dipto AS, Mostaque SK. **An Efficient Approach for Appearance Based Eye Gaze Estimation with 13 Directional Points**. In 2021 International Conference on Computer, Communication, Chemical, Materials and Electronic Engineering (IC4ME2) 2021 Dec 26 (pp. 1-5). IEEE.

Saha B, Mondal BK, Mostaque SK, Hossain M, Hossain J. **Numerical Modeling of CuSbSe2-based Dual-Heterojunction Thin Film Solar Cell with CGS Back Surface Layer**. AIP Advances. 2023 Feb 1;13(2):025255.

STANDARDIZED TEST RESULTS

TOEFL: 84 (Reading 15, Listening 26, Speaking 23, Writing 20)

EXPERIENCE

Business Automation Ltd. December 2023 - Present
Machine Learning Engineer *Rajshahi, Bangladesh*

- Leading the development and deployment of innovative Machine Learning, GenAI solutions to optimize business processes, fostering technological advancement.
- Collaborating with cross-functional teams to design and deliver high-impact AI-powered systems, including refining APIs for seamless integration and leading intelligent automation initiatives to enhance operational efficiency.

Get-Aid Ltd. January 2023 - November 2023
Assistant IoT Engineer *Dhaka, Bangladesh*

- Developed an Object Detection pipeline using YOLOv5 and v8 for grocery product recognition. (@mAP.50 – 0.995, @mAP.50:0.95 – 0.872)
- Implemented 5DOF inverse kinematic manipulator to navigate 3D shelf space using visual perception.
- Implemented PID control algorithm, resulting in precise and accurate slot navigation for robotic system.

Dr. Jaker Hossain's Research Group, University of Rajshahi April 2021 - August 2022
Undergraduate Research Assistant *Rajshahi, Bangladesh*

· Numerical analysis of Dual-Heterojunction thin film solar cell using SCAPS-1D. Cell parameters optimization. Literature review and paper writing.

Brainekt AI Lab October 2021 - January 2022
Computer Vision Research Intern *Remote*

· Data annotation and prepared Emotion Recognition Dataset.
· Trained deep learning algorithm for 9 facial expression recognition.

NOTABLE PROJECTS || COMPLETE PROJECT CATALOG

Native Vehicle Detection using Deep Learning (Working on Progress Research)

Developed a dataset, consists 14,500+ native vehicle images, and 72,000+ instances, further classified into 17 classes. Detection has been performed using You Only Look Once-YOLO (v5,v6,v7,v8) models. YOLOv7 demonstrated an accuracy of 88% in identifying and localizing vehicles accurately.
PyTorch, YOLO(v5,6,7,8) Albumentation, MMToolBox.

End to End Behavioral Cloning of Self-Driving Car

A CNN was trained on camera and steering wheel angle to plan trajectory at a hill road track. Average speed 10 MPH. A PID controller module was designed to ensure trajectory stability. GitHub YouTube
Python, Keras, OpenCV.

Appearance Based Eye Gaze Classification and Multilingual Keyboard
Supervisor: Md. Johirul Islam , Shaikh Khaled Mostaque

Developed a novel approach to classify 13 eye gaze directions in real time, based on active appearance method. Decision Tree, Random Forest and Extra Tree (ET) classifiers used to estimate gaze predictions. The proposed approach has about 98% accuracy with ET classifier. GitHub IEEE Xplore
Python, Dlib, OpenCV, Scikit-Learn.

Teleoperated Quadcopter for Aerial Mapping

The quadcopter equipped with ArduPilot 2.8, IMU, and GPS for precise aerial mapping. The system ensures stable flight, accurate positioning, and high-resolution imagery capture for surveying and mapping applications. Control Range - 2KM, Flight Duration - 15 Minutes YouTube
Mission Planner, ArduPilot 2.8, RF Trans-receiver.

Customer Queue Management with Waiting Time Prediction
Supervisor: Shaikh Khaled Mostaque

This project involves the design and implementation of a Customer Queueing System. The customers register for taking services, and a central server is responsible for assigning them to available service counters. A live tracking feature estimates waiting time using LSTM method.
Python, Sciki-Learn, Flask, Flask-JWT.

KUKA Robot's Object Sorting on Conveyor

This project implements inverse kinematics for precise motion planning and integrates computer vision to select specific types of boxes on a conveyor using a KUKA robot system. This enhances sorting efficiency by automating the process and reducing errors in industrial settings. YouTube
Python, PyGame.

EXTRA-CURRICULAR AND TALKS

Chairperson, IEEE RAS, University of Rajshahi SBC. (December 2020 - October 2022)
Secretary, IEEE University of Rajshahi Student Branch. (December 2019 - December 2020)
Volunteer, Bangladesh Innovative Education Society (April 2018 - March 2019)
Instructor, Design You PID Controller Webinar (August, 2021). YouTube
Instructor, Arduino Workshop Series, Electronics Club [EEE,RU] (October 2019 - January 2020)