Sheekar Banerjee

Cell: +8801760208590   sheekar.banerjee@gmail.com LinkedIn Github Google Scholar Website

Education	**IUBAT - International University of Business Agriculture and Technology**

Dhaka, Bangladesh

Bachelor of Computer Science and Engineering   May 2016-October 2020

CGPA: 3.86/4.00 (Class Rank: 3 out of 236)

Test Score	**IELTS - Academic**

Overall Band: 7.5   November 2023

Listening: 8.5, Reading: 7.0, Writing: 6.5, Speaking: 8.0

Publications

S. Banerjee, and M. K. H. Monir. *CEIMVEN: An Approach of Cutting Edge Implementation of Modified Versions of EfficientNet (V1-V2) Architecture for Breast Cancer Detection and Classification from Ultrasound Images*. Presented in the International Conference on Computing, IoT and Data Analytics, Spain (ICCIDA '23). To be Published in the Studies in Computational Intelligence, Springer-Nature, Switzerland.   *[Preprint]*

S. Banerjee, A. N. Jhumur, and M. E. Islam. *Nano Rover: A Multi-sensory Full-Functional Surveillance Robot with Modified Inception-Net*. International Conference of Machine Intelligence and Data Science Applications (MIDAS '21). Published in the Lecture Notes on Data Engineering and Communications Technologies, Springer-Nature, Singapore, 2022.   *[Paper Link]*

S. Banerjee, A.N. Jhumur. *A Novel Approach of Marine Ecosystem Monitoring System with Multi-Sensory Submarine on Robotic Platform for Visualizing the Climate Change Effect over Oceanic Environment*. Trends in Sciences, 2022. (SCOPUS- Q3 Journal)   *[Paper Link]*

Presentations

Approaching the world of Robotics, Deep Learning and Sensors, IUBAT Robotics Community, IUBAT, Dhaka, Bangladesh. [Keynote Speaker]. A Seminar on Artificial Intelligence, Robotics and IoT-Sensors, 2020 (AIRIS '20).

Demonstration of Sensor based Multiple Injection Prototype with Real Time Clock (RTC) Feature [Presented in front of Mr. Atiqul Islam, The Honorable Mayor of Dhaka-North City Corporation]. Smart City Expo '19, International Convention City Bashundhara (ICCB), 2019.   *[Image]*

Research Experience

JU CSE Computer Vision Lab with Prof. Dr. Md. Ezharul Islam   March 2021-December 2021

Worked as a *Research Assistant* on *Multi-Sensory Vision Enabled Surveillance Robot*. We named the project as "Nano Rover", where I worked as the lead researcher and first author.

- Developed the solution architecture according to the inception of the research idea, and developed the custom dataset of Human and weapons of different models for the detection of gender, age and weapons. Vigorously scrapped over 60,000 images related to weapons and humans from the internet for the preparation of the dataset.
- Implemented the sensory system of the robot with *Neo 6M Module* and *LIDAR* having prominently channelled with Arduino ATMega and Raspberry Pi3B.
- Rendered advanced computer vision technique with modification of Inception-Net with 20 layers, for giving our robot the most accurate capability for detecting weapons ahead and humans with their genders and ages.
- Achieved unprecedented performance in Detection Speed and Average Detection Accuracy for 6 different types of weapons; having approximately 92.23% of overall accuracy.

Brain Station 23   July 2020-October 2020

Worked as a *Deep Learning Research Intern* on Medical Image and Computer Vision based disease detection projects such as: *Skin Cancer Classification and Brain Tumor Prediction*.

- Wrote Deep Learning Algorithms for the implementations of 2 (two) of BS-23 Grant Projects regarding *AI-Computer Vision based Disease Detection*.
- Implemented ResNet-50-V1 Architecture for Skin Cancer Detection with ROI features and Classification and got 91.29% of testing accuracy.

- Implemented VGG-16 Architecture for Brain Tumor Detection with Bounding Boxed Marking features and Classification and got 87.89% of testing accuracy.

IUBAT CSE Robot-Vision Lab with Prof. Aminun Nahar (Jhumur) and Prof. Md. Alomgir Hossain
August 2019-June 2020

Worked as an *Undergraduate Student Researcher* on *Multi-Sensory Submarine on a Robotic Platform for underwater climate monitoring*; played my role as the lead researcher and first author.

- Developed a sensory chipboard attached inside its endo-skeleton which contains multiple sensors like DHT11 temperature-humidity, dust, Carbon Dioxide and YL69 pH sensors.
- Implemented a *Sensory Data Streaming Platform*; enabling marine biologists gather information of underwater whether the naval environment is habitable for the marine biological species or not.
- Assembled A-2212 1400KV BLDC motor for the navigation, three (3) TowerPro MG995 full metal Servo Motors for direction controls and 100 GPH 12V Submersible Marine Hydraulic Pump Motors for diving mechanism of the submarine.
- Coded a globally unique *Smartphone Application* with *Android Studio* for controlling the Diving and Navigation of the Submarine.
- Tested the submarine prototype in the Bay of Bengal and acquired the testing data from sensors and recorded the data as results.

Teaching Experience

Best Tutors Online - London
October 2020-September 2021

Robotics and IOT Instructor

- Remotely conducted classes and delivered virtual practical training about Internet of Things, Smart Sensors, Robotics and Programming to the international students around the world (mostly in United Kingdom).
- Instructed students to develop projects with Microcontrollers (Arduino UNO R3, ATMega2560, Nano) and Sensors, e.g., Environmental (DHT11-21, YL69), GY-BMI160 Gravitional, Flex, TTP223B Digital Touch, TCS230, TCS3200 Color, Optical, Barometric Pressure (BMP180), Sound (E30 module), Gas and Smoke (MQ2-9, MQ135) .

Department of Computer Science and Engineering, IUBAT
Summer 2017-Fall 2019

Teaching Assistant

- Taught *CSC397 Theory of Computation* at Fall 2019. Focused mostly in planning and delivering interesting and enjoyable lectures for almost 45 to 50 students on Deterministic Finite Automata (DFA), NFA to DFA conversion, Push Down Automata and Turing Machine.
- Taught *CSC391 Data Structures and Algorithms* at Fall 2019. Nurtured almost 120 students on Asymptotic Notations, Graph theory and Algorithm, Geometric Algorithm, Sorting, Searching and different Data Structure techniques.
- Taught *CSC283 Programming (C++)* at Fall 2018. Delivered lectures to almost 32 students.
- Taught *CSC183 Programming (C)* at Fall 2017. Delivered lectures to 52 students.
- Taught *CSC103 Fundamentals of Computers and Applications* at Spring 2017. Delivered lectures to almost 45 students.

Industry Experience

Vinacts, Seoul, South Korea
May 2023-Present

Artificial Intelligence Engineering Lead and Researcher (Onsite Mirpur-11, Dhaka Office)

- Writing Algorithms of Advanced Computer Vision, Image Recognition, Audio Processing, Automatic Speech Recognition (ASR) and Conversational AI for training Meta Human Characters for triggering Metaverse with Ethical AI and Responsible AI.
- Bridging up Python shell with Unreal Engine 5.2 Environment.
- Creating Servers (TCP/UDP) for AI models' communication channel.
- Converting AI models as REST APIs with Django, Flask and Socket Programming.

KaleidoSoft, Zagreb, Croatia
June 2022-April 2023

Senior AI and ML Engineer (Remote)

- Developed Android and Django based End-to-End Architecture and rapid prototype for AI based Breast Cancer Detection platform from ultrasound images with 95.96 % of prediction accuracy.

- Implemented core Deep Learning Models for Breast Cancer Melanoma Detection with Computer Vision Algorithms and modified Efficient-Nets-V1-V2 with 97.79% of accuracies. Converted AI models as APIs for the utilization of other micro-services (Kubernetes).
- Led and mentored a team of Junior and Mid-Level Engineers for the Rapid Prototyping, Implementations.
- Worked on Python Data Annotations, User data reservation with MongoDB, Open Telemetry and Google Cloud Platform (GCP) Services.

Cisscom LLC, California, USA   July 2021-May 2022

AI-ML Software Engineer (Onsite- Gulshan-1, Dhaka Office)

- Developed and AI-Computer Vision based Image Comparison and OCR Testing for pixel-by-pixel image verification in *TestJet-AI*. Upon launching, I got rave reviews from the clients exclusively for the AI Image Comparison and OCR Testing feature.
- Rendered solution for self healing web testing with healenium-python.
- Developed End-to-End AI based Web Solutions on Microservices (Kubernetes) with Tensorflow JS, Django, Node JS, Google AutoML Vision, AWS Rekognition, Sagemaker, IBM Watson and Azure.
- Developed solutions for large scale LIDAR image data annotation process for Volvo Self Driving Car Project.
- Implemented Image Processing Algorithms, Real Time Object Detection, Tracking and Recognition Custom ML Models with OpenCV, Inception-Net, YOLO (v3-v5), VGG16, Res-Net, E-Net(B0-B7), Mobile-Net, Inception-Net etc.)
- Coordinated and developed A.I. environment and properties for A.I. based Test Automation Software that automates any test record with Selenium AI, Grid, Web Driver, SeleniumBase etc.
- Managed AI Data and model pipeline with CI-CD, Docker, Jenkins, Kubernetes, Apache Pyspark, Kafka Cluster, AWS, Google Cloud

Leadership Experience

IUBAT CSE Robotics Club   March 2017-March 2020

Co-Founder and Chief Trainer

As a first year undergraduate student, I became fascinated in Programming Micro-controllers, Sensors, Motors, Vision Systems; all of which had eventually driven me into the world of Robotics. But there was no research community in my university at that time which was particularly working on Robotics. I felt it was necessary to create an organization so that I could share my knowledge of Robotics with other students and maintain a prominent research environment.

- Established IUBAT CSE the Robotics Club under the Department of Computer Science and Engineering in March 2017 along with five other senior undergraduate students.
- Launched lots of campaigns and organized 3 (three) Robotics Competitions to introduce the world of Robotics amongst the students and motivate them joining us.
- Directed the *Robotics Training Programs* every semesters which led us to create multiple strong teams for Robotics Championships and National Tech Project Competitions.
- Trained about a couple of hundred students on Robotics Systems, 40+ different types of Sensors (Environment, Biometric, Gesture, Gas, Liquid), Motors, Actuators, Arduino, Raspberry Pis and Programming (Python, Arduino, C++).
- Created and mentored teams which ended up winning 5 (five) National Technological Project Competitions in Bangladesh within 3 years upon its establishment.
- Arranged 34 hours of Basic to Advanced Robotics Workshops in 14 days at a stretch. The trained juniors are now bearing the responsibility for the future execution and success.

IUBAT SENSO CODER   September 2017-March 2020

Founder and Team Lead

While working in CSE Robotics Club, I felt like creating my own team under the club so that I could participate into National Robotics and Tech Project Competitions and bring glory to the club and my Department.

- Created the team IUBAT SENSO CODER in September 2017.
- Led the team to develop Bluetooth Submarine and Automated Rail Crossing Projects in Fall 2017 and Smart Injector in 2019.

	• Led the team, mixed with both junior and senior undergraduate students, to participate in fifteen (15) National Robotics and Tech Competitions between 2018 to 2020.
	• Led the team to win three (3) consecutive National Tech Competitions in Fall 2019 and Spring 2020, making it arguably the most successful competitive team ever in the history of IUBAT.
Humanitarian Research Projects	**SENSO CODER Ventilator Simulation for COVID-19 Patients** with Prof. Rashedul Islam Spring 2020
	• This is a design based simulation project which represents a research proposal of a cost-efficient sensor based ventilation system with *Robotic Arm Approach*, for COVID-19 patients in the rural area.
	• On the verge of a massive first wave of COVID-19 outbreak at March '20, studying as a final year undergraduate student, I led this simulation project collaborating with three mechanical engineering students at my university.
	• Demonstrated the features of *Leakage Free Oxygen Source*, Ventilation Bag attached with *Robotic Arm* with *Transverse Angle*, *Programmed Stepper Motor* for real time *Frequency Control* and *Precise Air Diffusion Rate* and *Respiratory Sensor* for reading the *Breathing Rate* of the patient.
	• Got acclamation from the Professors at my University due to the realistic feasibility of the design. *[Project Demo]*
	Smart Injector for ICU Patients with Prof. Md. Alomgir Hossain Summer 2019
	• Developed a fully *automated multiple injection system* prototype, activated through *RTC (Real Time Clock)* module.
	• Mitigated the need of nurses in hospitals for injecting medicinal fluid so that we could avoid the malpractices and gross negligence.
	• Allowed doctors to use a mobile application to set the timer of injection and the amount to be injected to the patients.
	• Demonstrated the partially functional prototype in front of *The Honorable Government Officials* for fundraising in late 2019.
Industrial Project	**TestJet-AI** with Cisscom LLC, California, USA July 2021 - May 2022
	• This is an AI powered Self-Healing Test Automation System for Mazda-USA within Web and Mobile Platform.
	• Implemented AI-Computer Vision based *Image Comparison* and *OCR Testing* capabilities for *pixel-by-pixel image verification* in TestJet.
	• Made Solution Architecture for self-healing web testing with *healenium-python*.
	• The beta version of the project has been launch for the users in the market on February 2022 when I was working at *Cisscom LLC*. Since then it has been gaining rave reviews from the users and software testers. *[Website Link]*
Awards	2021 **Best Paper Award** from International Conference of Machine Intelligence and Data Science Applications (MIDAS '21) by Springer *[Credential]*
	2020 **Runner-Up** at National Tech Idea Contest at Mujib Borsho IT Carnival, held in Dhaka International University (ranked 2 out of 17 selected top projects) *[Credential]*
	2019 **First Runners-Up** at National Tech Idea Competition, JU CSE Fest '19, held in Jahangirnagar University (ranked 2 out of 11 selected top projects) *[Credential]*
	2019 **Second Runners-Up** at Innovation Competition '19, powered by iLab innovation, Bangladesh ICT Ministry, held in IUBAT (ranked 3 out of 21 selected top projects) *[Credential]*
	2018 **Sixth position** in National Software Hackathon, BUP ICT Fest '18, Held in Bangladesh University of Professionals
	2018 **Finalist** at Autonomous Robotics Challenge in National Robotics Contest- ROBOLUTION'18, Held in Military Institute of Science and Technology, Bangladesh (ranked 11 out of 13 finalist teams, total number of participating teams was 200+)

2018 **Vice Chancellor's Award** for Academic Excellence, IUBAT (Top 1% in the whole University)
  [Credential]

2016 **Chair's Award** for Academic Excellence, IUBAT (Topper in the class of 236 Students) *[Credential]*

Media Appearances	January 2020 **The Daily Asian Age.** IUBAT secures runner-up at Mujib Year IT Carnival *[Media Link]* October 2019 **IUBAT News.** IUBAT SENSO CODER of IUBAT CSE Robotics Club Wing of IITS *[Media Link]*
Additional Courses	*PySpark and AWS: Master Big Data with PySpark and AWS [16.5 Hours].* Issued by Udemy, 2022 *[Credential]* *Deep Learning with PyTorch- Zero to GANs.* Issued by Udemy, 2022 *[Credential]* *Machine Learning Basics: Logistic Regression, LDA, KNN [6 Hours].* Issued by Udemy, 2020. *[Credential]*
Workshops Attended	*NASA Young Scientist Meetup: Rocket Design Workshop.* Issued by NASA, Held in City University, Dhaka, Bangladesh, 2019. *[Credential]* *Microsoft Student Partners: Cloud Camp (Azure).* Issued by Microsoft, Held in Jahangirnagar University, Dhaka, Bangladesh, 2019. *[Credential]*

Voluntary Involvement

Springer Nature - Computer Science,	*Peer Reviewer*	February 2023-Present
Sunnydale Math and Tech Fest'23,	*Honorable Judge*	February 2023
International Association of Engineers (IAENG), Hong Kong,	*Member*	April 2020-Present
National Collegiate Programming Contest (NCPC'18),	*Organizer*	July 2018
IUBAT University Robotics Contest (Robolion'17),	*Organizer*	September 2017
Underprivileged Student Education Program,	*Math-Physics Tutor*	February 2017-June 2017
Bhaktivedanta Academy of Cultural Education,	*Playwright*	August 2016-January 2017

Skills

Programming Languages: Python, C++, C, JavaScript, SQL.
Tools: VS Code, Pycharm, MATLAB, Arduino.
Python Libraries: Numpy, Pandas, Matplotlib, Seaborn, Scikit-Learn.
Computer Vision Libraries and Tools: OpenCV, Scikit-Image, Tesseract-OCR, Google Cloud-Vision API, AWS Rekognition, Azure-Vision.
ML Frameworks: Tensorflow, Keras, Tiny ML, Pytorch.
Cloud Platforms: Google Cloud Platform, Amazon Web Services.
Web Development: Django REST Framework, Flask, Node, MongoDB, HTML, CSS, Bootstrap.
Mobile App Development: Android Studio, Flutter.
Languages: English (Conversational), Hindi (Conversational), Bengali (Native)