Chironjeet Das Joy

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Research Focus
Autonomous Dexterous Robotic Manipulation System, Computer Vision, Sensory Infusion.

Education

BRAC University, Dhaka, Bangladesh ***May 2020-Present***
Bachelor of Science in Electrical and Electronic Engineering
Graduation: October 2024(Expected)
Specialization: Electronics, (With focused on Robotics and Intelligent System)
Current CGPA: 3.6/4 (As of Spring 2024)

Publications

T. Mahmud*, T. U. Wara, and **C. D. Joy,** *Risk Factor Identification and Classification of Malnutrition Among Under-Five Children in Bangladesh: Machine Learning and Statistical Approach.* (Under Review at Heliyon).

A. H. Kafi, **C. D. Joy,** P. M. Golpa, and R. S. I. Antara**,** "Optimizing soybean production with ground sensor terminal-based monitoring system," in *74th International Astronautical Congress (IAC)*, Baku, Azerbaijan, Oct. 2-6, 2023

On-Going Work

Thesis: *7 Dof Robotic Arm Solution for Automated Medicine Inventory Control.*

RAVEN*: IMU Based Neural Network Enabled Agile Flight Control in Complex Aerodynamics for Hexa-Copter. (LASSET)*

Research Experience

7 Dof Robotic Arm Solution for Automated Medicine Inventory Control with Dr. Abu S.M. Mohsin
September 2023-Present

- Working on to develop low cost robotics arm consisting seven degrees of freedom with available material, automated medicine shelving, stacking and fetching system to minimize the drug misplacement errors which cause death (accounted for 11.7% of all closed claims). The arm is equipped with stereovision cameras and twelve bit absolute magnetic encoder for increased accuracy and movement agility resulting reduced dispatch time.

**** The University Grant Commission (Bangladesh) addresses* ***Thesis*** *as* ***FYDP****(Final Year Design Project).*

Laboratory of Space System Engineering & Technology - LASSET with Abdulla Hil Kafi & Raihana Shams Islam Antara ***January 2023-Present***
Worked on *Satellite Ground Sensory Terminal Project* as the lead system designer & second author and *RAVEN* as the lead researcher and first author.

- Developed and implemented a time series data collection system for the *Satellite Ground Sensory Terminal Project*, utilizing multiple sensory inputs to monitor crop fields in rural areas via the KITSUNE Satellite. Designed a compact and easily deployable system, contributing significantly to project ideation and execution.
- **Raven:** Inspired by real-world problems with drone stabilization in complex aerodynamics during rescue scenarios, an Inertial Measurement Unit on the flight controller provides data about the drone cartesian position. Despite using regular PID controller, a Neural Network approach might lead to batter stabilization.
- Currently building a controlled room with infrared tracking camera completely built from scratch to simulate complex aerodynamics and to take 3D position of the drone for comparing to the IMU data.

Risk Factor Identification and Classification of Malnutrition Among Under-Five Children in Bangladesh: Machine Learning and Statistical Approach with Tasfin Mahmud

- Filtered and organized data collection from UNICEF (Dataset 2023) to make them suitable for different machine learning algorithm and made a comparative study to find out the risk factor of malnutrition among children below Five years in Bangladesh.

Control & Application Research Center with Dr. A.K.M. Abdul Malek Azad

September 2022-January2023

Worked on *Developing Solar Powered DC Compressor from Fridge & Air Conditioner.*

- Developed complete test bench to collect and analyze the data from multiple sensory input from solar panel, power storage, & DC compressor.

Grad Course and Other Projects

EEE383 Electronic System Design with Abdulla Hil Kafi ***Fall 2023***

- Partnered with five graduate students and worked on a NANO Satellite designing project to collect data from multiple ground station to send back the data to a centralized ground control system.
- Designed and implemented the payload and communication subsystem.

Flying Raijin

- Developed a STM32 based FPV drone equipped with custom stereo-vision camera built from scratch. The drone achieved ~150km/h in 0 to 2 second (as verified by the on board GPS module)

Key Skills

Designing Tools: Fusion 360, Altium, Simulink, Proteus, EasyEDA.

Programming: Python, OpenCV, Robot Operating System (ROS)[1&2], Matlab, C/C++, Arduino.

Machine Learning/Data Analysis: Deep Learning, including CNNs, RNNs; Machine Learning including SVM, KNN,, Decision Trees.

Reference

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