Ashshak Sharifdeen

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Education

University of Colombo **Expected May 2025**
Bachelor of Engineering Technology Honours in Instrumentation and Automation *Colombo, Sri Lanka*

Zahira College, Kalmunai **April 2011 – August 2019**
General Certified Examination Advanced Level *Sri Lanka*

- Z-Score: 2.071

Experience

Spaceonova **Sep 2022 – Dec 2022**
Research Intern *India, Hyderabad, Telangana*

- Design a robotic system to explore the lunar skylights/lava tubes near Mare Nectaris (Sea of Nectar). Worked on the Programming, Electronic, and Telecommunication Teams. This involved tasks related to ROS (Robot Operating System), SLAM (Simultaneous Localization and Mapping) packages, and the Gazebo simulation environment

Blackkeyhole-Website-You Tube **Oct 2019 – Present**
Self-Employed *Colombo, Sri Lanka*

- Established and managed the "BlackKeyhole" YouTube channel
- Published informative blog posts on AI, IoT, Robotics, and Arduino-related topics on the associated website
- Created and uploaded tutorial videos on AI, IoT, and Robotics on the YouTube channel.
- Maintained a consistent presence by regularly updating content on both the channel and the website.

Publications

Mr. Atharva Patil, Ms. Akanksha Bhagat, Ms. Diya Jose, Ms. Shreya Yadav, **Mr. Ashshak Sharifdeen**, Mr. Karthik R Varma. **FEASIBILITY STUDY OF ISRU ON LUNAR SURFACE EMPLOYING AN AUTONOMOUS 3D PRINTING SYSTEM**. (IAC 2023)

- Abstract

Selected Machine Learning Projects

Agrarian **August 2023**

- Led the creation of a 3D map and point cloud using drone technology to evaluate plant health indices.
- Utilized diverse image processing techniques such as thresholding, image overlaying, and color space conversion from RGB to LAB. Additionally, employed point cloud processing methods integrating classical machine learning and DBSCAN clustering algorithms.
- Leveraged AWS services, including EC2, RDS, S3, and Docker, to build a robust project infrastructure.
- Collaborated on the development and implementation of a mobile app specifically designed for farmers to improve accessibility and usability.

Mini-ImageNet-Classification-using-MAML-Few-Shot-Learning **November 2023**

- Implemented Model-Agnostic Meta-Learning Algorithm (MAML) for few-shot image classification tasks on the Mini-ImageNet dataset.
- Leveraged MAML to enable rapid adaptation to various tasks, enhancing the model's learning agility.
- MAML empowers models to learn adaptable strategies for diverse tasks, ensuring flexibility across multiple scenarios.
- Focused on handling numerous tasks grouped as sets of batches (p(T)) for continual model improvement without fixating on specific approaches: **Medium Article**

MAML-Few-Shot-Learning-Video Pose Classification **Present**

- Implemented Model-Agnostic Meta-Learning Algorithm (MAML) for few-shot image classification tasks on the CAUCAFall dataset.
- Pre-processed the CAUCAFall dataset in video format, passing each frame as an image into the model.
- Implemented the Model-Agnostic Meta-Learning (MAML) algorithm to adapt models for each frame of video data.
- Employed MAML to enable models to learn adaptable strategies for Video Data, ensuring flexibility across various scenarios.

DeepPoseX-Advancing-Human-Pose-Classification-with-Deep-Learning **Present**

- Conceptualized, developed, and fine-tuned a Custom Vision Transformer-based Bi-Directional LSTM model specialized for video understanding and action classification.
- Utilized advanced concepts such as, Transformer Encoders, and sequential models to enhance the model's performance.
- Optimized the transformer model by replacing linear layers with convolution layers to improve its efficiency and effectiveness
- Conducted various hyperparameter tuning experiments, including L1 and L2 regularization, dropout techniques, and adjustments to learning rates to enhance model accuracy.
- Explored different Augmentation techniques to further refine the model's performance and robustness.

Student Score Prediction ML Application **June 2023**

- Utilized classical machine learning algorithms such as Random Forest, Decision Tree, Gradient Boosting, Linear Regression, XGBRegressor, CatBoostRegressor, and AdaBoostRegressor for predicting student scores based on diverse factors.
- Employed a diverse range of machine learning models, optimizing them through hyperparameter tuning to achieve accurate predictions.
- Hosted the application on AWS Elastic Beanstalk, ensuring scalability and accessibility for users
- Developed a user-friendly Flask interface to provide a seamless experience for inputting data and retrieving scores.

Selected Undergraduate Projects

Atmega328P counter **July 2023**

- Contributed to the development of a dynamic counter circuit application.
- Implemented LED-based binary and SSD decimal value representation features within the circuit design.
- Integrated PWM visualization techniques to enhance the functionality of the circuit.
- Gained practical experience in circuit design and implementation.

Ros Robot Motion **June 2022**

- Created a project using ROS, emphasizing robot motions with TurtleBot3 Waffle Pi, Gazebo, and TurtleBotSim.
- Acquired knowledge about ROS nodes, packages, and basic robot motion.
- Developed proficiency in ROS file types, including launch files and URDF.
- Demonstrated skills in publishing and subscribing between different nodes.
- Utilized various ROS packages for enhanced functionality, such as Twist messages and pose information.

Wall Following Robot Gazebo Simulation **July 2023**

- Implemented a wall-following robot using ROS and Gazebo environments.
- Utilized various URDF (Unified Robot Description Format) configurations for robot modeling.
- Applied the Twist message package for controlling robot motion.
- Incorporated pose information for precise robot positioning.
- Integrated LIDAR packages for environment perception.
- Implemented an effective wall-following algorithm to navigate the robot autonomously.

Alcuberic drive **July 2021**

- Developed a Flutter project for school student progress checking and attendance monitoring using AI.
- Created a cloud-based mobile app platform enabling schools to register, establish classrooms, and manage student details securely.
- Utilized Firestore for effective database management.
- Integrated Google ML Kit for efficient face recognition functionality.
- Currently in the development phase, showcasing ongoing commitment to learning and skill enhancement in mobile app development.

Technical Skills

Languages: Python, C , C++, Java, Flutter
Developer Tools: ROS, SLAM Packages, Gazebo, TensorFlow, PyTorch, OpenCV, Numpy, Matplotlib, Open3d, Pandas, Scikit-Learn
Computer Vision: CNN, Vision Transformer, Hyperparameter tuning, Optimization, Multi-Task Model,Few-shot Learning, Meta Learning
Data Structure:Linked List, Binary Search, Bubble Sort, Merge Sort, Quick Sort

Leadership / Extracurricular

SEDS, Sri Lanka **Apr 2023 – Present**

Assistant Manager of the Rover and Robotics Division

- Coordinate and Manage all the projects under the Rover and Robotic Division of SEDS, Sri Lanka

AIESEC **Aug 2022 – Dec 2022**

Digital Experience and Marketing Specialis

- Responsible for marketing material shared among Outgoing Global Volunteer.

Extra Readings

Convolutional Neural Networks **August 2023**

DeepLearning.AI *Coursera*

- Certificate

Improving Deep Neural Networks: **August 2023**

DeepLearning.AI *Coursera*

- Certificate

Accomplishments

Raised Initial Funding of 1 million to build Agrarian **Feb 2023 - Aug 2023**

Selected as one of the top incubator-stage startups.

- Got into a six-month training program for CEOs
- Developed the prototype and pitched in front of investors
- Collected several drone image data from a paddy field for further the research.

Honored as a Finalist in Hackcx2022 **November 2022**

Selected as one of the 12 teams across the country.

- Developed a low-cost solution employing computer vision and RGB cameras to monitor critical parameters in real-time, including LAI, leaf nitrogen concentration, NDI, and excess of green in paddy fields
- Constructed Orthomosaic images and utilized Pointcloud Visualization from RGB images, enhancing paddy field visualization
- Implemented DBSCAN Algorithm for Pointcloud segmentation of plants based on density levels.