



Irfan Mohammad Al Hasib Machine Learning Researcher



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<https://irfanhasib0.github.io/>



<https://irfanhasib0.github.io/blogs>



www.linkedin.com/in/irfanhasib/

About me

I am a passionate engineer, always seeking to learn something new.

Skills

Deep Learning

Deep Neural Network, CNN

Transformers, Diffusion Models, LLMs

Reinforcement Learning

Proficient in TensorFlow, PyTorch, Keras

Proficient in Python, Numpy, Pandas, Sklearn

Machine Learning

Regression, SVM, Naive Bias, k-NN, Decision Tree, CART, Random Forest, AdaBoost, GBoosting, XGboost, Bagging, Boosting, Stacking, Ensemble, K Means Clustering etc.

Computer Vision

CNN : YOLO, SSD, U-Net, DeepLab, R-CNN, ResNet, MobileNet, EfficientNet. CV : HOG, Haar, SURF, SIFT, ORB, Opt. Flow, Segmentation, Detection, Tracking etc.

Reinforcement Learning

Value Iteration, Policy Gradient, MDP, TD/MC Learning, DQN, DDPG, PPO, A2C, A3C etc.

Experience

Vision AI Research Engineer

Digital Media Professionals Inc., Tokyo, Japan (February, 2024- Till Present)
www.dmprof.com

- » Researching on **object detection** and **6D object pose estimation** method development for performing precise pick and place operation with robotic manipulator.
- » Collaborating with the research work on **Vision Language Model** development for safe driving.

Computer Vision Engineer

Japan Infra Waymark (NTT West Group), Tokyo (August, 2021 - February, 2024)
www.jiw.co.jp

- » Research and Development of infrastructure inspection technology using **anomaly detection and visual change detection** from drone video.
- » Development of **structural component and defect detection** system from drone video for several top companies in Japan using SOTA AI models.
- » Led multiple client AI projects from requirement analysis to deployment.
- » Development and maintenance of the **Machine Learning Pipeline** for production environment. Frequently work with **Python, AWS, CI/CD, Linux systems, Docker** etc.

Artificial Intelligence Engineer

Hiperdyne Corporation, Japan (July, 2019- August 2021)
www.hiperdyne.com

- » Development of **AI based automation of an industrial process control system** with optimal control parameter estimation. [detail link](#)
- » Product shipment optimization utilizing **AI based optimization techniques**. An AI driven tool for shipment planning for oil supplier company. [detail link](#)
- » Development of **Deep Learning based system for Production KPI estimation**, from real time **sensor data** in a industry. [detail link](#)
- » A system for **Production dynamics visualization using Machine Learning**. The system generated 2D/3D dimensional visual output from high dimensional data stream to assists a human operator at industry. [detail link](#)

Artificial Intelligence and Japanese Language Training

Hiperdyne Corporation, Japan (November, 2018- April, 2019)
www.hiperdyne.com

Jr. Research Engineer (Product development and Research Dept.)

Pi Labs Bangladesh Ltd. (August, 2017- September, 2018)
www.pilabsbd.com

- » IoT based Security and Monitoring System Development utilizing **ESP8266** based sensor nodes and **Raspberry Pi** based server. [detail link](#)
- » Programmable Syringe Infusion Pump Development. Platforms : **AVR micro controller; FreeRTOS**. [detail link](#)
- » Box **tracking system** based on utilization of **GPRS signal** transmitted from the box at regular interval with location information. [detail link](#)
- » Online weight measuring machine in supply shop. [detail link](#)

Publications (lead author)

2023

My work as main author - "**Boosting auxiliary task guidance: a probabilistic approach**" has been published in IAES International Journal of Artificial Intelligence, [Volume 12, PDF](#)

Achievements

2016

Participated along with my team, Interplaneter in [University Rover challenge](#), 2016 at Utah, USA. Our team attained 5th position in Phobos final. I was in charge of **Robotic Manipulator Design and deployment**. The Competition is organized by [Mars Society](#), USA annually for college students world wide. [URC 2016 Result](#), video link [YouTube](#)

Skills

Programming

Python : Advanced Level (4 year +)

C++ : Intermediate Level (1.5 year)

Web Development, React JS : Basic (few months)

Data Analysis:

Standard Data Preprocessing Pipeline, SMOTE, Correlation & Feature Importance Analysis, Confusion Matrix, AUC & ROC, Data Visualization Tools, VAE, PCA, t-SNE, SVD, FFT, Wavelet Transform etc.

Development Platform

Linux : Intermediate Level (2 year +)

GitHub : Intermediate Level (3 year +)

DBMS (SQL) : Developing (1 year)

Docker : Developing (1 Year)

AWS : EC2, S3, ECS, Lambda Developing (1 Year)

Web Development : Flask, Django (6 months)

Spark & Hadoop : Basic (Roughly a month)

Kubernetes : (Learning)

Embedded System & IoT

AVR Micro-controller (C++), Basic ARM

ESP 8266, Raspberry Pi (Python, C++)

Engineering Mathematics:

Linear Algebra, Vector & Matrix, Transformations, Eigen-decomposition, Differential Calculus, Engineering Mathematics

Probability and Statistics :

Data Distributions, Bayes Theorem, Entropy, Cross Entropy, KL-divergence, Information Gain , Relevant theorems of Probability, Statistics and Information Theory.

Robotics:

IoT & Embedded System Design

Path Planning Algorithms

Robot Vision Algorithms

Robot Operating System (ROS)

Visual Odometry and SLAM

Data Structure and Algorithms

Data Structures and Sorting Algorithms

Graph and Tree based Algorithms

Recursion & Dynamic Programming

Project Management

Agile Project Management

Requirement Analysis

PM Tools : Trello, Asana

Machine Learning Project

- 2023 My Deep Learning and **Computer Vision Blogs** on FasterRCNN, YOLO, CNN Networks etc. <https://irfanhasib0.github.io/blogs/>
- 2023 Deep Learning projects (**Pose Tracking, YOLO-v8, Transformer, Diffusion models, Deeplab-V3**) [Github Page](#)
- 2020 Machine Learning Algorithms implementation from scratch (**ANN, SVM, Decision Tree, Logistic Regression, Naive Bias, kNN**) [Github Page](#)
- 2020 Implementation of **Computer Vision Algorithms** - Yolo-v3, UNet, Flow-Net(optical flow), Disparity estimator. [Github Page](#)
- 2020 Reinforcement Learning Algorithms from Scratch (**DQN, DDPG, A2C, PPO**) using Python and Tensorflow. [Github Page](#)
- 2019 **Kaggle Competition** : House Price Prediction focusing on data pre-processing methods and hyperparameter tuning. [Github Page](#)

Robotics Project

- 2019 Implementing optimal steering angle estimator for car simulators using **Model Predictive Controller (MPC)** and Iterative Linear Quadratic Regulator (ILQR) algorithms from scratch. [Github Page](#)
- 2018 Designed a simple two link Robot using URDF and written driver codes for **ROS in Python**. [YouTube link](#)
- 2017 Built a programmable (G- code) **Desktop CNC Machine** using AVR Platform, for G-code parsing I have used an open source called GRBL. [YouTube link](#)
- 2014 Visually instructed **Robotic arm on AVR Platform**. I have build a simple object tracker using IR sensor array [YouTube link 1](#) I also built a GUI software in python for controlling. [link 2](#)

Education

- 2017 **B.Sc. in Mechanical Engineering**
Bangladesh University of Engineering and Technology (BUET)
CGPA: 3.23 out of 4.00
- 2011 **HSC (Science)**
Rajuk Uttara Model College, Uttara, Dhaka 1207
GPA: 5.00 out of 5.00
- 2009 **SSC (Science)**
Rajuk Uttara Model College, Uttara, Dhaka 1207
GPA: 5.00 out of 5.00
- Language**
English : Business level proficiency in English
Japanese : Passed NAT-N5

Co-Curricular activities

- 2016 **Founding President at BUET ROBOTICS SOCIETY (BRS)** [\(page\)](#)
- 2016 Co-organized Annual Robotics Competition for BRS

Publications(co-author)

- 2016 Development of a two wheeled self balancing robot with speech recognition and navigation algorithm, [Journal : AIP](#)
- 2019 Integrating data mining and microsimulation modelling to reduce traffic congestion. [Journal : Urban Science](#)

Academic Project

- 2015 A Remote control Surveillance robot.The robot was able to pick up small objects from hole. It could also send temperature, pressure and video feed from an remote place using Bluetooth signal for surveillance support.[\(link\)](#)
- 2016 For undergrad thesis we developed a precision velocity measurement system. We used Kalman filtering for **Sensor Fusion** and combined **GPS (Ublox-NEO 6)** and **IMU Sensor(MPU6050)** data. [\(link\)](#)