



## Irfan Mohammad Al Hasib Machine Learning Engineer



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## 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 Engineer

**Digital Media Professionals Inc., Tokyo, Japan** ( February, 2024- Till Present)  
[www.dmprof.com](http://www.dmprof.com)

- » Working on precise 6D pose estimation of objects for factory automation.
- » Collaborating in the research work on Vision Language Model development for safe driving.

### Artificial Intelligence Engineer

**Japan Infra Waymark (NTT West Group), Tokyo** ( August, 2021 - February, 2024)  
[www.jiw.co.jp](http://www.jiw.co.jp)

- » Leading multiple client AI projects from requirement analysis to deployment.
- » Leading research on infrastructure inspection using **anomaly detection, visual change detection** from image data.
- » Research and Development of **structural component and defect detection** system from drone video for several top companies in Japan using SOTA AI models.
- » Development and maintenance 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](http://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 assist a human operator at industry. [detail link](#)

### Artificial Intelligence and Japanese Language Training

**Hiperdyne Corporation, Japan** ( November, 2018- April, 2019)  
[www.hiperdyne.com](http://www.hiperdyne.com)

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

**Pi Labs Bangladesh Ltd.** ( August, 2017- September, 2018)  
[www.pilabsbd.com](http://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](#)

## 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](#)

## 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 12PDF](#)

# 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

- 2022 My Deep Learning and **Computer Vision Blogs** on FasterRCNN, YOLO, CNN Networks etc. <https://irfanhasib0.github.io/blogs/>
- 2020 Machine Learning Algorithms implementation from scratch (**ANN, SVM, Decision Tree, Logistic Regression, Naive Bias, kNN**) [GitHub](#)
- 2020 Implementation of **Deep Learning based Computer Vision Algorithms - YOLO-V1-3, UNet, Flow-Net(optical flow), Disparity estimator**. [GitHub link](#)
- 2020 Reinforcement Learning Algorithms from Scratch (**DQN, DDPG, A2C, PPO**) using Python and Tensorflow. [GitHub link](#)
- 2019 **Kaggle Competition** : House Price Prediction using state of the art data preprocessing methods and hyperparameter tuning. [GitHub link](#)

## Robotics Project

- 2019 Implementing optimal steering angle estimator from road co-ordinates using **Model Predictive Controller (MPC)** and Iterative Linear Quadratic Regulator (ILQR) algorithms from scratch. Tested the on AirSim environment and OpenAI car racing environment.[GitHub link](#)
- 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

## Other Publications

- 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. [\(link\)](#)