



Irfan Mohammad Al Hasib Machine Learning Engineer



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66-13, Horikawacho, Saiwai-ku,
Kawasaki, Kanagawa, Building:
Kawasaki Technopia Horikawa-
cho Heights, Room : 606, Postal
Code : 212-0013



+81 070 3832 6371



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



irfanhasib.me@gmail.com

About me

I am a passionate research engineer, always seeking to learn something new. I am interested in designing smarter systems for advancement of humanity

Skills

Deep Learning

Deep Neural Network
Convolutional Neural Network
Reinforcement Learning
Proficient in Tensorflow & KERAS
Familiar with Basic Pytorch
Proficient in Python, numpy, pandas, sklearn

Machine Learning

Linear and Logistic Regression
Decision Tree, CART, Gradient Boosting
SVM, Naive Bias, KNN

Robotics:

Computer Vision Algorithms (OpenCV)
Basic Robot Operating System (ROS)

Programming

Proficient in Python
Working Experience in C++

Experience

Artificial Intelligence Engineer Hiperdyne Corporation

www.hiperdyne.com (July, 2019- Till Present)

» Implementing state of the art Reinforcement Learning Algorithms for Solenoid valve position (Set Point) controlling by observing sensor values (Process Value) for Oil Refinery Plant. After years of research and optimization eventually the performance of the AI solution exceeded performance of human experts in respective industry. The whole system relied on a MQTT sensor Network which made it dynamic and responsive.

» AI based scoring System for optimal oil shipping plan selection. The industry has options for transportation ship, supply refinery with certain capacities and delivery port with varying demand. The system utilized the Inventory data (supply and demand) and Ship Schedules (Ship and available routes). The system utilizes concepts of Q learning to predict wise score for each plan at a certain inventory status.

» Early prediction of "After Burn" phenomenon level in refinery prediction from Sensor Values using Deep Learning based techniques, for taking early measures to benefit production.

» Deep Learning based dimensionality reduction techniques have been applied to high dimensional sensor values to produce 2 dimensional output. this lower dimensional output was used to plot and visualize latent space of interest that showed the transition of the production phase and helped the operator to take necessary measures much earlier.

Jr. Research Engineer (Product development and Research Dept.) Pi Labs Bangladesh Ltd.

www.pilabsbd.com (August, 2017- September, 2018)

» Programmable Syringe Infusion Pump Development. An automatic syringe infusion pump that can be programmed by setting amount of fluid to be pushed in a certain time period. The whole system was developed on AVR micro controller platform and FreeRTOS based system.

» IOT Based Security and Monitoring System Development. Many standalone sensor units were developed on ESP8266 platform with minimal power consumption and could be placed at remote places that periodically report security status on a raspberry pi based server

» Box tracking system based on utilization of GPRS signal transmitted from the box at regular interval with location information's.

» Online weight machine for a supply shop. It will automatically send the weight and bar code to the system server while packaging.

Mars Rover Challenge

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 Arm Design and deployment. The Competition is organized by [Mars Society](#), USA annually for college students world wide. [URC 2016 Result](#), Critical Design Review [YouTube](#)

Machine Learning Project

2020

Machine Learning Algorithms implementation from Scratch (DNN, SVM, Decision Tree, Logistic Regression, Naive Bias, KNN) using python, numpy and pandas. I believe implementing from scratch effective way to study and understand an algorithm. [GitHub link](#)

2020

Reinforcement Learning Algorithms from Scratch (DQN, DDPG, A2C, PPO) using Python and Tensorflow. [GitHub link](#)

2019

I have implemented YOLO (object detection), U-Net (semantic segmentation), Flow-Net (optical flow), Disparity estimator. [GitHub link](#)

2019

Kaggle Competition : House Price Prediction using state of the art data preprocessing methods and hyper parameter tuning. [GitHub link](#)

Skills

Data Structure and Algorithms

Graph Search Algorithms
Sorting, Search and Tree based Algorithms

Embedded System Design

AVR Microcontroller (C++), Basic ARM
ESP 8266, Raspberry Pi (Python, C++)

Design Software

Proteus for Circuit Design
SolidWorks for CAD Design

Robotics Project

2019

Implementing optimal steering angle estimator from co-ordinates using Predictive Controller (**MPC**), Iterative Quadratic Regulator (**ILQR**) Tested the on AirSim environment OpenAI car racing environment (ILQR Paper : Synthesis of Complex Behaviors through Online Trajectory Optimization by -Yuval Tassa) Algorithms from Scratch [GitHub link](#)
Designed a simple two link Robot using URDF and written for ROS in Python. [YouTube link](#)
Built a programmable (G-code) Desktop CNC Machine using form, for G-code parsing I have used an open source [YouTube link](#)
Visually instructed Robotic arm in AVR Platform. I have built an object tracker using IR sensor [YouTube link 1](#) I also built a platform that enables it to be controlled by Joy-Stick controller video feed back and added some real time computer vision object tracking and localization based algorithm support

2018

2017

2014

(apologise for poor video quality)

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

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 a remote place using Bluetooth signal for surveillance support. ([Undergrad Project](#))

2016

For undergrad thesis we developed a precision velocity measurement system. Our approach was to use sensor fusion for combining GPS (Ublox-NEO 6) and IMU Sensor(MPU6050) data. We used Kalman filter as sensor fusion algorithm to exploit the instantaneous uncertainty information of different signal source. ([Undergrad : Project and Thesis](#))

Co-Curricular activities

2016

Founding President at BUET ROBOTICS SOCIETY (BRS)

2016

Co-organized Annual Robotics Competition for BRS

Publications

2016

Development of a two wheeled self balancing robot with speech recognition and navigation algorithm, [Journal : AIP Conference Proceedings](#)

2019

Integrating data mining and microsimulation modelling to reduce traffic congestion: A case study of signalized intersections in Dhaka, Bangladesh [Journal : Urban Science](#)

2021

My most recent research work as main author on Visual Odometry and Auxiliary Task guidance is under review for a renowned conference.