

# Gulam Waris

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Software Development Engineer I

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## EDUCATION

**Bachelor of Technology**, Indian Institute of Technology Delhi

Jun 2021

**Minor Degree in Robotics**, Indian Institute of Technology Delhi

Jun 2021

## EXPERIENCE

**Software Development Engineer I**

**Jun 2021 — Present**

*Times Internet*

*Noida, India*

### • GrowthRX : User Engagement Analytics Platform

- Implemented service for simulating real user traffic according to business constraints for ingestion into **kafka** event processors
- Worked on a **scheduler** for migration of old data into cold disk efficiently in large chunks in **clickhouse** (OLAP data warehouse)
- Developed and deployed **scalable APIs** for handling large volume of events, notifications and report generation respectively
- Made platform **GDPR** (General Data Protection Regulation) compliant by incorporating **HMAC** secured APIs for Data retrieval.
- Deployed a **spring-boot** app to extract expiry dates of encrypted ios notification certificates of users and email priority-wise

### Denmark : Content Management System

- Developed secured file upload APIs for prevention from **XSS-attacks** by blocking malicious files with any possible extension
- Refactored and optimized multipublish workflow (one click publish into multiple news channels) and made debugging easy
- Designed the overall flow for supporting any **parallax effect** and its optimal rendering on the news website and integrated with legacy workflow using effective object-oriented design and encapsulation methods for better abstraction and reuse
- Analyzed the **cache cleaning** workflow of news-website for better responsiveness and added support for future dated content publishing too by creating a microservice for processing and sending events for cache cleaning once the content is live
- Worked on web-services for user access and permission management on a finer level up to content by using **bitwise mapping**
- Designed the architecture for enabling the use of author-proxies (virtual authors of a content) and also their tracking for analysis, having one-to-many relationship with real authors and used **BTree indexed** table mapping for efficient search

## PROJECT

### Cable Driven Parallel Manipulator

- Ideated and build a **3D model** of cable driven manipulator for increased workspace, payload handling and dynamic response
- Simulated the model in **Mujoco**, **Solidworks** and **Gazebo** with different cable modelling strategies and Compared for accuracy
- Integrated **gym** environment for training **imitation RL** model on this manipulator for imitating the behaviour of agent's trajectory

### Gesture Based Pick and Place

- Did POC on simulating pick and place scenario with Niryo robot in a warehouse with various objects in **Gazebo**, **Unity** for speed
- Integrated **ROS publisher and subscriber** framework in Unity for getting the sending the positions of objects to pick in ros-msg
- Created a library of different shapes of objects for instantiating in Unity environment and implemented **mouse pointer location** based gesture recognition of object initial and final position and thus, optimal trajectory estimation for robot

### ToF (Time of flight) sensor based 3-D scanner

- Led a team of 3 students and built a 3D-object scanner by interfacing **ToF (VL53L0X)**, **IMU (MPU6050)** sensors with **Raspberry Pi**.
- Designed a unique prototype of the scanner in **Solidworks** and converted to URDF for simulating in Gazebo using ROS framework
- Calibrated sensors using least squares for bias removal and collected depth information from a programmed rotating platform
- Enforced Complimentary filter algorithm to fuse data of **accelerometer and gyroscope** to achieve accuracy and denoise data.
- Used **SLAM** techniques for estimation of position of the scanner and accounted for **dead-reckoning** while determining position

### Path planning using A\* algorithm in ROS

- Wrote a node to find the shortest path using **A\*** and euclidean distance as heuristics for Simultaneous Localization and Mapping
- Used this as a plugin in gazebo simulator for the navigation of **turtlebot** (using ros framework) in a mapped environment
- Given multiple goals, created an optimal path for the robot from source to destination in real-time and simulated in gazebo

### Machine Learning Project

- Derived Semi-Supervised form for **EM algorithm** and improved the convergence speed by 5% compared to unsupervised setting
- Devised a multi class **CNN classifier** over popular **MNIST** dataset using ReLU as activation function and Softmax for probability
- Built a lossy Image compressor using **k-means** by reducing the number of colors, compressed the file size by a factor of 6
- Developed a spam filter using **Naive Bayes** algorithm with multinomial event model and Laplace smoothing for regularization

### Course Project

- Used different algorithms for extracting the edges of gall-bladder in different ultrasound images using **opencv** library in python
- Trained a reinforcement learning model (**q-learning**) to play optimally the frozen-lake game using gym environment in python
- Implemented **buffer-pool** manager for fetching disk pages optimally in a **DBMS** and in multithreaded environment using c++ 11