

# Rahul Karanam

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## EDUCATION

### UNIVERSITY OF MARYLAND

#### MENG IN ROBOTICS

Expected May 2023 | College Park, MD

Cum. GPA: 3.56

#### COURSEWORK:

Robot Learning, Perception,  
Motion Planning, Software  
Development, Control System

Teaching: Linear Algebra (MATH461) &  
Computing Fundamentals ENME202

### BS IN MECHATRONICS

May 2018 | Chennai, India

Cum. GPA: 3.42 / 4.0

#### COURSEWORK:

Robotics, Sensors &  
Actuators, Statistics,  
Mechatronics System

## LINKS

Github:// [karanamrahul](#)

LinkedIn:// [rahulkaranam](#)

Medium:// [rahulkaranam777](#)

## CERTIFICATIONS

Advanced Natural Language Processing

TSAI 2021

Machine Learning Udacity 2020

Aerial Robotics Coursera 2018

## SKILLS

#### Programming:

C++ • Python • SQL • Matlab

• Bash • HTML •  $\text{\LaTeX}$

#### Framework/Technologies:

Robot Operating System (ROS) • Pytorch

• Tensorflow • Gazebo • V-rep • Linux

#### Packages:

OpenCV • PCL • Spacy • scikit-learn •

openNMT

#### Miscellaneous:

Git • Jenkins • SAP • MS SQL • Docker •

Rasa • Blender

## RESEARCH INTERESTS

Affective Computing

Natural Language Processing

3D Geometric Vision

## EXPERIENCE

### APOLLO TYRES | SENIOR EXECUTIVE - ROBOTICS AND COMMERCIAL DEPARTMENT

Dec 2018 – Mar 2021 | Chennai, India

- Responsible for providing procurement reports, cost analytics and related support from internal departments to support fact-based buying, provide impactful decision support, and enhance long-term relationships with suppliers.
- Managed and designed new procedure ("should cost model") to track capital spending and estimate pricing of a new component, reducing risk of error and misinformation using Python and Power BI.
- With this improvement, the controllers can now see overspending trends in real-time, rather than at quarter-end resulting in savings up to \$30K in Q2.
- Pipe lined data from SAP(MM) to Power BI using MS SQL Server Power BI Integration thereby saving 4 hours biweekly manual processing time for BI team.
- Built advanced Power BI dashboards to extract and visualize sensor and downtime data of palletization robot and automatic storage and retrieval system to find potential pitfalls and planning predictive maintenance increased system productivity by 15%.
- Collaborated with engineers and analysts to perform detailed study to optimize service contracts for all the plants across India. Presented the report and recommendations resulting in \$40 million savings per quarter.

## KEY PROJECTS

### Text2Py: Python code generation using Neural Machine Translation

- The Data set has been pre-processed using Spacy, word2vec and made into separate question answer pairs. Created separate tokenizers for pythonic syntax and natural language.
- Implemented a batched-input seq2seq Transformer architecture from scratch (in Pytorch) with self-attention mechanism to output accurate python code by considering proper indentations. ( Test Loss: 0.125 | Test PPL: 1.133 )

### Musketeers: Autonomous pickup and delivery fleet

- Developed a multi-robot(20) autonomous delivery framework, that works with husky robots from ClearPath robotics, in a simulation environment. The robots called "Musky" could access delivery and pickup locations via command line inputs and/or with a Graphical User Interface (GUI).
- Designed the interface using kivy for creating the GUI.
- Created a Custom map using gmapping and move\_base framework for the navigation.

### KitchenBot: a 6 DOF manipulator used for picking and packaging

- We used Move it for planning our UR5 robot to perform the pick and place operations. Implemented and validated the Kinematics using sympy and KDL.
- The commands were given using Moveit group interface (C++) and OMPL Planner to the robot.
- PID controller was implemented to control the joints and visualization of the sensor data was done using RQT and Rviz.

### Autonomous RC Car using Raspberry Pi

- Developed and built a scaled down version of an autonomous car. Trained the model using a supervised machine learning algorithm to learn the optimized steering angle with two hidden layers.
- Cost function was optimized using the L-BFGS-B algorithm.