AYUSH KUMAR SINGH

Robotics Engineer

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About Me

Robotics engineer with **4 years** of experience in core domain and **7 years** of total industrial experience. Experties in **automation**, control systems and **embaded systems**. Skilled in designing and optimizing robotic solutions, integrating hardware with realtime software, and solving complex challenges through innovation.

Skills

- Python
- C/C++
- ROS / ROS2
- Git
- OpenCV
- Embaded system
- PLC
- Point Cloud
- Matlab
- Labview
- Fusion 360
- Moveit
- Gazebo
- Arduino / ESP32
- Scrum
- InfluxDB
- Isaac SIM
- YOLO
- Detectron 2
- PyTorch

Education

Bachelor of Engineering **2011 - 2015**
New Horizon College of Engineering
Bangalore, India
Project: Secured data retrieval for decentralized tolerant Military Network.

Masters in Robotics & transport 2018 - 2020
Ecole Centrale de Lille
Lille, France
Project: Trajectory formation and signal filtering for 3d printing mobile robot.
Project: Collision avoidance and complex motion formation for humanoid robot NAO.

Certification

Oct 2014
CISCO Certified Network Associate

Languages

English
French
German
Hindi

Experience

Robotics Engineer **02/2023 - Present**
bAhead GmbH - Hamburg, Germany

- Made python based **ROS/ROS2** driver for Denso Cobotta robot.
- **Path planner** for robot arm using **A*** algorithm.
- Developed **user interface** for the end user to operate the robot
- Established communication protocols like **OPCUA**, **SILA2** between the robot and other medical devices
- Driver development for multiple **medical devices** like microplate washer, reader, shaker and endeffector wireless cameras (using vocore2).
- Object detection using **OpenCV** and **detectron2** trained model.
- OpenWRT based **custom OS** development for vocore2. Python, shell based drivers creation for vocore and camera for wireless communication, streaming.
- Camera based **calibration** algorithm for mapping the microplate.
- Developed **simulation** of the Denso robot for the end user using **RVIZ**,**moveit**.
- Developed torque based collision detection algorithm.
- Responsible for creating applications using **behavious trees**.
- Responsible for leading the team and **project management**.

Robotics Engineer **05/2021 - 12/2022**
Colruyt Group - Halle, Belgium

- Developed **C++** based API for point cloud generation of truck's cargo.
- C++ and ROS based **SImulator** development for **robotic fork-lift**.
- Motion controller development using **sensor fusion** for **pose estimation** by utilizing **Extended Kalman FIlter** algorithm.
- **Inverse kinematic** and trajectory creation of mobile robot using **A*** algorithm.
- **Pick and place** algorithm of product using **point cloud** for its orientation and position estimation using **RGBD camera** and universal robot **UR10**.
- Scanning product to create 3d image by concatinating point cloud images by using Intel RealSense camera mounted over Universal Robot **UR16**.

Machine Learning Engineer **04/2020 - 07/2020**
VisioLab - Berlin, Germany

- Training the neural network (siamnet) to detect food items
- Transforming this model from google cloud to coreML
- Creating an IOS application for the client

Transaction Risk Investigator **06/20216 - 08/2018**
Amazon - Bangalore, India

- Investigating buyer accounts on the platform via cases, transactions, emails
- Handling large scale credit card transactions and bank accounts
- Training and assisting new employees on investigating cases

Technical Support Engineer **09/20215 - 06/2016**
Hewlett Packard - Bangalore, India

- Technical support to commercial clients for HP hardware or software issues.