Raj Mohan

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Kalathil House,Arattuvazhy Ward,Alappuzha,Kerala 688007

Inquest of challenging career prospects in the field of Robotics and Embedded System in an organization of high repute.

CAREER SYNOPSIS

Completed **Masters** in Robotics and Automation engineering from Amrita school of engineering with **University first Rank and Gold Medal.**

Presently associated with Admatic Solutions,Chennai as a Robotics Engineer Intern,leading a team of four members.

Having **industrial experience of more than a year**, in the field of Robotics and Embedded systems.

Skilled in **Mobile Robotics,Embedded System Design,Electronics,Internet of Things(IoT),Machine Learning**

Interested in the fields of Robotics,Electronics& Communications,**Robot Operating System(ROS), Simultaneous Localization And Mapping** (**SLAM**)**, Aerial Robotics,Industrial Automation**, Mathematics

Always **willing to innovate** the new things which can improve the existing technology

CORE COMPETENCIES

Technical

Operating System	: Windows, Ubuntu 14.04,ROS (Robot Operating System)
Programming Language	: Embedded C, Python ,C ,C++ , MATLAB , Micro python
MicroControllers	: Arduino Uno,Mega 2560,Pro-mini,Nano,ESP 8266,ESP 12E,Raspberry Pi,Atmega Series,PIC microcontrollers
Communication Protocols	:UART,SPI,I2C,RS 232
RDBMS	: MySql
IDE	: Arduino 1.8,PyCharm 4.5.4, Eclipse 3.2,OpenCV

CAREER CONTOUR

Since August `17
Admatic Solutions ,Chennai as Robotics Engineer Intern.

Responsibilities

Handling Development, debugging and troubleshooting of the Robotics and Iot based project.

Leading and providing guidance to the **Robotics and IoT team** of four members

Development of hardware and software framework for the Mobile Robotics domain.

Integration and testing of algorithms developed with the Robotics platform

Preparing various documents related to the project.

Projects Handled

Title : **RFID-based-Mobile-Robotic System for Ware house Management**
Client : **Admatic Solutions**
Duration : **August 2017-November 2017**
Technologies : **Mobile Robotics, Embedded System Design, RFID Tags, IMU Sensors, IoT , MQTT , Path Planning , Obstacle Detection , Line follower**
Microcontroller : **Arduino Mega 2560,NodeMCU**
Languages : **Embedded C, MicroPython , Python**

Synopsis : This is an RFID based Mobile Robotics system for the ware house management purposes Localization is done for the workspace using the nodes with RFID tags and black strips of lines were used for assisting the navigation across the arena. The robot basically consists of two controllers:ie primary controller with a NodeMCU and a secondary controller with an Arduino Mega for motion control .Primary controller deals with the commands sending and receival with the CPS(Central Processing System) and secondary controller.In other terms it could be defined as the brain of the system.Secondary controller deals with the basic motion across the grids.It consists of LSA 08 advanced line sensor and the MPU 6050 IMU which asssists its motion through the environment.Communication between primary and secondary controllers happens through serial communication.Communication between primary controller and the CPS (Central Processing System) happens across MQTT

Key Tasks : Design and development of Mobile Robot
Leading and Coordinating the Robotics-IoT team
Design of algorithm
Integration and testing of algorithm with the robotics platform

Team Size : 4 Members

Previous Assignments

Innovations Lab,Tata Consultancy Services as Intern **From Aug'16 – Jun'16**

Title : **T-Analyzer**
Client : **Innovations Lab,Tata Consultancy Services**
Duration : **May 2017-June 2017**
Technologies : **Embedded System Design , Machine Learning , NRF Communication**
Microcontroller : **Arduino Mega 2560**
Languages : **Embedded C,Python**

Synopsis : A device used to analyze and detect various odour levels in rest rooms/toilets.An offensive smelling toilet is more often caused by a lack of cleaning.While regular cleaning definitely minimizes toilet odor,depending on the usage rate,the frequency in which toilet should be cleaned would varies. In this project a solution is proposed to analyze and detect various odour levels in rest rooms/toilets.It produces alerts at instances where the odor level exceeds the limit.The system consists of a transmitter module which is kept inside the toilet and a receiver/display module which is kept either just outside toilet or within the vicinity of cleaning staffs.The sytem consists of various gas sensors like MQ2,MQ3,MQ6,MQ135 for detecting different gaseous componenets in the environment. The sensor values were logged for 5 hours and k-means clustering was done for classifying the values into two different regions.

Key Tasks : Developed an Embedded system for analysing the odour level in the toilet.
Implemented Machine Learning algorithm

Team Size : 2 Members

Title : **Multi Level Car Parking Monitoring Robot**
Client : **Innovations Lab,Tata Consultancy Services**
Duration : **August 2016-June 2017**
Technologies : **Mobile Robotics, Embedded Systems Design , Image Processing , RaspberryPi ArUco Marker ,OpenCV**
Microcontroller : **Arduino Mega 2560, ESP 8266 , Raspberry Pi 3**
Languages : **Embedded C,C++**

Synopsis : In the existing car parking monitoring system, a security will be moving across entire parking region collecting registration number of car parked and corresponding slot number.In order to reduce the human effort and save time to a greater extent,a Multi Layer Car Parking(MLCP) monitoring robot is being introduced .The security in the MLCP will be able to control the motion of the mobile robot using an android gadget/autonomous mode.Visual markers(ArUco) was used for the localisation and navigation of the mobile robot. The camera mounted on top of the robot will be used for collecting images of vehicle number plates from the parking area.The collected images would be uploaded into the cloud data base.Using a google vision based API ,the characters in the number plate would be extracted.So by the end of the day the details of vehicles parked in a particular floor could be collected with least human effort.

Key Tasks : Development of a mobile robot the following functionalities from scratch:
Control using android gadget,autonomous mode,human follower mode,gesture controller mode
Team Size : 2 Members

Government Engineering College, Thrissur as Student **From Jun '10 – Jun '14**

Title : **Gesture Controlled Rescue Aiding Robot**
Client : **Government Engineering College,Thrissur.**
Duration : **January 2014-May 2014**
Technologies : **Embedded System Design,Robotics,RF, Communication,PCB Design**
Controllers : **Atmega 16**
Languages : **Embedded C**

Synopsis : The objective of this project is to build a mobile robot that can be controlled by hand gestures. User will be able to control motions of the robot by wearing the controller glove and performing predefined gestures. This project provides a basic platform for potential applications like human-machine interfacing. For this project we are using a gyro controlled transmitter glove for the direction and speed control of the robot. For efficient aiding in commando operating an in the field of post disaster operation we are employing gas detection, human detection and temperature sensing.
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Key Tasks : Requirement gathering
Design and implementation.
Team Size : 4 Members

Title : **Pre-Paid Energy Meter**
Client : **Government Engineering College,Thrissur**
Duration : **August 2013-December 2014**
Technologies : **Embedded System Design,PCB Design**
Microcontrollers : **PIC**
Languages : **C**

Synopsis : Scarcity of electricity is the one of the important crisis in the world now a day. The careless use of electricity is the main reason. This motivated us to introduce a fixed prepaid concept of electricity and to bring a control over the usage of electricity. The main aim of the project is to develop a system for electricity where user can recharge for particular unit of electricity and can use the electricity till he has balance. It also introduces a prepaid concept of electricity.

Key Tasks : Design and developed of an embedded system from scratch
Design of algorithm for the process
Team Size : 4 Members

ACADEMIA

2017 **M.Tech (Robotics And Automation)** from Amrita School of Engineering;
CGPA:9.34/10
University First Rank and Gold Medalist

2014 **B.Tech(Electronics And Communication**),Government Engineering College,Thrissur;
CGPA:7.58/10

2010 **12th**(State Board of Higher Secondary),T.D.H.S.S Alappuzha
Percentage : 96.6%

2008 **10th(S.S.L.C)**,Carmel Academy E.M.H.S ,Alappuzha
Percentage: 95%

Trained Skills

- Robotics And Automation
- Embedded System Design
- Electronics and Communication
- Mobile Robotics
- Internet of Things (IoT)
- Machine Learning
- Robot Operating System(ROS)

Achievements and Participation

- Achieved **Gold medal for securing the highest rank** in Robotics And Automation,Mtech in 2015-2017

- **Organized workshops** for high school students in four remote villages of Andra Pradesh regarding **Human-Machine interaction and basic robotics** in June 2016

- Attended a **workshop in IIT Jodhpur on 'Aerial Robotics'** by Dr.Vijay Kumar in December 2015

- Attended a workshop in 'I-sensobotz on AVR' at Government Engineering College, Thrissur

- Participated in RoboWar competitions as part of various techno-managerial fests.

PUBLICATIONS

UAV based security system for prevention of harassment against woman Published in ICICICT 2017

PERSONAL DOSSIER

Date of Birth : 22nd August 1992
Work Samples : https://github.com/rajmohan747
Linkedln : https://www.linkedin.com/in/rajmohan747/