Ragesh **Ramachandran**

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"The present is theirs; the future for which I really worked, is mine."

Summary

I am a roboticist with a keen interest in mobile robots and embedded systems. Being involved in numerous projects right from the conceptual stage to their commissioning, I have acquired extensive problem-solving capabilities in this domain. My areas of expertise include:

- **ROS**
- **Mobile Robotics**
- **Embedded systems**
- **Team Management**

Experience

Fraunhofer IPA, Robotics and Assistance Systems
Stuttgart, Germany

Research Assistant — *March. 2019 - Present*

- Development of deterministic/Real-time ROS packages for industrial scan and polish robots.
- Identification of safety critical modules in the package and porting them to ROS 2.0 for making the system deterministic

Ingeniarius,Lda
Coimbra, Portugal

Robotics Engineer Intern — *July. 2018 - Sept 2018*

- Developed Autonomous docking service for the recharging of STOP - "Seguranças robóTicos coOPerativos" Robot in ROS and Gazebo using the ROS navigation stack.

RobotCraft - Robotics Craftsmanship International Academy
Coimbra, Portugal

Internship — *July. 2018 - Sept 2018*

- Worked on the development of a differential drive robot, including rapid prototyping, electromechanical design, embedded system design and embedded firmware development for sensors and drives using Arduino and ROS

Mechatronics and Intelligent Systems Research Lab
Kerala, India

Research Assistant — *Jan. 2017 - August. 2017*

- My research work includes Prosthetic arm controlled using EMG signals, system design of Unmanned Ground Vehicles for rescue missions, Teaching pendant for industrial robotic arms.
- During my tenure at the lab, I mentored students in their final year projects, conducted workshop on embedded systems and robotics and represented the lab at a national robotic festival "Robotsavam 2017".

United Kingdom University Rover Challenge 2016
Manchester, UK & Kerala, India

Team Lead — *Jan. 2015 - July. 2015*

- Cleared the Critical Design Round of the United Kingdom University Rover Challenge 2016 and got shortlisted among the final 14 teams
- Lead a team of 23 people and designed electronic circuitry for control system of robotic arm, power management, wireless communication, sensors, drive system, localization and path planning for the rover.

University Rover Challenge 2015
Utah, USA & Kerala, India

Embedded System designer — *Dec. 2014 - May. 2015*

- Designed the embedded system of the rover and robotic arm, power distribution system, and obstacle avoidance system consisting of IMU, Ultrasonic sensors and laser range finder
- Designed and developed H-bridge motor driver using MOSFET for the rover and also designed a wireless kill switch for the rover using NRF24 module.

Education

Ecole Centrale de Nantes
Nantes, France

Masters in Robotics and Embedded Real-Time systems — *Mar. 2017 - Present*

Amrita Vishwa Vidyapeetham (Amrita University)
Kerala, India

Bachelors in Electronics and Communication — *June. 2013 - May. 2017*

Publications

SAKSHA-Self Automated Kinematic Smart Haptic Arm
Chennai, India

International Conference on Robotics and Smart Manufacturing (RoSMa2018) — *2018*

Design and Development of an Intelligent Rover for Mars Exploration
Washington DC, USA

The 18th Annual International Mars Society Convention — *2016*

An Advanced Spider like Rocker-Bogie Suspension System for Mars Exploration Rovers *Bucheon, Korea*

4th International Conference on Robot Intelligence Technology and Applications (RITA) *2015*

Skills

Languages

- English: Proficient (TOEFL 87)
- French: Elementary

Operaring Systems

- Linux, ROS, FreeRTOS.

Programming Language

- Matlab, VHDL, Embedded C, Arduino, C++ and Python .
- Working knowledge of Github, CMake and Qt creator

Softwares and Library

- Experienced in Gazebo, Simulink, OpenCV, Eagle CAD and Proteus

Tools

- Rapid prototyping in 3D printers and CNC machines.
- Experience in PCB design and development.

Network Protocols

- Solid understanding of TCP/IP, UDP, SPI, I2C and CAN protocols.

Projects

Development of an autonomous docking routine for the STOP - Robot *Coimbra, Portugal*

Graduate student *July. 2018 - Sept. 2018*

- Autonomous docking service for the recharging of STOP-robot was developed out using the navigation stack of ROS.

Calibration and development of a multi-robot localization system *Nantes, France*

Graduate student *April. 2018 - PRESENT*

- Developed and calibrated the system of four IR image sensors for the absolute localization of the Turtlebots in ROS.

Hybrid localization of mobile robot using dead reckoning and magnets *Nantes, France*

Graduate student *Jan. 2018 - Feb. 2018*

- Localization of a mobile robot was performed using wheel odometery and magnet beacons and the estimation was done using Extended Kalman filter .

ASTRA -Multi-robot system integrating UAV and UGV for surveillance *Kerala, india*

Embedded system designer and Software architect *Jun. 2016 - PRESENT*

- The embedded system for the robot was designed consisting of GPS, Odometer, IMU, Laser range finders and Ultrasonic sensors on ATmega 2560 MCU running a freeRTOS.
- The firmware of the robot was developed for Arduino and ROS

DHRUV-Disaster and Hazard Rescue Unmanned Vehicle *Kerala, india*

Mentor and Mechatronic engineer *Dec. 2015 - June. 2016*

- A systems was developed consisting of thermal camera, sensors for measuring carbon monoxide, carbon dioxide, methane, butane, ammonia, chlorine and air quality on ATmega 2560 platform and firmware developed for ROS
- The system was integrated into a custom-made robotic platform for hazard rescue missions

References

Harsh Deshpande
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