Rajendra Singh

Fourth year
Computer Science and Engineering
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SUMMARY

◆ **Domain**	:	Artificial intelligence(AI) and Robotics
◆ **Internships**	:	UST Global, Researshala and IIT Madras.
◆ **Projects**	:	SLAM, Swarm robotics, Manipulators
◆ **Position**	:	Former Head, Robotics club, IIT Palakkad
◆ **Achivements**	:	KVPY fellowship, AWES Scholarship
◆ **About**	:	Passionate about vision-based robotics, research oriented and looking forward to work with enuthusiatic team in this domain.

EDUCATION

Program	Institution	%/CGPA	Year
• **B. Tech**	Indian Institute of Technology, Palakkad	7.19 (Till VI Semester)	2016 - April, 2020
• **XII**	Delhi Public School, Udaipur	89%	2015 - 16
• **X**	Delhi Rajasthan Public School, Rajsamand	96%	2013 - 14

TECHNICAL SKILLS

Title	Skills
▸ **Robotics**	• SLAM(2D / 3D) • Perception(Feature matching, Segmentation, Detection) • Motion and path planning • Sensor fusion(Kalman, Particle filter) • Swarm algorithms • Robot kinematics and dynamics(DH/Newton/Eular/Lagrangian method) • Control system • Embedded system(ARM, RTOS, FPGA)
▸ **Reinforcment Learning**	Q-learning, Sarsa, Monto carlo, TD, Multi-armed bandit, DQN, Genetic algorithm
▸ **Deep Learning**	CNN, RNN(LSTM, Seq2seq,etc.), Unstructured data, Topic modeling, Word embedding
▸ **Languages**	C++ , Python
▸ **Software/Tools**	ROS1/2, Moveit, Gazebo, V-REP, Matlab, Fusion 360, Keil, Atmel studio 6, OpenGL
▸ **Hardware**	Rplidar A2M8, Realsense D435, Nvidia Jetson(Tx2, nano), Raspi3B+, GstarIV GPS, Zybo-zyng FPGA, KL25Z arm cortex-M0+ , Atmega16/32/2560, NodeMCU, GSM, Pyboard, OpenMV, PlutoX

WORK EXPERIENCES

May-July, 2019
Research intern, UST Global, Trivandrum
Studied various SLAM algorithm and implemented it using ROS by fusing sensor data of lidar and 3d depth camera. Later, I worked on control and planning of robotics manipulator for vision based pick and place task.

May-July, 2018
Data Science intern, Researchshala, Chandigarh
Worked on NLP projects related to transfer learning, topic modelling, web and pdf scraping, extrating and analysing useful information from unstructured data.

May-June, 2017
Vistaar Program, IIT Madras
Studied state of art 3D printing technology and then built Prusa i3 3D printer and a robotic arm using this printer.

SEMINAR PRESENTATIONS

- Visual SLAM on mobile manipulator using ROS, Industry-Academia Conclave'19, IIT Palakkad August, 2019

- Low cost 3D printer Prusa-i3, Open House'17, Centre for Inovation(CFI), IIT Madras October, 2017

SELECTED PROJECTS

- Implemented SLAM on automated guided vehicle(AGV) by sensor fusion of data from 2D lidar and 3D camera.
- Vision based control and trajectory planning of robotics manipulator in pointcloud data.
- Path planning of Swarm of drone for flying in synchronized manner, under Smart India Hackerthon 2019.
- Built EOG based typing system for individual with motor neuron diseases.
- Built automated Toilet Cleaning Robot for cleaning toilet seat and floor, Inter-IIT 2017-18, IIT Madras.
- Build model for Satellite image classification using just 14 images, for Inter-IIT 2018-19, IIT Bombay.

To know more about these projects, please visit: https://iamrajee.github.io/projects/

RELEVANT COURSES

Area	Courses
Maths	Linear algebra, Probability, Stochastic Process and Statistics, Differential and Integral Calculus
CS	Data Structures and Algorithms, DBMS, OS, Computer networks, Compilers, Parallel programming
AI	Principle of machine learning, Deep learning, Reinforcement learning
Robotics	Robotics manipulation and control, Embedded system, Signal and system, Engineering mechanics, Biomedical and Instrumentation

POSITION OF RESPONSIBILITY

- **Head of Robotics Club, IIT Palakkad** July 2018 - May 2019
  - Teach basics and advance concept of robotics.
  - Mentor student projects.
  - Encourage student to participate in regional and national competition.
  - Prepare and lead team in competitions.

SCHOLASTIC ACHIEVEMENTS

- Winner, Kaizen Robotics Competition, Lema labs. 2017
- Awarded KVPY Fellowship by DST, Govt. of India. 2016
- Qualified IIT-Jee Advanced 2016 with a percentile of 99.3 amongst a total of 1.2 million students. 2016
- Best Student of Year Award 2014–15, Rajsamand District Private Education Committee. 2015
- Awarded Merit Scholarship Class X, Army Welfare Education Society(AWES). 2014

REFERENCES

- **Mr. Ashok Nair**
  Director Service Delivery,
  UST Global, Thiruvananthapuram
  E-Mail: ashok.nair@ust-global.com

- **Mr. Shubham Jain**
  Founder and CEO,
  Researshala, Chandigarh
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- **Dr. Piyush P. Kurur**
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