

Rajendra Singh

Fourth year
Computer Science and Engineering
Indian Institute of Technology, Palakkad

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SUMMARY

- Skills** : Artificial intelligence(AI) and Robotics
- Internships** : UST Global, Researchshala and IIT Madras.
- Projects** : Simultaneous localization and mapping (SLAM), Swarm Algorithms
- Position** : Former Head, Robotics club, IIT Palakkad
- Achivement** : KVPY and AWES fellowship

EDUCATION

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

TECHNICAL SKILLS

Title	Skills
Robotics	SLAM(RtabMap, Gmapping, Hector), Perception(SIFT, SURF, HOG, R-CNN, ICP, SGM, etc.), Sensor fusion(CLT, EKF, DST), Motion and Path planning(A*,D*,RRT,OMPL, Bezier and B-spine curves), Swarm Algorithms (PSO,ACO,ABC,etc.), Robot Kinematics and Dynamics(DH parameters, Newton-Euler and Euler-Lagrange methods), Embedded System(ARM, RTOS, FPGA, MIPS)
Reinforcement Learning	Q-learning, TD, Sarsa, Monto carlo, Multi-armed bandit, DQN, DDPG, A3C, Genetic algorithm
Deep Learning	CNN, RNN(LSTM, Seq2seq,etc.), GANs, Unstructured data, Topic modeling, Word embedding
Languages	C++ , Python and Java
Software/Tools	ROS1/2, Moveit, Gazebo, V-REP, Matlab, Fusion 360, Keil, Atmel studio 6, Eagle, OpenGL, Cuda
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

- Summer intern, UST Global, Trivandrum** May-July, 2019
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.
- Data Science intern, Researchshala, Chandigarh** May-July, 2018
Worked on [NLP projects](#) related to transfer learning, topic modelling, web and pdf scraping, extrating and analysing useful information from unstructured data.
- Vistaar Program, IIT Madras** May-June, 2017
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**
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• **Mr. Shubham Jain**
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