

# 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, Robotic Manipulator
- Position** : Former Head, Robotics club, IIT Palakkad
- Achivement** : KVPY and AWES fellowship, IIT-Jee 99.3 percentile

## 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 planning(A*,D*,RRT,OMPL), 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, AutoCAD, 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 [projects](#) related to transfer learning, topic modelling, web and pdf scraping, extracting 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.

## SELECTED PROJECTS

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- 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** using pointcloud data.
- [Path planning](#) for **swarm** of two drones, for Smart India Hackerthon 2019.
- Built **EOG** based typing [system](#) for individual with motor neuron diseases.
- Built automated **toilet cleaning robot**, Ranked 6<sup>th</sup> in 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 the projects, please visit: <https://iamrajee.github.io/projects/>

## RELEVANT COURSES

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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

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- **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

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- 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

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• **Mr. Ashok Nair**  
Director Service Delivery,  
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• **Mr. Shubham Jain**  
Founder and CEO,  
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• **Dr. Piyush P. Kurur**  
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