

Nabarun Pal

B.Tech. Metallurgical & Materials Engineering
UG(IV Year I Semester)
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Registration No: B.Tech./MT/14118057/2018

Indian Institute of
Technology
Roorkee



Area of Interest

Software Development, Internet of Things, Robotics, Machine Learning

Education

Year	Degree/Examination	Institution/Board	CGPA/Percentage
2017	B.Tech. 3rd Year	Indian Institute of Technology Roorkee	8.393
2014	Twelfth	Lawrence and Mayo Public School	89.0 %
2012	Tenth	Sri Krishna Mission School	10.0

Internships

Software Engineer | rorodata

May 2017 - July 2017

- Built a universal data science platform for enabling the data scientists to deploy and scale ML applications
- Systemized cloud based automatic data extraction and storage from IoT devices reducing development time by 80%
- Delivered microservices architecture for running, storing and logging scheduled jobs by users
- Co-authored firefly - an open source function-as-a-service framework which is used as the backend for various platforms
- Presented one of my internship projects at PyData Delhi 2017 - a community conference of open source data tools

Full Stack Engineer | Gurupriyam Innovation Labs

May 2016 - July 2016

- Innovated experiential products using Leap Motion Controller and various web APIs like Twitter Stream API
- Built personalized software interface for a Smart Mirror module which provides relevant information to users
- Designed a productivity enhancement device for offices to track employee sitting time and remind them of stroll breaks
- Developed IoT based Water Saving Automatic Irrigation System controller using 555 timer and ESP8266

Projects

Molecular Dynamic Modelling of Bake Hardening in Minimal Carbon Steels | IIT Roorkee

July 2017 - Present

- Developing a General Purpose simulation software for predicting material properties
- Input parameters are macroscopic process parameters like Temperature, Initial Composition, Stresses on the material
- Highly useful in automobile industry as material testing takes a lot of time and economic inputs

Forecasting Household Electricity Prediction and Comparison of Various Models | IIT Roorkee

January 2017 - May 2017

- Formed a time series forecasting model using electricity consumption dataset to forecast household electricity usage
- Compared different models such as Support Vector Machines, Extreme Learning Machines, and Neural Networks
- The model helped to predict electrical energy demand in power grids to optimize global energy generation and storage

Asobi: The Landing Disc | IIT Roorkee

August 2016 - March 2017

- Executed Frisbee Throwing Robot with two throwing mechanisms solving the problem statement of ABU Robocon 2017
- Spearheaded software systems for the whole robot including sensor units, computer vision and navigation modules
- Delivered navigational algorithms for mechanum wheeled robots for precise odometry using Optical Flow Sensors
- Designed Python and C++ libraries to get data from generic USB Joysticks and DualShock 3 controllers using any Linux based system or Arduino

Swarm Robotics | IIT Roorkee

August 2016 - March 2017

- Delivered 4 micro robots which could perform synchronous tasks like geometrical formations and coordinated motion
- Designed system for communication of robot coordinates from localizer module to robots using client server model
- Developed image processing algorithm for detection micro robots on the movement plane

Indoor Localization | IIT Roorkee

January 2017 - March 2017

- Fabricated an Autonomous robot which can localize itself based on WiFi signals
- Developed an algorithm to calculate robot movement parameters from WiFi Received Signal Strength
- Gathered data using two Edimax WiFi modules through Unix commands running as root
- 5th position at 5th Inter IIT Tech Meet Kanpur 2017 out of participating teams from other IIT's

Chai Yo: Clean Energy Recharging the World | IIT Roorkee

August 2016 - March 2017

- Delivered a manual robot and an autonomous robot fulfilling the problem statement of ABU Robocon 2016
- Designed multi-layered PCB's to support Arduino, Raspberry Pi and other robot systems
- Developed autonomous navigation algorithms for control of robots using data from rotary encoders and distance sensors
- Designed a voltage indicator circuit to prevent under-voltage of Li-Po batteries

NAINA | IIT Roorkee

January 2016 - March 2016

- Made a Virtual Reality application in which the user held a torch drawing in air with the path visualized on a phone
- Implemented a Flask server which acted as an intermediate node for processing, storage and communication
- Used Computer Vision algorithms to measure depth and position of torch through two cameras

Self Balancing Robot | IIT Roorkee

January 2015 - May 2015

- Fabricated and developed robot which balanced on two wheels
- Gathered feedback from a 6-axis Inertial Measurement Unit comprising Accelerometer and Gyroscope
- Implemented Kalman filters and PID control on Arduino Uno and processed output was sent to DC Motors

- Fabricated differential wheeled manual robot having pick, place and throw mechanisms as a learning project
- Designed wireless serial uploader module via Bluetooth to upload algorithm code from PC to Arduino

Awards / Scholarships / Academic Achievements

- 1st Position out of 30 colleges in Robosapiens, Cognizance 2017
- Best Aesthetic Robot in ABU Robocon 2016 India Leg
- 2nd Position out of 45 colleges in Robosapiens, Cognizance 2015
- Awarded the distinction of *Dedicated Proficiency Holder* for distinguished social service in NSS for the year 2014-2015
- Recipient of Merit-cum-Means Scholarship for 3 consecutive years for outstanding academic achievement

Skills

Computer languages	Python, C++, JavaScript, HTML, CSS, SQL
Software Packages	Git, Vim, Docker, Fabric, Supervisor, nginx, Amazon Web Services, Flask, Arduino IDE, GNU/Linux, Eagle, Matlab, Photoshop
Additional Courses Taken	Artificial Neural Networks and its Applications, Innovation and Business Models, Economics, Artificial Intelligence for Robotics, Delta Automation Training, Applied Cryptography, Computer Architecture, Networking for Web Developers
Minor/Honours Courses	Design and Analysis of Algorithms, Computer Architecture and Microprocessors, Database Management Systems
Languages Known	English (SRW), Hindi (SRW), Bangla (SRW)

Positions of Responsibility & Extra Curriculars**Joint Secretary | Models and Robotics Section, Hobbies Club**

April 2016 - May 2017

- Responsible for maintaining a team of 133 proficiency holders of the section
- Ideating for project ideas in Srishti, the annual exhibition of the Hobbies Club held in the Spring semester every year
- Conducting and speaking on open lectures on robotics for all students in the campus
- Managed software systems at Team Robocon IIT Roorkee which represents the college at ABU Robocon

Web Development Head | IIT HeartBeat

April 2016 - May 2017

- Responsible for the Web Activities of the magazine and managed a team of 15 members
- Rolled out the magazine website using *Jekyll* following a static site generation architecture

Mentor | Student Mentorship Program

August 2016 - Present

- Mentored a group of 7 freshers in AY 2016-2017; 6 freshers in AY 2017-2018
- Provided them guidance in terms of academics, extra-curricular's and life skills

Coordinator | Robosapiens, Cognizance 2016

March 2016

- Organised the biggest center-stage robotic event Robosapiens which was completed in 3 days with great success
- Brought in a participation of 54 teams comprising about 250 members and managing the event and teams successfully

code.fun.do | Microsoft

17th, 18th October 2015

- Built a *Recommendation Engine* application in only 24 hours
- The system suggests books and courses based on previous year's feedback

Volunteer | National Service Scheme

August 2014 - May 2015

- Involved in the Event Management and Promotions Cell where I managed and promoted the various activities of NSS
- Successfully organized 2 Blood Donation Camps where approx. 1000 units of blood was collected in each event
- Initiated *Cloth and Newspaper Collection Drives* 2 times in each semester

References**Dr. Saurabh Das**

Assistant Professor
Indian Institute of Technology Roorkee
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Dr. Ananth Krishnamoorthy

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