

# SHUBHANSHU KHANDELWAL

THIRD YEAR UNDERGRADUATE  
DEPARTMENT OF ELECTRICAL ENGINEERING  
INDIAN INSTITUTE OF TECHNOLOGY, KANPUR

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## EDUCATION

| Year  | Degree   | Institute                    | Grade  |
|-------|--|------------------------------|--------|
| 2019* | Bachelor of Technology in Electrical Engineering | IIT Kanpur                   | 9.3**  |
| 2015  | Rajasthan Board of Secondary Education           | Keshav Public School, Jaipur | 89.6%  |
| 2013  | Rajasthan Board of Secondary Education           | Keshav Public School, Jaipur | 91.33% |

\*expected; \*\*after five semesters

## RESEARCH INTERESTS

Applied Machine learning, Artificial Intelligence, Autonomous Navigation and Convex optimization.

## ACADEMIC ACHIEVEMENTS

- Secured **All India Rank 427** in JEE Advanced 2015 amongst **1,50,000** students.
- Recipient of Kishore Vaigyanik Protsahan Yojna(**KVPY**) Fellowship in 2015, By Govt. of India.
- Awarded **MCM scholarship** by IIT Kanpur in 2017 for Merit.
- Scored a perfect **10 SPI** in semester Fall'17.
- Secured **A\* grade** for excellent performance in the course of Linear Algebra and Ordinary differential equation among **800** students batch.

## PROJECTWORK

- Simultaneous Localization and Mapping for Mobile Robots(Ro-SLAM)** *IIT Kanpur, May '17-Nov'17*
  - Undergraduate Project, Prof. Ketan Rajawat
  - Experienced the technicalities in the navigation of a robot in an unknown environment, using range measurements of **Deca wave sensor**, by setting up an artificial environment.
  - Worked in the field of **Ro-SLAM**, Learnt about particle **filters**, Extended **Kalman filters** and their application in SLAM.
  - Implemented **Smoothing and Mapping** (sqrt-SAM) and **Spectral Learning Algorithm** for Ro-SLAM problem using MATLAB.
  - Studied about Odometry calibration and Localization of a mobile robot in known environment.
  - Learnt tools like ROS and **Sensor interfacing** with Microcontroller Arduino.
  - Observed the improved performance of Ro-SLAM algorithms in presence of beacon to beacon range measurements and learnt the spectral graph partitioning algorithm for outlier rejection for Robust Range only beacon localization.
- Generating logically coherent short stories based on user input plot points** *IIT Kanpur, Jan '18-Present*
  - Course project for CS671, Prof. Harish Karnick
  - Studied machine learning and deep network concepts from various sources like coursera and Stanford online lectures, Implementing various classification algorithms.
  - Involved in the course project of Natural Language Processing of generating logical short stories by applying RNN and Seq2Seq learning techniques.

## SKILL SET

- Programming Languages C, Python, MATLAB
- Operating Systems Ubuntu, Windows
- Tools ROS, LATEX, MS Word, MS Excel

## RELEVANT COURSEWORK

### CORE

Digital Signal Processing (EE301)\*  
Communication System (EE321)\*  
Principals of Communication (EE320)  
Digital Electronics (EE370)  
Signals, Systems and Networks (EE200)  
Microelectronics-I (EE210)  
Control Systems Analysis (EE250)

### MATHEMATICS

Probability and Statistics (MSO201)  
Linear Algebra and Ordinary  
Differential Equations (MTH102)  
Complex Analysis (MSO202A)  
Partial Differential Equations  
(MSO203B)  
Real Analysis and Calculus (MTH101)

### BASIC SCIENCES & ENGINEERING

Natural Language Processing (CS671)\*  
Data Structures and Algorithms (ESO207)  
Fundamentals of Computing (ESC101)  
Introduction to Electrodynamics (PHY103)  
Introduction to Mechanics (PHY102)

*\*ongoing*

## STUDENT ACTIVITIES

- **Counselling Service, IIT Kanpur**
  - Volunteered as Academic Mentor for courses of Mathematics and Physics.
  - Assisted Freshmen Students with weak English background to adjust in new environment.
- **Sports**
  - Member of Institute Field Hockey team from 2015.
  - 1<sup>st</sup> Runner up in Inter IIT'16, Annual Inter college sports fest of all the IIT's, Hosted by IIT Kanpur.
  - Best player of Summer Camp'16, IIT Kanpur.

## HOBBIES AND INTERESTS

- Enjoy playing hockey, football, badminton and other outdoor games. Cycling enthusiast.
- Love to listen melodic music, especially the musical works of A.R. Rahman.
- Enjoy performing card tricks and playing card games.