

Kartik Patel

B.Tech. Final Year – Electronics and Communication Engineering

Indian Institute of Technology, Roorkee, India

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Education

Electronics and Communication Engineering

B. Tech., GPA: 9.31/10, Class Rank: 2nd

Indian Institute of Technology, Roorkee, India

2013-Present

Exam Scores

Graduate Record Examination

324/340 (Verbal: 155, Quant: 169, AWA: 4.0)

TOEFL

109/120 (R: 30, L: 29, S: 23, W: 27)

Experience

Undergraduate Thesis Project.....

Analytical Modelling of Bluetooth Low Energy Protocol based Sensor Networks

Supervisors: Dr. Neelesh Mehta, Associate Professor, Indian Institute of Science, Bangalore

Dr. Debashis Ghosh, Professor & Head of Department, IIT Roorkee

July 2016-Present

- Developing a mathematical model to analyse Bluetooth Low Energy protocol based sensor networks using renewal theory.
- Analysis will also be done for energy harvested network.

Research Projects and Internships.....

Energy Harvesting Wireless Sensor Network design with Bluetooth Low Energy protocol

Supervisors: Dr. Neelesh Mehta, Associate Professor, Indian Institute of Science

May-July 2016

- Aim: Design a sensor network for a specific scenario using a Bluetooth Low Energy (BLE) protocol.
- Because of lack of professional BLE simulators, the first task was to develop a BLE protocol module on NS3 [[Documentation](#)].
- A BLE protocol based energy harvesting sensor network would be designed based on it.

Non-parametric Spectrum Sensing Technique for Full Duplex Cognitive Radio

Supervisors: Dr. Dhaval Patel, Assistant Professor, Ahmedabad University

2015-2016

- A novel spectrum sensing technique for Full Duplex Radios was proposed.
- The technique provided better performance against existing spectrum sensing techniques in literature.

Implementation of Spectrum Sensing method on WARP Board

Supervisors: Dr. Pyari Mohan Pradhan, Assistant Professor, IIT Roorkee

May-July 2015

- Set up Wireless Open-Access Research Platform(WARP) test bed to analyse the spectrum sensing techniques.
- Receiver Operating Characteristics(ROC) curves were plotted for different SNR and sample size.
- Experimental results were compared with analytical and simulation results to verify the set up.

Literature Survey: Full Duplex Radio

September-2015

- Understood the concept and challenges in the field of Full Duplex Radio.
- Carried out extensive survey to understand the fundamentals of Full Duplex Radio.

Implementation based projects.....

Open-Source development of Communication System Toolbox in Scilab

FOSSEE, IIT Bombay, Ministry of Human Resource Development, Govt. of India

February-April 2016

- The project was focused on development of open source simulation packages equivalent to proprietary software.
- Developed various functions of equalizers for Communication System Toolbox in Scilab.

MIPS Single Cycle Microprocessor using VHDL [[Link](#)]

October 2014

- o Implemented a processor capable to run 7 basic instructions.
- o Simulated the implementation using ModelSim. Added python script to convert assembly code to ModelSim Simulation Script to provide a programming like interface to simulate the project.

Academic Achievements

- o Won *IIT Roorkee Heritage Excellence Award* for two consecutive years
- o Ranked in top 1% students of the country in JEE-Advance 2013
- o Secured 99.99%tile in JEE-Mains 2013

Computer skills

Programming Languages: C, C++, Python, Java, Shell Scripting, VHDL

Softwares: MATLAB, NI LabView, GNU Radio, NS3

Relevant Courses

ECN-512: Information and Communication Theory

ECN-516: Advance Digital Communication

ECN-311: Communication Systems

ECN-312: Digital Signal Processing

ECN-212: Principles of Digital Communication

ECN-203: Signals and Systems

IMA-301: Advance Engineering Mathematics

MAN-006: Probability and Statistics

CSN-341: Computer Networks

CSN-102: Data Structures & Algorithms

Courses to be taken in next semester.....

ECN-515: Coding Theory and Applications

ECN-614: Adaptive Signal Processing

ECN-612: Wireless Networks

Additional Courses.....

IITK, NPTEL: Principles of Modern CDMA/MIMO/OFDM Wireless Communications [[Certificate](#)]

6.00.2x, MITx: Introduction to Computational Thinking and Data Science [[Certificate](#)]

Positions of Responsibility

Student Chair, IEEE Student Chapter, IIT Roorkee

2014-Present

With an aim of increasing technical culture in campus, IEEE Student Chapter conducts activities like Special Interest Groups, Workshops, Guest Lectures and Internship Program for Electrical and Electronics Engineering students.

- o Initiated a Sixth Sense Lecture Series to explain fundamental concepts like Information Theory, Transforms and Linear Algebra in intuitive manner.

Chief Technical Lead, Information Management Group, IIT Roorkee

2014-Present

We develop and maintain the IIT Roorkee Intranet & Internet systems. We manage the Institute website, Content Management System, Placement Portal, Academic Portal and many other applications for the institute.

- o Maintaining the technical stack and servers of institute's intranet and internet systems.
- o Responsible of initiating fundamental changes in development of applications to optimize the resource usage of servers and reduce no. of communications between servers and databases.

Community Service

SOPAN - A Voluntary Initiative

2015-Present

o **Weekly Discussions**

Conduct and actively participate in weekly discussions on topics ranging from modern education system to appropriate technology and economics to sociology, aimed at developing an insight into various sustainable development paradigms.

o **Rural visits and End-semester camps**

Regularly visit rural segments of society to witness the grass root level problems and closely study the systems evolved to tackle these challenges alongside ideating technological solutions to address the aforementioned problems without disrupting indigenous way of life.

Mentor, Academic Reinforcement Programme

2015-2016

o Conducted weekly lectures for freshers facing academic problems.

o Also, mentored a group of specific students to enhance their performance by initiating one to one discussions to tackle problems like language barrier, alienation and social awareness.

References

[Dr. Neelesh Mehta](#)

Associate Professor

Department of Electrical and

Communication Engineering,

Indian Institute of Science, Bangalore

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[Dr. Debashis Ghosh](#)

Professor & Head of Department

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[Dr. Dhaval Patel](#)

Assistant Professor

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