# Charul

PhD (ECE, MT16089)

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DOB: January 09, 1995

## Education

**IIIT Delhi** — CGPA: 9.26
PhD (ECE)
June,2017 –Current

**IIIT Delhi**
M.Tech (ECE) — CGPA: 9.26
2016 –2018

**IGDTU**, Delhi
B.Tech(ECE) — Percentage:86.49
2012-2016

**Kendriya Vidyalaya, Paschim Vihar, New Delhi** — Percentage: 93.2
CBSE
2011 – 2012

**Kendriya Vidyalaya, Paschim Vihar, New Delhi** — CGPA: 9.4
CBSE
2009 – 2010

## Skills

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|---|---|
| **Research Interests** | Transportation , Machine Learning, Deep Learning, Variational Bayesian, Graph Signal Processing, Optimization for signal processing |
| **Programming Language** | C, C++,Python |
| **Tools and Technologies** | Matlab, CST, HFSS, Arduino, 8051 microcontroller |
| **Hardware Descriptive Languages** | VHDL, Verilog |

## Internship

**Telecommunications Consultants India Ltd** (Industrial) (Jun,15 –July,15)
Guide: Neha Gupta
PAN-AFRICA e-Network

**DMRC** (Industrial) (Jun,14 –July,14)
Guide: Prashant Kumar Gupta
Study of Signaling and Communication in metro

## Projects

**Air Quality sampling and Prediction**
Guide: Dr. Pravesh Biyani
We will monitor and predict the air quality in a region. (May 19- Current)

**Deep Traffic Sampling and Reconstruction**
Guide: Dr. Pravesh Biyani
We explore deep learning based framework to sample the time varying signal on the graph that will provide the low reconstruction error. (Jan 19-April 19)

**Deep learning based generative model for Bus ETA Prediction**
Guide: Dr. Pravesh Biyani
We propose a novel ETA prediction algorithm based on generative autoregressive deep learning model that integrates both traffic speed corresponding to the bus as well as the stopping time in one framework. The algorithm utilises only the historic GPS data from the same route and can be independently implemented irrespective of availability of traffic data in the city. We implement our algorithm on the real-world transit data available in Delhi, India. (April,18 –Jan 19)

**Online Variational Bayesian Subspace filtering for Traffic Estimation and Prediction**
Guide: Dr. Pravesh Biyani
A variational Bayesian subspace filtering (VBSF) approach is proposed, where the traffic matrix is modeled as comprising of an underlying low-rank subspace evolving according to a linear dynamical model. The proposed method is capable of automatically assessing the relevance of each parameter. The proposed algorithm is tested on real traffic data collected over a large area in New Delhi. (Aug,17 -April,18)

**Voice mimicking Sytem**
Guide: Dr. Pravesh Biyani, Dr. Anubha Gupta, Dr. Saket Anand
This project aims in mapping the voice characteristic of one user to another user. GMM, neural network methods(RNNs i.e. LSTM, GRU) are used to develop a model to map the acoustic features of one user to the other. (Aug,17- Nov-17)

**Spatio Temporal Traffic Estimation and Prediction**
Guide: Dr. Pravesh Biyani
This project includes the prediction of the current traffic by exploiting the spatial and temporal correlation between the data. By exploiting (Jan,16 –Jun 17)

the temporal, spatial and correlation and periodicity, wiener filtering, matrix completion based method to estimate the traffic state.

**Millimeter Wave for 5G cellular** (Jan,17 – April,17)
Guide: Dr. Vivek Bohara
This project is based on finding how current cellular system can be used with millimeter wave for 5G.

**Stimulation and design of Quadrifilar helix Antenna** (Sept,16 –Nov,16)
Guide: Dr. Shobha Sundar Ram Team Size-2
A circular polarized, narrowband ,5dBi quadrifillar helix antenna is stimulated in CST. Implemented design is also developed.

**PC to PC communication using LiFi** (Jan,16 – May,16)
Guide: Mr Kanchan Sharma Team Size-2
This project is based on visible light communication between two computers.

**Home Automation using IOT** (Aug,15 – Dec,15)
Guide: Mr Kanchan Sharma Team Size-2

## Awards and Achievements

- *TA Excellence Award* for your TAship in 2017 for the course Principle of communication system.
- Qualified GATE 2016 with 98.489 Percentile.
- Received Shail Bala Jain Motivational price for good academics in B.Tech.
- Event head in IGIT tech fest Impulse' 15
- Event Management in various events at Impulse'14, Impulse'13, Taarangana'14, Taarangana'15
- Active member of Leaders for Tomorrow(NGO) in B.Tech.

## Papers

- Charul, Uttkarsha Bhatt, Pravesh Biyani and Ketan Rajawat "Online Variational Bayesian Subspace Filtering" in Acoustics, Speech and Signal Processing (ICASSP), IEEE International Conference 2019
- Charul, Pravesh Biyani "To each route its own ETA: A generative modeling framework for ETA prediction", IEEE Intelligent Transportation Sysytem Conference (ITSC), 2019.

Declaration: The above information is correct to the best of my knowledge.
Charul
Date: September 6, 2019