

# Ritesh Kumar

Ph.D Student

Department of Electrical Engineering

Indian Institute of Technology Hyderabad

Email : ee20resch11005@iith.ac.in

ritesharyan622@gmail.com

Phone : +91-8409626306

## Academic Qualifications

| Year           | Degree/Certificate | Institute                | CPI/%   |
|----------------|--------------------|--------------------------|---------|
| 2020 - present | Ph.D               | IIT, Hyderabad           | 9/10    |
| 2018 - 2020    | M.Tech             | IIT, Patna               | 8.31/10 |
| 2013 - 2017    | B.Tech             | SBSSTC, Ferozepur        | 76.77 % |
| 2010 - 2012    | BSEB Patna(XII)    | Maharaja College, Ara    | 71.6%   |
| 2010           | BSEB Patna(X)      | H N K +2 High School Ara | 79.4%   |

## Publications

- **Ritesh Kumar**, Shashank Vatedka, “ **Communication-Constrained Distributed Mean Estimation of Log-Concave Distributions** ”, 29th National Conference on Communications (NCC) 2023.
- **Ritesh Kumar**, Pritam Khan, and Sudhir Kumar, ”**Healthcare Data Encryption Technique using Hybrid Cellular Automata in IoT Networks**”, Wireless Personal Communications, Springer, October 2022.
- **Ritesh Kumar**, Pritam Khan, and Sudhir Kumar, “ **A Cellular Automata-based Healthcare Data Encryption Technique for IoT Networks**”, 16th IEEE India Council International Conference (INDICON), IEEE, Rajkot, India, 2019.

## Key Projects

- **Distributed Inference with Limited Communication (PhD Work)** (Ongoing)  
**Supervisor: Dr Shashank Vatedka** , Department of Electrical Engineering, IIT Hyderabad.
  - \* Currently, we are working on developing efficient algorithms for a distributed system with limited communication capabilities. The primary objective of these algorithms is to investigate and analyze the trade-off between estimation accuracy and the number of clients, considering communication constraints. These algorithms are specifically designed for distributed networks utilizing federated learning schemes. In our ongoing work, we are conducting an analysis of various existing algorithms that demonstrate efficiency in statistical inference. In parallel, we are also working on a types-based quantization scheme for discrete probability mass functions (PMFs).
- **Data Security for IoT Networks ( M.Tech Project )** (Completed in 2020)  
**Thesis advisor: Dr Sudhir kumar** , Department of Electrical Engineering, IIT Patna.
  - \* Implemented data encryption and decryption using the Cellular Automata (CA) concept.
  - \* Collected healthcare data from MySignal Kit and processed it for the application of CA rules.
  - \* Successfully implemented cryptographic algorithms using Rule 60 and other additive rules suitable for IoT networks.
- **YatraVihar ( startup ) ( B.Tech Project )** (Completed in 2017 )  
**Mentors: Dr Satvir Singh and Dr Sanjiv Dewara**,  
Department of ECE, SBSSTC Ferozepur.
  - \* Created a prototype for a company that offers an online platform for tourists to hire a guide along with additional facilities.
- **Automatic Stove Gas Control System ( B.Tech Project )** (March 2016)
  - \* Accomplished the implementation of an automatic stove gas control system by employing thermal sensors and an 8051 micro-controller.
- **Implemented a Multi-functional Robot System at SBSSTC Ferozepur ( B.Tech Project )** (March 2016)
  - \* Hardware implementation of the wireless robot capable of functioning in three modes: light-phobic, light-philic, and obstacle detection.

## Technical Skills

- **Programming Languages:** C, L<sup>A</sup>T<sub>E</sub>X, MATLAB, Python

## Positions of Responsibility

- **Teaching Assistant**

|  |   |
|--|---|
| Linear Algebra<br>Information Theory<br>Channel Coding<br>Digital System (Lab) | Convex Optimization<br>Source Coding<br>Concentration Inequalities.<br>Wireless Communication |
|--|---|

- **Group Leader of start-up Team** (2016-17)
  - Guided and mentored the startup team and management. Worked as a motivator and dealt with various types of situations to complete the startup company using both internal and external resources.

- **PRO in Cultural festival**

- Worked as a Public Relations Officer (PRO) in **Jashan - 2k16** at SBSSTC Ferozepur.

(March 16)

## Relevant Courses

|   |   |
|---|---|
| Linear Algebra<br>Information Theory<br>Channel Coding<br>Digital Communication System<br>Probability and Statistics<br>Random Variables and Stochastic Process | Convex Optimization<br>Source Coding<br>Network Information Theory<br>Wireless Communication<br>Optical Communication<br>Machine Learning for Signal Processing (ongoing) |
|---|---|

## Achievements

- Won the best paper award at “**National Conference on Communication 2023**”.
- Secured 1st position in the national contest: **MV Chauhan Paper Contest (Organized by INDICON) 2019**.
- Secured 1st position in the **Project Exhibition** organized by ISTE SBSSTC Ferozepur.
- Secured 3rd position in the **Mathematics Competition** at the district level in secondary school.
- Secured 3rd position in the **Kavita Path** (poetry) competition at the district level in secondary school.

## Extra-Curricular Activities

- Inter-IIT Hockey Player.
- Attended a 3-day workshop on “**Interplay of Machine Learning and the Internet of Things**”, conducted by IIT Patna.
- Participated in **Nebula - 2018** (as a stage play artist) and **Nebula - 2019** (as a stage play coordinator) at **IIT Patna**.
- Attended a 3-day workshop on “Robotics,” conducted by **IIT Roorkee**.