

# Department of Computer Science and Engineering



## National Institute of Technology Delhi



# VISION & MISSION



**VISION**

To communicate quality Computer Science Education for producing globally identifiable technocrats and entrepreneurs upholding sound ethics, profound knowledge, and innovative ideas to meet industrial and societal expectations.

1. To impart value-based technical knowledge and skill relevant to Computer Science and Engineering through effective pedagogies and hands-on experience on the latest tools and technologies to maximize employability.
2. To strengthen multifaceted competence, nurture creativity and innovation and create entrepreneurial environment for an ever-changing technological scenario requiring communally cognizant solutions.
3. To create an appetite for research and higher education in contemporary and emerging areas of Computer Science.
4. To inculcate the moral, ethical, and social ideals essential for prosperous nation-building.



**MISSION**

# Research & Development Activities : Prof Geeta Sikka

## Sponsored Project:

1. Sponsored Fund for Improvement of S&T Infrastructure (FIST) by DST for **Rs 118 Lakhs** as **Principal Investigator** for AI Research & Innovation Laboratory(AIRIL) at CSE Dept, NIT Delhi (Started 2023-24)
2. An intelligent network analyzer cum patcher for advanced security hardening of the organizational network. Device Development Programme (DDP), Department of Science & Technology, SERB Project with **Rs 72,79,420** at CSE Dept NIT Jalandhar (Ongoing)
3. Ministry of Human Resource Development (MHRD) Project for **Rs 10,00,000** under MODROBS at NIT Jalandhar(Completed)
4. Utilizing the power of Real Time Data Analytics and IoT to improve Traffic; E-governance for Smart Cities,National Project Implementation Unit (NPIU) Project with **Rs 11,00,000** (Completed)

# Research Activities : Dr. Shelly Sachdeva

- **DST (NCSTC Division) sponsored project:**

- TRIP AID - Travel Risk Information in a Pandemic using Artificial Intelligence Development (Completed).
- 1 year Project, Rs. 1251000

- **Organized More than 15 Seminars/Conferences/Short Term Courses/Summer Schools/Winter School**

- International Conference on Big Data Analytics in Astronomy, Science, and Engineering, 05-Dec-2023 to 07-Dec-2023.
- Research Orientation Workshop 08-Jun-2023 to 10-Jun-2023.
- International Conference on Big Data Analytics in Astronomy, Science, and Engineering, 05-Dec-2022 to 07-Dec-2022.
- FDP on Information System Frontiers 26-Sep-2022 to 07-Oct-2022
- International Conference on Big Data Analytics in Astronomy, Science, and Engineering, 07-Dec-2021 to 09-Dec-2021.
- FDP on Machine Learning Frontiers in Healthcare 26-Jul-2021 to 30-Jul-2021.
- 8th International Conference on Big Data Analytics 15-Dec-2020 to 18-Dec-2020.
- 7th International Conference on Big Data Analytics 17-Dec-2019 to 20-Dec-2019.
- FDP on Python Programming with Industry Perspective 02-Dec-2019 to 06-Dec-2019
- FDP on VLSI Chip Design Hands on using Open Source EDA 08-Jul-2019 to 12-Jul-2019.
- Computing with Words via Fuzzy logic with Applications 06-May-2019 to 10-May-2019.
- 6th International Conference on Big Data Analytics 18-Dec-2018 to 21-Dec-2018.

- **Organized National & International Conferences**

- **Published More than 11 Books/ Book Chapters**

- **Published More than 59 Conference Papers**

- **Published More than 40 Journal Papers**

- **Delivered more than 38+ Invited Talks**

- **Gold Medalist (M.Tech)**

- **Japanese Monbukagakusho Fellow (MEXT Fellow)**

# Research Activities : Dr. Anurag Singh

## • **Sponsored project:**

- Project titled "The project entitled **“Empowering communication Video Captioning of Indian Sign Language”** has been granted under Cognitive Science Research Initiative (CSRI) for research in interdisciplinary areas of Cognitive Science by DST for Rs 34,00,000 in July 2025 (PI).
- Project titled **"TraceBite: Representing traceability and integrity in every bite of food"** has been granted under SPRINT - Ideathon initiative, AWaDH IIT Ropar with grant of Rs. 2.5 lakhs. (Ongoing from March 2025) (PI).
- Project titled **"Design and Development of an IOT based Hybrid System for accurate detection of distinct soil parameters to monitor the water and fertilizer operation in the Agricultural fields"** has been granted under SPRINT - Ideathon initiative, AWaDH IIT Ropar with grant of Rs. 7 lakhs. (Ongoing from March 2025) (Co-PI).
- INCOIS Project on **"Extended Forecast of Wind-wave Parameters along the Indian Coastline using Multi-tasking Machine-learning Techniques"** (Rs. 17,31,000 Ongoing) (Co-PI).
- Received Rs 1,18,00,000 under FIST 2023 program as Co-PI.
- A startup grant of Rs 10,00,000 received in 2022 from TIH IIT Patna and a company, **"Palanan Technology Pvt. Ltd."**, is established for a video analytics project (PI).
- MARICS SERB: A special call on COVID-19 modelling, **"Development of Dynamic Mathematical Modeling for COVID-19 Spread and Containment"** is accepted for MATRICS, SERB, DST. (Rs 5,50,000 for 1 year, completed, July 2020, July 2021).
- MATRICS, SERB, DST Project on **"Mathematical Model for Multidimensional Multilayer Networks Using Quantum Mechanics"** started from Feb 20, 2020, and completed (Rs 6,60,000 for 3 years)

• **Involved in various research problems with international research collaborators from countries like Spain, Germany, France etc.**

## • **Founder and promoter of PALANAM Technology Pvt. Ltd. (Startup)**

- The proposed solution is a decentralized parental control software, enabled by machine learning to generate state-of-the-art analysis models
- It is the multi-model client-side software solution is a versatile and user-friendly software that combines various models and algorithms into a lightweight package.



# Research Activities : Dr. Karan Verma

## SERB Project's:

### Completed -

- **DST-INRIA-CNRS - Modeling of SMART CITY – “a fusion of IoT and Big Data”** (3 Years, Rs. 35,00,000/-)
- **DST- MOST - Big Data Analytics in Healthcare**, (2 Years, Rs. 28,00,000/-)
- **(TEQIP-III) – NPIU - Secure Healthcare surveillance using smart IoT devices** (1 Years, Rs. 11,00,000/-)
- **(TEQIP-III) – NPIU - Border Surveillance system using wireless sensor networks** (2 Years, Rs. 9,00,000/-)

### Ongoing –

- **IUSSTF – AirMObiSim (Open-source unmanned aerial vehicle simulation)** (2 Years, Rs. 18,00,000/-)
- **EEoES - FedVEC Client (Selection in Federated Vehicular Clouds)** (2 Years, Rs. 38,00,000/-)
- **DST –MATRICS (Optimizing LoRa Spreading Factor Scheduling through Incentive Mechanisms)** (Rs 6,00,000/-)
- **DST –EEQ (Development of a system for the early diagnosis of heart diseases based on deep learning models using ECG signal processing )** (Rs 35,77,000/-)

### Awards (NIT Delhi) –

- **ADHOC (ELSEVIER) 2022 Best Journal Paper Award** – “Energy efficient cluster based routing protocol for WSN using butterfly optimization algorithm and ant colony optimization” – 1000 USD.
- DST International Travel Support (ITS) – **USA Washington D.C** – Nov. 11-15, 2022.
- DAAD – IIT/UGC Exchange Faculty Fellowship Program (Bilateral Exchange Academics) – (Georg-August-Universität Göttingen (Germany), 01 June to 30 June, 2019.
- IETF – 101 Internet Engineering Task Force (IETF) meeting supported by **IRTF Fellowship**, March 11-18, 2018, **London, UK**.

### Ubiquitous Computing Research Lab

- ✓ HBE-IoT Smart Server
- ✓ HBE-IoT Xnode Home with Edge Server
- ✓ QUBE-SERVO-2-USB Workstation
- ✓ OMNI Bundle
- ✓ IoT Smart Health Lab (with suitable PC: i7, 16 GB RAM, 1TB SSD, WIN PRO)



FedVEC



AirMObiSim



# Research Activities : Dr. Munesh Singh

- **Sponsored project:**

- Project Title: A Lightweight Hardware Logic Locking based Data Encryption Model for Securing IoT Devices from hardware and cyber-attacks , Role: Co-PI, Agency: Data Security Concil of India, Duration: 6 month (2023), Budget: INR 6.5 Lakhs
- Project Title: Design And Fabrication of Smart Hybrid IOT-Based Solar Dryer for Food Items, Role: Co-PI, Agency: Soulmaitri Organics (OPC) Private Limited, Raipur , Duration: 2 Year (2023-2024), Budget: INR 5 Lakhs
- Project Title: UAV-assisted Wi-Fi Geofencing for UAV Tracking and Activity Monitoring in Restricted Perimeter , Role: PI, Sponsoring Agency: TiHAN-IIT Hyderabad, Status: Ongoing, Duration: 18 Months (2022-2023), Budget: INR 15.70 lakhs.
- Project Title: Knowledge Graph for Adverse Drug Reaction (ADR) Association for Safety Signal Detection Using Public Safety Databases, Role: Co-PI, Agency: Datafoundry Pvt.Ltd Bangalore, USA, Status: Completed, Budget Rs: 15,50,400, Duration 2 Year (2018-2019)
- Project Title: Development of Fresh Water Pearl Culture Unit Based on IoT-Data Analytics, Role: PI, Agency: DST SEED SYST, Status: Ongoing, Budget Rs: 17,46,371, Duration 3 Year (2020-2023)
- Project Title: Device Free Target Localization in Wireless Networks Using Machine Learning, Role: PI, Agency: SEED Grant from IIITDM Kancheepuram, Status: Completed, Budget Rs: 8,00,000, Duration 1 Year (2020-2021)

# Research Activities : Dr. Vipin Pal

## Sponsored project:

- **Project Title:** Cloud-assisted Data Analytics based Real-Time Monitoring and Detection of Water Leakage in Transmission Pipelines using Wireless Sensor Network for Hilly Regions, **Role:** PI, **Agency:** National Mission on Himalayan Studies Implemented by the Ministry of Environment, Forest & Climate Change (MoEF&CC), **Duration:** 36 month, **Budget:** INR 44 Lakhs, **Status:** Final Technical Report Submitted.
- **Project Title:** A Machine Learning Framework for Deploying Mobile Edge Clouds for Real- Time Analytics on IoT Data over 5G, **Role:** Co-PI, **Agency:** MEITY, **Duration:** 36 Months, **Budget:** INR 45 Lakhs, **Status:** Final Technical Report Submitted.

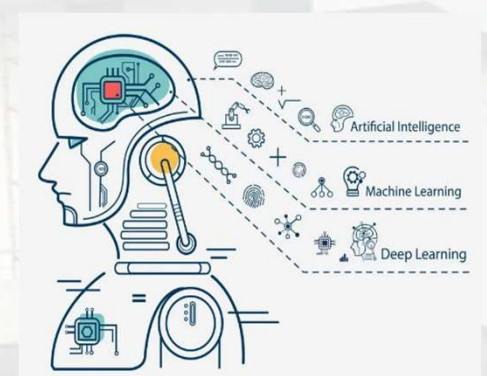
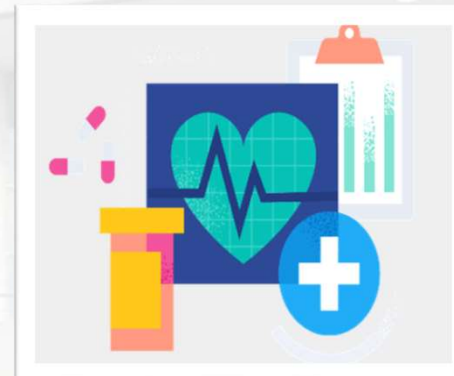
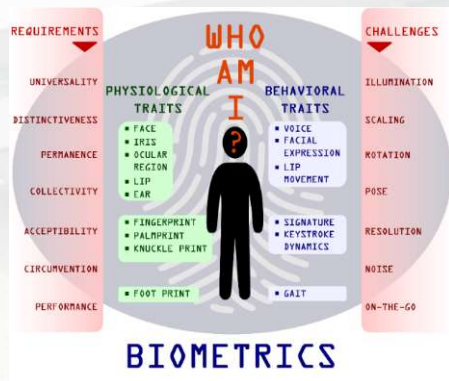




# Research Activities : Dr. Gautam Kumar

## ➤ Research Interests:

Biometric Security, Image Processing and Computer Vision, Machine Learning and Deep Learning, Healthcare and Robotics.



## ➤ Research Lab:

**Visual Computing and Robotics (VCR) Lab**, Ground Floor, Room No. 14, Dept. of CSE, Admin Block, NIT Delhi.



## Achievements of the Dept. / Patents Filed

### List of Patents:

- Patents Applied / Filed in the Last 5 years: 06
- Patents Granted in the Last 5 years: NIL

| S. No | TITLE                                                                                            | AUTHORS                                                                                                                                 | FILE NUMBER  |
|-------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1     | A Solar Assisted Apparatus for Cultivation                                                       | <b>Prof. Ajay K. Sharma</b><br>S. Swain, S. S. Sahoo, M. K. Nayak, V. S. Pandey, G. Rath, S. Thomas, J. Das, P. Mohanty and S. S. Panda | 202231071172 |
| 2     | Telecentric digital holographic microscopy system and method for extended depth of focus imaging | <b>Prof. Ajay K. Sharma</b><br>Dr. Vineeta Kumari, Ms. Neelam Barak<br>Dr. Gyanendra Sheoran                                            | 202211025485 |
| 3     | Common-path digital holographic configuration for quantitative imaging                           | <b>Prof. Ajay K. Sharma</b><br>Dr. Gyanendra Sheoran                                                                                    | 202311000321 |
| 4     | Smart And Safe Shopping Mart For Covid-19                                                        | <b>Dr. Shelly Sachdeva</b><br>Batra Shivani, Sukhija Namrata, Goel Ankit,<br>Gahlot Amit, Agarwal Aanchal                               | 2021100310   |
| 5     | Electronic Vehicle Identification System                                                         | <b>Dr. Shelly Sachdeva</b><br>Batra, Goswami, P. and<br>Bhatia, KK                                                                      | 202011019359 |
| 6     | Hands-free navigation system for controlling unmanned vehicles (UVs)                             | Akshay Singh, Dr. Karan Verma                                                                                                           | 202411099032 |



# Projects/Combined Projects till date

| Supervisor              | S. No | Title                                                                                                                                   | Date of Approval | Duration | Date of Completion | Amount    |
|-------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|--------------------|-----------|
| Prof. (Dr.) Geeta Sikka | 1     | An Intelligent network analyzer cum patcher for advanced security hardening of the organizational network                               | March, 2021      | 3 years  | Ongoing            | 7889120   |
|                         | 2     | Utilizing the power of real time data analytics and IoT to improve Traffic and E Governance for smart cities                            | June 2019        | 2 years  | Completed          | 1161000   |
| Dr. Shelly Sachdeva     | 1     | TRIP AID - Travel Risk Information in a Pandemic using Artificial Intelligence Development                                              | 8 Jan 2022       | 1 Year   | Completed          | 1251000   |
| Dr. Anurag Singh        | 1     | Mathematical Model for Multidimensional Multilayer Networks Using Quantum Mechanics                                                     | Feb. 20, 2020    | 3 years  | Feb. 20, 2023      | 6,60,000  |
|                         | 2     | Development of Dynamic Mathematical Modeling for COVID-19 Spread and Containment"                                                       | Jul. 15, 2020    | 1 years  | Jul. 15, 2021      | 5,50,000  |
|                         | 3     | Startup grant for Palanam Technology Pvt. Ltd.                                                                                          | Jan. 2023        | 2 years  | ongoing            | 10,00,000 |
|                         | 4     | INCOIS Project on "Extended Forecast of Wind-wave Parameters along the Indian Coastline using Multi-tasking Machine-learning Techniques | 2024             | -        | Ongoing            | 17,31,000 |



# Projects/Combined Projects till date

| Supervisor      | S. No | Title                                                                                                                                   | Date of Approval | Duration | Date of Completion | Amount    |
|-----------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|--------------------|-----------|
| Dr. Karan Verma | 1     | Modeling of SMART CITY – “a fusion of IoT and Big Data”                                                                                 | Jan 2017         | 3 Years  | Jan 2020           | 3500000   |
|                 | 2     | Big Data Management in VANET                                                                                                            | Feb 2018         | 2 Years  | Feb 2020           | 2800000   |
|                 | 3     | Secure Healthcare surveillance using smart IoT devices                                                                                  | Feb 2019         | 1 Year   | March 2020         | 1100000   |
|                 | 4     | Surveillance system using wireless sensor networks                                                                                      | Feb 2019         | 1 Year   | March 2020         | 900000    |
|                 | 5     | Open-source unmanned aerial vehicle simulation                                                                                          | Mar 2023         | 2 Years  | Ongoing            | 2500000   |
|                 | 6     | INCOIS Project on "Extended Forecast of Wind-wave Parameters along the Indian Coastline using Multi-tasking Machine-learning Techniques | 2024-2027        | 3 Years  | Ongoing            | 6,00,000  |
|                 | 7     | Development of a system for the early diagnosis of heart diseases based on deep learning models using ECG signal processing             | 2024-2027        | 3 Years  | Ongoing            | 35,77,000 |