Placement Brochure 2021-22

Communication & Signal Processing

MTECH
ELECTRICAL ENGINEERING
IIT Hyderabad

भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

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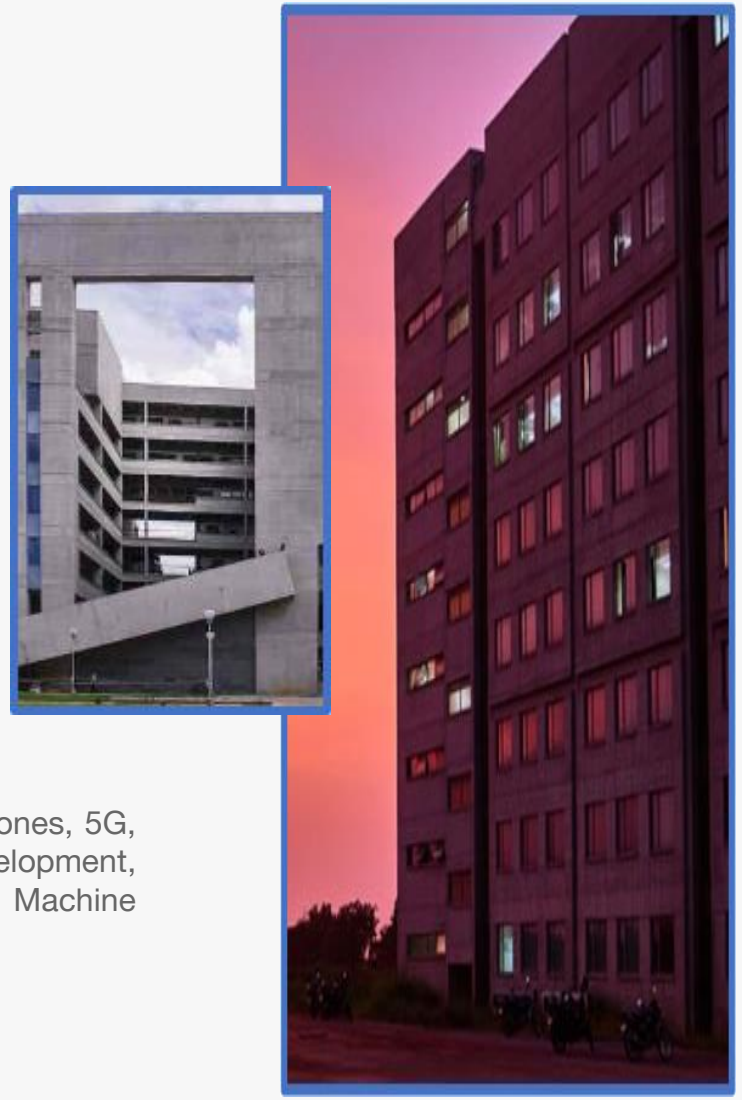
MTech Program – Electrical Department

Program	2 Years (TA)	Self - Sponsored	3 Years (RA)
Semesters	4	4	6
Course Work	24 credits	24 credits	24 credits
Thesis Work	24 credits	24 credits	24 credits



MTech (TA) Program - 2 Year:

- In the first year, students take Intensive courses designed by expert and highly efficient faculties.
- In the second year, they do research activities under the supervision of a professor.

Self-Sponsored Program – 2 Year: This is a 2-year program with the same course content as the regular 2-year MTech(TA). The only difference is in the fee structure, which is higher than MTech (TA).

MTech (RA) Program - 3 Year:

- Greater research component than 2-year MTech program
- The curriculum is identical to the two-year MTech program
- The curriculum is distributed over 3 years to give greater emphasis on research.

During research, the students contribute to developing technologies like Autonomous Vehicle, Passenger Drones, 5G, MIMO, smart city, UAV based smart agriculture, video analytics, natural language processing, app development, Beamforming, Radar, Li-Fi, IoT, Video quality assessment, Speech processing, High-rate Coding theory, Machine Learning, Deep Learning, Precision Farming, LiDAR Processing, AI-enabled Healthcare and Computer Vision.

45+ Projects

12 faculty

21 student

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Communication and Signal Processing

Students

Akhileswar Chowdary

Project work : UAV communications, NOMA, CoMP, LoRa.
Guide : Dr. Abhinav Kumar
Skills : MATLAB, Python, C.
Linkedin Profile

Avvaru Bharat

Project work : Phase reconstruction using DNN
Guide : Dr. K Sri Rama Murty
Skills : Machine Learning, Python, Image Processing
Linkedin Profile

Bala Priya C

Project work : Signal Processing, Applied Probability
Guide : Dr. Aditya Siripuram
Skills : Python, Machine Learning, Mathematics

C Shiva Kumar

Project work : Speech Recognition, Representation Learning
Skills : Python, PyTorch, ML/DL.
Linkedin Profile

Divyasree Voleti

Project work : 5G Physical Layer
Guide : Prof. Kiran Kuchi

Dubey Sachinkumar Omprakash

Project work : ML for Autonomous navigation, Comm. between drones.
Guide : Dr. G V V Sharma
Skills : ML, Embedded systems, C, Python, MATLAB
Linkedin Profile

H B Chetan

Project work : Keyword Spotting in Speech using Machine Learning
Guide : Dr. K Sri Rama Murty
Skills : Python, C++,Shell script
Linkedin Profile

Kakarla Yaswanth Satyaram Chowdary

Project work : Deep learning and Signal Processing
Guide : Dr. Aditya Siripuram

Kusuma Priya Pulavarty

Project work : V2X (Vehicular Communication)
Guide : Dr. Abhinav Kumar
Skills : Python, MATLAB
Linkedin Profile

Mounika R

Project work : 5G NR Downlink Physical layer Channels and ORAN Fronthaul
Guide : Prof. Kiran Kuchi
Skills : MATLAB, C, Python

Mylavarapu Pavan Manesh

Project work : HDR Video Quality Assessment
Guide : Dr. Sumohana Channappayya
Skills : C, MATLAB, Python
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Neha Rani

Project work : Commensal Radar, Wireless comm, Machine learning
Guide : Dr. Mohammed Zafar Ali Khan
Skills : GNU Radio, Python, MATLAB
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Students

Pulkit Saxena

Project work : Wireless Communication, 5G Testbed development
Skills : MATLAB , C/C++, Python
Linkedin Profile

Rajesh S

Project work : Human Embryo Quality Assessment
Guide : Dr. Sumohana Channappayya
Skills : Computer Vision, Signal Processing, Machine Learning, Deep Learning.
Linkedin Profile

Satyam Singh

Project work : Digital image processing in medical field
Guide : Dr. Soumya Jana
Skills : Python, Machine Learning, Deep Learning
Linkedin Profile

Shreeshan S

Project work : Computer Vision & Deep learning-based Plant Phenotyping using Point Cloud & RGB Data.
Guide : Dr. P. Rajalakshmi
Skills : Computer Vision, Deep Learning, Reinforcement Learning
Linkedin Profile

Subhra Shankha Bhattacherjee

Project work : Drone Image processing, ML, DL, Pruning & Optimization
Guide : Dr. P. Rajalakshmi
Skills : Machine learning, Deep learning, computer vision
Linkedin Profile

Vayyavuru Venkatesh

Project work : Syllable based Speech Recognition for Indian languages
Guide : Dr. K Sri Rama Murty
Skills : Speech Recognition, Machine Learning, Deep Learning
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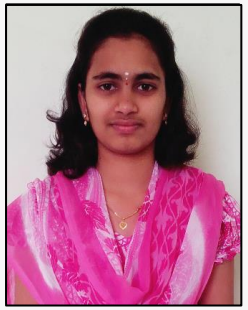
Vikram Shanmukh Satya Prabhu Tej

Project work : Computing the Discrete Fourier Transform of signals with partially known support
Guide : Dr. Aditya Siripuram



Vyshnavi Vangari

Project work : 5G Testbed Physical Layer
Guide : Prof. Kiran Kuchi
Skills : C, MATLAB, python

Yenigalla Samyuktha

Project work : Information theory and Wireless communications
Guide : Prof. Lakshmi Prasad Natarajan
Skills : MATLAB, C, Python
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Main Courses studied by students

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Machine Learning and IoT

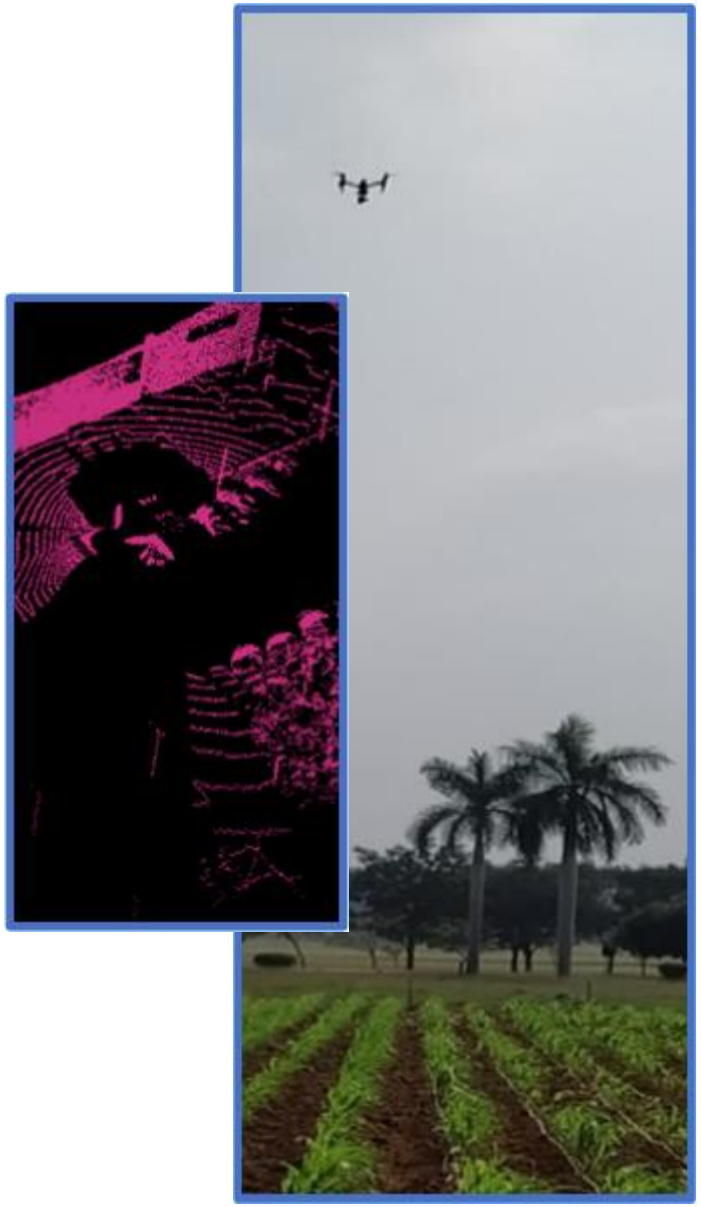
- Linear Algebra
- Probabilistic Graphical Model
- Pattern Recognition and Machine Learning
- Image Processing
- Introduction to Statistical learning
- Kernel Methods
- Deep Learning
- Machine Learning for Signal Processing
- Internet of Things (IoT)
- Applied Machine Learning
- Autonomous Navigation
- Reinforcement Learning
- Advanced Data Structures and Algorithms
- Representation Learning
- Introduction to Modern AI.
- Introduction to Submodular Functions
- Sequential Learning
- Introduction to Drones and Its Application

Communication & Signal Processing

- Random Variables
- Random Processes
- Communication & Signal Processing Lab
- Convex Optimization
- Wireless Communication
- Advanced Digital Signal Processing
- Digital signal processing lab
- Information Theory
- Digital Modulation
- Detection & Estimation Theory
- Field Programmable Gate Array(FPGA) Lab
- Advanced Cellular Communication
- Advanced Digital Communications
- Source and Channel Coding
- Error Correcting Codes
- Game Theory

What We Do

- Research in various cutting-edge technologies- machine learning, autonomous vehicles, passenger drone, smart city, UAV based smart agriculture, video analytics, natural language processing, app development, 5G, mm-wave radar, etc.
- Many of us already have prior industry experience, which helps us take up new challenges and solve them efficiently.
- Our branch's research work can be broadly classified into two domains - AI/ML IoT and communication.
- In the field of AI/ML IoT, some of the industry-oriented projects are
  1. Autonomous navigation system using LiDAR point cloud processing
  2. Smart traffic management using image & video processing
  3. Android app development for intelligent health management system
  4. System integration & software development for passenger drones
  5. Robust automatic speech recognition systems
  6. Drone-based agriculture monitoring
  7. Astronomical image processing
- In the field of communication system, we are working on
  1. 5G, Massive MIMO
  2. Baseband ASIC and SoC design
  3. Development of cognitive radio
  4. Design and develop NB-IoT modem and chipset



Communication and Signal Processing

Research Areas:

- Image and Video Quality Assessment
- Machine Learning
- Autonomous Vehicles
- Passenger Drones
- LiDAR Processing
- UAV assisted smart farming
- Biomedical image Processing
- Cardiac Signal Analysis
- V2I & V2V Communication
- Speech and Multimedia Signal Processing
- 5G, Massive MIMO
- Radar Communication
- Cognitive Radio/Radar
- Cyber Physical Systems
- Information Theory
- Spectrum Sensing

Research Labs:

- WiNet Lab
- WiCoN Lab
- LFOVIA Lab
- Immersive Multimedia Lab
- SIP Lab
- M2Smart Lab
- MIMO Lab
- CSP Lab
- CPS Lab
- FPGA Lab
- Signal processing and Information theory Lab

Communication and Signal Processing
Research Labs

Wireless Sensor Network (WiNet) Lab

Supervised under Prof. P Rajalakshmi

Tools, Collaborations, Research areas and Projects.

Immersive Multimedia Lab

Supervised under Prof. Soumya Jana

Tools, Collaborations, Research areas and Projects.

Speech Information Processing (SIP) Laboratory

Supervised under Dr Sri Rama Murty Kodukula

Tools, Collaborations, Research areas and Projects.

Lab For Video and Image Analysis (LFOVIA)

Supervised under Dr Sumohana S. Channappayya

Tools, Collaborations, Research areas and Projects.

Signal processing and Information theory Lab

Supervised under Dr Lakshmi Prasad Natarajan

and Dr Aditya Siripuram

Tools, Collaborations, Research areas and Projects.

Wireless Communications and Networking (WiCoN) Laboratory

Supervised under Dr Abhinav Kumar

Tools, Collaborations, Research areas and Projects.

5G Testbed (MIMO & CSP Labs)

Supervised under Prof. Kiran Kumar Kuchi

Tools, Collaborations, Research areas and Projects.

Cyber Physical System (CPS) Lab

Supervised under Prof. Mohammed Zafar Ali Khan

Tools, Collaborations, Research areas and Projects.

Communication and Signal Processing

Faculty

Name & Position	Website
Dr U. B. Desai (Professor)	https://www.iith.ac.in/~ubdesai/
Dr Kiran Kuchi (Professor)	https://sites.google.com/a/iith.ac.in/kkuchi/home
Dr P. Rajalakshmi (Professor)	https://www.iith.ac.in/~raji/
Dr Mohammad Zafar Ali Khan (Professor)	https://sites.google.com/iith.ac.in/zafar/home
Dr Soumya Jana (Professor)	https://iith.ac.in/ee/jana/
Dr Sumohana Channappayya (Associate Professor)	https://www.iith.ac.in/~sumohana/
Dr Sri Rama Murty Kodukula (Associate Professor)	https://iith.ac.in/ee/ksrm/
Dr Abhinav Kumar (Associate Professor)	https://www.iith.ac.in/~abhinavkumar/
Dr Aditya Siripuram (Assistant Professor)	https://iith.ac.in/ee/staditya/
Dr Lakshmi Prasad Natarajan (Assistant Professor)	https://www.iith.ac.in/~lakshminatarajan/
Dr Shashank Vatedka (Assistant Professor)	https://www.iith.ac.in/~shashankvatedka/html/home.html
Dr G.V.V Sharma (Associate Professor)	https://iith.ac.in/ee/gadepall/
Dr Sundaram Vanka (Associate Professor)	https://www.iith.ac.in/ee/sundar.vanka/

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Thank You

- Kindly register through our Office of Career Services (OCS) Portal - https://ocs.iith.ac.in/
- OCS Email : office.placement@iith.ac.in
- Hoping for a positive response