



## National Institute of Technology, Tiruchirappalli

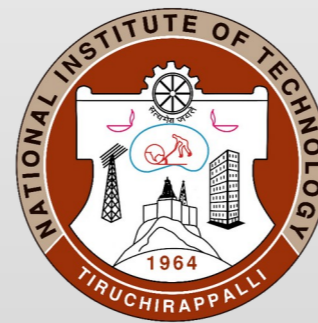
The National Institute of Technology (formerly known as Regional Engineering College) Tiruchirappalli (NITT) was started as a joint and co-operative venture of the Government of India and the Government of Tamil Nadu in 1964 with a view to catering the needs of manpower in technology for the country. NITT is one of the 31 National Institutes of Technology established by the Government of India and ranks first among all the NITs in NIRF ranking. The institution offers Undergraduate Courses in ten branches and Post Graduate Courses in twenty-six disciplines of Science, Engineering & Technology besides M.S. (by Research) and Ph.D. in all the departments.

## Department of Electronics and Communication Engineering

The Electronics and Communication Engineering (ECE) Department was established in the year 1968. The vision of the department is to provide valuable resources for industry and society through excellence in technical education and research. The Department offers Undergraduate, Post Graduate, Research Degrees (M.S. & Ph.D.) programs. Research in the Department focuses on various disciplines such as Communication Systems, Wireless Networks, Signal and Image Processing, RF MEMS, Microwave Antennas, MIC, Optical Communication, Photonics and VLSI systems.

## About Accelerate Vigyan

"Accelerate Vigyan" (AV) strives to provide a big push to high-end scientific research and prepare scientific manpower which can venture into research careers and knowledge-based economy. Recognizing that all research has at its base as development of quality, well-trained researchers, AV will initiate and strengthen mechanisms of identifying research potential, mentoring, training and hands-on workshops, on a broad-based national scale. The aim is to expand the research base in the country, with three broad goals - consolidation / aggregation of all scientific training programs, initiating High end Orientation Workshops and creating opportunities for Training and Skill Internship.



## Vritika (Training & Skill Internship)

on

## OTFS and Cooperative Communication for High Mobility Applications in B5G and 6G Wireless Communications

1 June - 30 June, 2023

Organized by  
**Department of Electronics and Communication Engineering**  
**National Institute of Technology, Tiruchirappalli**



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## About VRITIKA

VRITIKA is the call for initiation and practice in science through research internships. The main objective of VRITIKA is to groom students (primarily from Universities, Colleges, Private Academic Institutions, and newly established Institutes) in their scientific career pursuits by developing dedicated research skills in selected areas/discipline/fields of Science and Engineering through Training and Skill Internship. VRITIKA aims to provide opportunities to promising PG students from universities and colleges to get exposure and hands-on research experience. This internship program is aimed at the Post Graduate Students of Science / Engineering/ Technology who have research aptitude and enthusiasm to learn the B5G and 6G wireless communication systems and their characterization. The program offers participants an internship rich in experimental learning and professional development opportunities, as well as a chance to be a part of our research group. Internship program also offers the Postgraduate students a chance to interact with Professors of NITT for their future research endeavors.

## General Information:

- **Eligibility:** Students pursuing PG or PhD in Electronics and Communication Engineering, or any other specialization relevant to wireless communication or signal processing.
- Interns are expected to work in NIT Tiruchirappalli campus and **Accommodation** will be provided at NIT Tiruchirappalli hostel with catering facilities, if requested.
- Students selected for this internship are eligible for **Travel allowance (TA)** reimbursement for their journey to NIT Tiruchirappalli from their home town or host institute as well as return journey as per SERB & GoI norms.
- Candidates will be selected on the **basis of merit**. After last date of registration, selected candidates will be intimated through email.
- Selected candidates will have to acknowledge participation in the internship through return email failing which the waitlisted candidates will be called for attending the workshop.
- The candidate must get a letter of authentication about your current affiliation and **No Objection Certificate (NOC)** from **Supervisor or Head of the Department or Head of the institute**. This letter must be uploaded in the registration link for participating in the internship. The format for the same is provided herewith. It must be obtained on the institute/university letterhead.

## Overview of the Internship:

Due to multipath fading, mobile radio channel causes severe variations in signal attenuation at the receiver side. The multipath fading phenomenon changes with change of spatial location of receiver as well as objects in the multipath channel. Cooperative communication utilizes spatially distributed relays to take advantage of spatial diversity.

Use cases in B5G and 6G wireless communications are required to cater emerging application scenarios in high-mobility environments such as unmanned aerial vehicles (UAVs), drones, autonomous vehicles/cars, etc. Specifically, for UAV and drone communications, cooperative relaying can be used for range and coverage extension. High mobility and high carrier frequency result in high Doppler shift in the received signal, which may lead to erroneous decoding. Recently proposed Orthogonal time–frequency space (OTFS) modulation is well suited for high-mobility environments. It is a two-dimensional modulation scheme in which information symbols are multiplexed in the delay–Doppler domain.

The amalgamation of cooperative communication and OTFS will give promising results in terms of addressing both the high Doppler and the coverage extension for UAV and drone communications. To the best of our knowledge, this topic is very less explored in the literature. The amount of impact this topic has in B5G and 6G wireless communications is also high since drones are widely used nowadays.

## Objectives:

- To enable the students and technologists to conceive innovative ideas and contribute in OTFS-based cooperative communication topic.
- To improve effective quality of service and evaluate the performance at the physical layer of wireless communication.
- To attain better network coverage, reliability, and energy efficiency.
- To exploit wireless channel fading phenomenon to achieve better diversity by using relay based cooperative communication

## Registration Fee

Registration fee is not charged. The course is completely sponsored by SERB Accelerate Vigyan Vritika (Training & Skill Internship) program.

## Number of Seats

**4 Ph.D scholars and 1 PG student**

## Venue

National Institute of Technology Tiruchirappalli.

## Mode of Internship

In-person, Offline

## Term and Conditions

- The period of the Training and Skill Internship is from 1-June-2023 to 30-June-2023.
- The supervisor to whom the interns are attached would be assigning them tasks/assignments, on which, the intern should work and prepare a report to be submitted.
- A certificate regarding successful completion of internship shall be issued to the intern by the supervisor and head of the department on satisfactory completion of the internship and on submission of the assignment report.
- Interns not completing the requisite period will not be issued any certificate.
- The participant will not be paid any stipend.
- Hostel accommodation with catering facilities will be provided based on request and availability.
- TA will be provided as per SERB and GoI norms.

## Last Date for Registration

**May 15, 2023 (15.05.2023), 23:59 (IST)**

## Registration Procedure

Register online using the following link or QR code:



[Click here](#)

No Objection Certificate (NoC) format can be downloaded using the following link or QR code:



[Click here](#)

## Address for Correspondence:

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