PMRF-ISSS Teaching Programme

Prime Minister Research Fellowship students' teaching requirement
facilitated by the Institute of Smart Structures and Systems

Module PMRF-ISSS074/II/2025

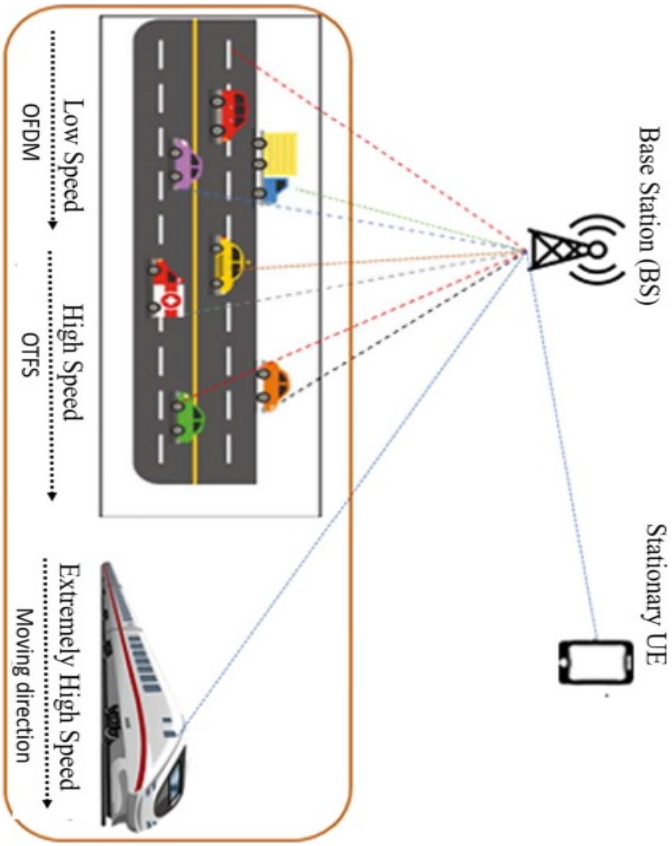
Delay-Doppler Communications

Name of the PMRF student

Niladri Halder, IISc Bangalore

Required background of the students taught

Electronics and Communications Engineering, Telecommunication Engineering



Details of the content of the module

1. High-mobility channel (HMC) models
2. 4G waveforms and their limitations:
   a) System model
   b) Advantages and disadvantages
   c) OFDM in HMCs
3. Delay-Doppler (DD) modulation
   a) System model
   b) Matrix formulation for OTFS
   c) Variants of OTFS
4. DD transforms
   a) Basis functions
   b) Discrete Zak transform for OTFS
5. Equalization techniques
   a) Diagonal equalizer
   b) MMSE equalizer
6. Communications through underwater acoustic (UWA) channels
7. UWA channels estimations
8. Conclusions & future directions

Schedule of the module

Start date: August 23, 2025

End date: October 19, 2025 (Tentative)

Class timing: Saturday, Sunday - 5 PM-8 PM

Recorded lectures will be uploaded regularly.

Total lecture hours: 50 hours

Meeting link : Will be shared later

Link

Contact email ID: isss.forum@gmail.com

Registration link: here

https://forms.gle/iye1YsyHJa6UUvis8