

Preety Priya

PERSONAL INFORMATION

Address: Department of Electronics Engineering, IIT (ISM)
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RESEARCH INTERESTS

High Mobility Communications, OTFS Modulation, Overspread Channel Estimation, 5G mmWave MIMO-OFDM Wireless Communications, Sparse Signal Processing, Synchronization and Channel Estimation, Nonlinear Data Detection (Particle Filter), Integrated Communications and Sensing for 6th Generation Wireless Communications.

EXPERIENCE

Assistant Professor June 2025 to Present
Department of Electronics Engineering, Indian Institute of Technology, Dhanbad.

Responsibilities:

- Teaching subjects and carrying out research.
- Writing project proposals.

Assistant Professor March 2024 to May 2025
Department of Electronics and Communications Engineering, National Institute of Technology, Calicut.

Responsibilities:

- Teaching subjects and carrying out research.
- Writing project proposals.
- Setting up New 5G Lab.

Postdoctoral Research Fellow July 2022 to March 2024
Supervisors: Associate Prof. Yi Hong and Prof. Emanuele Viterbo
Project Name: *New modulation techniques for future high-mobility wireless communications*
Electrical and Computer Systems Engineering, **Monash University**, Australia

Focusing on novel modulation techniques to support high-mobility wireless communications with superior performance.

Responsibilities:

- Perform research in the area of detection and channel estimation for OTFS systems in high mobility applications.
- Writing reports, papers, and presentations at international conferences.
- Co-supervision of PhD students and conducting practical classes.

Research Associate Dec 2021 to July 2022
Project Name: *Next Generation Wireless Research and Standardization on 5G and Beyond* (Meity, GoI)
G. S. Sanyal School of Telecommunications, **IIT Kharagpur**, India

Focusing on Research and Technology Development for mmWave systems.

Responsibilities:

- Perform research in the area of channel state information enhancement in high mobility applications.
- Develop and implement systems according to the requirements of the projects.

- Presentation of the research in project meetings, international conferences, and seminars.
- Writing reports, papers, and patents.

PhD Scholar

July 2016 to Dec 2021

Supervisor: Associate Prof. Debarati Sen

G. S. Sanyal School of Telecommunications, **IIT Kharagpur**, India

Thesis Title: *Estimation and Detection for mmWave Systems with Power Amplifier Nonlinearity.*

The focus was to provide a reliable communication for mmWave systems with baseband processing algorithm design (CFO and channel estimation, nonlinear detection) in presence of power amplifier nonlinearity.

Responsibilities:

- Study and define problems relevant to mmWave systems with power amplifier nonlinearity issues.
- Perform innovative research to find solutions to provide reliable communication in the defined problems.
- Perform simulations to demonstrate the efficacy of the proposed solutions.
- Writing reports, papers, and patents.
- Supervision of master student and their projects.
- Presentation of the research in international conferences.

Assistant Professor

June 2014 to July 2016

School of Electronics Engineering,

Kalinga Institute of Industrial Technology (Deemed To be University),

Taught wireless communication and digital communication subjects and supervise students in classrooms and labs.

Responsibilities:

- Teaching subjects in class of size 70 students.
- Mentored students professionally and personally.
- Sets question paper for the subjects.
- Evaluation of undergraduate students.
- Demonstrated Lab experiments and evaluated undergraduate students through viva-voce.

Teaching Assistant

- Teaching Assistance in **NPTEL Online Certification Course “Spread Spectrum Communications and Jamming”** in Jan-Apr, 2020, 2021, and 2022.
- Teaching assistance for the subjects “spread spectrum communications and jamming, and communication for signal processing and algorithms” during 2017-2021 in IIT Kharagpur, India.
- Assisted, tutored, and supervised students in labs and classrooms during the year 2013-2014 in E&ECE, IIT Kharagpur.

JOURNAL AND CONFERENCE PUBLICATIONS

1. **Preety Priya**, Y. Hong, and E. Viterbo “OTFS Channel Estimation and Detection for Channels with Very Large Delay Spread,” in *IEEE Transactions on Wireless Communications*, vol. 23, no. 9, pp. 11920-11930, Sept. 2024, doi: 10.1109/TWC.2024.3386160. **I.F.-9.603**
2. **Preety Priya**, E. Viterbo and Y. Hong, “Low Complexity MRC Detection for OTFS Receiver with Oversampling,” in *IEEE Transactions on Wireless Communications*, vol. 23, no. 2, pp. 1459-1473, Feb. 2024, doi: 10.1109/TWC.2023.3289610. **I.F.-9.603**

3. **Preeti Priya**, Y. Hong and E. Viterbo, "Oversampled Receiver for Coded OTFS with Different D/A Reconstruction Filters," in *IEEE Wireless Communications Letters*, vol. 13, no. 9, pp. 2327-2331, Sept. 2024, doi: 10.1109/LWC.2024.3406612. **I.F.-4.6**
4. **Preeti Priya**, C. S. Reddy and D. Sen, "Channel Estimator and Nonlinear Detector for Mmwave Beamformed OTFS Systems in High Mobility Scenarios," in *IEEE Transactions on Vehicular Technology*, vol. 72, no. 9, pp. 11698-11713, Sept. 2023, doi: 10.1109/TVT.2023.3266481. **I.F.-7.106**
5. **Preeti Priya** and D. Sen, "Particle Filter Based Nonlinear Data Detection in Presence of CFO for Frequency Selective mmWave MIMO-OFDM Systems," in *IEEE Transactions on Vehicular Technology*, vol. 70, no. 6, pp. 5892-5907, June 2021, doi: 10.1109/TVT.2021.3078103. **I.F.-7.106**
6. **Preeti Priya** and D. Sen, "Data Detection With CFO Uncertainty and Nonlinearity for mmWave MIMO-OFDM Systems," in *IEEE Systems Journal*, vol. 16, no. 3, pp. 3734-3745, Sept. 2022, doi: 10.1109/JSYST.2021.3093333. **I.F.-4.4**
7. C. S. Reddy, **Preeti Priya**, D. Sen and C. Singhal, "Spectral Efficient Modem Design With OTFS Modulation for Vehicular-IoT System," in *IEEE Internet of Things Journal*, vol. 10, no. 3, pp. 2444-2458, 1 Feb.1, 2023, doi: 10.1109/JIOT.2022.3211531. **I.F.-10.976**
8. Nisal Vihan Kalpage, **Preeti Priya**, and Y. Hong, "DCT-Based OTFS with Reduced PAPR," in *IEEE Communications Letters*, vol. 28, no. 1, pp. 158-162, Jan. 2024, doi: 10.1109/LCOMM.2023.3337778. **I.F.-4.182**
9. B. Srinivas, **Preeti Priya**, D. Sen and S. Chakrabarti, "Channel Estimation in Sub-6 GHz and Hybrid Millimeter Wave MIMO Systems with Low-Resolution ADCs," in *IEEE Transactions on Green Communications and Networking*, vol. 7, no. 2, pp. 707-723, June 2023, doi: 10.1109/TGCN.2022.3232580. **I.F.-3.881**
10. **Preeti Priya**, Emanuele Viterbo, and Yi Hong, "Practical Low Complexity MRC Detector for OTFS with Oversampling Receiver" in Proc. *ICC Workshop*, Rome, Italy, 2023, pp. 543-548, doi: 10.1109/ICCWorkshops57953.2023.10283574.
11. **Preeti Priya** and D. Sen, "Particle Filter Based Nonlinear Data Detection for Frequency Selective mm-Wave MIMO-OFDM Systems," *2020 IEEE 92nd Vehicular Technology Conference (VTC2020-Fall)*, Victoria, BC, Canada, 2020, pp. 1-6, doi: 10.1109/VTC2020-Fall49728.2020.9348523. **I.F.-1.19**
12. **Preeti Priya**, S. Verma, S. Chakraborty and D. Sen, "A Semi Blind Joint CFO Estimation, Equalization and Data Detection in Presence of Non-Linearity for mm-Wave Communications," *2018 IEEE 88th Vehicular Technology Conference (VTC-Fall)*, Chicago, IL, USA, 2018, pp. 1-5, doi: 10.1109/VTCFall.2018.8690598. **I.F.-1.19**

PATENTS

1. **Preeti Priya**, Ch Santosh Reddy and D. Sen, "Method and System for Pilot Design and Channel Estimation in Presence of Nonlinearity in the Delay-Doppler Domain for mmWave OTFS Systems", *Indian Patent Number-430680*, Date of Grant-1st May, 2023.
US Patent App.-US20230379194A1, Published on 23-11-2023.
2. **Preeti Priya**, Ch Santosh Reddy and D. Sen, "Signal Receiver and Receiving Method for OTFS Based mmWave Communication Systems with Non-Ideal Power Amplifier." *Indian Patent Number-431157*, Date of Grant-8th May, 2023.
US Patent App.-US20240007332A1, Published on 04-01-2024.

3. Ch Santosh Reddy, **Preeti Priya**, C. Singhal, and D. Sen, “System and Method for Spectrally Efficient Pilot and Detector Design in Delay-Doppler Domain for OTFS-Based NR (New Radio) IOT and Massive Machine to Machine (M2M) Communications.” *Indian Patent Number-535492*, Date of Grant-29th April, 2024. *US Patent App.-US20230370316A1*, Published on 16-11-2023, Accept for Grant, November 2024.

EDUCATION

Indian Institute of Technology Kharagpur, Kharagpur, India

Ph.D., G. S. Sanyal School of Telecommunications, April 2022

- Thesis Topic: *Estimation and Detection for mmWave Systems with Power Amplifier Nonlinearity*
Description: The work aims to provide reliable communication for mmWave systems in the presence of nonlinearity.
- Grade of coursework: (9.6/10)

Indian Institute of Technology Kharagpur, Kharagpur, India

M.Tech., Telecommunication System Engineering, June 2014

- Thesis Topic: *Noise Specific Speech Enhancement*
- Grade: (8.26/10)

Asansol Engineering College, West Bengal

B.Tech., Electronics and Communication Engineering, June 2010

- Grade: 8.12/10)

SCHOLASTIC ACHIEVEMENTS

Qualcomm Innovation Fellowship India 2017

Received Qualcomm Innovation Fellowship (QInF) India 2017 for the proposal “*Blind Joint Equalization and Detection in Presence of Nonlinearity and Synchronization Errors for Millimeter Wave Communications*”.

POSITION OF RESPONSIBILITIES

- Departmental Women’s Representative of G S Sanyal School of Telecommunications, IIT Kharagpur for the academic session 2017-18.
- Worked as a volunteer in “IEEE National Conference on Communications”, 2020 organized by IIT Kharagpur.
- Reviewed papers in IEEE TGCN, IEEE TCOM, IEEE Comm Letts. and IEEE NCC.

FELLOWSHIP

Postdoc Fellowship — Monash University, Australia	
• Australian Research Council Discovery Project (DP200100096)	2022 to 2024
Ph.D. Fellowship — Indian Institute of Technology Kharagpur	
• MHRD, Govt. of India fellowship	2016 to 2021
Gate Fellowship — Indian Institute of Technology Kharagpur	
• AICTE, Govt. of India fellowship	2012 to 2014

SKILLS

- Programming
- MATLAB, LABVIEW, LaTeX
- Operating System
- Windows

LANGUAGES

English, Hindi

INTEREST	Cooking, Dancing, Traveling
REFEREES	A/Professor Yi Hong Associate Professor, Department of Electrical and Computer Systems Engineering, Monash University, Clayton, Australia Contact no.- +61 3 9905 3824 e-mail: Yi.Hong@monash.edu Professor Emanuele Viterbo Professor, Department of Electrical and Computer Systems Engineering, Monash University, Clayton, Australia Contact no.- +61 3 9905 3473 e-mail: Emanuele.Viterbo@monash.edu Dr. Debarati Sen Associate Professor, Indian Institute of Technology, Kharagpur, India Contact no.- +91-3222-283908 e-mail: debarati@gssst.iitkgp.ac.in