

Sudhakar Modem

Assistant Professor, Electronics & Communication Engineering, IIIT- Dharwad.



Phone: +91 9582688220, Email: {modemsudhakar@gmail.com, sudhakar@ee.iitd.ac.in}

Research Interests

- *Cooperative communication*: Two-way relaying protocols, one way relaying protocols, throughput analysis, ergodic sum-rate analysis.
- *Energy harvesting*: Radio frequency energy harvesting (EH), battery assisted EH relaying, optimization of time-switching relaying, optimization of power-splitting protocols.
- *Cognitive radio*: Cognitive two-way relaying systems, cognitive multi user networks, interference apportioning protocols for EH networks.
- *Millimeter wave (mmWave) communication*: Optimization of EH based mmWave sensor networks.

Education

Ph.D. , Communication Engineering, Electrical Engineering Department, (Defended on 9/2/18) Advisor: Prof. Shankar Prakriya	Indian Institute of Technology at Delhi Thesis: Optimization of Networks with Energy Harvesting Relays.
M. Tech. , Communication and Signal Processing, Electrical Engineering Department, 2012 (CGPA: 8.8/10) Advisor: Dr. Sowmya Jana	Indian Institute of Technology at Hyderabad Thesis: 3D Video Reconstruction & Compression From Multiple 2D Views.

Research & Academic Experience

Assistant Professor (MHRD-world bank project, TEQIP-III, MITS Gwalior), 03 Jan. 2018-07 Aug. 2018;

Research Associate (Indian Institute of Technology Delhi), Oct. 2017-Dec. 2017 (3 months);

- Analysis of battery-assisted EH relaying network.
- Research contributions submission to IEEE transaction for possible publication.

Doctoral Research (Advisor: Prof. Shankar Prakriya), Jan. 2013-Sep. 2017 (4 years 9 months);

Electrical Engineering, Indian Institute of Technology at Delhi

- Analysis of spectral efficient two-way relaying protocols in EH wireless communication networks.
- Designing protocols for minimization energy consumption in energy constrained battery-limited networks using energy harvesting.

- Design of optimum protocols for cognitive two-way EH relaying networks and cognitive multiuser networks with interference apportioning.

Project Associate, August 2012 – December 2012 (5 months);

Electrical Engineering, Indian Institute of Technology at Hyderabad

- 3D manifold creation from 2D views.
- 3D reconstruction, rendering and compression.

Master Research (Advisor: Dr. Sowmya Jana), Aug. 2010- Jul. 2012 (2 years);

Electrical Engineering, Indian Institute of Technology at Hyderabad.

- Motion estimation for image and corresponding depth map.
- Motion vectors, generation and compression of 3D video.

Publications

PATENT

- S. Modem and S. Prakriya, "Optimization of Supplementary Battery-Assisted Energy Harvesting Nodes," May 08 2017, Indian Provisional Patent 201711016203, has application in management of battery energy in IoT type devices (5G), Indian patent application filed, PCT application filed.

JOURNALS PUBLISHED/ACCEPTED

- S. Modem and S. Prakriya, "Optimization of Two-Way Relaying Networks with Battery-Assisted EH Relays," in *IEEE Transactions on Communications*, IEEE early access [online], 2018.
URL: <https://ieeexplore.ieee.org/document/8368152/>
- S. Modem and S. Prakriya, "Performance of EH Protocols in Two-Hop Networks with a Battery-Assisted EH Relay," in *IEEE Transactions on Vehicular Technology*, IEEE early access [online], 2018.
URL: <https://ieeexplore.ieee.org/document/8405612/>
- S. Modem and S. Prakriya, "Performance of Analog Network Coding Based Two-Way EH Relay With Beamforming," in *IEEE Transactions on Communications*, vol. 65, no. 4, pp. 1518-1535, April 2017.
URL: <https://ieeexplore.ieee.org/document/7831382/>
- S. Modem and S. Prakriya, "Optimization of Links with a Battery-Assisted Time-Splitting Wireless Energy Harvesting Relay," in *IEEE system journal*, IEEE early access [online], 2017.
URL: <https://ieeexplore.ieee.org/document/8122019/>
- S. Singh, S. Modem and S. Prakriya, "Optimization of Cognitive Two-Way Networks With Energy Harvesting Relays," in *IEEE Communications Letters*, vol.21, no. 6, pp. 1381-1384, June 2017.
URL: <https://ieeexplore.ieee.org/document/7847314/>

JOURNALS UNDER PREPARATION

- "Comparison of Energy Transfer Protocols in Cognitive TWR Networks with EH Relays," to be submitted.
- "Energy Cooperation and Scheduling in mmWave Sensor Networks," to be submitted.

CONFERENCE

- S. Modem and S. Prakriya, "Performance of analog network coding based two-way EH relay with beamforming," in 2016 IEEE 83rd Vehicular Technology Conference (VTC Spring), May 2016, pp. 1–5.
- M. Sudhakar, K. K. Vupparaboina and S. Jana, "Parameterized estimation of common motion for image and depth sequences," 2013 National Conference on Communications (NCC), New Delhi, India, 2013, pp. 1-5.

Graduate Courses

Digital communication, Signal theory, Estimation and Detection, Wireless communication, Information theory, Multimedia signal processing.

Achievements, Awards and Professional Affiliations

- All India Rank 248/104291 in Graduate Aptitude Test in Engineering (GATE), 2010.
- Received ministry of human resources development stay fund, 2010-2012.
- Student member, Institute of Electrical and Electronics Engineers, 2014-present.

References

Prof. Shankar Prakriya,
Electrical Engineering Department,
Indian Institute of Technology Delhi,
HauzKhas, New Delhi-110 016.
Email: shankar@ee.iitd.ac.in
Tel: (91)-11-2659-1050 (O)
Fax: (91)-11-2658-1606

Dr. Satyam Agarwal, Assistant Professor,
Room No. 216, New Extension Block, EEE
Department, IIT Guwahati, ASSAM-781039.
Email: satyama@iitg.ernet.in
Tel: 036-12583470

Dr. Sreejith T V, Assistant Professor,
Indian Institute of Technology Bhilai,
Department of Electrical Engineering, IIT Bhilai,
GEC Campus, Sejbahar, Raipur.
Email: sreejith@iithbhilai.ac.in
Tel: 0771-492015

