



## CURRICULUM VITAE

Dr. Vikash Sachan

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### Job Objective

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To achieve a challenging position in academic field, work towards perfection with responsibility entrusted upon and seek research excellence in all endeavors, assisted by the right opportunity.

### Education

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- Doctor of Philosophy (Wireless Communication) from N.I.T, Patna-15<sup>th</sup> October 2020.
- Master of Technology (Communication System) from N.I.T, Patna India - June 2015 with CGPA of 7.98.
- Bachelor of Technology (Electronics & Communication Engineering) from U.I.E.T, CSJM University, Kanpur, India – June 2008 with percentage of 68.80.

### Experience Summary

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- 1 Years & 6 months of experience as a Guest Lecturer in Electronics & Communication Engineering Department in U.I.E.T, Kanpur, Kanpur.
- Teaching Assistantship at N.I.T Patna.

### Career Profile

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University Institute of Engineering and Technology, Kanpur from July 2011 to December 2012

**Responsibilities:**

- Session July 2011-December 2011  
Basic Electrical & Electronics Engineering
- Session January 2012-June 2012  
Digital Electronics, Antenna & Microwave Engineering
- Session July 2012-December 2012  
Basic Electrical & Electronics Engineering,  
Measurement & Instrumentation Engineering

#### **Teaching Assistant in N.I.T Patna**

**2013-2015**

Electronics & Communication Engineering Department, N.I.T Patna

- Conducted UG Analog Electronic Circuits Laboratory.
- Conducted UG Basic Electrical & Electronics.

#### **Teaching Assistant in N.I.T Patna**

**2015-2020**

Electronics & Communication Engineering Department, N.I.T Patna

- Conducted UG Digital Communication Lab.
- Conducted PG and PhD Advance Communication Lab

#### **Professional Services**

Reviewer- Tencon 2019

### **B.Tech Project**

#### **Reasonable Optical Near Joint Access (RONJA) 2007-2008**

This is the topic of my B.Tech. project. The project is based on Free Space Optics (FSO) which shows the basic concept of optical communication in which laser light is used as an optical source. It is a "User Controlled Technology" of optical point to point data link. We are transmitting the data from the transmitter side wirelessly. Both the transmitter and receiver sections are interfaced with the two computers respectively with the interfacing ports. The optical communication has been shown successfully.

Supervisor: Er. Vishal Awasthi, H.O.D, Electronics & Communication Engineering Department, U.I.E.T, Kanpur.

### **M.Tech Thesis**

#### **Bio-inspired Learning Algorithm for Routing Protocol in Wireless Sensor Network 2014-2015**

In wireless sensor networks (WSNs), due to the limitation of nodes' energy, energy efficiency is an important factor should be considered when the protocols are designing. As a typical representative of hierarchical routing protocols, LEACH Protocol plays an important role. In response to the uneven

energy distribution that is caused by the randomness of cluster heads forming, this paper proposes a new improved algorithm of LEACH protocol (LEACH-TLCH) which is intended to balance the energy consumption of the entire network and extend the life of the network. The new algorithm is emulated by Matlab simulation platform, the simulation results indicate that both energy efficiency and the lifetime of the network are better than that of LEACH Protocol. Cluster-based routing protocol is always a hot research area in wireless sensor networks. Classical LEACH protocol has many advantages in energy efficiency, data aggregation and so on, so it is widely used until now.

Supervisor: Dr. Bikash Chandra Sahana, Assistant Professor and H.O.D, Electronics & Communication Engineering Department, N.I.T Patna.

## **PhD Thesis**

### **Performance Analysis of MIMO Cooperative Relaying Networks for Wireless Communication 2015-2020**

- Performance Analysis of Multiple Input Multiple Output (MIMO)–Space Time Block Code (STBC) based single relay and multi-Relay cooperative communication over various fading channels.
- Performance analysis of symbol error rate (SER) of selective decode-forward (DF) relaying based multiple input multiple output (MIMO) orthogonal space time block coded (OSTBC) cooperation network, considering channel estimation error using Nakagami-m fading channel.
- To improve the performance of the relaying network by using cooperative communication in conjunction with STBC and MIMO because at present, it is significantly challenging to implement massive MIMO in mobile scenarios and further research is necessary before it can be successfully implemented in mobile cooperative communication systems.
- To improve the performance of relaying network, using antenna selection (transmit antenna, receive antenna or relay selection).
- To improve the performance of Spatially modulated MIMO Cooperative System.
- Uplink Sum Rate and Capacity of Hybrid Precoding mmWave Massive MIMO System.

Supervisor: Dr. Ritesh Kumar Mishra, Associate Professor, Electronics & Communication Engineering Department, N.I.T Patna.

## **Short Tem Courses**

1. Attended Short term training program on "**Network Simulator 2 & IPv6**" from 13<sup>th</sup> to 17<sup>th</sup> October 2014 Organised by Department of Mathematics and Computer Applications at MANIT, Bhopal

2. Attended Short term training program on " **Recent Trends in Speech and Image Processing**" from 23<sup>rd</sup> to 27<sup>st</sup> June 2015 Organised by Department of Electronics and Communication Engineering at NIT Patna
3. Attended Short term training program on "**MIMO- OFDM Wireless Communications**" from 19<sup>th</sup> to 21<sup>st</sup> February, 2016 by Department of Electrical Engineering at IIT Kanpur
4. Attended Short term training program on "**Cognitive Radio and Wireless Communication- Theory, Practice and Security**" from 1<sup>th</sup> to 10<sup>st</sup> September, 2016 by Department of Electrical Engineering at IIT Kanpur
5. Attended Short term training program on "**Advance Topics in Coding Theory** " from 13<sup>th</sup> to 22<sup>nd</sup> October, 2016 Organised by Department of Electrical Engineering at IIT Kanpur
6. Attended Short term training program on "**Signal Processing for 5G Massive MIMO Wireless Systems** " from 28<sup>th</sup> to 30<sup>th</sup> January, 2017 Organised by Department of Electrical Engineering at IIT Kanpur
7. Attended Short term training program on "**5G secure smart city**" from 20<sup>th</sup> to 21<sup>st</sup> March 2017 Organised by Department of Electronics and Communication Engineering at NIT Patna
8. Attended Short term training program on "**Cooperative 4G/5G MIMO Wireless Communication** " from 27<sup>th</sup> to 29<sup>th</sup> May, 2017 Organised by Department of Electrical Engineering at IIT Kanpur
9. Attended Short term training program on "**MIMO, Massive MIMO and OFDM 4G/5G Wireless Technologies**" from 20<sup>th</sup> to 23<sup>rd</sup> June, 2017 by Department of Electrical Engineering at IIT Kanpur
10. Attended Short term training program on "**Massive MIMO and Millimeter Wave (mm Wave) MIMO Technologies for 5G Networks**" from 20<sup>th</sup> to 23<sup>rd</sup> June, 2017 by Department of Electrical Engineering at IIT Kanpur

## **Journals**

1. Vikash Sachan and Ritesh Kumar Mishra. "**Uplink Sum Rate and Capacity of Hybrid Precoding mmWave Massive MIMO System**", *Traitement du Signal(SCIE)*, Vol. 36, No.2, pp. 155-160, April 2019.
2. Vikash Sachan and Ritesh Kumar Mishra, "**Pairwise Error Probability Performance of SM-MIMO and Spatially Modulated Cooperative Communication Employing SDF Protocol**", *International Journal of Engineering and Advanced Technology (Scopus)*, Vol. 8, No. 6, pp. 4755-4761, August 2019.
3. Vikash Sachan, Indrajeet Kumar, Ravi Shankar, Ritesh Kumar Mishra, "**Analysis of transmit antenna selection based selective decode forward cooperative communication protocol**", *Traitement du Signal (SCIE)*, Vol. 35, No. 1, pp.47-60, December 2018.

4. Indrajeet Kumar, Vikash Sachan, Ravi Shankar, Ritesh Kumar Mishra, "**An investigation of wireless S-DF hybrid satellite terrestrial relaying network over time selective fading channel**", *Traitement du Signal (SCIE)*, Vol. 35, No. 2, pp. 103-120, December 2018.
5. Shankar, R., Sachan, V., & Mishra, R. K, "**Performance of MIMO-STBC Decode and Forward Cooperative Communications with Channel Estimation Error over Nakagami-m Fading Channels**", *International Journal of Control Theory and Applications (Scopus)*. 9(18), pp.8985-8993,2016.
6. R. Shankar, V.Sachan and Ritesh Kumar Mishra, "**MIMO STBC Multi Node Selective C(0) Protocol Based Cooperative Wireless Communication over Nakagami-m Fading Channel Considering the Effect of Channel Estimation Error**", *Journal of Engineering and Applied Sciences (Scopus)*, 12(7) , 2017 .
7. Vikash Sachan, Ravi Shankar and Ritesh Kumar Mishra. "**Selective Decode-Forward Cooperative Communication over Nakagami-m Fading Channel with Channel Estimation Error**", *Journal of Telecommunication, Electronic and Computer Engineering (Scopus)*, Vol. 9, no. 2-6, pp. 85-90, 2017.

## Conferences

1. Vikash Sachan, Indrajeet Kumar, Lokesh Bhardwaj, Ritesh Kumar Mishra, "**Pairwise Error Probability Analysis of SM-MIMO System Employing k- $\mu$  Fading Channel**", *Procedia Computer Science (Elsevier)*, Vol. 167, pp. 2516-2523, 2020.
2. Indrajeet Kumar, Vikash Sachan, Ravi Shankar, Ritesh Kumar Mishra, "**Performance Analysis of Multi-User Massive MIMO Systems with Perfect and Imperfect CSI**", *Procedia Computer Science (Elsevier)*, Vol. 167, pp. 1452-1461, 2020.
3. Vikash Sachan, Ravi Shankar, Indrajeet Kumar and Ritesh Kumar Mishra, "**Performance Analysis of SM-MIMO System Employing Binary PSK and M'ary PSK Techniques Over Different Fading Channels**", *Procedia Computer Science (Elsevier)*, Vol. 152, pp. 323-332, 2019.
4. Shankar, R., Kumar, G., Sachan, V. & Mishra, R. K, "**An Investigation of Two Phase Multi-Relay S-DF Cooperative Wireless Network Over Time-Variant Fading Channels with Incorrect CSI**", *Procedia Computer Science (Elsevier)*, Vol. 125, pp. 871-879, 2018.
5. Vikash Sachan, Ravi Shankar and R.K. Mishra, "**End to End Outage Probability Analysis of MIMO-STBC based Cooperation Protocol over Time Selective fading**", in *Proc. International Conference on Computing and Sensor Networks* Kolkata, India, vol. 1, pp.83-91, December 2017.
6. Shankar, R., Pandey, K. N., Kumari, A., Sachan, V., & Mishra, R. K, "**C (0) protocol based cooperative wireless communication over Nakagami-m fading channels: PEP and SER**

**analysis at optimal power"**, CCWC, 2017 IEEE 7th Annual IEEE. 1-7, LasVegas, USA, January 9-11, 2017.

7. Ravi Shankar, Vikash Sachan, R. K Mishra, "**New Space Time Block Code for Wireless**", IEEE ICACSE pp. 3-6, October 14-16, 2016.

## Academic Qualification Details

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Examination	Board/University	Year	CGPA / %	Subject
PhD	N.I.T Patna	2020		Wireless Communication
M.Tech	N.I.T Patna	2015	7.98	Communication System
B.Tech	U.I.E.T Kanpur	2008	68.80	Electronics & Comm.

## Academic Achievements

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- Qualified **GATE** exam **2011**
- Qualified **GATE** exam **2012**
- Qualified **GATE** exam **2013**
- Qualified **GATE** exam **2014**
- Qualified **GATE** exam **2015**
- Qualified **GATE** exam **2016**
- Qualified **GATE** exam **2017**

## About Myself

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### Hobbies

- I love yoga
- I love watching movie.

### Personal Details

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**Name** : Dr. Vikash Sachan  
**Father's Name** : Sri Narayan Sachan  
**Mother's Name** : Pushpa Devi  
**Sex** : Male  
**Nationality** : Indian  
**Date of Birth** : 4<sup>th</sup> april 1983  
**Marital Status** : Married  
**Email Address** : [vsnitp83@gmail.com](mailto:vsnitp83@gmail.com) , [vikash.ece15@nitp.ac.in](mailto:vikash.ece15@nitp.ac.in)  
**Contact No** : 9336861482, 9455843653

## References

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Dr. R.K Mishra  
Associate Professor (ECE), N.I.T Patna  
Contact No. : 07070094411  
E-Mail : [ritesh@nitp.ac.in](mailto:ritesh@nitp.ac.in)

Dr. Bikash Chandra Sahana  
Assistant Professor & HOD (ECE), N.I.T Patna  
Contact No. : 09430427925  
E-Mail : [sahana.nitp@gmail.com](mailto:sahana.nitp@gmail.com)  
: [sahana@nitp.ac.in](mailto:sahana@nitp.ac.in)

## Declaration

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I consider myself to be familiar with the various aspects of Electronics and Communication Engineering. I hereby declare that the above information given is true to the best of my knowledge.

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Vikash Sachan

PLACE : KANPUR

(Dr. VIKASH SACHAN)