

# Dr. Nagendra Kumar

Assistant Professor, Department of Electronics and Communication Engineering  
National Institute of Technology, Jamshedpur (NITJSR), India  
(An Institute of National Importance)

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## RESEARCH PROFILES

- Orcid ID: 0000-0002-7376-308X
- Research ID: Z-4043-2019
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## RESEARCH INTERESTS

- Performance Analysis
- Wireless and Mobile Communications
- Cooperative Communications
- Relaying and Diversity Techniques
- Cooperative MIMO Systems
- UAV Communications

## TEACHING EXPERIENCE

- Working as an Assistant Professor (Scale-II) in the Department of Electronics & Communication Engineering at National Institute of Technology (NIT) Jamshedpur since 01 June 2018 till date.
- Worked as an Assistant Professor (Temporary) in the Department of Electronics & Communication Engineering at National Institute of Technology (NIT) Jamshedpur from August 01, 2017 to May 31, 2018.
- Worked as an Assistant Professor in the Department of Electronics & Communication Engineering, TIT Group of Institutions, Bhopal M. P., from July 12, 2012 to December 31, 2013).

## ACADEMIC PROFILE

- Indian Institute of Technology (IIT) Indore, M.P.  
Major: Wireless Communications  
C.P.I.: **9/10**  
Doctor of Philosophy  
(Jan. 2014-Sept. 2017)
- Jaypee University of Engineering & Technology, Guna, M. P.  
Major: Electronics & Communication Engineering  
C.G.P.A.: **8.5/10**  
Master of Technology  
(2010-12)
- NRI Institute of Information Science and Technology, Bhopal, M. P.  
Major: Electronics & Communication Engineering  
Aggregate percentage: **72.44**  
Bachelor of Engineering  
(2006-10)

## THESIS AND PRIMARY RESEARCH

- **PhD Thesis, "Performance analysis of cooperative relay network for QAM signals under various fading channels".**  
**Guide:** Dr. Vimal Bhatia, Prof., Discipline of Electrical Engineering, IIT Indore, M. P.
- **M. Tech Thesis, "Performance analysis of amplify-and-forward cooperative diversity systems in Rayleigh fading channels for QAM signals".**  
**Guide:** Mr. Dharmendra Dixit, Assistant Prof., Dept. of Electronics & Communication Engg., Jaypee University of Engineering and Technology (JUET) Guna, M. P.

## List of Publications

### IEEE Journals:

1. **N. Kumar** and V. Bhatia, "Exact ASER analysis of rectangular QAM in two-way relaying networks over Nakagami-m fading channels," IEEE Wireless Commun. Lett., vol. 5, no. 5, pp. 548-551, Oct. 2016. **Impact Factor = 4.66**
2. **N. Kumar**, S. Sharma and V. Bhatia, "Performance analysis of OFDM-based nonlinear AF multiple-relay systems," IEEE Wireless Commun. Lett., vol. 6, no. 1, pp. 122-125, Feb. 2017. **Impact Factor = 4.66**
3. P. K. Singya, **N. Kumar** and V. Bhatia, "Mitigating NLD for Wireless Networks: Effect of Nonlinear Power Amplifiers on Future Wireless Communication Networks," IEEE Microw. Mag., Vol. 18, no. 5, pp. 73-90, Jun. 2017. **Impact Factor = 2.928**

4. P. K. Singya, **N. Kumar** and V. Bhatia, "Impact of Imperfect CSI on ASER of Hexagonal and Rectangular QAM for AF Relaying Network" *IEEE Commun. Lett.*, vol. 22, no. 2, pp. 428-431, Feb. 2018. **Impact Factor = 3.457**
5. **N. Kumar**, P. K. Singya and V. Bhatia, "ASER Analysis of Hexagonal and Rectangular QAM Schemes in Multiple Relay Networks," *IEEE Trans. Veh. Technol.*, vol. 67, no. 2, pp. 1815-1819, Feb. 2018. **Impact Factor = 5.379**
6. P. K. Singya, **N. Kumar**, V. Bhatia and M. S. Alouini, "On Performance of Hexagonal, Cross and Rectangular QAM for Multi-relay Systems" *IEEE Access*, vol. 7, no. 1, pp. 60602-60616, Dec. 2019, DOI: 10.1109/ACCESS.2019.2915375. **Impact Factor=4.098**
7. P. K. Singya, **N. Kumar**, V. Bhatia and M. S. Alouini, "On the Performance Analysis of Higher Order QAM Schemes over Mixed RF/FSO Systems," *IEEE Trans. Veh. Technol.*, vol. 69, no. 7, pp. 7366-7378, Jul. 2020. **Impact Factor = 5.379**
8. D. Dixit, **N. Kumar**, S. Sharma, V. Bhatia, S. Panic, C. Stefanovic "On the ASER Performance of UAV-Based Communication Systems for QAM Schemes," *IEEE Commun. Lett.*, DOI: 10.1109/LCOMM.2021.3058212, **Impact Factor = 3.457**
9. C. Stefanovic, S. Panic, V. Bhatia, **N. Kumar** "On Second-Order Statistics of the Composite Channel Models for UAV-to-Ground Communications with UAV Selection," DOI: 10.1109/OJCOMS.2021.3064873, ACCEPTED for publication in the *IEEE Open Journal of the Communications Society*.
10. P. K. Singya, P. Shekh, **N. Kumar**, V. Bhatia and M. S. Alouini, "A Survey on Higher-Order QAM Constellations: Technical Challenges, Recent Advances, and Future Trends," ACCEPTED for publication in the *IEEE Open Journal of the Communications Society*, March 2021.

#### Other Journals:

11. **N. Kumar** and V. Bhatia, "Performance analysis of amplify-and-forward cooperative networks with best-relay selection over Weibull fading channels," *Springer Wireless Pers. Commun.*, vol. 85, no. 3, pp. 641-653, Dec. 2015. **Impact Factor = 1.2**
12. **N. Kumar** and V. Bhatia, "Outage probability and average channel capacity of amplify-and-forward in conventional cooperative communication networks over Rayleigh fading channels," *Springer Wireless Pers. Commun.*, vol. 88, no. 4, pp. 943-951, Jun. 2016. **Impact Factor = 1.2**
13. **N. Kumar**, P. K. Singya and V. Bhatia, "Performance analysis of orthogonal frequency division multiplexing-based cooperative amplify-and-forward networks with non-linear power amplifier over independently but not necessarily identically distributed Nakagami-m fading channels," *IET Commun.*, vol. 11, no. 7, pp. 1008-1020, May 2017. **Impact Factor = 1.779**
14. **N. Kumar**, V. Bhatia and D. Dixit, "Performance analysis of QAM in amplify-and-forward cooperative communication networks over Rayleigh fading channels," *Elsevier Int. J. Electron. Commun., (AEU)*, vol. 72, pp. 86-94, Feb. 2017. **Impact Factor = 2.853**

15. **N. Kumar** and V. Bhatia, "Performance analysis of OFDM based AF cooperative systems in selection combining receiver over Nakagami-m fading channels with nonlinear power amplifier," Wiley Int. J. Commun. Systems, vol. 30, no. 7, pp. 1-17, May 2017. **Impact Factor = 1.278**
16. P. K. Singya, **N. Kumar** and V. Bhatia, "Performance Analysis of AF OFDM System using Multiple Relay in presence of Nonlinear-PA over i.n.i.d. Nakagami-m Fading," Wiley Int. J. Commun. Systems, vol. 31, no. 1, pp. 1-15, Jan. 2018. **Impact Factor = 1.278**
17. P. K. Singya, **N. Kumar**, V. Bhatia, and Faheem Khan "Performance Analysis of OFDM Based 3-hop AF Relaying Network over Mixed Rician/Rayleigh Fading Channels," Elsevier Int. J. Electron. Commun., (AEU), vol. 93, pp. 337-347, Sep. 2018. **Impact Factor = 2.853**
18. **N. Kumar** and V. Bhatia, "Performance Evaluation of QAM Schemes for Multiple AF Relay Network Under Rayleigh Fading Channels," Springer Wireless Pers. Commun., vol. 99, no. 1, pp. 567-580, Feb. 2018. **Impact Factor = 1.2**
19. **N. Kumar**, P. K. Singya and V. Bhatia "ASER Analysis for Higher Order QAM Schemes in Two-Way Multiple Relay Networks under Imperfect CSI," IET Commun., vol. 14, no. 10, pp. 1511-1520, Jun 2020. **Impact Factor = 1.779.**

#### IEEE Conferences

1. P. Shekh, P. K. Singya, V. Bhatia, and **N. Kumar** "On Impact of Imperfect CSI over SWIPT Device-to-Device (D2D) MIMO Relay Systems" International conference on Signal Processing and Communications (SPCOM 2020), July 20-23, 2020, Indian Institute of Science (IISc) Bangalore, India
2. P. Shekh, P. K. Singya, V. Bhatia, and **N. Kumar** "ASER Analysis of Cross QAM for TAS/MRC-MIMO Cooperative Relay System with Imperfect CSI," IEEE International Conference on Advanced Networks and Telecommunications Systems (IEEE ANTS), December 16-19, 2019, BITS Pilani, K K Birla Goa Campus, India
3. A. K. Singh, Y. Shukla, and **N. Kumar**, "Impact of ART and DPC on AODV Routing Environment for Dynamic Network using QualNet 7.1," International Conference on Electrical, Electronics and Computer Engineering (UPCON), November 08-10, 2019, Zakir Husain College of Engineering and Technology, Aligarh Muslim University, Aligarh, India
4. P. K. Singya, **N. Kumar**, V. Bhatia "Performance Analysis of Opportunistic Two-Way 3P-ANC Multi-Relay System with Imperfect CSI and NLPA," IEEE Global Communication Conference (GLOBECOM), December 09-13, 2018, Abu Dhabi, United Arab Emirates, United Arab Emirates

5. **N. Kumar**, P. K Singya and V. Bhatia, ``ASER analysis of rectangular QAM with SC receiver in OFDM based nonlinear AF relay network over Nakagami-m fading,’’ in Proc. IEEE 85th Vehicular Technology Conference (VTC-Spring), Sydney, Australia, 2017.
6. P. K. Singya, **N. Kumar**, V. Bhatia and F. A. Khan ``Outage probability analysis of shared UE-side distributed antenna system based cooperative AF relaying network for 5G systems,’’ in Proc. IEEE 85th Vehicular Technology Conference (VTC-Spring), Sydney, Australia, 2017.
7. P. K. Singya, **N. Kumar** and V. Bhatia, ``Performance analysis of OFDM based multiple relay cooperative AF system with relay selection and nonlinear power amplifier,’’ in proc. IEEE 10th Int. Conf. on Advanced Networks and Telecommun. Sys. (IEEE ANTS), IISc Bangalore, India, 2016 (Best Paper Award).
8. **N. Kumar** and V. Bhatia, ``Outage analysis of OFDM AF relaying systems over Nakagami-m fading channels with non-linear power amplifier,’’ in Proc. IEEE Wireless Commun. Networking Conf. (WCNC), Doha, Qatar, Apr.2016, pp. 2198-2203.
9. **N. Kumar** and V. Bhatia, ``Outage analysis of OFDM based AF cooperative systems in selection combining receiver over Nakagami-m fading channels with nonlinear power amplifier,’’ in Proc. IEEE Sensor Signal Processing for Defense (SSPD), Edinburgh, Scotland, 2015, pp. 1-5.
10. R. Mitra, **N. Kumar** and V. Bhatia, ``A hybrid MBER-IMSC based blind equalization scheme in amplify and forward relay protocol in Rayleigh fading environments,’’ in Proc. IEEE Bombay Section Symposium (IBSS), Mumbai, India, 2015, pp. 1-6.
11. **N. Kumar** and V. Bhatia, ``Analysis of symbol error rate for amplify-and-forward networks with best-relay selection over Weibull fading channels,’’ in Proc. Int. Conf. Signal Process. Commun. (ICSC), IIIT, Noida, India, 2015, pp. 111-115.
12. R. Mitra, **N. Kumar** and V. Bhatia, ``Blind MBER based selection diversity combining in amplify-and-forward relay protocol in Rayleigh fading environments,’’ in Proc. Int. Conf. Signal Process. Commun. (ICSC), IIIT, Noida, India, Mar. 2015, pp. 136-140.

#### BOOK CHAPTER

1. **N. Kumar**, V. Bhatia and D. Dixit, Performance Analysis of Quadrature Amplitude Modulation Schemes in Amplify-and-Forward Relay Networks over Rayleigh Fading Channels, in the book Advances in Networks, Security and Communications: Reviews”, Edited by Sergey Y. Yurish Vol. 1, Publisher: IFSA Publishing, S.L., Barcelona, Spain (2018).

#### MEMBERSHIP

- **IEEE Professional Membership with identity: 95497223.**

## REVIEWER EXPERIENCE

- IEEE Transactions on Vehicular Technology (IF=5.339)
- IEEE Transactions of Communications (IF=5.69)
- IEEE Wireless Communication Letters (IF=3.546)
- IEEE Access (IF=4.098)
- Transactions on Emerging Telecommunications Technologies (IF=1.258)
- International Journal of Electronics & Communication (IF=2.853)
- Physical Communication (IF=1.451)
- International Journal of Communication Systems (IF=1.278)

## COURSES TAUGHT

- Analog Communication (UG)
- Digital Communication (UG)
- Signal & Systems (UG)
- Information Theory & Coding (UG & PG)
- Estimation Theory (PG)
- Advance Wireless Communication (PG)
- Advance Digital Communication (PG)

## LABORATORIES CONDUCTED

- Basic Electrical Circuit Lab
- Basic Electronics Lab
- Analog & Digital Communication Lab
- Signal and System Lab

## SKILL SET

Programming Languages	: MATLAB, MATHEMATICA
Operating Systems	: Windows XP, Vista
Application Packages	: LATEX, MS Office

## AWARDS & ACHIEVEMENTS

- Best Paper Award in IEEE 10th Int. Conf. on Advanced Networks and Telecommun. Sys. (IEEE ANTS), Bangalore, India, 2016.
- Research Fellowship for PhD by MHRD, India, 2014
- Qualified GATE in 2010

## PERSONAL PROFILE

Name	: Dr. Nagendra Kumar
Date of Birth	: 27-01-1987
Father's Name	: Rambilas Mahto
Mother's Name	: Late Kishun Devi
Strengths	: Optimism and patience for good results
Hobbies	: Reading Books, Playing Badminton, Watching Movies
Language Known	: English and Hindi

I hereby declare that the above-mentioned details are true to the best of my knowledge.