

Ruchi Tripathi

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RESEARCH INTEREST

- AI/ML for 5G advanced and 6G, Rel-18 CSI Feedback Enhancement, 5G NR PHY layer, Online Convex Optimization, Adaptive Signal Processing, Stochastic Convex Optimization & Communications, Statistical signal processing.

Work EXPERIENCE

- Assistant Professor**, Guru Ghasidas Vishwavidyalaya Bilaspur, C.G. Feb-2023 -till present
- Project Executive Officer** at IIT Kanpur Oct 2021 -Jan-2023
Title: Next Generation Wireless Research and Standardization on 5G+ and 6G" funded by MEITY
Supervisor: Dr. Rohit Buhiraja
- Project Engineer** at IIT Kanpur Dec 2019 -Feb 2021
Title: Stochastic Optimization in 5G Networks Supervisor: Dr. Ketan Rajawat
- Sr. Student Project Associate** at IIT Kanpur Mar 2019 -Dec 2019
Title: Stochastic Optimization in 5G Networks Supervisor: Dr. Ketan Rajawat
- Project Associate** at IIT Hyderabad Jul 2011- May 2012
Title: Cyber Physical Systems (CPS-Hub)
Supervisor: Dr.P Rajalaxmi, Department of Electrical Engineering, IIT Hyderabad

Projects

- Seed Money project from Guru Ghasidas Vishwavidyalaya, Fund Money Rs. 1,00,000/-, March, 2023-24
- DoT funded Effecient 6G systems designs in 5G/6G Communication,Fund Money Rs. 55,49,420/-, Sept, 2024-27

INDUSTRY EXPERIENCE

- 3GPP RAN1 Delegate Oct2021-Jan 2023
Representing IIT Kanpur (TSDSI)

Ph.D. Thesis Ongoing

- Gargi Mishra, Optimizing Renewable Energy Prediction using Machine Learning Algorithms
- Stuti Faith Luke,

M.Tech Thesis Guided

- Bhuwneshwar Sahu , "Smart Health monitoring System Using IoT" July 2025

B.Tech Major Projects Guided

- Ravi Rankjan K et al. "Savior-X" May 2025
- Angad Singh et. al, "Automatic Number plate detection" May 2024

Education

- Ph.D.** in Electrical Engineering Jul 2012-Oct-2019
INDIAN INSTITUTE OF TECHNOLOGY, KANPUR
Thesis Title: Dynamic Low Rank Matrix Completion
Supervisor: Dr. Ketan Rajawat

- **M.Tech** in Communication Engineering Jul 2009- Oct-2011
UNIVERSITY OF ALLAHABAD
Thesis Title: Built in software for enhancement of embedded devices and implementation of Ultrasonic distance meter
- **B.Tech** in Electronics and Communication Engineering Jul 2006- Jul-2009
UNIVERSITY OF ALLAHABAD

ACHIEVEMENTS & AWARDS

- Best poster presentation award at SRC, IIT Kanpur, 2019
- Best poster presentation award at Research conclave, IIT Guwahati, 2019
- Best Ph.D. presentation award in COMSNETS-2015, held in Bengaluru 6-10 Jan, 2015.
- Outstanding TA award for summer session 2013-2014.
- MHRD scholarship to pursue Ph.D.

Publications

BOOK CHAPTERS

1. Ved P Tiwari, Stuti Faith Luke, and **R. Tripathi**, "Ethical Challenges and Considerations," (Submitted) Intelligent Horizons: AI and the Evolution to 6G, 2025.
2. Gargi Mishra, and **R. Tripathi**, "Smart Grid Integration and Communication," (Submitted), 2025.

Publications

JOURNALS

1. Stuti Faith Luke, and **R. Tripathi**, "Responsible AI: Mitigating Bias and Promoting Explainability in Recommender Systems," (Submitted) IEEE Transactions on Systems, Man and Cybernetics: Systems, 2025
2. H. Vardhan, and **R. Tripathi**, "Radar Sensing and Tracking with Adaptive Matrix Completion," (Submitted) IEEE Sensors Journal 2025.
3. **Ruchi Tripathi** and K. Rajawat, "Adaptive Network Latency Prediction From Noisy Measurements," in IEEE Transactions on Network and Service Management, vol. 18, no. 1, pp. 807-821, March 2021, doi: 10.1109/TNSM.2021.3051736. (SCI Indexed Impact factor 4.195)
4. Rishabh Dixit, Amrit Singh Bedi, **Ruchi Tripathi**, Ketan Rajawat, "Online Learning with Inexact Proximal Online Gradient Descent Algorithms", in IEEE Transactions on Signal Processing, vol. 67, no. 5, pp. 1338-1352, March 1, 2019. doi: 10.1109/TSP.2018.2890368 (SCI Indexed Impact factor 5.27)
5. **Ruchi Tripathi**, Boda Mohan, Ketan Rajawat, "Adaptive Low Rank Matrix Completion", IEEE Transactions in Signal Processing, page no. 3603-3616, Volume: 65, Issue: 14, July 15, 2017, DOI: 10.1109/TSP.2017.2695450 (SCI Indexed Impact factor 5.27) [Most downloaded paper in Apr-May 2017]

CONFERENCES

1. Gargi Mishra, and **R. Tripathi**, "Solar Energy Prediction Using LSTM and MLP: Performance Evaluation on Real-World Data," IEEE International Conference on Electronics and Electrical Engineering (ICE3), 2025 (Accepted for publication)
2. H. Vardhan, **R. Tripathi** and K. Rajawat, "Adaptive Front-end for MIMO Radar with Dynamic Matrix Completion," 2020 International Conference on Signal Processing and Communications (SPCOM), 2020, pp. 1-5, doi: 10.1109/SPCOM50965.2020.9179549.
3. **Ruchi Tripathi** and K. Rajawat, "Dynamic Network Latency Prediction with Adaptive Matrix Completion," 2018 International Conference on Signal Processing and Communications (SPCOM), Bangalore, India, 2018, pp. 407-411. doi: 10.1109/SPCOM.2018.8724422

4. R. Dixit, A. S. Bedi, **R. Tripathi** and K. Rajawat, "*Time Varying optimization via Inexact Proximal Online Gradient Descent*," 2018 52nd Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, 2018, pp. 759-763.doi: 10.1109/ACSSC.2018.8645323
5. **Ruchi Tripathi**, Ketan Rajawat, "*Tracking and predicting internet latencies using Kalman filter*", Comsnets-2015, Bangalore. (**Best PhD presentation**)

SERVICES AND PROFESSIONAL ACTIVITIES

MEMBERSHIP

- IEEE, IEEE Communications Society, IEEE Signal Processing Society, IEEE Vehicular Technology Society, IEEE Young Professional

REVIEWER

- IEEE Transactions on Signal Processing, Elsevier Journal of Signal Processing, IEEE Access, National Conference on Communications, International conference on Signal Processing and Communications (SPCOM), ICIP-2014

KEY ACADEMIC AND EXTRACURRICULAR ACTIVITIES

- Care Taker Officer NCC, Guru Ghasidas Vishwavidyalaya August 2025- till present
- Member Natraj Kala Manch, July 2023- till present
- Member IQAC Guru Ghasidas Vishwavidyalaya, Feb 2023- till present
- Faculty Incharge, Convener University Day Care Centre Sept 2023- till present
- Art of living volunteer since 2011
- Appointed as Student representative of Department post-Graduate Committee, EE, IIT Kanpur.
- Appointed as reading room secretary for Girls hostel-1 at IIT Kanpur
- Won first prize for mixed double carom, Navonmesh-2007, University Of Allahabad
- Performed anchoring in Reverberation-2009
- Won first prize science exhibition at district level, Allahabad,2002
- Won consolation prize science exhibition at state level, Allahabad,2003
- Won Second prize in kho-kho, 1995, District level,Sahibabad

SELECTED PRESENTATIONS

- Delivered a talk on "Ethical AI and challenges for Smart Grid Integration" at FDP AI-Powered Smart Grids: Advancing Resilient and Equitable Energy Systems organized by O. P. Jindal University, July 2025
- Served as Organizing secretary for One week International Short-Term Course (STC) "Next-Gen Wireless Technologies: 5G and Its Impact on Smart Systems"
- Delivered an invited talk on "AI towards Optimizing 6G PHY Layer: An Industry Perspective" at the Two-Week Faculty Development Program (FDP), Institute of Information Technology, Sambalpur University, Odisha, 05/03/2025
- Served as session chair in IEEE Sponsored, International Conference on IoT, Communication and Automation Technology (ICICAT 2023)
- Delivered an expert talk on "5G Advanced Communication" during 2 Weeks of Online Professional Training in "Allied Tools and Techniques under Interdisciplinary Engineering Fields for Learning Sustainability", organized by the Department of Industrial and Production Engineering, School of Studies, Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), 05 to 16 June 2023

- Speaker at "DoT-TEC-TSDSI joint workshop on 5G Advanced and beyond (6G)" CSI Feedback Enhancement for Rel-18
- Speaker at "NCC 2018" Online learning with dynamic convex optimization [<https://youtu.be/DxKqBOt340A>](My Talk starts at 2:13:24)
- Student Research Convention, "Dynamic low-rank matrix completion", Mar., 2019, IIT Kanpur (Best Poster)
- Research Conclave, "Dynamic low-rank matrix completion", Mar., 2019, IIT Guwahati (Best Poster)
- SPCOM-2018, "Dynamic network latency prediction", Jul, 2018, IISC Bangalore
- COMSNETS-2015, "Tracking and Predicting Network Latencies", Jan., 2015, Bangalore (Best Ph.D. presentation)
- Research Scholar Day "Network latency prediction for dynamic networks", Nov. 1, 2014 at IIT KANPUR

WORKSHOP & CONFERENCES ATTENDED

- Completed AICTE Approved FDP on Quantum Computation August 2025
- Completed AICTE-approved FDP on Basic Quantum Programming July 2025
- Completed an AICTE approved FDP on "Teaching ECE lab subjects using free simulators", 07/03/2025, organized by NITTTR Chandigarh
- Completed an AICTE approved FDP FDP on "AI for engineering Applications", 08/11/2024, organized by NITTTR Chandigarh
- Completed an AICTE approved FDP FDP on "AI for SDGs under Unnat Bharat Abhiyan", 22/11/2024, organized by NITTTR Chandigarh
- Research Conclave IIT Guwahati, 2019
- Student research convention IIT Kanpur 2019
- SPCOM 2018 held at IISC Bangalore.
- NCC 2018 held at IIT Hyderabad.
- Workshop on Applied Probability - ATMW-2015 held at IIT Mumbai.
- COMSNETS-2015 held in Bengaluru
- NCC-2014 held at IIT Kanpur
- Short term course on "Estimation Theory for Communications and Signal Processing" (Jan 21-23, 2014), IIT Kanpur
- Workshop on Wireless Sensor Network ,IIT Delhi,2011
- CORD workshop, IIT Hyderabad,2011

COURSES CREDITED During Ph.D.

- Introduction to signal analysis
- Representation and analysis of random signal
- Information and coding theory
- Digital communication networks
- Wireless communication
- Convex optimization in SP/COM

TECHNICAL SKILLS

- Languages: C, Python.
- Tools: BWSIM, IT++, MATLAB, LATEX, CVX.
- Operating System: Windows, Ubuntu.