Dr. Km. Deepa

Assistant Professor
Department of Mathematics
Central University of Jammu
Samba, Rahyaa Suchani, J&K-181143 (India)

✉ deepar938@gmail.com, deepa.math@cujammu.ac.in, ☏ +91-8954411325
Google scholar/Deepa-Rathi,

EDUCATION

Doctor of Philosophy (Ph.D.)   27/12/2018 –06/09/2024
Indian Institute of Technology Roorkee, Roorkee, India
Specialization: Mathematics
Supervisor: Prof. Sanjeev Kumar
Thesis Title: Quantum secret sharing algorithms in noisy environment with cheat-identification

Master of Philosophy (M.Phil.)   07/2017 – 10/2018
Ch. Charan Singh University, Meerut, India
Specialization: Mathematics
Project Title: Study of some inventory models for decaying items with variable holding cost

Master of Science (M.Sc.)   07/2013 – 06/2015
Ch. Charan Singh University, Meerut, India
Specialization: Mathematics

Bachelor of Science (B.Sc.)   07/2010 – 06/2013
Ch. Charan Singh University, Meerut, India
Specialization: Physics, Chemistry, Mathematics

EMPLOYMENT

Research associate-III   13/08/2024 – 09/01/2025
Indian Institute of Technology Jodhpur, Jodhpur, India

RESEARCH INTERESTS

Quantum cryptography, Quantum visual cryptography, Quantum image processing

PUBLICATIONS

1. **Deepa Rathi,** Sanjeev Kumar, "Verifiable dynamic quantum secret sharing based on generalized Hadamard gate," *Quantum Information Processing,* 23.10, 328 (2024).
   DOI: https://doi.org/10.1007/s11128-024-04535-2

2. **Deepa Rathi,** Sanjeev Kumar, Farhan Musanna, Deepak Singh, "Quantum secret sharing protocol through noisy channel with application in visual cryptography," *Concurrency and Computation: Practice and Experience,* 36.2, e7899 (2024).
   DOI: https://doi.org/10.1002/cpe.7899

3. **Deepa Rathi,** Sanjeev Kumar, "Quantum multi-secret sharing scheme with access structures and cheat identification," *International Journal of Quantum Information,* 22.7, 2450015 (2024).
   DOI: https://doi.org/10.1142/S0219749924500151

4. **Deepa Rathi,** Sanjeev Kumar, "A d-level quantum secret sharing scheme with cheat-detection (t, m) threshold," *Quantum Information Processing,* 22.5, 183 (2023).
   DOI: https://doi.org/10.1007/s11128-023-03928-z

5. **Deepa Rathi,** Sanjeev Kumar, Reena Grover, "Multi-dimensional Quantum Secret Sharing Scheme with Noisy Environment," *2023 International Conference on Quantum Technologies, Communications, Computing, Hardware and Embedded Systems Security (IQ-CCHESS).* IEEE, (2023).
   DOI: https://ieeexplore.ieee.org/document/10391367

SKILLS

- Computer languages and Tools: LaTeX, Mathematica, Matlab, Python, Qiskit
- Software Skills: MS Office; MS Excel, MS Word, MS PowerPoint

WORKSHOPS/CONFERENCES EXPERIENCE

- Presented a paper, "Authenticable quantum secret sharing scheme based on generalized unitary operators," in the International Conference on "Computations and Data Science (CoDS-2024)" held on March 08-10, 2024, Department of Mathematics, IIT Roorkee.

- Presented a poster, "Authenticable quantum secret sharing algorithms," in "Institute Research Day 2024," held on March 14, 2024, at IIT Roorkee.

- Presented a poster, "Quantum secret sharing protocol using Grover's search algorithm with noisy environments," in the 27th International Conference on "Quantum Information Processing (QIP 2024)" in Taipei, Taiwan, on January 13-19, 2024.

- Presented a paper, "Multi-dimensional quantum secret sharing scheme with noisy environment," in IEEE iQ-CCHESS conference held on Sept 15-16, 2023, Department of CSE-Cyber Security, IIIT Kottayam, Kerala.

- Participate in an International workshop, "Recent Trends in Applied Mathematics and Research Methodology," during March 04-05, 2021, Department of Mathematics, Govt. MGM PG College Itarshi, M.P.

- Participated in Faculty development program, "Practical Quantum Computing using Qiskit and IBMQ," from 12 September-04 October 2020, Electronics and ICT academy, IIT Roorkee.

- Participated in the online short-term course entitled, "Optimization Theory, Methods and Applications," organized during August 18-20,2020, Department of Mathematics, IIT Roorkee.

- Presented a paper, "Two warehouse inventory models for deteriorating items with ramp type demand," in the 2nd International Conference on Frontiers of Science & Technology held on July 21-22, 2018, Department of Applied Sciences, KIET Group of Institutions, Ghaziabad, U.P.

TEACHING EXPERIENCE

- **Teaching assistant, Department of Mathematics, IIT Roorkee, Roorkee, India**
  TA duty for B.Tech. first-year courses: MAN 002- Mathematical Methods (Autumn 2020, 2021), MAN 001-Mathematics-I (Spring 2019, 2021, 2022).

- **Teaching assistant, NPTEL, IIT Roorkee, Roorkee, India**
  TA duty for the NPTEL online certification courses Multivariable Calculus from Jan-Mar 2020, 2021. TA duty for the NPTEL online certification courses Matrix analysis with applications from Sep-Nov 2020, Aug-Oct 2021, July-Sep 2022, July-Sep 2024.

POSITIONS OF RESPONSIBILITY/ EXTRA CURRICULAR

- Participated as a volunteer in an international conference on Computations and Data Science (CoDS-2024), held on March 08-10, 2024, Department of Mathematics, IIT Roorkee.

- Course coordinator for Mathematics-I (Autumn 2023), IIT Roorkee, Roorkee, India

- Participated as a volunteer in an international conference on Dynamical systems, Control, and their applications, during July 01-03, 2022, Department of Mathematics, IIT Roorkee.

- Maintenance secretary at the Vigyan Bhawan hostel, IIT Roorkee, from June 2019 to July 2021.

AWARDS AND ACHIEVEMENTS

- DST-SERB travel grant 2024.

- Awarded the CSIR-JRF(SRF) fellowship for Ph.D. by the CSIR from 2018 to 2023.

- Qualified JRF Joint CSIR UGC Test for Eligibility for Assistant Professor in Mathematics in December 2017.

- Qualified GATE-Graduate Aptitude Test in Engineering (Mathematics) in 2017, 2018.

- Awarded the gold medal for the category of versatile talent in graduation in 2013.

- Awarded the gold medal for achieving the highest marks in graduation in 2013.