

# Shivani Goel

## PERSONAL DETAILS

Email	<a href="mailto:shivani.goel.maths@gmail.com">shivani.goel.maths@gmail.com</a>
Languages	English, Hindi
Research Interest Areas	Algebraic graph theory and Enumerative combinatorics.

## WORKING EXPERIENCE

December, 2024 - Present	<b>Assistant Professor</b> , Bharati Vidyapeeth (Deemed to be University), Department of Engineering and Technology Off Campus, Navi Mumbai.
September, 2024 - December, 2024	<b>Guest Faculty</b> , Department of Mathematics, NIT Meghalaya, Shillong.
October, 2023 - November 2023	<b>Assistant Professor</b> , School of Engg. & Science, IIT Madras Zanzibar campus, Tanzania.
January, 2023 - October 2023	<b>NPDF-National Postdoctoral Research Fellow</b> , IISc Bangalore, India. Supervisor- <a href="#">Dr. Arvind Ayyer</a> , Associate professor, IISc Bangalore.
April, 2021 - Dec, 2022	<b>IOE-Postdoctoral Research Fellow</b> , IISc Bangalore, India. Supervisor- <a href="#">Dr. Arvind Ayyer</a> , Associate professor, IISc Bangalore.

## EDUCATIONAL BACKGROUND

Jan, 2021 - Mar, 2021	<b>Pre-doc Research Fellow.</b> , I.I.T Madras, Chennai, India. Supervisor- <a href="#">Dr. R. Balaji</a> , Professor, I.I.T Madras.
Dec, 2016 - Dec, 2020	<b>Ph.D.</b> , I.I.T Madras, Chennai, India. Thesis title- On distance matrices of certain graphs. Supervisors- <a href="#">Dr. R. Balaji</a> , Professor, I.I.T Madras, <a href="#">Prof. R. B. Bapat</a> , ISI Delhi.
Aug, 2015 - Dec, 2016	<b>M.Phil</b> , University of Delhi, India. Thesis title- <a href="#">Annihilating Ideal Graph Of A Commutative Ring</a> . Supervisor- <a href="#">Dr. Atul Gaur</a> , Assistant professor, University of Delhi.
2013 - 2015	<b>M.Sc</b> (Mathematics), Indraprastha College for Women, University of Delhi, India.
2010 - 2013	<b>B.Sc(H)</b> Mathematics, Indraprastha College for Women, University of Delhi, India.

## REFEREEING

- Linear Algebra and its Applications
- Linear and Multilinear Algebra
- Indian Journal of Pure and Applied Mathematics
- Advances in Applied Mathematics
- Computational and Applied Mathematics
- IEEE Transactions on Information Theory
- AMS MathSciNet Mathematical Reviews (Reviews of published work)

- Involve, a Journal of Mathematics
- Zentralblatt MATH (Reviews of published work)
- Proyecciones, Journal of Mathematics

## PUBLICATIONS/PREPRINTS

1. R. Balaji, R. B. Bapat and Shivani Goel, On resistance matrices of weighted balanced digraphs, **Linear and Multilinear Algebra**, 71(13), 2222-2248, 2023. DOI:[10.1080/03081087.2022.2094866](https://doi.org/10.1080/03081087.2022.2094866)
2. Azimi, Ali, Bapat, Ravindra B. and Goel, Shivani, Steiner distance matrix of caterpillar graphs, **Special Matrices**, 10 (1), 267-284, 2022. DOI:[10.1515/spma-2022-0162](https://doi.org/10.1515/spma-2022-0162)
3. R. Balaji, R. B. Bapat and Shivani Goel, On distance matrices of wheel graphs with odd number of vertices, **Linear and Multilinear Algebra**, 70:17, 3370-3401, 2022. DOI:[10.1080/03081087.2020.1840499](https://doi.org/10.1080/03081087.2020.1840499)
4. R. Balaji, R. B. Bapat and Shivani Goel, Resistance matrices of balanced directed graphs, **Linear and Multilinear Algebra**, 70 (5), 787-808, 2022. DOI:[10.1080/03081087.2020.1748850](https://doi.org/10.1080/03081087.2020.1748850)
5. R. Balaji, R. B. Bapat and Shivani Goel, Generalized Euclidean distance matrices, **Linear and Multilinear Algebra**, 70 (21), 6908-6929, 2022. DOI:[10.1080/03081087.2021.1972083](https://doi.org/10.1080/03081087.2021.1972083)
6. Shivani Goel, On distance matrices of helm graphs obtained from wheel graphs with an even number of vertices, **Linear Algebra and its Applications**, 621, 86-104, 2021. DOI:[10.1016/j.laa.2021.03.008](https://doi.org/10.1016/j.laa.2021.03.008)
7. R. Balaji, R. B. Bapat and Shivani Goel, An inverse formula for the distance matrix of a wheel graph with even number of vertices, **Linear Algebra and its Applications**, 610, 274-292, 2021. DOI:[10.1016/j.laa.2020.10.003](https://doi.org/10.1016/j.laa.2020.10.003)
8. R. Balaji, R. B. Bapat and Shivani Goel, Distance matrices perturbed by a Laplacian, **Application of Mathematics**, 65 (5), 599-607, 2020. DOI:[10.21136/AM.2020.0362-19](https://doi.org/10.21136/AM.2020.0362-19)
9. R. Balaji, R. B. Bapat and Shivani Goel, Resistance distance in directed cactus graphs, **The Electronic Journal of Linear Algebra**, 36, 277-292, 2020. DOI:[10.13001/ela.2020.5093](https://doi.org/10.13001/ela.2020.5093)
10. Anita Arora, Hiranya Kishore Dey and Shivani Goel, Distance matrix of enhanced power graphs of finite groups, 2023, [arXiv:2304.04288](https://arxiv.org/abs/2304.04288)

## TEACHING EXPERIENCE

- Teaching Assistant - **Linear algebra and optimisation** (online), BITS Pilani, May-Oct 2024.
- Teaching Assistant - **TEW Group Theory, Linear Algebra and Enumerative Combinatorics (2024)** held at Mangalore University, August 2024.
- Mentor - **Mathematics Training and Talent Search Programme 2024** held at ICT Mumbai, May-June 2024.
- Mentor - **Online Foundation Course in Mathematics** (OFCM) 2023 organised by MTTs trust, August 2023.
- Teaching Assistant - MA 219: **Linear algebra**, IISc Bangalore, Aug-Nov, 2023.
- Teaching Assistant - **Mathematical foundation for data sciences** (online) and **Mathematical foundation for artificial intelligence and machine learning** (online), BITS Pilani, May-Nov 2023.
- Teaching Assistant - **AIS Algorithmic Graph theory**, IIT Indore, June-July, 2023.
- Course instructor - MA 375: **Algebraic Graph Theory**, IISc Bangalore, Aug-Nov, 2022.
- Teaching Assistant - MA 261: **Probability Models**, IISc Bangalore, Aug-Nov, 2021.
- Teaching Assistant - **Basic Calculus 1**, NPTEL, Jan-Apr 2021.
- Teaching Assistant - **Mathematical foundation for data sciences** (online), BITS Pilani, Apr-Nov 2020.

- Teaching Assistant - MA1101: **Functions of Several Variables**, MA2130: **Basic Graph theory**, and MA1102: **Series and matrices**, IIT Madras, 2017-2021.
- Teaching Assistant - **Representation Theory of finite groups**, University of Delhi, 2016.
- Teaching Assistant - **Module Theory**, University of Delhi, 2016.

#### AWARDS/PRIZES/FELLOWSHIPS

- **SERB-National Post Doctoral Fellowship** (N-PDF), 2022.
- **IOE-Postdoctoral fellowship**, IISc, Bangalore, 2021.
- **Pre-doctoral fellowship** (Jan, 2021-Mar, 2021), Department of Mathematics, I.I.T Madras.
- **Best Thesis Award 2021**, Department of Mathematics, I.I.T Madras.
- **Institute research award 2020**, I.I.T Madras.
- **UGC JRF NET**, June 2016.
- **Prize for the highest marks**, M.Sc (2nd year) Mathematics.
- **Most deserving student**, M.Sc. (1st year) Mathematics.
- **Prize for the highest marks**, BSc(H) Mathematics (3rd year).
- **Prize for the highest marks**, BSc(H) Mathematics (2nd year).

#### RESEARCH VISITS

- Visited Dr. Krishnan Sivasubramanian at IIT Bombay from 23rd, January - 26th January 2023.
- Visited Prof. Safique Ahmad at IIT Indore from 2nd, January - 7th January 2023.

#### CONFERENCES/WORKSHOPS

- Contributed talk in **Sage Days 126**, held at IMSc Chennai during 31 Aug-2, Sept 2024.
- Contributed talk in **Contact III** (online), held during 16-17, March 2024.
- Contributed talk in the **World of GroupCraft III** (online), held on 4th, September 2023.
- Contributed talk in the annual conference of **Indian Women and Mathematics (IWM)** at IISER Bhopal, held during the period 13-15, July 2023.
- Attended **First Meru Combinatorics Conference 2023** at Pondicherry University from 29–31, May 2023.
- Attended FDP on Mathematical Foundation for Data Science at B.M.S. College of Engineering, Bangalore from 15–20, May 2023.
- Organised a one-day event consisting of two talks and a movie screening on 12th May (**International women in Mathematics Day**) at IISc, Bangalore.
- Paper presentation in the **International Conference on Number Theory and Graph Theory** (ICNG 2023) at Manipal institute of technology, Manipal, Mangalore, held during the period 18-20, January 2023.
- Contributed talk in the **International Conference on Graphs, Networks and Combinatorics** (ICGNC 2023) at Ramanujan College, University of Delhi, held during the period 10-12, January 2023.
- Paper presentation in the **National Symposium on Mathematics and Applications** (NSMA 2022) held at IIT Madras on 22nd, December 2022.
- Attended **Lectures in Probability and Stochastic Processes XV** (LPS XV) at IISc, Bangalore from 2–6, December 2022.

- Paper presentation in the **Mathematics Postdoc-Student Symposium** held at IISc, Bangalore from 23–24, November 2022.
- Attended **FPSAC 2022** at Indian Institute of Science, Bangalore.
- Attended workshop on **Combinatorial Methods in Graph Theory** at Amrita Vishva Vidhyapeetham from 14, July-16, July 2022.
- Invited talk in the e-seminar series **Graphs, matrices and applications** organised by Dr. Rajesh Kannan in January 2021.
- Attended **National Workshop on Special Matrices and Stochastic Games, WSMSG2020** at Sikkim Manipal Institute of Technology, Sikkim during the period 6th Jan-15th Jan 2020.
- Contributed talk in the **Conference on Linear Algebra and its Applications** held in honor of Prof. R. B. Bapat in Dec 2019 at ISI Delhi.
- Attended **Introductory Workshop on SageMath: Matrices, Graphs and Networks**, at Manipal institute of technology, Manipal, Mangalore during the period 20th Dec-21st Dec 2018.
- Attended **National Workshop on Matrix Analysis and Game Theory, MAGT 2018** at Manipal institute of technology, Mangalore during the period 10th Dec-21st Dec 2018.
- Attended **PTMT** 2016 at S.V University, Tirupati.
- Attended **MTTS** 2016 at Shiv Nadar University as a teacher participant.
- Attended **AIS Matrix Analysis**, ATM School organised by National Centre of Mathematics (NCM) at Shiv Nadar University, Noida during the period 2nd May- 21st May 2016.
- Participated in **Poster Presentation** held on 14th March 2016 at the Department of Mathematics, University of Delhi and secured II position.
- Participated in **Pi-Pedia** held on 14th March 2016 in the Department of Mathematics, University of Delhi and gave presentation on Buffon Needle Problem.
- Participated in **AFS-1**, ATM School organised by National Centre of Mathematics (NCM) at JECRC University, Jaipur during 30th November - 26th December 2015.
- Attended the **National Conference on MATHEMATICS BEYOND FORMULAE AND THEOREMS** at I.P college for women in 2011.

## COMPUTER LANGUAGES AND SOFTWARE

- Sagemath
- LateX
- Matlab
- Overleaf

## MISCELLANEOUS

- Got acknowledgment in Issue 70 of IMAGE magazine of **International Linear Algebra Society** (ILAS) for submitting the correct solution for Problem 69-1 of its 69th issue.