

Dr. Prachi Jayant Natu

Assistant Professor

Computer Science and Engineering Department

Fr. Conceicao Rodrigues College of Engineering, Mumbai (FrCRCE)

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Professional Experience:

- July 2026- Present
- Fr. Conceicao Rodrigues College of Engineering, Bandra.
- Nov 2023-May 2026
- Associate Professor,
- Usha Mittal Institute of Technology, SNDT University, Juhu.
- Jun 2013-Oct 2022
- Assistant Professor
- Mukesh Patel School of Technology Management and Engineering
- NMIMS University
- Jul 2010-Apr 2013
- G.V. Acharya Institute of Engineering and Technology, Shelu.
- Jul 2009-May 2010
- Thadomal Shahani Engineering College, Bandra.
- Feb 2005- June 2008
- Konkan Gyanpeeth College of Engineering, Karjat.

Educational Qualification:

- **PhD (Image Processing)** from MPSTME, NMIMS, Mumbai in January 2017.
- **M.E. (Computer Engineering) with Distinction** from Thadomal Shahani Engineering College in 2011.
- **B.E. (EXTC), First Class**, from Konkan Gyanpeeth College of Engineering, Karjat in 2004.

Area of Specialization:

Deep Learning, Machine Learning, Generative AI, Image Processing.

Subjects Taught:

Deep Learning, Machine Learning, Image Processing, Data Mining, Artificial Intelligence.

Projects Guided:

- **Guided two PhD research scholars**
 - **Guided M Tech projects, 30+ B Tech projects** and mentored students to publish conference papers
 - **Guided a project in Smart India Hackathon, which won First prize.**
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Administrative Responsibilities:

- **Program Coordinator** in the Computer Engineering Department from 2017 to 2022.
 - **Course Coordinator** in the Computer Engineering Department from 2013 to 2017.
 - Member of the Department Advisory Board.
 - **Designed Curriculum** for courses like **Machine Learning, Deep Learning, Natural Language Processing, Artificial Intelligence, and Computer Vision.**
 - Worked as ABET and NBA Coordinator.
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NPTEL Online Certifications:

- 12-Week course on “Machine Learning for Engineering and Science Applications”
 - 12-week course on “Deep Learning for Computer Vision”
 - 12-week course on “Introduction to Large Language Models”
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Professional Certifications:

- “Machine Learning” from Coursera.
 - “Deep Learning Specialization” from Coursera.
 - “Generative Adversarial Network Specialization” from Coursera.
 - “TensorFlow Specialization” from Coursera.
 - “IBM Data Science Specialization” from Coursera.
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STTP Organized/ Attended:

- Co-ordinated a one-week STTP on ‘Data Analytics’ in July 2016 at MPSTME.
 - Attended a three-day STTP on ‘Wavelet Transform and Its Application’ in July 2016 at MPSTME.
 - Attended a three-day STTP on ‘Research Opportunities in Speech and Image Processing and Neural Networks’ in July 2015 at MPSTME.
 - Attended a two-week STTP on ‘Computer Programming’ conducted by IIT Bombay at MPSTME.
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Research Papers Reviewed:

- Reviewed 7 papers in the International Conference on Communication, Computing and Emerging Technologies 2026(IC3ET), sponsored by IEEE.
 - Reviewed 3 papers in the International Conference on Blockchain and Distributed System Security 2025, sponsored by IEEE.
 - Reviewed 25+ papers in the International Conference on Climate Change organized by SNDT University in January 2025
 - Reviewed manuscripts in Springer Nature Journal “Discover Applied Sciences” in March 2025
 - Reviewed papers at the International E-Conference on Advances in Information Technology and Research held at Vidyalankar Institute of Technology, 2021.
 - Reviewed papers at the International Conference on Fuzzy Systems and Data Mining (FSDM 2021) held in Seoul, South Korea, in October 2021.
 - Reviewed papers at the Springer International Conference on Machine Intelligence and Smart Systems, organised by IPS College of Technology and Management, Gwalior, Madhya Pradesh, in 2021.
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Research Papers Published in Journals:

1. S. Agarwal, Prachi Natu, "OBB Detector: Occluded object detection based on geometric modelling of video frames", The Visual Computer, 2024.
2. S. Agarwal, Prachi Natu, "ABGS Segmenter: pixel-wise adaptive background subtraction and intensity ratio-based shadow removal approach for moving object detection", The Journal of Supercomputing, pp. 1-33, 2022.
3. Prachi Natu, Kekre H. B. and Tanuja Sarode. "Color Image Compression using Vector Quantization and Hybrid Wavelet Transform", Procedia Computer Science Journal, pp. 778-784, 2016.
4. Dr. H. B. Kekre, Dr. Tanuja Sarode and Prachi Natu, "Image Compression Using Real Fourier Transform, Its Wavelet Transform and Hybrid Wavelet With DCT" International Journal of Advanced Computer Science and Applications (IJACSA), Vol. 4 Issue (5), pp. 41-47, 2013.
5. Prachi Natu, H.B. Kekre, Tanuja Sarode, "Performance Comparison of Hybrid Wavelet Transform Formed by Combinations of Different Base Transforms with DCT on Image Compression", International Journal of Image, Graphics and Signal Processing (IJIGSP), vol.6, no.4, pp.39-45, 2014.
6. Prachi Natu, Shachi Natu, "Fusion Model for Solar Panel Surface Defect Detection using SqueezeNet and Vision Transformer", Journal of Image and Graphics, 2026(Accepted for publication).
7. Pranjali Khiratkhar, Prachi Natu, Dipti Reddy, Shyam Rajagopalan, "Identification of Autism Spectrum Disorder from Resting State fMRI using Functional Connectivity across Multiple Atlases", Journal of Health Psychology, (Under Review)
8. Mehta, Kunal, Vineet Makharia, Rumil Dand and Prachi Natu. "A Review on Organizational Modules of Autonomous Vehicles." International Journal of Computer Applications 975: 8887.
9. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Efficient image compression technique using full column and row transforms on color image", International Journal of Advances in Engineering and Technology, (IJAET, IF 1.07), Vol. 6, Issue 1, pp. 88-100, March 2013.
10. Prachi Natu, H.B. Kekre, Tanuja Sarode, "Image Compression Using Column, Row and Full Wavelet Transforms of Walsh, Cosine, Haar, Kekre, Slant and Sine and Their Comparison with Corresponding Orthogonal Transforms". International Journal of Engineering Research and Development (IJERD, IF 1.458), Vol. 6, Issue 4, pp. 102-113, March 2013.
11. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Performance Comparison of Column Hybrid Row Hybrid and full Hybrid Wavelet Transform on Image compression using Kekre Transform as Base Transform", International Journal of Computer Science and Information Security, (IJCSIS, IF 0.438 calculated by Thomson Reuters) Vol. 12, No. 2, pp. 5-17, 2014.
12. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Performance Analysis of Hybrid Transform, Hybrid Wavelet and Multi-Resolution Hybrid Wavelet for Image Data Compression", International Journal of Modern Engineering Research (IJMER IF 1.227), Vol. 4, Issue 5, pp. 37-48, May 2014.
13. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Image Compression using Real Fourier Transform, its Wavelet Transform and Hybrid Wavelet with DCT". International Journal of Advanced Computer Science and Applications (IJACSA, IF 1.324). Vol. 4, Issue 5, pp. 41-47, May 2013.
14. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Image Compression Based on Hybrid Wavelet Transform Generated using Orthogonal Component Transforms of Different Sizes.", International Journal of Soft Computing and Engineering, (IJSCE, IF 1.275), Vol. 3, Issue 3, pp. 53-57, July 2013.

15. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Image Compression using Wavelet Transforms of DCT, DST, Hartley and Real-DFT with Variation in Size of Component Transforms", International Journal of Scientific & Engineering Research, (IJSER, IF 3.2), 4(10), 512-517, 2013.
16. Prachi Natu, H. B. Kekre, Tanuja Sarode, Performance Comparison of Walsh Wavelet, Kekre Wavelet and Slant Wavelet Transform in Image Compression. International Journal of Advanced Research in Computer and Communication Engineering (IJARCCE, IF 4.582) Vol. 2, issue 10, 3834-3840, 2013.
17. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Performance Comparison of Hybrid Haar Wavelet Transform with Various Local Transforms in Image Compression using different error Metrics", International Journal of Image Processing (IJIP), Vol. 8, Issue 4, pp.186-203, June 2014.
18. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Performance Comparison of Hartley Transform with Hartley Wavelet and Hybrid Hartley Wavelet Transforms for Image Data Compression", International Journal of Computers and Technology (IJCT, IF 1.341) Vol. 12, No. 6, pp.3634-3641, February 2014.
19. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Color Image Compression using Hybrid Wavelet Transform with Haar as Base Transform", International Journal of Scientific and Research Publications (IJSRP, IF 1.22), Volume 4, Issue 6, pp. 1-13, June 2014.
20. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Digital Image Compression using Hybrid Transform with Kekre Transform and Other Orthogonal Transforms", Journal of Computer Engineering (IF 1.213), Vol. 16, Issue 1, Ver. III, pp. 38-46, Jan. 2014.
21. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Study of Increase in Global Components in Hybrid Wavelets on Data Compression", International Journal of Computers and Technology (IJCT, IF 1.341), Vol. 9, No. 2, pp. 1028-1039, July 2013.
22. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Performance Comparison of Multi-resolution Wavelet Transforms to Hybrid Transforms for Image Compression" IJRCCT (IF 3.751), Vol. 3, Issue 4, pp. 444-453, February 2014.
23. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Comparison of Energy Distribution Property with Hybrid Walsh Wavelets with Original Walsh Transform", International Journal of Advances in Science and Technology, Vol. 6, No.6, pp. 1-11, 2013.
24. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Color Image compression using Hybrid Haar-DCT Wavelet in Different Color Spaces", AIVP Vol. 2 issue 4, pp. 1-11, August 2014.
25. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Color Image Compression using DKT-DCT Hybrid Wavelet Transform in Various Color Spaces", IJSIP-Korea, Vol. 7 Issue 5, pp. 105-124. October 2014.
26. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Image Compression using Hybrid Slant Wavelet where Slant is Base Transform and Sinusoidal Transforms are Local Transforms", International Journal of Emerging Technologies in Computational and Applied Sciences (IJETCAS, IF 1.237), Vol. 9 Issue 1, pp. 1-10, August 2014.
27. Prachi Natu, H. B. Kekre, Tanuja Sarode, "Image Compression using Fusion of Hybrid Wavelet Transform and Vector Quantization" African journal of Computing and ICT (IEEE Chapter). Vol. 7, No. 5, pp. 85-94, Dec 2014.
28. Prachi Natu, Tanuja Sarode, H. B. Kekre, Shachi Natu, "Performance Comparison of Face Recognition Using DCT Against Face Recognition Using Vector Quantization Algorithms LBG, KPE, KMCG, KFCG", CSC-International Journal of Image Processing (IJIP), Volume (4): Issue (4), September 2010.
29. Prachi Natu, Tanuja Sarode, H. B. Kekre, Shachi Natu, "Performance Comparison of face Recognition using DCT and Walsh Transform with Full and Partial Feature Vector Against KFCG VQ Algorithm", (IJCA).

30. Shachi Natu, Tanuja Sarode, H. B. Kekre, Prachi Natu, "Performance Comparison Of 2-D DCT On Full/Block Spectrogram And 1-D DCT On Row Mean of Spectrogram for Speaker Identification", CSC-International Journal of Biometrics and Bioinformatics (IJBB), Volume (4): Issue (3), August 2010.
31. Shachi Natu, Tanuja Sarode, H. B. Kekre, Prachi Natu, "Performance Comparison of Speaker Identification Using DCT, WALSH, HAAR on Full and Row Mean of Spectrogram", International Journal of Computer Applications (IJCA), August 2010.
32. Shachi Natu, Tanuja Sarode, H. B. Kekre, Prachi Natu, "Speaker Identification using 2-d DCT, Walsh and Haar on Full and Block Spectrograms", International Journal of Computer Science and Engineering, Volume 2, Issue 5, August 2010.
33. Shachi Natu, Tanuja Sarode, H. B. Kekre, Prachi Natu, "Performance Evaluation of Speaker Identification for Partial Coefficients of Transformed Full, Block and Row Mean of Speech Spectrogram using DCT, WALSH and Haar", International Journal of Computer Science and Internet Security, Volume 8, No. 6, September 2010, USA.
34. Shachi Natu, Tanuja Sarode, H. B. Kekre, Prachi Natu, "Performance Evaluation of Speaker Identification using Spectrogram and Hartley Transform with Cropped Feature Vector", International Journal of Computer Science and Information Security (IJSIS), USA, Volume 10, No.2, February 2012, pp.102-105.
35. Prachi Natu, Tanuja Sarode, H. B. Kekre, Shachi Natu, "Performance Evaluation of Face Recognition Technique using Hartley and DCT with Fractional Feature Vector", International Journal of Computer Applications (IJCA), USA, Volume 41, No. 8, March 2012, pp.38-41.

Research Papers Published in Conferences:

36. Prachi Natu, H.B. Kekre, Tanuja Sarode, "Performance Superiority of Hybrid DKT-DCT Wavelet Compared to DKT, DCT Individual Transforms and Their Wavelets in Image Compression", 5th **IEEE** International Conference pp. 619-624, Confluence 2014.
37. Shah Chinmay, Jaaneel Shah, Maruf Shaikh, Harshit Sandhu, and Prachi Natu, "Anthropometric Measurement Technology Using 2D Images", In Proceedings of Second International Conference on Sustainable Expert Systems: ICSES 2021, pp. 127-142. Singapore: **Springer Nature** Singapore, 2022.
38. G. M. Shirpurkar, R. R. Sheth, T. A. Surana, K. N. Shah, R. Garg and P. Natu, "End-to-End System for Handwritten Text Recognition and Plagiarism Detection using CNN & BLSTM", 4th International Conference on Artificial Intelligence and Speech Technology (AIST), Delhi, India, pp. 1-6, 2022, available on **IEEE Xplore**.
39. Agrawal Supriya and Prachi Natu. "An improved Gaussian Mixture Method based background subtraction model for moving object detection in outdoor scene", 4th International Conference on Electrical, Computer and Communication Technologies (ICECCT), pp. 1-8. **IEEE**, 2021.
40. Jethwa Nishant, Hamza Gabajiwala, Arundhati Mishra, Parth Joshi and Prachi Natu, "Comparative Analysis between InceptionResnetV2 and InceptionV3 for Attention-based Image Captioning", 2nd Global Conference for Advancement in Technology (GCAT), pp. 1-6. **IEEE**, 2021.
41. Gabajiwala Hamza Juzer, Nishant Kamlesh Jethwa, Parth Bimal Joshi, Arundhati Anurag Mishra, and Prachi Natu. "Comprehensive review of various optimization algorithms for image captioning." 3rd International Conference on Advances in Computing, Communication Control and Networking (ICAC3N), pp. 1703-1708. **IEEE**, 2021.
42. Rawat Shaurya, Rushang Phira, and Prachi Natu. "Use of Machine Learning Algorithms for Android App Malware Detection." In 2021 5th International Conference on Electrical, Electronics,

- Communication, Computer Technologies and Optimization Techniques (ICEECOT), pp. 448-454. **IEEE**, 2021.
43. Mehta Kunal, Maya Salvi, Rumil Dand, Vineet Makharia, and Prachi Natu. "A comparative study of various approaches to adaptive web scraping." ICDSMLA 2019: Proceedings of the 1st International Conference on Data Science, Machine Learning and Applications, pp. 1245-1256. **Springer** Singapore, 2020.
 44. Shah, Jaaneel, Chinmay Shah, Harshit Sandhu, Maruf Shaikh, and Prachi Natu. "A methodology for extracting anthropometric measurements from 2D images." In 2019 International Conference on Advances in Computing, Communication and Control (ICAC3), pp. 1-6. **IEEE**, 2019.
 45. H. B. Kekre, Tanuja Sarode, Sanjay Sange, Shachi Natu, Prachi Natu, "Halftone Image Data Compression Using Kekre's Fast Code Book Generation (KFCG) Algorithm for Vector Quantization", **Springer** Link, Communications in Computer and Information Science, 2011, Volume 145, Part 1, pp. 34-42,
 46. K. Jain, A. Joshi, S. Kaushal and P. Natu, "A Hybrid Technique for Brain Tumour Detection and Classification," 4th International Conference on Applied and Theoretical Computing and Communication Technology (iCATccT), Mangalore, India, pp. 195-200, 2018, available on IEEE Xplore.
 47. H. B. Kekre, Tanuja Sarode, Sanjay Sange, Shachi Natu, Prachi Natu, "Image reconstruction using Half tone and Kekre's Fast Codebook Generation Vector Quantization technique" International Conference on Technology Systems and Management (ICTSM) 2011 Proceedings published by International Journal of Computer Applications ® (IJCA), pp. 37-44.
 48. Prachi Natu, H. B. Kekre, Tanuja Sarode, Shachi Natu, "Transform-Based Face Recognition with Partial and Full Feature Vector using DCT and Walsh Transform", Proceedings of the International Conference & Workshop on Emerging Trends in Technology 2011, pp. 1295- 1300.

Books and Book Chapters Published:

49. Prachi Natu, Shachi Natu, and Upasana Agrawal. "Privacy Issues in Medical Image Analysis", Data Protection and Privacy in Healthcare, pp. 51-64. **CRC Press, Taylor and Francis Group**, 2021 (Book Chapter- **SCOPUS Indexed**).
50. Prachi Natu, Shachi Natu and Tanuja Sarode, "Face Recognition using Vector Quantization: A novel approach to Face Recognition", LAP Lambert Academic Publishing, Koln, DEU. **ISBN: 978-3-659-15431-7**