Prachi Bhoir

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Professional Summary

Research scholar and educator with over ten years of teaching experience in Electronics and Biomedical Engineering at the undergraduate level. Active research portfolio in computer vision and embedded systems for healthcare diagnostics, including multiple peer-reviewed publications, four UK Registered Designs, the First Prize at CiiA-5 (2026) National Innovation Competition, and the IEEE PuneCon 2025 Best Paper Award. Seeking an Assistant Professor position to contribute to outcome-based teaching, curriculum development, student mentorship, and translational research.

Education

K. J. Somaiya School of Engineering, Somaiya Vidyavihar University *2023 – Present*
Ph.D. in Electronics Engineering Mumbai, Maharashtra

- Research focus: Low-cost embedded computer vision systems for point-of-care urinalysis
- Coursework CGPI: 9.93/10 (Semester 1: 9.86, Semester 2: 10.0)
- Supervisor: Dr. Ninad Mehendale; Co-supervisor: Dr. Jagannath Nirmal

Ramrao Adik Institute of Technology, Mumbai University *2015*
M.E. in Instrumentation Engineering CGPI: 8.76/10

Vidyalankar Institute of Technology, Mumbai University *2010*
B.E. in Biomedical Engineering 77.9% (Distinction)

Teaching Experience

Assistant Professor, Department of Electronics Engineering *Aug 2013 – Jun 2021*
Vidyalankar Institute of Technology Mumbai, Maharashtra

- Delivered undergraduate courses in Electronic Devices and Circuits, Analog Integrated Circuits, Analog Communication, Biomedical Instrumentation, and Human Anatomy & Physiology across multiple semesters
- Designed laboratory experiments, assignments, and assessment rubrics aligned with outcome-based education guidelines
- Developed digital learning content and integrated innovative pedagogical methods including project-based and flipped-classroom approaches
- Served as Exam In-charge of the Electronics Department and coordinated the institute-wide ATKT examination process
- Contributed to admission committee activities and managed CET examination logistics
- Mentored undergraduate students on academic progression, internships, and final-year project work, maintaining strong faculty–student–parent communication
- Collaborated on curriculum revision, syllabus review, and lesson-plan development at the departmental level

Lecturer, Department of Biomedical Engineering *Feb 2011 – Jul 2013*
Yadavrao Tasgaonkar Institute of Engineering and Technology Karjat, Maharashtra

- Taught core biomedical engineering subjects using diverse instructional modalities and support materials
- Designed and refined lesson plans to promote active, student-centred learning

- Created comprehensive assessment materials including quizzes, term tests, and practical projects
- Participated in conferences and faculty development programs to remain current with disciplinary advances

Research Experience

Embedded Computer Vision for Urinalysis *2023 – Present*
K. J. Somaiya School of Engineering, Mumbai

- Designing an automated, low-cost point-of-care urinalysis system on the Raspberry Pi 5 platform, integrating optical hardware, embedded software, and machine learning for ten-analyte quantification.

Publications

P. Bhoir, T. Shinde, J. Nirmal, et al. "Machine Vision-Powered Point-of-Care Diagnostics: A Quantitative Analysis of Urine Test Strips." Annals of Data Science, (2026). DOI: 10.1007/s40745-026-00702-7.

T. Shinde, **P. Bhoir**, J. Nirmal, and N. Mehendale. "The Automated Paper Strip Reader (APSR): A Reliable Low-Cost Solution for Colorimetric Detection." *IEEE Journal on Flexible Electronics*, 2026. DOI: 10.1109/JFLEX.2026.3677153.

P. Bhoir, J. Nirmal, and N. Mehendale. "Optimal Focal Length Selection for Point-of-Care Urine Test Strip Analysis Using Machine Vision." *2025 IEEE Pune Section International Conference (PuneCon)*, pp. 1–6, IEEE, 2025. DOI: 10.1109/PuneCon67554.2025.11379790. *[Best Paper Award]*

V. Patkar, **P. Bhoir**, and N. Mehendale. "Evaluation of Path-Planning Algorithms for Autonomous Navigation in Unstructured Indian Road Environments Considering the Effects of Weather and Road Curvatures." *Annals of Data Science*, pp. 1–29, 2025. DOI: 10.1007/s40745-025-00615-x

V. Patkar, **P. Bhoir**, and N. Mehendale. "Assessment of Path-Planning Algorithms for Autonomous Navigation on Unstructured Indian Roads Considering Effects of Weather and Road Curvature." *International Journal of Intelligent Robotics and Applications*, pp. 1–17, 2025. DOI: /10.1007/s41315-025-00514-7

P. Bhoir, J. Nirmal, and N. Mehendale. "Development of a Low-Cost Computer Vision System for Quantifying Ketone and Glucose in Urine Dipstick Tests." *IEEE 3rd World Conference on Applied Intelligence and Computing (AIC)*, 2024. DOI: 10.1109/AIC61668.2024.10777895.

P. Bhoir et al. "An Approach Towards Intra-Body Communication for Data Transfer." *1st International Conference on Computing, Communication, Electrical, Electronics, Devices & Signal Processing (CEEDS-2015)*, Lankapali, A.P., 28–30 March 2015.

Registered Design Patents

P. A. Bhoir, G. R. Vaidya, J. H. Nirmal, and N. D. Mehendale. "Pathology laboratory equipment for colorimetric analysis of urine test strips." *UK Registered Design 6464327*, UK Intellectual Property Office, August 2025. *Assignee: K. J. Somaiya School of Engineering.*

P. A. Bhoir, G. R. Vaidya, J. H. Nirmal, and N. D. Mehendale. "Camera and LED strip holder for colorimetric urine test strip reader." *UK Registered Design 6464328*, UK IPO, August 2025.

P. A. Bhoir, G. R. Vaidya, J. H. Nirmal, and N. D. Mehendale. "Detachable top lid for colorimetric urine test strip reader." *UK Registered Design 6464329*, UK IPO, August 2025.

P. A. Bhoir, G. R. Vaidya, J. H. Nirmal, and N. D. Mehendale. "Power switch holder for pathology laboratory equipment." *UK Registered Design 6464330*, UK IPO, August 2025.

Awards & Recognition

- **First Prize, CiiA-5 (Creative Ideas & Innovations in Action)** February 2026
  National Innovation Exhibition cum Project Competition, Nehru Science Centre, Mumbai (5–7 Feb 2026). Awarded INR 1,00,000 for the project "Urine Test Strip Reader." Selected among Top 100 out of 656 teams nationwide; guided by Dr. Ninad Mehendale and Dr. Jagannath Nirmal.

- **Best Paper Award, IEEE PuneCon 2025** December 2025
  IEEE Pune Section International Conference, awarded for the paper "Optimal Focal Length Selection for Point-of-Care Urine Test Strip Analysis Using Machine Vision."

Faculty Development Programs

- **IBM Gurucool Program on Emerging Technologies** September 2020
  Six-day training followed by a Project Build-a-Thon, conducted by IBM India University Relations

- **Opportunities and Challenges in Electronics and Allied Industries in India Post Covid-19** May 2020
  One-week online FDP, Department of Electronics Engineering, Vivekanand Education Society's Institute of Technology

- **Examination Reforms** April–May 2020
  Four-day online course conducted by AICTE

Subject Expertise

Biomedical Engineering

Biomedical Instrumentation, Medical Imaging, Human Anatomy and Physiology, Prosthetics and Orthotics

Electronics Engineering

Electronic Devices and Circuits, Analog Communication, Analog Integrated Circuits, Instrumentation Systems

Emerging Areas

Machine Learning Applications, Computer Vision, Embedded Systems

Technical Skills

Python (OpenCV, scikit-learn, NumPy, Pandas, Matplotlib), MATLAB / Simulink, LaTeX, Image Processing, Embedded systems, SolidWorks, LTspice, Electronic circuit design

Professional Skills

Outcome-based curriculum development, online learning tools, project management, Microsoft Office Suite

Certifications

- **Coursera:** Electrical Power Systems; Fundamentals of Teaching for Learning; Introduction to Electronics

- **NPTEL:** Digital Circuits; Internet of Things; Principles of Communication, Part 1

- Certificate on Energy Literacy

Languages

English (Fluent) | Hindi (Native) | Marathi (Native)