

Dr. SNEHA ARUN PATIL

Electronics & Electrical Engineering Academician | AI & Deep Learning Researcher
| Research & Innovation Coordinator

Dynamic and research-oriented academic professional with 11+ years of experience in teaching, curriculum development, research supervision, innovation management, and interdisciplinary engineering projects. Specialised in Artificial Intelligence, Deep Learning, Renewable Energy Systems, IoT, Embedded Systems, and Smart Agriculture Applications. Completed a PhD in Electronics Engineering with a strong research focus on AI-driven disease detection systems and advanced image-processing techniques for agricultural applications. Demonstrated expertise in publishing high-impact research papers, filing patents and copyrights, mentoring postgraduate scholars, and leading institutional academic initiatives aligned with NAAC, IIC, and Outcome-Based Education standards. Recognised for driving research productivity, interdisciplinary collaboration, student innovation ecosystems, and academic leadership while supervising multiple M.Tech and UG research projects across Electrical, Electronics, IoT, Renewable Energy, and Machine Learning domains.



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📖 scholar.google.com/citations?hl=en&user=Y14RI9UAAAAJ

TECHNICAL SKILLS

Machine Learning for Smart Agriculture	Artificial Intelligence & Deep Learning	Renewable Energy Systems	Electric Vehicle Charging Systems
IoT & Embedded Systems	Wireless Sensor Networks	MATLAB / Simulink / NS2	Python, Java, SQL, C, C++
CNN, Hybrid CNN-SVM Models	Research Methodology & Publication	Curriculum Development	Patent Filing & IPR Management
NBA / NAAC Documentation	Academic Leadership & Mentorship	Outcome Based Education (OBE)	

WORK EXPERIENCE

ASSOCIATE PROFESSOR

Padmabhushan Vasantraodada Patil Institute of Technology (PVPIT), Budhgaon

08/2017 - Present

Tasks

- Guided 25+ major academic projects and dissertation works involving Deep Learning, Smart Energy Systems, EV Charging Infrastructure, Wireless Networks, and Intelligent Automation with measurable research outcomes and publication contributions.
- Developed and redesigned departmental curriculum frameworks as BoS Secretary, contributing to implementation of NEP-aligned academic structures and industry-oriented syllabus enhancements across PG programs.
- Spearheaded postgraduate academic operations as PG Coordinator and Head of PG Program, improving student project completion rates by 35% and strengthening research-oriented learning methodologies.
- Coordinated IIT Bombay Spoken Tutorial initiatives for 700+ students and faculty members, enabling certification-driven technical skill enhancement in Python, Latex, C/C++, and Open-Source technologies.
- Played a critical role in NAAC accreditation activities including documentation, academic audits, criterion preparation, and quality assurance processes, contributing significantly to institutional compliance and academic governance.
- Led innovation-driven academic activities under Institution Innovation Council (IIC), facilitating startup awareness sessions, research ideation workshops, and interdisciplinary innovation programs involving 200+ student participants annually.
- Directed institutional IPR activities as Patent & IPR Cell In-charge, supporting patent drafting, copyright filing, and innovation disclosures that resulted in multiple patents, copyrights, and design registrations.
- Organized technical symposiums, FDPs, cultural events, and multidisciplinary academic activities as Cultural Dean, increasing student engagement and institutional participation in co-curricular initiatives by 40%.
- Supervised interdisciplinary renewable energy and AI-based research activities leading to multiple Scopus-indexed publications, IEEE conference papers, and collaborative innovation projects.

WORK EXPERIENCE

JUNIOR ENGINEER

Pro Tech Steel Industries, Miraj

06/2015 - 05/2017

Tasks

- Managed industrial electrical maintenance operations and troubleshooting activities for automated production systems, improving operational reliability and reducing equipment downtime by nearly 25%.
- Assisted in implementation of preventive maintenance schedules for industrial electrical systems, enhancing machine efficiency and process continuity across manufacturing operations.
- Performed electrical diagnostics, testing, and system inspections for industrial machinery while ensuring adherence to operational safety standards and quality benchmarks.
- Supported automation-related activities and equipment calibration processes for production units handling heavy industrial operations and material processing.
- Coordinated technical documentation and operational reporting for plant maintenance activities, improving response tracking and maintenance planning accuracy.

VISITING LECTURER

Government Polytechnic, Miraj

08/2011 - 04/2014

Tasks

- Delivered foundational and advanced engineering subjects including Digital Electronics, Communication Systems, and Microprocessors to diploma-level students with strong student feedback outcomes.
- Designed laboratory demonstrations and practical learning modules to strengthen conceptual understanding and technical problem-solving capabilities among engineering students.
- Mentored students in mini-project development, technical presentations, and practical experimentation activities aligned with industry-focused engineering education.
- Conducted student academic counselling sessions and supported departmental activities related to examinations, laboratory administration, and curriculum implementation.

EDUCATION

Ph.D. in Electronics Engineering

Sanjay Ghodawat University, Kolhapur

2026

M.E. in Electronics & Telecommunication Engineering

Shivaji University, Kolhapur

2014

B.E. in Electronics Engineering

Shivaji University, Kolhapur

2011

RESEARCH

DOCTORAL RESEACH

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Ph.D. Thesis (Detection of Rhizome Rot Disease in Curcuma Longa Using Machine Learning Approach)

Research Highlights

- Developed an advanced deep learning framework for automated disease detection and severity classification in turmeric plants using CNN, VGG19, Hybrid CNN-SVM, and attention-based CNN architectures.
- Created a customized agricultural image dataset with annotated disease severity levels ranging from 10% to 100% for intelligent disease progression analysis.
- Achieved 96% classification accuracy and 92% severity prediction accuracy using attention-based CNN architecture for precise disease identification and severity estimation.
- Designed a two-stage intelligent classification mechanism capable of distinguishing healthy and infected crop regions while evaluating disease intensity levels.
- Improved feature extraction and localization efficiency using attention mechanisms and image-processing optimization techniques for agricultural AI applications.
- Proposed lightweight computational models suitable for scalable deployment in smart farming and precision agriculture systems.
- Contributed toward development of intelligent crop-monitoring systems capable of improving agricultural productivity and early disease diagnosis.

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RESEARCH

ACADEMIC RESEARCH

M.Tech Dissertation (Sensor Localization in Irregular Areas Using Reliable Anchors)

Research Highlights

- Proposed an optimized localization methodology for Wireless Sensor Networks operating in irregular terrains with obstacle-aware positioning techniques.
- Improved localization accuracy by introducing reliable anchor node selection mechanisms capable of minimizing sensor position estimation errors.
- Reduced localization deviation and routing inaccuracies through elimination of unreliable anchors affected by environmental obstacles and signal detouring.
- Implemented and validated the complete localization model using Network Simulator-2 (NS2) on Ubuntu platform for real-time simulation analysis.
- Evaluated performance metrics including localization error, anchor reliability, routing efficiency, and communication stability under varying deployment scenarios.
- Demonstrated enhanced node localization precision and network reliability compared to conventional localization algorithms in irregular wireless sensor environments.

B.E. : Magnetic Card Security System & Emergency Light System

Research Highlights

- Designed a magnetic-card-based electronic security framework capable of generating dynamic randomized passwords for secure authentication.
- Enhanced access control reliability through automated verification logic and secure password generation mechanisms.
- Developed an automatic emergency lighting system capable of instantaneous illumination during power failures with integrated charging support.
- Implemented energy-efficient switching and backup charging circuitry for uninterrupted emergency operation.

PATENT, DESIGN, COPYRIGHT

UTILITY PATENT GRANTED

Dhawale N M,, Patil A V, Ghewade D V, Patil S A, Harugade M L, “An autonomous device to monitor multiple pointer gauges and sensor data to perform predictive analysis” Innovation Patent, Patent No. 2021105630, IP Australia, Australian Government, Granted on 03rd November 2021

An autonomous device to monitor multiple pointer gauges and sensor data to perform predictive analysis, N.M. Dhawale, P. Prusty, S.A. Patil, A.V. Patil, D.V. Ghewade, M.L. Harugade, The Patent Office, Government of India AMCZ-2110365039, 08/17/21, 2021105630, 11/03/21, 202121021898, 05/14/21

DESIGN PATENTS

Patil, S.A & Mahadik, S.R.2025, Rhizome Rot Disease Detection Device, The Patent Office, Government of India, IN Design No. 450454-001, Application No. 2023123456, filed Mar. 15, 2025; issued Jul. 12, 2025. [Online]. Available: <https://ipindiaservices.gov.in>

Dhawale N M, Patil A V, Ghewade D V, Patil S A, Harugade M L, “An autonomous device to monitor multiple pointer gauges and sensor data to perform predictive analysis” Innovation Patent, Patent No. 2021105630, IP Australia, Australian Government, Granted on 03rd November 2021

S. A. Patil, S. K. Gheware, and C. H. Hunnur, Regenerative Braking System, Indian Design Patent 2021105630, filed Mar. 11, 2021, and published May 14, 2021 as 202121021898.

COPYRIGHT

Mahadik, S.R. & Patil, S.A., 2025. Algorithm for Detection of Rhizome Rot Disease in Curcuma Longa. Copyright registered with the Copyright Office, Government of India. Application No.: 7523/2025-CO/SW, Date of Filing: 05 M a r h 2025, Certificate No.: SW-202520756.

N. M. Dhawale, A. R. Dandekar, D. V. Ghewade A. V. Patil, M. L. Harugade, S. A. Patil, A. A. Kusnale, “Idea Generation Te Incubation, Incubation Te Yashaswi Startup-P.V.P.I.T. Budhgaon - Sanglichee Naveenypurna Yojana”, Granted and accepted on 14th March 2022.

RESEARCH PUBLICATIONS

S. A. Patil, S. R. Mahadik, and A. G. Bhosale, "Rhizome Rot Disease Recognition in Turmeric Plant Using CNN-SVM Hybrid Algorithm," *African Journal of Biomedical Research.*, vol. 27, no. 3s, pp. 295-305, Sep. 2024. <https://doi.org/10.53555/AJBR.v27i3S.1972>

S. A. Patil, S. R. Mahadik, "Severity Net: A Comparative Analysis of Deep Learning Approaches for Rhizome Rot Disease Severity Recognition in Turmeric Plant",J. Electrical Systems 20-10s (2024): 8283-8293 DOI:<https://doi.org/10.52783/jes.7158>

S. A. Patil, A. Bhosale and A. Patil, "Advancements in Plant Leaf Disease Detection: A Comprehensive Review of Latest Trends and Technologies," 2024 3rd International Conference for Innovation in Technology (INOCON), Bangalore, India, 2024, pp. 1-5, doi: 10.1109/INOCON60754.2024.10511970.

Microinverter for PV Grid Integration ,S.A.Patil,Pradnya Patil ,International Conference on Inventive Computation Technologies (ICICT 2024),Part Number : CFP24F70-DVD ; ISBN : 979-8-3503-5928-2 doi: 979-8-3503-5929-9/24/\$31.00 ©2024 IEEE

S. A. Patil, “Electric Vehicle Charger with Interleaved Converter,” Journal of Electrical Systems (JES), vol. 21, no. 1, 2025. [Online]. Available: <http://journal.esrgroups.org/jes>

RESEARCH PUBLICATIONS

S. A. Patil, "Advancement in multi-technology energy storage system for renewable energy generation & transportation: An overview," in Proc. ISTE Global TechCon 2026 – First Global Conf. on Engineering Technology & Education, Kolhapur, India, Jan. 8–9, 2026.

Performance analysis of a nine level cascaded H-Bridge Multilevel Inverter in comparison to Comparable Lower-Level Topologies, Sneha A. Patil, Teja R. Shenai, Maiden Edition of IEEE Delhi section, International Conference on Electrical, Electronics and Computer Engineering (Delcon2022), pp. 0973–0978, 10.1109/DELCON.2022.8936236

On The Development Of A Semi-Automated Soil And Crop Image Analyst Using Smart Phones: A Tool To Enhance Use Of Information Systems In Agriculture, N.M. Dhawale, S.A. Patil, D.V. Ghewade, S.A. Shinde, V.P. Desai, V.S. Patil, 1st International Conference on Plantation Technology, 23-24 November 2021, Kuala Lumpur, Malaysi

On Design Rapid Prototyping and Testing of IoT Enabled Sensors using Open Source Tools, N. Dhawale, S.A. Patil, A.R. Rajput, K.A. Shinde, R. S. Kulkarni, N.R. Chavan, International Journal of Advances in Engineering and Management (IJAEM), 3, 10, October 2021, 168-173, 2395-5252

Sensor Localization in Irregular Areas Using Reliable Anchors, S. A. Patil, S. S. Shinde, Masters of Engineering in Electronics and Telecommunication, Shivaji University, 2013-14

Different Algorithms for localization of Sensor, S. A. Patil, S. S. Shinde, National Conference ON Emerging Trends in Engg, Feb. 2013

S.A. Patil, "Current advances in image-based plant disease detection techniques using deep learning," in Proc. Int. Conf. Convergence of Technologies for Viksit Bharat (ICCTVB-2025), Sanjay Ghodawat University, Kolhapur, India, Dec. 19–20, 2025.

ACADEMIC PROJECTS SUPERVISED

M.TECH :

Hybrid Energy Management System for BLDC Motor Drive

- Guided development of a hybrid renewable energy management framework integrating intelligent energy balancing for BLDC motor applications.
- Supervised simulation and optimization of seamless power transition mechanisms between multiple energy sources to improve system stability and energy utilization.

Battery Health Monitoring of Electric Vehicle Using Machine Learning

- Mentored postgraduate research focused on AI-driven battery health estimation and predictive analytics for electric vehicle energy storage systems.
- Guided implementation of machine learning models for battery degradation analysis, charging cycle optimization, and predictive maintenance applications.

ANN Based SHEPWM Operated 5-Level Modified CHB Inverter

- Supervised development of ANN-assisted Selective Harmonic Elimination PWM techniques for cascaded H-bridge multilevel inverter systems.
- Improved harmonic reduction efficiency and inverter output quality through intelligent switching optimization strategies.

Electric Vehicle Charger with Interleaved Converter

- Guided research involving interleaved converter topology for high-efficiency EV charging applications with reduced ripple and improved power quality.
- Assisted students in performance optimization and converter stability analysis for smart EV charging infrastructure development.

A Novel Optimization Technique for Microinverter Based Solar PV Integration

- Directed research on optimization-based microinverter integration strategies for improved solar PV efficiency and distributed renewable energy management.
- Supervised performance evaluation of grid-integrated PV systems under dynamic operating conditions and load variations.

Performance Analysis of 9-Level Cascaded H-Bridge Multilevel Inverter

- Guided comparative performance analysis of advanced multilevel inverter topologies with emphasis on harmonic minimization and switching performance.
- Evaluated efficiency, THD reduction, voltage quality, and converter stability using simulation-based methodologies.

SKILL CERTIFICATIONS

Software Testing Training

Manual Testing

Java And Selenium, Agile methodology

Deep Learning

Python, IOT

COURSES TAUGHT

Microprocessor & Microcontroller

Internet of Things

Material science

Data Science

Linear Integrated circuits

Digital Electronics

Power Electronics

Renewable energy sources

Computer Network

FDP/STTP/WORKSHOPS /CERTIFICATION

FACULTY DEVELOPMENT PROGRAMS

- Successfully completed AICTE Training and Learning (ATAL) Faculty Development Program on "Principles, Techniques, and Perspectives on Optimisation Techniques in Engineering Applications and Future Trends", organised by Sindhudurg Shikshan Prasarak Mandal's College of Engineering from 20th January 2025 to 25th January 2025.
- Successfully completed a two-week AICTE-sponsored Faculty Development Program on "Machine Learning & its Applications" organized by the Department of Electronics & Telecommunication Engineering, Kolhapur Institute of Technology's College of Engineering (Autonomous), Kolhapur, from January 5 to 15, 2021.
- Successfully Completed a one-week AICTE-sponsored Faculty Development Programme on "Sustainable Development: Theory & Practice" organised by Rajarambapu Institute of Technology (Mentor) and Adarsh Institute of Technology & Research Centre, Vita (Mentee), from August 19 to 23, 2019.
- Successfully completed a one-week faculty development program on "IPR – Patent, Design, Trademark & Copyright", organised by the Department of Electronics & Telecommunication Engineering in collaboration with the Department of MBA, SVERI's College of Engineering, Pandharpur, from 17th to 22nd July 2023.
- Successfully completed a One Week AICTE-ISTE Approved STTP on "Research Methodology and IPR" organised by the Department of Electronics and Telecommunication Engineering, P.V.P.I.T., Budhgaon, from 18th to 22nd December 2017
- Completed a One-Week Online Faculty Development Program on Python 3.4.3, organised by P.V.P.I.T. Sangli (Budhgaon) in association with IIT-Bombay Spoken Tutorial, from 26th April to 2nd May 2020.
- Completed One-Week FDP on Generative AI and Advanced Excel Mastery Organized by Guru Gobind Singh College of Engineering & Research Centre, Nashik, 13th to 18th January 2025
- Successfully completed a 6-day National Level Online Faculty Development Program on Professional Skills and Moral Leadership (Fundamentals) in 25-30 July 2020.
- Completed a one-week online Faculty Development Program on Latex, organized by Padmabhushan Vasantodada Patil Institute of Technology in association with IIT Bombay Spoken Tutorial (April-May 2020)
- Organized and successfully Completed Faculty Development Program (FDP) on Advanced Teaching Tools including Latex, Python 3.4.3, and C/C++ organized by Padmabhushan Vasantodada Patil Institute of Technology in association with IIT Bombay Spoken Tutorial (26th Apr. to 2nd May. 2020)

CERTIFICATIONS

- Hybrid Energy Management System for Solar PV-Battery Powered BLDC Drive (Original: A Hybrid Energy Management System for Solar PV-Battery Fed BLDC Motor Drive with Seamless Mode Transition) 06 & 08 May 2026
- Interleaved Converter-Based EV Charging System (Original: Electric Vehicle Charger With Interleaved Converter) 22nd 23rd March 2026
- Successfully Completed Module 7: "Creative Problem Solving, Innovation and Meaningful R&D" under the National Initiative for Technical Teachers Training (NITTT) by AICTE through SWAYAM in February 2022
- Completed Latex training and certification through the Spoken Tutorial Project, IIT Bombay, on 18th February 2020, conducted at PVPIT Budhgaon.
- Completed the of 12 weeks course of "Neural Networks and Deep Learning" offered by DeepLearning.AI through Coursera on March 20, 2022.
- Completed the "Introduction to Industry 4.0 and Industrial Internet of Things" course through NPTEL, IIT Kharagpur, with a 67% score, January to April 2022.
- Completed online Python 3.4.3 training and certification in May 2020 through IIT Bombay Spoken Tutorial Project at Padmabhushan Vasantodada Patil Institute of Technology.
- Completed software testing training at QSpiders, covering Manual Testing, Java & Selenium, Agile Methodology, and Web Security Testing – August 2017.
- Organized and participated as Member of Board of studies for Syllabus setting for Post graduate Program 8 Aug 2025
- Attended a two-day research workshop on "Professional Growth: Getting the most out of your PhD" at Sanjay Ghodawat University, Kolhapur on August 8th and 9th, 2023
- Attended and deliver expert talk at the webinar "Tyre – An Engineering Marvel" organized by PVPIT Budhgaon in collaboration with Apollo Tyres, delivered by Mr. Arvind Krishna, on 5th August 2020.

FDP/STTP/WORKSHOPS /CERTIFICATION

- Attended the "India First Leadership Talk" with Ms. Ashwini Deshpande (Co-Founder & Director, Elephant Design), organized by government of India, MHRD's Innovation Cell, on 6th June 2019 at PVPIT Budhgaon
- Active participation Workshop on syllabus, revision of T.Y.BTech electrical and computer engineering under Dr.Babasaheb Ambedkar Technical University, Lonere on 27 January 2024
- Completed six months software testing training at QSpiders, covering Manual Testing, Java & Selenium, Agile Methodology, and Web Security Testing – August 2017.
- Successfully completed workshops on Data-structure, PIC Programming Aug 2014
- Completed ISTE-approved STTP on Advances in wireless communication ATMEGA-32 AVR Micro-Controller" from "NXG Embedded System, Pune

ADMINISTRATIVE & LEADERSHIP RESPONSIBILITIES

- Dean – Industry Institute Interaction
Led industry-academia collaborations, strengthening corporate partnerships to drive internships, placements, training programs, and student career development.
- Active participation in the Research and Development Cell. Accomplished academician and dedicated Assistant Professor at Padmabhushan Vasantraodada Institute of Technology (PVPIT), Budhgaon,
Active involvement in multiple institutional committees and research initiatives.
- Head P.G Programs - (M.Tech Electrical Engineering)
Coordinating postgraduate academic activities, student progress monitoring, project guidance, and departmental communication for M.Tech programs.
- Member & research Coordinator for PVPIT's Institutions Innovation Council (IIC) [2020- Till]
Promoting innovation, entrepreneurship, and research culture by organizing activities, guiding projects, and supporting institutional innovation initiatives.
- Institute representative and Chief coordinator of PVPIT's for ST Training program IIT-Bombay [2019-Till]
Coordinating institute-wide training programs in collaboration with IIT Bombay, ensuring smooth execution, student participation, and skill enhancement initiatives.
- Lead participant, host and active Member in various college level committee
Actively contributing to institutional committees by supporting academic planning, event execution, student engagement, and administrative coordination activities.
- Cultural Event organizer –Chief Coordinator –Vasantosav ,Vasant karandak
Planned and executed large-scale cultural events, overseeing team coordination, scheduling, budgeting, and smooth event management.
- IIT-Bombay spoken tutorial departmental Coordinator, Organizer and Invigilator [2019-till]
Managing departmental training sessions, conducting examinations, and facilitating technical skill development programs through IIT Bombay Spoken Tutorials.
- Worked as NAAC Criteria No.1 (NAAC 2019) (NAAC 2024)
Managed documentation and compliance activities related to curricular aspects, ensuring quality standards and accreditation readiness for NAAC evaluations.
- Mentoring Coordinator
Leading student mentoring initiatives by guiding academic performance, career development, and overall student well-being through structured mentoring programs.
- Patent Coordinator
Facilitating patent filing processes, encouraging innovation-driven research, and supporting faculty and students in intellectual property documentation and submissions.

VOLUNTEER / EXTRA CURRICULAR ACTIVITIES

- Life Member – Savendna NGO
Life Member of Savendna, actively contributing to the welfare, care, education, and empowerment of specially-abled children, including intellectually disabled, physically challenged, and Divyang children, through various social and developmental initiatives.
- President of Giants Welfare Association
Led and actively participated in community development, social welfare, and philanthropic initiatives, driving programs focused on public service and community engagement.
- Awarded as Hirakani Puraskar and Nari Shakti Puraskar
Recognition of outstanding contributions to the academic, social, and educational sectors, demonstrating leadership and impact in community development and empowerment initiatives.
- Represented Maharashtra State and Shivaji University at the National Level in Archery,
Showcased competitive excellence, discipline, and sportsmanship in inter-state and national championships.
- Recipient of the Chairman's Award for Best Dancer from the Akhil Bharatiya Sanskrutik Sangh
Selection to represent India in an international cultural performance tour in Spain.

LANGUAGES

Marathi
Native or Bilingual Proficiency

English
Full Professional Proficiency

Hindi
Full Professional Proficiency