

Dr. Pavinder Yadav

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[LinkedIn](#) | [Google Scholar](#) | [ResearchGate](#) | [GitHub](#)

Publications - 10, **Citations** - 200, **h-index** - 5, **i10-index** - 4

Professional Profile

Assistant Professor at the University of Petroleum and Energy Studies (UPES) with a Ph.D. in Mathematics and Scientific Computing from the National Institute of Technology Hamirpur. My research interests include computer vision, deep learning, trustworthy AI, intelligent surveillance, and explainable machine learning, with an emphasis on developing efficient AI systems for real-world applications. I have authored publications in high-impact international journals and actively engage in teaching, student mentorship, and interdisciplinary research collaborations.

Research Interest

Machine Learning: Regression and Classification Models (Linear Regression, Decision Tree, Random Forest, SVM, ANN). Deep Learning: Applications in Object Detection, segmentation and Tracking. Optimization Techniques. Exploration of YOLO-based Models, CNNs, and Applications Across Various Fields. Data Analysis: Proficient in SQL, Pandas, and Numpy for Data Manipulation and Analysis. Statistical and Probabilistic Methods: Foundations for Data-Driven Decision Making. Data Visualization: Expertise in Matplotlib and Other Visualization Tools.

Education

Ph.D. Mathematics and Scientific Computing	2020 – 2025
<i>National Institute of Technology, Hamirpur, Himachal Pradesh, India</i>	
<i>Thesis Title: Real-Time Weapon Detection Systems Using Deep Learning Architectures</i>	
M.Sc. Mathematics	2015 – 2017
<i>Deenbandhu Chhotu Ram University of Science and Technology, Sonapat, Haryana, India</i>	
<i>Applied Mathematics</i>	
B.Sc. Computer Science	2011 – 2014
<i>Kurukshetra University, Kurukshetra, Haryana, India</i>	
<i>Computer Science</i>	

Employment History

Assistant Professor, Computer Science and Engineering	02/2025 – Present
<i>University of Petroleum and Energy Studies (UPES), Dehradun, Uttarakhand, India</i>	
Research and Teaching	
Courses Taught - Programming in Python, Probability and Statistics, Fundamentals of Data Science, Applied Machine Learning, Database Management System, Linux and Shell programming.	

Assistant Professor, Mathematics (Visiting) 08/2018 – 06/2019 & 02/2020 – 06/2020
Deenbandhu Chhotu Ram University of Science and Technology, Haryana, India

- Taught advanced mathematical topics to undergraduate and postgraduate students, covering a range of subjects.
Courses Taught - Linear Algebra, Abstract Algebra, Calculus, Solid Geometry, Topology, Functional Analysis, Real Analysis, Engineering Mathematics.

Block Resource Person - Mathematics 08/2019 – 02/2020
Board of School Education, Haryana, India

- Conducted teacher training programs for mathematics educators in the Panchkula block, facilitating the development of effective learning materials and teaching strategies.

Research Publications

Journal Articles

- **P. Yadav**, N. Gupta, and P. K. Sharma, “Robust weapon detection in dark environments using yolov7-darkvision,” *Digital Signal Processing*, vol. 145, 2024. [10.1016/j.dsp.2023.104342](https://doi.org/10.1016/j.dsp.2023.104342).
- **P. Yadav**, N. Gupta, and P. K. Sharma, “A comprehensive study towards high-level approaches for weapon detection using classical machine learning and deep learning methods,” *Expert Systems with Applications*, vol. 212, 2023. [10.1016/j.eswa.2022.118698](https://doi.org/10.1016/j.eswa.2022.118698).
- **P. Yadav**, N. Gupta, and P. K. Sharma, “WeaponVision AI: a software for strengthening surveillance through deep learning in real-time automated weapon detection.” *International Journal of Information Technology*, vol. 17, pages 1717–1727, 2025. [10.1007/s41870-024-02375-y](https://doi.org/10.1007/s41870-024-02375-y)
- **P. Yadav**, S. B. Shantilal, V. Kumar, P. Sihag, P. K. Sharma and P. Rana “A Deep Learning Approach for Recognizing and Solving Handwritten Mathematical Equations” *Neural Computing & Application*, 2025. [10.1007/s00521-025-11025-8](https://doi.org/10.1007/s00521-025-11025-8)
- V. Kumar, **P. Yadav**, P. Rana, M. Kaur, R. Rawat, and R. Ali, “AF-SGS: Blockchain-assisted secure authentication framework for smart grid systems,” *International Journal of Information Technology*, 2026. doi: [10.1007/s41870-025-03069-9](https://doi.org/10.1007/s41870-025-03069-9).

International Conference Proceedings

- **P. Yadav**, N. Gupta, and P. K. Sharma, “Enhancing video surveillance with deep learning-based real-time handgun detection and tracking,” in *International Conference on Computer Vision and Image Processing*, vol. 173, pp. 173–184, Springer Nature Switzerland, Nov. 2023. [10.1007/978-3-031-58181-6_15](https://doi.org/10.1007/978-3-031-58181-6_15)
- **P. Yadav**, N. Gupta, and P. K. Sharma, “Real-time firearm detection system utilizing deep learning and super-resolution CNNs,” in *International Conference on Innovative Computing and Communication*, Springer Nature Singapore, pp. 369–380, Feb. 2024. [10.1007/978-981-97-3591-4_30](https://doi.org/10.1007/978-981-97-3591-4_30)
- H. Gupta, A. Jaiswal, **P. Yadav**, and N. Gupta, “Deep learning-based automated electronic meter reading system using YOLOv5 architecture,” in *Proceedings of the 2023 International Conference on Big Data Mining and Information Processing*, pp. 45–53, 2023. [10.1145/3645279.3645288](https://doi.org/10.1145/3645279.3645288)

- N. S. Bajaj, **P. Yadav**, and N. Gupta, “COVID-19 detection from CT scan images using transfer learning approach,” in Proceedings of the 2024 8th International Conference on Machine Learning and Soft Computing, pp. 152–157, Jan. 2024. [10.1145/3647750.3647774](#)

Books and Chapters

- M. Arya, **P. Yadav**, and N. Gupta, “Handwritten equation solver using Convolutional Neural Network.” In: *Deep Learning Applications*, CRC Press, 2023. [10.1201/9781003453406](#)

Communicated

- **P. Yadav**, N. Gupta, and P. K. Sharma, “YOLO-WDNet: Enhancing Real-Time Weapon Detection in Surveillance Systems through a Modified YOLOv8 Architecture” (**Under Review – Cluster Computing**)
- **P. Yadav**, V. Gautam, N. Gupta, P. K. Sharma and S. Prasad, “MHAT-YOLO: Multi-Head Attention Deep Learning Framework for Enhanced Threat Detection in X-ray Baggage Screening” (**Under Review – Applied Soft Computing**)
- **P. Yadav**, S. Singh, A. Singh, A. Rastogi, L. Upadhyay, V. Kumar, “A Comprehensive Review of Plant Disease Detection from Traditional Machine Learning to Deep Learning for Precision Agriculture” (**Under Review – Artificial Intelligence Review**)

Projects

WeaponVisionAI: Advanced Weapon Detection Software - [Link](#) 2024

- Developed a software, WeaponVisionAI for CPU and GPU, for real-time weapon detection and tracking using deep learning.

Deep Learning Models for Weapon Detection in Night vision - [Link](#) 2020–2024

- Integrated YOLO-based architectures and DarkVision to enhance detection accuracy in low-resolution and dark environments.

AI-Powered Golf Swing Analysis and Biomechanics with React Native App 2026–Present

- Building App for Golf Swing Analysis

Professional Activities

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- Serving as a peer reviewer for leading international journals, including *Expert Systems with Applications* (Elsevier), *Scientific Reports* (Nature Portfolio), *IEEE Access* (IEEE), *Signal, Image and Video Processing* (Springer Nature), and *Discover Applied Sciences* (Springer Nature).

Technical Skills

Programming	Python, R, C, C++, MATLAB, L ^A T _E X
Artificial Intelligence	Machine Learning, Deep Learning, Computer Vision, Explainable AI
Frameworks & Libraries	PyTorch, TensorFlow, OpenCV, Ultralytics YOLO, Scikit-learn
Data Science	NumPy, Pandas, SQL
Visualization	Matplotlib, Tableau, Power BI
Languages	English (Fluent), Hindi (Fluent)

Courses and Certifications

Deep Learning	NPTEL, IIT Madras (2022)
Python for Data Science	NPTEL, IIT Madras (2022)

Workshops and Trainings

Recent Advancements in Deep Learning Architectures (RADA-2025)	<i>November 2025</i>
<i>National Institute of Technology, Kurukshetra and the Electronics and ICT Academy</i>	
Digital Security Faculty Training	<i>June 2025</i>
<i>Digital Security Faculty Training, GCA + UPES, India</i>	
WADLA-2023	<i>December 2023</i>
<i>International Research Workshop on Advances in Deep Learning and Applications, Indian Institute of Information Technology, Sri City, Chittoor, Chittoor, India</i>	
Deep Learning and AI Workshop	<i>September 2021</i>
<i>Recent Advancements in Artificial Intelligence and IoT, National Institute of Technology Hamirpur, India</i>	
Deep Learning & Applications	<i>September 2021</i>
<i>Two-week FDP jointly organized by Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, under MeitY, Govt. of India.</i>	
Mathematical and Statistical Methods for Machine Learning	<i>November 2020</i>
<i>e-Workshop at National Institute of Technology Hamirpur, India.</i>	
LaTeX and Scientific Writing	<i>March 2021</i>
<i>One-week workshop at Guru Jambheshwar University of Science and Technology, Hisar, India.</i>	
Fundamentals of Deep Learning	<i>2021</i>
<i>Workshop conducted by NVIDIA Deep Learning Institute.</i>	

Awards and Achievements

- Delivered an expert lecture on “Industry expert lecture on Linear Regression and its applications using python” organized by Department of Mathematics and Statistics, Manipal University, Jaipur, November 2025.

- Delivered an expert lecture on “Hyper parameter Tuning and Optimization” at the Workshop on Deep Learning, organized by SIAS Research Forum, Calicut University, Kerala, March 2024.
- Qualified CSIR NET/JRF (Mathematics) in December 2017 and June 2018.
- Qualified GATE (Mathematics) in February 2019.
- Awarded Junior Research Fellowship (JRF) by the University Grants Commission (UGC), New Delhi, in October 2020.
- Awarded Senior Research Fellowship (SRF) by the University Grants Commission (UGC), New Delhi, in October 2022.

Project Guidance

- Mentored a **B.Tech Data Science (3rd Year, IBM)** student team on the project “*Traffic Sign Recognition Model*” (2024–25).
- Guided a **B.Tech CCVT (4th Year, IBM)** student team in developing a “*Meeting Summarizer*” using AI and Natural Language Processing techniques (2024–25).
- Supervised a **B.Tech Data Science (3rd Year)** internship project on “*Customer Segmentation for Investment Services*” (2024–25).
- Mentoring an **MCA (Data Science)** final-year project titled “*Role-Based Personalized Learning Pathway Engine*” (2025–26).
- Mentoring **B.Tech CSE (Data Science)** student team on the project “*Farmer’s Friend: Instant Plant Disease Detection Using Machine Learning and Deep Learning Models*” (2025–26).
- Mentoring **B.Tech (DevOps)** student teams (3rd Year) on the project “*Risk-Aware CI/CD Pipeline with Security Scoring*” (2025–26).

Referees

Dr. Pawan Kumar Sharma

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Dr. Rifaqat Ali

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