

Praful Hambarde

Curriculum Vitae

Assistant Professor,
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Career Objective

To leverage my knowledge, skills, and research experience by contributing to eminent academic institutions and industry-oriented research environments.

- Ph.D. professional with over three years of experience in industrial research and development.
- Entrepreneurial experience through the conceptualization and co-founding of a deep-tech startup, Reagvis Labs Pvt. Ltd.

Education

2018–2022 **Ph.D. Degree in Computer Vision - Indian Institute of Technology Ropar, Rupnagar, Punjab, India.**

Thesis Title: Deep Learning Based Approaches For Single Image Depth Estimation

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2018–2022 **Ph.D. in Computer Vision, Indian Institute of Technology Ropar, Rupnagar, Punjab, India.**

Thesis Title: Deep Learning Based Approaches for Single Image Depth Estimation

2016–2018 **M.Tech. in Electronics Engineering, SGGS Institute of Engineering & Technology, Nanded, India.**

Thesis Title: Prostate Lesion Segmentation in MR Images Using Machine Learning and Deep Learning Techniques

2011–2015 **B.Tech. in Electronics and Telecommunication Engineering, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, India.**

Graduation Project: pH and Turbidity Measurement of Industrial Wastewater

2011 **Higher Secondary Education, Maharashtra State Board, India.**

Yeshwant Mahavidyalaya, Nanded

2009 **Secondary Education, Maharashtra State Board, India.**

Shivaji Vidyalaya, CIDCO, New Nanded

Research Interests

Computer Vision, Generative AI, Deep Learning, Multimodal AI, Robotics, LLMs, Cybersecurity, Quantum Neural Networks, Medical Image Analysis.

Entrepreneurship

- 1st June 2025–Present **Co-Founder**, *Reagvis Labs Pvt. Ltd., India (www.reagvis.com)*.
o Building AI-powered deep-tech solutions for digital forensics, cybersecurity, and the Banking, Financial Services, and Insurance (BFSI) ecosystem.

Work Experience

- 10th Feb 2025–Current **Assistant Professor**, *Centre for Artificial Intelligence and Robotics (CAIR), IIT Mandi*.
- 05th July 2023–10th August 2024 **Artificial Intelligence Researcher**, *TECH5 India Private Limited, specializing in the development of Generative AI-based models for biometric applications..*
- 15th Sept 2022–31st March 2023 **Associate Research Fellow**, *Deakin University Australia. Worked on blind face image restoration using generative and diffusion models..*
- 1st Feb 2022–14th Sept 2022 **Computer Vision Research Scientist**, *Kroop AI Private Limited, India*, [1] Build a complete lightweight deep learning pipeline for cartoon image generation. [2] Worked on MetaHuman Creator and Unreal Engine. [3] Worked on audio driven face image generation.
- 2018–2022 **Research Scholar and Teaching Assistant**, *Computer Vision and Pattern Recognition Lab, Department of Electrical Engineering, Indian Institute of Technology Ropar, Rupnagar, Punjab, India.*

Research Grants

Sr. No	Project Title	Agency	Budget	Dur(Yrs)	Role
1	Feasibility Study and Benchmarking of Secure, Offline AI-Driven Document Digitization Workflows	DRDO	10 Lakhs	1	PI
2	Multi-modal AI for Automated Structure Health Monitoring	IIT Mandi	15 Lakhs	2	PI
3	AI-Enabled Autonomous Secure Drone Navigation in GPS-Denied Environments Using Multi-Sensor Fusion and Visual Guided Localization	IHub IIT Mandi	39.82 Lakhs	2	Co-PI

Publications

Transactions and Journals

1. N Pandey, S Prakash S.K, A Gupta, A Shivrathri, **P Hambarde**, A Shukla, "Autonomous Vision-based Low-altitude Tracking of Horizontal Pipe-structure by Multi-copter", In **IEEE Transactions on Artificial Intelligence**, 2026,1-18

2. D Ameta, H Sharma, **P Hambarde**, L Behera, "Biomedical Fragmented Attention Spectral Transformer Network for Infrared spectra analysis", In **IEEE Transactions on Instrumentation and Measurement**, 2026,75, 1-12.
3. V M. Galshetwar, **P Hambarde**, P W. Patil, A Dudhane, S K Vipparthi, S Murala, "Clear Roads, Clear Vision: Advancements in Multi-Weather Restoration for Smart Transportation", In **IEEE Transactions on Intelligent Transportation Systems**, 2026, 1-19.
4. S N Tazi, **P Hambarde**, S K Vipparthi, S Murala, "HiT-HGR: A Multi-Scale Oriented Hierarchical Transformer for Hand-Gesture Recognition", In **IEEE MultiMedia Journal**, 2026, **(Accepted)**.
5. A Gupta, A Gupta, **P Hambarde**, A Shukla, "Lateral-Offset-Invariant Depth Estimation of Buried Cables via Four-Coil Electromagnetic Sensing", In **IEEE Transactions on Instrumentation and Measurement**, 2026, **(Under review)**.
6. V Shukla, Raghav Agarwal, S Chavan, **P Hambarde**, A Shukla, "QAV-Net: Quantum-Attentive Vision Framework for Pavement Surface Monitoring in Autonomous Vehicles", In **IEEE Transactions on Intelligent Vehicles**, **(Under review)**.
7. V Shukla, **P Hambarde**, A Shukla, "OmniCrackFormer: A Unified Transformer Model for Crack Segmentation Across Various Infrastructure", In **IEEE Transactions on Intelligent Transportation Systems**, **(Under review)**.
8. D Ameta, U Mishra, **P Hambarde**, A Shukla, "GRAD-Former: Gated Robust Attention-based Differential Transformer for Change Detection", In **IEEE Transactions on Geoscience and Remote Sensing**, **(Under review)**.
9. D Ameta, H Sharma, **P Hambarde**, L Behera, "CIRSNet: A lightweight Chemo-metric Infrared Spectral Network for spectral analysis", In **IEEE Transactions on Instrumentation and Measurement**, 2025, 1-13.
10. S N Tazi, **P Hambarde**, S K Vipparthi, S Murala, "CrFe-CCT: Cross-feature Aggregation-based Compact Convolution Transformer for Hand-Gesture Recognition", In **Computers and Electrical Engineering**, 2025, **(Accepted)**.
11. **P. Hambarde**, G. Wadhva, S. K. Vipparthi, S. Murala, A. Dhall, "Occlusion Boundary Prediction and Transformer Based Depth-Map Refinement From Single Image", in **ACM Transactions on Multimedia Computing, Communications, and Applications**, 2024.
12. **P. Hambarde**, S. Murala, A. Dhall, "UW-GAN: Single Image Depth Estimation and Image Enhancement for Underwater Images", in **IEEE Transactions on Instrumentation and Measurement**, 70, 1-12, 2021.

13. **P. Hambarde**, S. Murala, "S2dnet: Depth estimation from single image and sparse samples", in *IEEE Transactions on Computational Imaging*, **6**, 806-817, 2020.
14. S. Bhagat, M. Kokare, V. Haswani, **P. Hambarde**, T. Taori, P. Ghante, and D Patil. "Advancing real-time plant disease detection: A lightweight deep learning approach and novel dataset for pigeon pea crop", *Elsevier Smart Agricultural Technology*, **100408**, 2024
15. S. Bhagat, M. Kokare, V. Haswani, **P. Hambarde**, R. Kamble, "Eff-UNet++: A novel architecture for plant leaf segmentation and counting", in *Elsevier Ecological Informatics*, **101583**, 2022.
16. **P. Hambarde**, S. Talbar, A. Mahajan, S. Chavan, M. Thakur, and N. Sable, "Prostate lesion segmentation in MR images using radiomics based deeply supervised U-Net", *Elsevier Biocybernetics and Biomedical Engineering*, **40(4)**, pp.1421-1435, 2020.
17. A. Dudhane, **P. Hambarde**, Prashant W. Patil, S. Murala, "Deep Underwater Image Restoration and Beyond", *IEEE Signal Processing Letters*, **27**, 675-679, 2020.
18. **P. Hambarde**, S. Talbar, A. Mahajan, S. Chavan, M. Thakur, and N. Sable, "Radiomics for peripheral zone and intra—prostatic urethra segmentation in MR imaging", *Elsevier Biomedical Signal Processing and Control*, **51**, pp.19-29, 2019.

Conferences

1. A Negi, H Sharma, P Shaily, J Kumar, S Chaudhary, A Dudhane, **P Hambarde**, and A Shukla. "Beyond Backbones: Degradation-Aware Prototype Fusion for Robust Deepfake Detection." In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 2227-2235. 2026.
2. H Sharma, A Negi, P Shaily, J Kumar, S Chaudhary, A Dudhane, **P Hambarde**, and A Shukla. "TRIDENT: Robust Deepfake Detection via Tri-Modal Forensic Ensembles." In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 2508-2517. 2026.
3. U. Mishra, V. Shukla, **P. Hambarde**, A. Shukla, "Improvise, Adapt, Overcome: Telescopic Adapters for Finetuning Vision-Language Models for Segmentation Tasks in Medical Imagery (Ultralightweight)," In *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision*, pp. 7605-7615. 2026.
4. S. Tiwari, M. Vaibhav, **P. Hambarde**, A. Shukla, and L. Behera, "PRISM-Nav:Pre-SLAM Integrated Scan Merging for Autonomous Wheelchair Navigation," in *Proc. 2026 IEEE 22nd Int. Conf. Automation Science and Engineering (CASE)*, Shenyang, China, Aug. 2026, Accepted.

5. J Rachapudi, R Vatsi, P Singh, **P Hambarde**, A Shukla, "BackFlush: Knowledge-Free Backdoor Detection and Elimination with Watermark Preservation in Large Language Models," **IEEE International Joint Conference on Neural Networks (IJCNN 2026)**. Accepted
6. V Florin-Alexandru, T Seizinger, Z Zhou, Z Wu, R Timofte, **P Hambarde**, L Beltrame, J Salzinger et al. "Advances in Single-Image Shadow Removal: Results from the NTIRE 2026 Challenge." In **Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), Workshop**, pp. 2582-2595. 2026.
7. H Benedikt, R Timofte, C Qu, J Li, **P Hambarde**, F Wu, D Lu, M Yao et al. "Robust Deepfake Detection, NTIRE 2026 Challenge: Report." In **Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), Workshop**, pp. 1925-1938. 2026.
8. C George, A Rehman, F Dharejo, R Ali Naqvi, M V. Conde, R Timofte, **P Hambarde**, Z Jin et al. "Low Light Image Enhancement Challenge at NTIRE 2026." In **Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), Workshop**, pp. 1741-1753. 2026.
9. G Aleksandr, K Abud, E Shumitskaya, A Filippov, G Bychkov, S Lavrushkin, **P Hambarde** M Erofeev et al. "NTIRE 2026 Challenge on Robust AI-Generated Image Detection in the Wild." In **Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), Workshop**, pp. 1895-1913. 2026.
10. P Korshunov P, A.M. Vedit, C Ecabert, N Shamoska, H Sharma, S Chaudhary, A Dudhane, **P Hambarde**, A Shukla, J., Lazarevic, L Khizbullin, R. Evteeva, "Deepid challenge of detecting synthetic manipulations in id documents". In **Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV-2025)**. IEEE (Vol. 3).
11. A Gautam, A Pawar, A Joshi, SN Tazi, S Chaudhary, **P Hambarde**, A Dudhane, S Vipparthi, S Murala, "Pureformer: Transformer-Based Image Denoising", In **Proceedings of the Computer Vision and Pattern Recognition Conference CVPR-2025**, pp. 1441-1449, 2025.
12. Bin Ren, Hang Guo, **P Hambarde**, Lei Sun, Zongwei Wu, Radu Timofte, Yawei Li, et al. "The tenth NTIRE 2025 efficient super-resolution challenge report", In **Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR-2025)**, Workshops, 2025.
13. Lei Sun, Hang Guo, **P Hambarde**, Bin Ren, Luc Van Gool, Radu Timofte, Yawei Li, et al. "The tenth ntire 2025 image denoising challenge report", In **Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR-2025)**, Workshops, 2025.

14. Zheng Chen, Kai Liu, **P Hambarde**, Jue Gong, Jingkai Wang, Lei Sun, Zongwei Wu, Radu Timofte, Yulun Zhang, Xiangyu Kong, et al. "NTIRE 2025 Challenge on Image Super-Resolution (x4): Methods and Results", In Proceedings of the **IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR-2025)**, Workshops, 2025.
15. Yuekun Dai, Dafeng Zhang, **P Hambarde**, Xiaoming Li, Zongsheng Yue, Chongyi Li, Shangchen Zhou, Ruicheng Feng, Peiqing Yang, et al. "MIPI 2024 Challenge on Nighttime Flare Removal: Methods and Results", In Proceedings of the **IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR-2024)**, Workshops, 2024.
16. R Tekchandani, R Maheshwari, **P Hambarde**, S N Tazi, S K Vipparthi, S Murala, "LUMINATE: Linguistic understanding and multi-granularity interaction for video object segmentation", In **IEEE International Conference on Image Processing ICIP-2024**, Abu Dhabi, United Arab Emirates, pp. 4028-4034, 2024.
17. Florin-Alexandru Vasluianu, Tim Seizinger, **P Hambarde**, Zhuyun Zhou, Zongwei WU, Cailian Chen, Radu Timofte, et al. "NTIRE 2024 image shadow removal challenge report", In Proceedings of the **IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR-2024)**, Workshops, 2024.
18. Y Dai, D Zhang, **P Hambarde**, X Li, Z Yue, C Li, S Zhou, et al. "MIPI 2024 Challenge on Nighttime Flare Removal: Methods and Results", In Proceedings of the **IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR-2024)**, Workshops, 2024.
19. P. Patil, J. Singh, **P. Hambarde**, A. Kulkarni, S. Chaudhary, S. Murala, "Robust Unseen Video Understanding for Various Surveillance Environments", In **IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS-2022)**, Hybrid - Madrid, Spain, pp. 1-8, 2022.
20. R. Malik, **P. Hambarde**, S. Murala, "Depth Estimation Using Sparse Depth and Transformer", In **International Conference on Computer Vision and Image Processing (CVIP 2021)**, pp. 329-337, 2021.
21. S. Bhagat, M. Kokare, V. Haswani, **P. Hambarde**, R. Kamble, "WheatNet-Lite: A Novel Light Weight Network for Wheat Head Detection", n Proceedings of the **IEEE/CVF international conference on computer vision (ICCVW-2021)**, Montreal, Canada, pp. 1332-1341, 2021.
22. S Bhagat, M Kokare, V Haswani, **P Hambarde**, R Kamble "MS-Net: A CNN Architecture for Agriculture Pattern Segmentation in Aerial Images ", In **International Conference on Computer Vision and Image Processing (CVIP 2021)**, pp. 489-500, 2021.

23. **P. Hambarde**, A. Dudhane, Prashant W. Patil, S. Murala, A. Dhall "Depth Estimation from Single Image and Semantic Prior's", **IEEE International Conference on Image Processing (ICIP-2020)**, Abu Dhabi, United Arab Emirates, pp. 1441-1445, 2020.
24. A. Dudhane, K. Biradar, Prashant W. Patil, **P. Hambarde**, S. Murala, "Varicolored Image De-hazing", In proceedings of the **IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR-2020)**, Seattle, WA, USA, pp. 4564-4573, 2020.
25. P. Alaspure, **P. Hambarde**, A. Dudhane, S. Murala, "DarkGAN: Night Image Enhancement Using Generative Adversarial Networks", In **International Conference on Computer Vision and Image Processing (CVIP 2020)**, pp.293-302, 2020.
26. **P. Hambarde**, A. Dudhane, S. Murala, "Single image depth estimation using deep adversarial training", in **IEEE International Conference on Image Processing (ICIP-2019)**, Taipei, Taiwan, pp. 989-993, 2019.

Extra Curricular Activities

1. Organized **"ZenTej Hackthon 2025"** at IIT Mandi, INDIA.
2. Conducted Certificate Course on **"Artificial Intelligence using Deep Learning"** at Don Bosco Institute of Technology Mumbai, INDIA. in 2022
3. Conducted Certificate Course on **"Deep Learning: Concepts and Applications"** at SGGSI&T Nanded, INDIA.
4. Co-coordinated Organizing Committee in **"CVIP-2021"**, (International Conference) held at IIT Ropar, INDIA.
5. Co-coordinated Organizing Committee in **"ICIIS-2020"**, (International Conference) held at IIT Ropar, INDIA.
6. Co-coordinated Organizing Committee in **"ICIIS-2018"**, (International Conference) held at IIT Ropar, INDIA.
7. Co-coordinated Organizing Committee in **"IConSIP-2016"** (International Conference) held at SGGSI&T Nanded, INDIA.

Academic Responsibilities

- Serving as Assistant Warden of Beaskund Hostel.
- Member of the Canteen/Mess Selection Committee.
- Nominee to the Board of Academic Affairs (BoA) from CAIR.

Achievements

- Achieved a **top-5 global ranking** in the **ICCV, DeepID Challenge 2025**, an international deepfake detection competition.
- Achieved a **top-8 global ranking** in the **CVPR, NTIRE 2025 Image Denoising Challenge**.
- Achieved a **top-10 global ranking** in the **CVPR, NTIRE 2025 Efficient Super-Resolution Challenge**.
- Achieved a **top-15 global ranking** in the **CVPR, NTIRE 2025 Image Super-Resolution ($\times 4$) Challenge**.
- Received a **USD 1,000 travel grant** from the **IEEE Signal Processing Society** to attend **ICIP 2019** held in Taipei, Taiwan.

Professional Services

Reviewer

1. IEEE Transactions on Instrumentation and Measurement (IEEE)
2. IEEE Transactions on Geoscience and Remote Sensing (IEEE)
3. IEEE Transactions on Affective Computing (IEEE)
4. IEEE Transactions on Multimedia (IEEE)
5. IEEE Transactions on Computational Imaging (IEEE)
6. IEEE Transactions on Intelligent Vehicles (IEEE)
7. IEEE Transactions on Circuits and Systems for Video Technology (IEEE)
8. IEEE Signal Processing Letters (IEEE)
9. IEEE Geoscience and Remote Sensing Letters (IEEE)
10. IEEE Journal of Biomedical and Health Informatics (IEEE)
11. Computers in Biology and Medicine (Elsevier)
12. Biomedical Signal Processing and Control (Elsevier)
13. Engineering Applications of Artificial Intelligence (Elsevier)
14. Computer Vision and Pattern Recognition (CVPR)
15. Winter Conference on Applications of Computer Vision (WACV)
16. AAAI Conference on Artificial Intelligence (AAAI)