

Javed Ahmad

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Research Interests:

- **Core Areas:** 3D Computer Vision, Deep Learning, Multimodal 3D Scene Perception
- **Robotics:** Motion Planning, Robotic Manipulators
- **3D:** SfM, NeRF, Gaussian Splatting and SLAM systems

Experiences

- 02/2025 – present **PostDoc**
Research Lab: Advanced Robotics, IIT, Italy
- Working on immersive remote tele-operation of robots
 - Developing a novel Gaussian Splatting based SLAM system
- 02/2024 – **PostDoc**
01/2025 **Research Lab:** Center for Cultural Heritage Technology, IIT, Italy
- Collaborated with [CTE-Genova](#) for 3D artifact reconstruction via robotic manipulators
 - Designed synchronized motion planning pipelines for UR5e and UR3e robotic arms to scan artifacts with Artec 3D scanner and manipulate artifacts tray.
 - Developed algorithms for precise pose tracking of complex shaped artifacts
- 11/2020 – **Doctoral Researcher**
12/2023 **Research Lab:** Pattern Analysis and Computer Vision (PAVIS), IIT, Italy
- Developed novel LiDAR-Camera fusion scheme, improving accuracy and reliable 3D perception
 - Contributed to 3D object localization for [MEMEX Project](#) from crowd-sourced images
 - Performed LiDAR-Camera calibration procedures
- 07/2017 – **Research Assistant**
10/2020 **Research Lab:** CACTUS, ITU, Pakistan
- Worked on SfM 3D reconstruction
 - Worked on vibration signal processing via machine learning for fault diagnosis in rotating machinery
- 2017 – 2019 **Teaching Assistant**
University: Information Technology University (ITU), Pakistan
- **Graduate Course:** Machine Learning
 - **Undergrad Courses:** Calculus & Analytical Geometry, Power System Analysis

Education

- 11/2020 –12/2023 **Ph.D. in Computational Vision, Automatic Recognition, and Learning**
Thesis Title: Multimodal 3D Scene Perception
Research Lab: Pattern Analysis and Computer Vision (PAVIS), IIT, Italy
University: University of Genoa (UniGe), Italy

- 2017 – 2019 **Master of Science in Electrical Engineering**
University: Information Technology University (ITU), Pakistan
Major Subjects: Advanced Mathematics, Machine Learning, Control System Theory, Digital Signal Processing
- 2013 – 2017 **Bachelor of Science in Electrical Engineering**
University: University of Central Punjab, Pakistan
Major Subjects: Signal Processing, Image Processing, Control Systems, Electronics

Programming and Skills

- Python: *Expert* (Pytorch, Numpy, Pandas, Scipy, and more)
- Computer Vision: *Expert* (OpenCV, Open3D, Meshcat, Viser, Nerfstudio, BPY, Torchvision, MMCV, and more)
- Deep Learning: *Expert* (Transformers, DINO, UNet, and more)
- Robotics Lib.: *Experienced* (ROS2, Pinocchio, Pyroboplan, UR-RTDE)
- Robotic Arms: *Experienced* (UR5e, UR3e)
- 3D Perception: *Advanced* (mmdetection3D, LiDAR-Camera Fusion Techniques)
- Parallel Computation: *Experienced* (Franklin-HPC: NVIDIA Tesla V100, A100, A6000)
- Others: *Knowledgeable* (Blender, C++, MATLAB)
- Currently Practicing: NVIDIA Omniverse & Isaac Sim, Moveit2

Publications

- IROS 2025 (Decision Pending) **Ahmad J.**, et al. DARS: A Dual-Arm Robotic System for Autonomous 3D Scanning of Artefacts. [Project Page: https://javi-99.github.io/DARS/](https://javi-99.github.io/DARS/)
- IEEE/ASME **Ahmad, J.**, Frascella, S., Dassiè, F., et al. Automated Artifacts Position and Orientation Estimation in Cultural Heritage. 2024 IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA) [[Teaser](#)] [[Presentation](#)] [[IEEEExplore DOI](#)]
- arXiv **Ahmad, J.**, Del Bue, A. mmFUSION: Multi-modal Fusion for 3D Object Detection. 2023 [[arXiv link](#)] [[Presentation](#)]
- ICIAP **Ahmad, J.**, Toso, M., Taiana, M., James, S., Del Bue, A. Multi-view 3D Objects Localization from Street-level Scenes. 2022 International Conference on Image Analysis and Processings. [[Springer DOI](#)] [[GitHub code](#)] [[Presentation](#)]
- Journal Castro, E., ..., Ahmad, J., et al. Fill in the Blank for Fashion Complementary Outfit Product Retrieval. 2022 Journal of Machine Vision and Applications. [<https://doi.org/10.1007/s00138-022-01359-x>]
- CVPR Workshop **Ahmad, J.**, Shamshad F., et al. Deep Unsupervised Deblurring Approach for Improving Crops Disease Classification. 2020 CVPR Workshop on Agriculture-Vision. [[Workshop Link](#)]

Reviewer Activity

Reviewer for IEEE RA-L, ICRA 2025, IROS 2025

Summer Schools

- Jul 2023 **International Computer Vision Summer School (ICVSS), Sicily**
School Theme: From Perception to Action
My Poster: 3D Scene Perception from Single to Multi-modalities [[Poster link](#)]
- Jul 2022 **Vision and Sports Summer School (VS3), Prague**
Focused on advanced computer vision techniques for 2D/3D object recognition, multi-modal learning, and 3D neural rendering.
- Jul 2021 **Vision Understanding and Machine Intelligence Summer School (VISUM), Porto**
Winner of project competition on fashion product retrieval using deep learning. [[Presentation link](#)]
- Jul 2020 **Eastern European Machine Learning Summer School (EEML)**
Winner of 3D historic landmark reconstruction proposal in unconference research competition. [[Presentation link](#)]

Awards & Prizes

1st Prize Winner — VISUM 2021 and EEML 2020 Competition Challenges
MS Fellowship granted by ITU, Pakistan

Community Service

Former member of Akhuwat Foundation, Pakistan, involved in charity fundraising. Actively seeking further community engagement opportunities.