

Javed Ahmad

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Expertise & Research Focus

- **Core:** 3D computer vision | deep learning | multimodal scene understanding
- **3D Vision & Mapping:** SLAM | SfM | NeRF | 3D Gaussian Splatting | large-scale 3D reconstruction
- **Robotics:** robotic-arm motion planning | autonomous micro-UAV systems

Experience

- 09/2025 – Present **Computer Vision Researcher, DeepPlants, Rome, Italy**
- Developing SLAM and 3D reconstruction pipelines for agricultural field analysis.
 - **ModelAI micro-UAV (development platform):** Designing ground-station and onboard pipelines for VOXL 2 (MAVSDK/MAVLink, PX4), enabling fully autonomous flight and real-time RGB data streaming for backend SLAM integration.
 - **DJI Mavic 3 (commercial platform):** Conducting large-scale field-scanning missions to generate high-resolution imagery used for SLAM benchmarking and as reference data for development.
- 02/2024 – 08/2025 **Postdoctoral Researcher, Italian Institute of Technology (IIT), Italy**
- Advanced Robotics (ADVR), IIT Genova** 02/2025 – 08/2025
- Developed real-time SLAM pipelines using 3D Gaussian Splatting for immersive teleoperation (RIAP Project).
- Center for Cultural Heritage Technology (CCHT), IIT Venice** 02/2024 – 01/2025
- Built an autonomous 3D artefact-scanning system using UR5e/UR3e manipulators and Artec3D.
 - Delivered and deployed the scanning system at [CTE-Genova](#).
 - Developed 6-DoF pose-tracking algorithms for complex cultural-heritage artefacts.
- 11/2020 – 12/2023 **Doctoral Researcher, PAVIS Lab, IIT, Italy**
- Developed a LiDAR-camera fusion framework enhancing 3D scene perception for autonomous vehicle applications.
 - Worked on multi-view 3D object localization as part of the cultural-heritage augmented-reality [MEMEX Project](#).
- 07/2017 – 10/2020 **Research & Teaching Assistant, Information Technology University, Pakistan**
- Worked on 3D reconstruction and applied machine learning, and served as a teaching assistant for graduate Machine Learning and undergraduate Calculus and Power Systems courses.

Technical Skills (including but not limited to)

Python	NumPy SciPy Pandas Matplotlib Multiprocessing PyTest
Deep Learning	PyTorch Transformers DINO U-Net 2D/3D model training
3D Vision	OpenCV Viser Open3D Nerfstudio MMCV NeRF 3D Gaussian Splatting
Robotics SW	ROS 2 Pinocchio PyRoboplan MoveIt 2 UR-RTDE
Robotics Hardware	UR5e UR3e Raspberry Pi RDK-X5 Artec3D Zivid ZED RealSense
3D Mapping	COLMAP MAST3R/VGGT-SLAM ViPE DepthAnything 3 MMDetection3D
Drones	ModelAI PX4 MAVSDK MAVLink VOXL 2 Gazebo SITL
GPUs	NVIDIA V100/A100 RTX A6000/4090/5090

Education

- 2020 – 2023 **Ph.D. in Computer Vision and Machine Learning**,
Italian Institute of Technology (IIT) & University of Genoa (UniGe), Italy
Thesis: *Multimodal 3D Scene Perception*
- 2017 – 2019 **Master of Science in Electrical Engineering**,
Information Technology University, Pakistan
- 2013 – 2017 **Bachelor of Science in Electrical Engineering**,
University of Central Punjab, Pakistan

Selected Publications

- arXiv 2025 **Ahmad, J.**, et al. *From Fields to Splats: A Cross-Domain Survey of Real-Time Neural Scene Representations*. [arXiv:2509.23555](#)
- arXiv 2025 **Ahmad, J.**, et al. *Hands-Free Heritage: Automated 3D Scanning for Cultural Heritage Digitization*. [arXiv:2510.04781](#)
- IEEE/ASME MESA 2024 **Ahmad, J.**, 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](#)] [[IEEE Xplore DOI](#)]
- arXiv 2023 **Ahmad, J.**, Del Bue, A. *mmFUSION: Multi-modal Fusion for 3D Object Detection*. [[arXiv Link](#)] [[Presentation](#)]
- ICIAP 2022 **Ahmad, J.**, Toso, M., Taiana, M., James, S., Del Bue, A. *Multi-view 3D Object Localization from Street-level Scenes*. International Conference on Image Analysis and Processing (ICIAP), 2022. [[Springer DOI](#)] [[GitHub Code](#)] [[Presentation](#)]
- Machine Vision and Applications 2022 Castro, E., ..., **Ahmad, J.**, et al. *Fill in the Blank for Fashion Complementary Outfit Product Retrieval*. Journal of Machine Vision and Applications, 2022. [[DOI: 10.1007/s00138-022-01359-x](#)]

Awards & Prizes

- 1st Prize Winner at VISUM 2021 and EEML 2020
Merit-based Master's Fellowship, ITU Pakistan

Reviewer Activity

- IEEE RA-L, ICRA 2025, and IROS 2025

Summer Schools

- 2023 **ICVSS, Sicily**, poster on 3D scene perception [[Poster](#)]
2022 **Vision and Sports, Prague**
2021 **VISUM, Porto**, competition winner [[Project](#)]
2020 **EEML, Poland**, proposal winner [[Proposal](#)]
2020 **OXML, London**, Fully sponsored based on academic profile

Community Service

- Former member of Akhuwat Foundation, Pakistan, contributed to charity fundraising initiatives.