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Javed Ahmad

Expertise and Research Focus

Core 3D computer vision, deep learning, multimodal scene perception

3D Mapping SLAM, structure from motion (SfM), neural radiance fields (NeRF), 3D Gaussian Splatting, large-scale 3D reconstruction

Robotics Autonomous UAV perception, robotic manipulation, motion planning, visual localization

Experience

09/2025–Present **Computer Vision Researcher**, *DeepPlants*, Rome, Italy
- Developing autonomous UAV perception systems for agricultural mapping, combining visual localization, SLAM and dense 3D reconstruction.
- Implemented a UAV perception and mission-control pipeline on the ModalAI VOXL 2 platform with PX4, MAVSDK/MAVLink, telemetry and RGB streaming.
- Conducting aerial data-acquisition missions using DJI Mavic 3 imagery for field-scale reconstruction and benchmarking.

02/2024–08/2025 **Postdoctoral Researcher**, *Italian Institute of Technology (IIT)*, Italy

Advanced Robotics (ADVR), Genoa *02/2025–08/2025*
- Developed SLAM and 3D Gaussian Splatting pipelines for robotic teleoperation and real-time 3D environment visualization.

Center for Cultural Heritage Technology (CCHT), Venice *02/2024–01/2025*
- Developed an autonomous 3D artifact-scanning system with UR5e/UR3e robotic manipulators and an Artec3D scanner.
- Developed 6-DoF pose estimation and object-scanning methods for cultural-heritage applications.
- Deployed a robotic scanning demonstration at CTE Genova.

11/2020–12/2023 **Doctoral Researcher**, *PAVIS Lab, Italian Institute of Technology*, Genoa, Italy
- Developed LiDAR–camera multimodal fusion methods for 3D object detection and autonomous-vehicle perception.
- Investigated multi-view 3D object localization from street-level imagery for the EU MEMEX cultural-heritage project.

07/2017–10/2020 **Research and Teaching Assistant**, *Information Technology University*, Pakistan
- Conducted research on 3D reconstruction and applied machine learning.
- Assisted graduate Machine Learning and undergraduate Calculus and Power Systems courses.

Education

2020–2023 **Ph.D. in Computational Vision, Automatic Recognition, and Learning**, *University of Genoa and Italian Institute of Technology*, Italy
Thesis: *Multimodal 3D Scene Perception*.

2017–2019 **M.S. in Electrical Engineering**, *Information Technology University*, Pakistan

2013–2017 **B.S. in Electrical Engineering**, *University of Central Punjab*, Pakistan

Technical Skills

Programming Python, NumPy, SciPy, Pandas, Matplotlib, PyTest

Deep Learning	PyTorch, Transformers, DINO, U-Net, 2D/3D model training
3D Vision	OpenCV, Open3D, Viser, Nerfstudio, NeRF, 3D Gaussian Splatting
3D Mapping	COLMAP, MASt3R, VGGT, ViPE, Depth Anything 3, MMDetection3D
Robotics SW	ROS 2, Pinocchio, PyRoboplan, MoveIt 2, UR-RTDE
Hardware	UR5e/UR3e, Raspberry Pi, Artec3D, Zivid, ZED, RealSense
UAV Systems	ModalAI VOXL 2, PX4, MAVSDK, MAVLink, Gazebo SITL
GPU Computing	NVIDIA V100/A100, RTX A6000/4090/5090

Selected Publications

WACV 2027 **Ahmad, J.**, Ahmad, S., Amiri, D., and Pirri, F. *AgroMap3D: Reliability-Aware Dense Mapping from Agricultural UAV Video*. IEEE/CVF Winter Conference on Applications of Computer Vision (WACV 2027), Application Track. **Accepted, Project Page:** https://deepplants.github.io/agromap3d/..

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. *Withdrawn pending museum approval for image materials*.

MESA 2024 **Ahmad, J.**, et al. *AAPOE: Automated Artifacts Position and Orientation Estimation in Cultural Heritage*. 20th IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications. DOI: 10.1109/MESA61532.2024.10704902.

arXiv 2023 **Ahmad, J.** and Del Bue, A. *mmFUSION: Multimodal Fusion for 3D Objects Detection*. arXiv:2311.04058.

MVA 2023 Castro, E., et al. (including **Ahmad, J.**). *Fill in the Blank for Fashion Complementary Outfit Product Retrieval: VISUM Summer School Competition*. *Machine Vision and Applications*, 34, Article 16. DOI: 10.1007/s00138-022-01359-x.

ICIAP 2022 **Ahmad, J.**, Toso, M., Taiana, M., James, S., and Del Bue, A. *Multi-view 3D Objects Localization from Street-Level Scenes*. International Conference on Image Analysis and Processing. DOI: 10.1007/978-3-031-06430-2_8.

Awards and Prizes

10/2026 **Ambassador of Pakistan High Achievers Award** – Presented by the Embassy of Pakistan in Rome in recognition of achievements in robotics, computer vision, and technological innovation.

2021 **First Prize, VISUM Summer School Competition** – Vision Understanding and Machine Intelligence (VISUM), Porto, Portugal.

2020 **First Prize, EEML Proposal Competition** – Eastern European Machine Learning Summer School (EEML).

2017 **Merit-Based Master's Fellowship** – Information Technology University, Pakistan.

Summer Schools

2023 International Computer Vision Summer School (ICVSS), Sicily; poster on 3D scene perception

2022 Vision and Sports Summer School, Prague

2021 VISUM Summer School, Porto; competition winner

2020 Eastern European Machine Learning (EEML); proposal competition winner

2020 Oxford Machine Learning Summer School (OxML); sponsored participation

Community Service

Previously contributed to Akhuwat Foundation fundraising initiatives in Pakistan.