Awais Ahmed Nizamani

Perth, Australia | +61 0431 009 633 | awaisnizamani125@gmail.com
Google Scholar | LinkedIn | Website

Education

Murdoch University (MU) & University of Western Australia (UWA) | Perth, Australia *October 2023- Present*
Doctor of Philosophy in Artificial Intelligence
Advisors: Prof. Hamid Laga (MU), Prof. Mohammed Bennamoun (UWA), and Prof. Farid Boussaid (UWA)
Funded by: **ARC Australian Research Council**

- **Research Project: Intelligent Virtual Human Companion (1.5 Million $)**
  - Researching Neural Rendering Methods for Scene and Avatar Generation.
  - Focusing on optimization 3D Generation pipeline.
  - Experimenting with existing structures from motion and Neural Rendering methods on different 3D modalities.
  - Enabling functional shape analysis of 3D and 4D generated shapes.

- **Teaching:**
  - **Programming Fundamentals (ICT-159), 2024–2025** – Delivered lectures on core programming concepts using C, guiding Bachelor's students in developing problem-solving and coding skills.
  - **Foundations of Computer Systems (ICT-170), 2024–2025** – Taught key principles of computer architecture, assembly programming, and system-level operations to Bachelor's students.
  - **Advanced Machine Learning and Artificial Intelligence (ICT-303), 2025** – Lectured Bachelor's and Master's students on advanced ML/AI topics including Multi-Layer Perceptrons (MLP), Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Variational Autoencoders (VAEs), Object Detection, Transformers, and Generative Adversarial Networks (GANs).

National University of Computer and Emerging Science (NUCES) | Karachi, Pakistan *August 2016 - July 2020*
Bachelor of Science in Computer Science, GPA 3.58
Thesis Advisor: Dr. Tahir Syed

- **DisasterTweetNet: Multimodal Hierarchical Classification of Natural Disaster Tweets**
  - Worked on multi-modal natural disaster datasets containing Twitter tweets of text and images.
  - Developed a real-time tweet processing system by finetuning joint feature embeddings using fusion techniques.
  - Experimented on the pre-trained text embeddings, optimization of hierarchical label, and combination of text/image features.

Publication

Awais Nizamani*, Hamid Laga**,** Gaunjin Wang, Farid Boussaid, Mohammed Bennamoun, Anuj Srivastava (CVPR, 2025)
"Dynamic Neural Surfaces for Elastic 4D Shape Representation and Analysis."

Sateesh Kumar*, Sanjay Haresh*, ***Awais Ahmed**,* Andrey Konin, M. Zeeshan Zia, Quoc-Huy Tran, (CVPR, 2022)
"Unsupervised Action Segmentation by Joint Representation Learning and Online Clustering."

Hamza Khan*, Sanjay Haresh, ***Awais Ahmed**,* Shakeeb Siddiqui**,** Andrey Konin, M. Zeeshan Zia, (IROS, 2022)
Quoc-Huy Tran, "Timestamp Supervised Action Segmentation with Graph Convolutional Networks."

Awais Ahmed Nizamani, "Dataset Augmentation Strategies for Visual Activity Recognition in (ICCC, 2022)
Deep Neural Networks".

Andrey Konin, Shakeeb Siddiqui, Hasan Gilani, Muhammad Mudassir, M Hassan Ahmed, (ISMAR, 2022)
Taban Shaukat, Muhammad Naufil, ***Awais Ahmed**,* Quoc-Huy Tran, M Zeeshan Zia,
"AI-mediated Job Status Tracking in AR as a No-Code service."

Muhammad Shakeeb Hussain Siddiqui Quoc-Huy Tran, Muhammad Zeeshan Zia, Andrey Konin, (US Patent, 2022)
Sateesh Kumar, Sanjay Haresh, ***Awais Ahmed***, Hamza Khan,
"System and method for determining sub-activities in videos and segmenting the videos
with little to no annotation."

Experience

Gordian Robotics | Pittsburgh, Pennsylvania *Jan 2024 - Mar 2024*
Part time Contractor (Computer Vision)

- Worked as a part-time contractor to help develop a prototype online retail system for an early-stage startup.
- Integrated computer vision models like YOLO, Segment Anything, and DINOv2 to detect and track grocery products.
- Designed a smart shelf monitoring pipeline to predict stock depletion and update product databases in real-time.

Retrocausal, Inc. | Redmond, Washington *July 2020 - Nov 2023*
Lead Research Engineer (Computer Vision)
Advisors: Dr. Zeeshan Zia (Ex-ETH and Ex-MSR) and Dr. Quoc-Huy Tran (Ex NEC-Labs)

- **NASA Exploratory Medical Capabilites (ExMC)**
  - Worked on NASA 125K $ funded grant for their Mars Exploratory Mission.
  - Created Realtime Medical guidance for professional workers and students.
  - Integrated multimodal action recognition and anomaly detection models.
  - Developed medical guidance for Central Line Placement, Blood Draw, and FAST Exam with Ultrasound (link).
  - Delivered prototype product for software experience.

- **Smart Activity Tracking Platform (MLOps)**
  - Leading our AI mediated Job Status Tracking system with No Code service.
  - Integrated and built SOTA functionalities for seamless object tracking using Segment Anything/Sythesis Algorithms.
  - Developed end to end pipeline using AWS services, containerization, and terraform for tracking and monitoring.
  - Designed architecture pipeline on existing Path Finder application with customer feedback.

- **Pathfinder Platform for real-time worker guidance with Computer Vision (MLOps)**
  - Designed activity experience for 10+ customers including Ford, Honda, Nissan, Bosch, Siemens, and SBD.
  - Experimented with action recognition models that include C3D, I3D, X3D, TSM, TCN, ViVit, and MoviNet.
  - Integrated object tracking experience for substep verification.
  - Optimized action models for edge device experience using TensorRT.
  - Altered Object Detection, Action Recognition, and Pose Estimation algorithms for customer specifications.
  - Published our software experiences and best practices for video understanding in *ISMAR* and *ICCC*.

- **Unsupervised Activity Segmentation (Research)**
  - Proposed novel unsupervised action segmentation model with joint representation learning and online clustering.
  - Introduced temporal cues by using temporal optimal transport and temporal coherence loss.
  - Created a memory-efficient model with online clustering.
  - Achieved 12% improvement over state-of-the-art methods and published in *CVPR.*
  - Developing non-monotonic and background frame handling.

- **Time-Stamp Supervised Activity Segmentation (Research)**
  - Proposed weighted and unweighted graph convolution network for label propagation.
  - Introduced end-to-end training module configuration by superseding heuristic based approaches.
  - Achieved 4% improvement over SOTA methods and published the results in *IROS* .

NCAI Labs. | Karachi, Pakistan *January, 2020 - April 2020*
Research Intern (Computer Vision)

- **Autonomous Car Project**
  - Developed object detection, optical character recognition, and depth estimation models for city streets.
  - Evaluated RealTime model performance on Python and C++.

Software Skills

Programming: Python, C++.
Framework: PyTorch, TensorFlow, OpenCV, GitHub, Docker, CUDA.
Cloud Platforms: AWS and Azure.
Computer Vision: Activity Recognition, Object Detection, Neural Rendering, Pose Estimation, and Semantic Segmentation.

Relevant Coursework

Convolutional Neural Networks for Visual Recognition (Stanford CS 231n): studied foundations of computer vision using deep learning methods; experimented with rudimentary neural networks towards Generative and Reinfocement Learning models; experienced various computer vision tasks like object recognition, video and scene understanding.

Fundamentals of Computer Vision: evolution of computer vision, and its progress from signal processing and Fourier transform towards convolutional networks; developed object descriptors like SIFT; convolutional models.

Machine Learning and Deep Learning Specialization (Coursera): studied mathematical notion of machine learning models like SVM, Decision Tree, etc, learned its evolution towards deep learning; specialized in hyperparameter tuning, convolution networks, recurrent networks and transformer models.

Talks & Outreach

Python WA (2025) – *PyTorch: Recognizing Objects and Humans from Images and Videos using Deep Learning*

Fortescue (2025) – *AI for Computer Vision Applications in Mining and Industry*

Python WA (2024) – *Introduction to Deep Learning with PyTorch*