

# Tanseef Shahid

COMPUTER VISION RESEARCHER (3D/2D)

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## Professional Summary

Experienced computer vision researcher with almost 5 years of expertise in 3D reconstruction, pose estimation, and generative AI. Specialized in developing cutting-edge solutions, including virtual fitting systems, 3D avatar modeling, and garment segmentation, leveraging advanced deep learning frameworks such as PyTorch and TensorFlow. Demonstrated proficiency in creating and fine-tuning state-of-the-art models, including Stable Diffusion, for real-world applications. Skilled in end-to-end workflows, from data preparation and preprocessing to model development and optimization. Passionate about driving innovation in computer vision and 3D reconstruction, with a strong foundation in generative and parametric modeling.

## Work Experience

### PERSPECTIVE Corp.

Seoul, Korea

#### SENIOR AI RESEARCHER

APR. 2022 - Present

- **Virtual Try-On System:** Adapted techniques from the paper "LADi-VTON: Latent Diffusion Textual-Inversion Enhanced Virtual Try-On" to develop a robust virtual fitting model. Prepared high-quality training data, implemented advanced preprocessing (DensePose, Pose Estimation, SCHP), and trained all pipeline modules. Enhanced garment fitting accuracy by optimizing pose-based alignment and refining model performance, delivering realistic and scalable virtual try-on solutions.
- **3D Reconstruction:** Utilized generative AI models, including LRM, NeRF and Occupancy Networks, to reconstruct 3D objects from 2D images. Applied advanced deep learning techniques to enhance the accuracy and detail of 3D reconstructions, developing and integrating novel methods for improved 2D to 3D transformation.
- **Object Segmentation:** Developed a robust background removal and object segmentation process to extract objects from 2D images for 3D reconstruction. Implemented advanced computer vision algorithms to achieve precise object segmentation, including detailed part segmentation and classification for virtual try-ons of clothing. Enhanced segmentation accuracy to support high-quality 3D model generation and virtual fitting applications.
- **Expertise in 3D Modeling and Procedural Rendering Techniques:** Expertise in 3D Reconstruction and Computer Vision Techniques: Developed a deep understanding of 3D reconstruction methods, including point clouds, voxels, and mesh processing, with extensive experience in 3D surface reconstruction and handling complex 3D data. Proficient in procedural rendering for CAD and 3D models, utilizing Blender's bpy scripting to automate rendering workflows. Extracted camera intrinsics, optimized lighting, applied rotations, and introduced noise to generate high-quality and diverse training datasets.
- **FaceSwap Service Using DeepFake Technology:** Developed a FaceSwap service based on deepfake technology, enabling seamless and cost-effective digital transformations for commercial applications. Leveraged a FaceSwap model to perform realistic facial swaps in images and videos, ensuring high accuracy and visual realism. Designed and optimized the model to handle complex scenarios, including side poses, faces covered by hands or hair, and varied lighting conditions.

- **Safety Equipment and Zone Monitoring System:** Developed and deployed an AI-powered solution to detect construction workers' safety equipment (e.g., helmets, vests) and monitor restricted zones for enhanced on-site safety. Designed and trained object detection and zone monitoring models, optimized for real-time inference on the Jetson TX2 board. Successfully deployed the system on a construction site, ensuring accurate and efficient detection of safety compliance and hazardous zone breaches.
- **Automatic License Plate Recognition System for Gas Stations:** Designed and implemented a real-time AI system to capture and recognize license plates of vehicles across all fueling machines. Developed synthetic datasets of diverse license plate types to train and optimize the recognition model, ensuring robust performance in varying conditions. Deployed the system for real-time operation, automating vehicle identification to enhance efficiency and monitoring at gas stations.
- **Abnormal Behavior and Action Detection System:** Contributed to the development of an AI-driven system for detecting abnormal behaviors and tracking actions in real-time. Utilized advanced computer vision and deep learning techniques for person tracking and object tracking across video feeds. Implemented algorithms to identify and classify abnormal activities, enhancing security and situational awareness. Worked on optimizing model performance to ensure accurate detection in diverse environments and dynamic conditions.
- **Boilerplate Text Recognition for Gas Inspection Monitoring:** Developed a module to automatically detect and extract date stamps on boilerplates to track gas inspection records. Utilized Tesseract-OCR for text recognition and OpenCV for image pre-processing, noise reduction, and region extraction.

## Education

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**CAU (Chung-Ang University) - [www.cau.ac.kr](http://www.cau.ac.kr)**

Seoul, South Korea

M.S. IN COMPUTER SCIENCE (COMPUTER VISION)

Mar. 2017 - Sep. 2019

- **Thesis Title:** Object Segmentation with Active Contours Driven by Weight Matrix
- **Research Areas:** Active Contours, Image Segmentation, Object Detection and Tracking
- **Project:** Real-time Object Detection and Tracking with UAV (Drone)

**GIKI (Ghulam Ishaq Khan Institute of Engineering Sciences and Technology) - [www.giki.edu.pk](http://www.giki.edu.pk)**

Topi, Pakistan

B.S. IN ELECTRONIC ENGINEERING

2011 - 2016

- **Final Year Project:** Smart Blind Navigation System  
The project aimed to assist visually impaired individuals in walking, identifying familiar faces, and navigating using Raspberry Pi, camera, and GSM module with OpenCV algorithms.

## Technical Skills

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### PROGRAMMING

Python, C++, PyTorch, OpenCV, CUDA, TensorFlow

### 3D GRAPHICS

NeRF, Occupancy Networks, Automated 3D Rendering

### GENERATIVE MODELS

Stable Diffusion, CLIP-based models

### TOOLS & FRAMEWORKS

Docker, ONNX, Qt Framework, Blender Python (bpy)

### VERSION CONTROL

Git, GitHub

## DEPLOYMENT

Real-time inference on Jetson TX2, API development with Docker

## Academic Achievements

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### CAYSS SCHOLARSHIP:

Won Chung Ang Young Scientist Scholarship for my masters degree.

### FYP COMPETITION:

Secured Second position in the final year project competition in bachelor's.

## Publications

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### Masters

- A Munir, S. Soomro, **M.T. Shahid**, T.A. Soomro, K.N. Choi. "Hybrid active contours driven by edge and region fitting energies based on p-Laplace equation", IEEE Access (2019).
- Kim, D. D., **M.T. Shahid**, Kim, Y., Lee, W. J., Song, H. C., Piccialli, F., Choi, K. N. (2019, November). "Generating Pedestrian Training Dataset using DCGAN". In Proceedings of the 2019 3rd International Conference on Advances in Image Processing (pp. 1-4).
- Memon, Asif Aziz, Shafiullah Soomro, **M.T. Shahid**, Asad Munir, Asim Niaz, and Kwang Nam Choi. "Segmentation of Intensity-Corrupted Medical Images Using Adaptive Weight-Based Hybrid Active Contours". Computational and Mathematical Methods in Medicine 2020 (2020).

### Master's Thesis

- Object Segmentation with Active Contours Driven by Weight Matrix, 131th Master's Thesis, Chung-Ang University.