Atharva Vaidya

AI/ML, Computer Vision Engineer

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Experience

Computer Vision Engineer   May 2024 – Present
Carl Zeiss AG   *Oberkochen, Germany*

- Developed real-time multiview RGB and RGBD-based 3D human pose estimation pipelines for integration into robotic visualization systems
- Developing a digital shadow of a robotic system with integrated camera for testing and synthetic data generation
- Involved in developing a digital twin toolbox based on OpenUSD for opto-robotic simulation and visualization
- Generated high-fidelity synthetic data using Mitsuba 3 for accurate instance segmentation in microscopic images of neuro and ophthalmic surgery
- Implemented ControlNet-based texture synthesis and material parameter learning techniques to achieve realistic rendering of a digital twin of the human eye
- Designed and integrated a conversational language understanding model by Azure AI Language Studio for enabling voice interaction with microscope

Computer Vision Intern/Master Thesis   Dec. 2022 – Dec.2023
Carl Zeiss AG   *Oberkochen, Germany*

- Developing solutions for human pose estimation under blanket occlusion using only RGB images
- Enhancing a Docker-based pipeline for generating synthetic data with automatic annotations
- Manipulating synthetic human character models using Blender's Python API
- Domain randomization in the synthetic data for reduction in domain gap and better generalization to the real world
- Developing training pipelines of multiple SOTA models like YOLOv7, YOLOv8, ViTPose for synthetic-to-real transfer learning
- Implementation of domain adaptation with feature distribution matching in YOLOv7 architecture
- Uplifting the 2D keypoint predictions to 3D using multi-view images

Education

RWTH Aachen, Germany   2020 - 2024
Master of Science in Robotic Systems Engineering
Grade: 2.2
Thesis: Utilizing and Adapting Synthetic Data for Pose Estimation of Occluded Humans in Horizontal Positions

BITS Pilani, India   2015 - 2019
Bachelor of Engineering (Hons.) in Mechanical Engineering
Grade: 8/10
Thesis: Design, Simulation, and Fabrication of a Chemical Vapor Deposition (CVD) setup for Graphene Synthesis

Skills

Domains: Computer Vision, Synthetic Data, Generative AI, Machine Learning, Natural Language Understanding
Programming Languages: Python, C++, C#
Libraries: OpenCV, PyTorch, TensorFlow, Keras
Software Tools: Docker, Blender API
Version Control: Git
Languages: German (advanced), English (fluent)