# Atharva Hude

Arizona, USA

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## Education

**Arizona State University** — **Aug. 2023 – May 2025**
*MS Robotics and Autonomous Systems (Artificial Intelligence) | CGPA: [3.89/4]* — *Tempe, AZ*

**Savitribai Phule Pune University** — **Aug. 2017 – May 2021**
*Bachelor of Engineering Computer | CGPA: [9.18/10]* — *Pune, India*

**Udacity Nano Degree** — **May 2024 – Aug. 2024**
*Sensor Fusion | Completion Certificate* — *Online*

## Experience

**ASU (Teuvonet Technologies)** — **Jan 2024 – Present**
*Research Aide* — *Tempe, AZ*

- Fused Neuro-Symbolic approaches with Object Detection models to create Explainable AI (XAI) deep learning solutions, enhancing performance and interpretability, and achieving a **30%** increase in recall for geospatial imagery.
- Secured Air Force/Space Force STTR Phase 1 contract for the research effort, as reported by *W. P. Carey News*.
- Created a comprehensive **stress testing framework** to perform a comparative study of XAI vs. Non-XAI models against various patch and camouflage attacks. Utilized the **Meta SAM 2** model to simulate real-time camouflage attacks on objects for enhanced evaluation.
- Optimized and deployed **XAI models** with custom post-inference processing on **Nvidia Jetson Xavier Orin**, leveraging TensorRT acceleration, quantization, and model pruning for efficient edge inference.

**Automaton AI Infosystems Ltd** — **Oct 2021 – May 2023**
*AI Solutions Architect* — *Pune, India*

- Developed an end-to-end computer vision solution using **Nvidia TensorRT**, employing model quantization to significantly accelerate inference, enabling faster detection of LPG cylinder tare weight and boosting process efficiency by **20-25%** for a leading gas provider in India.
- Led the development of synthetic data generation pipeline using GANs, improving image resolution by **2x** through techniques like Super-Resolution, Deblur, DeHaze etc for **ADVIT™** Deep Learning Platform.

## Publications

High-Fidelity Worker Motion Simulation With Generative AI. *Paper* — **Aug 2024**

Semantic Image Segmentation of Kidney Histology Images Using U-Net. *Paper* — **July 2023**

## Projects

**Robot Waypoint Planning with Vision-Language Models** | *Python, OpenAI API, ROS2, NAV2* | *GitHub* — **Feb 2025**

- Combined Vision-Language Models (VLMs) with ROS2 Nav2 to enable TurtleBot3 to navigate autonomously using natural language commands.
- Enabled the robot to interpret spatial descriptions, plan user specific routes, and adapt to dynamic environments.

**Data Leakage in Vision-Language Models** | *LLaMA, Microsoft Phi 3 Vision, Qwen* | *GitHub* — **Dec 2024**

- Analyzed data leakage in VLMs to assess if models solve problems or rely on memorized knowledge.
- Evaluated state-of-the-art models (LLaMA-3, Qwen-7B-VL, Phi-3-Vision, Llava-1.5) across multiple datasets.
- Designed robustness tests (paraphrasing, restructuring, image modifications) to detect biases and memorization.

**Lightning NeRF Extension with Semantic Information** | *Pytorch, Nerf Studio, Python* — **Apr 2024**

- Led the re-implementation of the state-of-the-art Lightning NeRF framework for efficient radiance field reconstruction in autonomous driving scenarios, optimizing performance and scalability.
- Enhanced the framework by integrating semantic information, improving scene understanding and reasoning, resulting in a **10%** increase in PSNR.

## Technical Skills

**Languages:** Python, C++, Matlab

**Machine Learning & AI:** PyTorch, TensorFlow, Keras, ONNX, TensorRT, YOLO, VLM

**Computer Vision & 3D Perception:** OpenCV, PCL, scikit-image, dlib, CUDA/cuDNN, Albumentations, Meta SAM

**Robotics & Sensor Fusion:** ROS, Gazebo, LiDAR/Radar Processing, Kalman Filters (EKF/UKF), SLAM, PDDL

**Optimization & Edge AI:** Model Pruning, Quantization, TensorRT Acceleration, Nvidia Jetson Orin, Raspberry Pi

**Software Development & DevOps:** AWS, Git, Docker, TensorBoard, Wandb, Eigen, CMake