AMEY AVHAD

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RESEARCH INTERESTS

Aspiring AI researcher with a strong foundation in computer vision, deep learning, and robotics, focusing on multimodal perception and intelligent systems. Experienced in publishing and conducting cross-disciplinary research integrating LLMs, medical imaging, and human-robot collaboration.

EDUCATION

B.Tech Computer Engineering, Savitribai Phule Pune University 02/2021 - 09/2024

Relevant Coursework: Machine Learning, Deep Learning, Internet of Things, Design and Analysis of Algorithms, Computer Networks, Data Structures and High Performance Computing

CGPA - 9.09/10

SKILLS

Technical Skills	Python, AI, ML, Research, IOT, Computer Vision, Deep Learning, Data Science, Data Mining, Data Visualization, MicroPython, Cloud Computing, C++, C, P4, SDN
Soft Skills	Communication, Teamwork

EXPERIENCE

Research Intern 06/2025 - 09/2025

National Yang Ming Chiao Tung University *Hsinchu, Taiwan*

- Developed an **AI-powered assistive robotic arm** integrated with an **electric wheelchair** to autonomously recognize, interpret, and execute human commands for item retrieval for convenience store items such as drinks, rice balls, etc.
- Integrated multimodal AI modules, combining **Whisper** for speech recognition, **Gemma 3–4B LLM** for semantic inference, and vision-based grasp prediction for seamless human-robot interaction.
- Designed a **dual vision pipeline** using **YOLO-E (zero-shot)** and fine-tuned YOLOv11 for accurate multimodal object detection and segmentation.
- Programmed and controlled the **Kinova Gen2** robotic arm using **NVIDIA Isaac SDK** and integrated **GraspGen**, a diffusion-based framework for 6-DOF grasping, enabling real-time motion planning.
- Deployed all models locally to ensure low latency and high data privacy during operation.

Research Intern 05/2024 - 09/2024

National Chung Cheng University *Minxiong, Taiwan*

- Developed and optimized multiple **YOLO** models (YOLOv8, YOLOv7, YOLOv6, ScaledYOLOv4, YOLOv3) for **esophageal cancer detection** using hyperspectral imaging datasets.
- Conducted a comparative performance analysis between White Light Imaging (WLI) datasets and Narrow Band Imaging (NBI) datasets obtained through the **Spectrum Aided Visual Enhancer (SAVE)** method, demonstrating superior performance of SAVE in esophageal cancer detection.
- Achieved an average **10% improvement in precision, 8% higher recall**, and **23% increase in mAP50**, enhancing detection and classification performance.
- Authored a **research paper** based on these findings, contributing to advancements in medical imaging and diagnostics.

Research and Development Intern 12/2023 - 03/2024
Indian Institute of Technology Kharagpur *Kharagpur,India*

- Developed and integrated custom MicroPython firmware to enable the customization of DSCP values in socket packets, enhancing network control and performance.
- Extensively tested the solution using Software-Defined Networking (SDN) for simulation, ensuring optimal functionality and compatibility with advanced networking technologies.
- Designed and implemented a P4 switch with integrated Machine Learning models on the BMV2 platform, pushing the boundaries of intelligent network processing.

PROJECTS

- **Vehicles and building detection using Deep Learning for drone images (01/2024 - 05/2024)**
  Designed advanced CNN architectures for vehicle and building detection using deep learning. Additionally, implemented a YOLOv5 model and conducted comparative analyses to evaluate its performance alongside my custom CNN models, showcasing an accuracy of 97.25%.
- **Brain Tumor Classifier using Deep Learning (11/2022 - 01/2023)**
  Developed CNN-based brain tumor classifiers using advanced deep learning models such as YOLOv8, YOLOv5, and EfficientNet, achieving classification accuracies of 99%, 95.8%, and 98.8% respectively.
- **Data Analysis and Visualization of FIFA-19 Dataset (09/2021 - 11/2021)**
  Performed analysis and visualization of Fifa-19 dataset including cleaning and plotting various graphs representing different features and attributes of the data.

PUBLICATIONS

- Weng, W.-C., Huang, C.-W., Su, C.-C., Mukundan, A., Karmakar, R., Chen, T.-H., **Avhad, A.R.**, Chou, C.-K., and Wang, H.-C. (2025). **Optimizing Esophageal Cancer Diagnosis with Computer-Aided Detection by YOLO Models Combined with Hyperspectral Imaging**. *Diagnostics, 15*(13), 1686.
- Dange, B. J., **Avhad, A.**, Bhakare, S., More, M., and Aghav, S. (2024). **Vehicle and Building Detection using Convolutional Neural Network for Drone Images**. In *2024 Third International Conference on Smart Technologies and Systems for Next Generation Computing (ICSTSN)*, pp. 1–6. IEEE.

EXTRA-CURRICULAR ACTIVITIES

- Participated in Solving for India Hackathon (03/2023) by GeeksforGeeks.
- Participated in NLP - Driven Enterprise Culture Analytics Hackathon (05/2023) by Culture OS.

CERTIFICATES

- *Artificial Intelligence with Machine Learning* - WAC (IIT Roorkee)
- *Neural Networks and Deep Learning* - Deep Learning.ai (Coursera)
- *Introduction to Internet of Things* - NPTEL (IIT Kharagpur) (Ranked in the top 1% nationwide)
- *Google Cloud Big Data and Machine Learning Fundamentals* - Google (Coursera)

ACHIEVEMENTS

- Ranked in the Top 1% nationwide among all the students in India who wrote the examination in the course 'Introduction to Internet of Things' by NPTEL.
- First Prize Winner in Profest Project Competition for the Project Smart LetterBox.

LANGUAGES

- English (IELTS 7.5 – CEFR C1)