Naveen Madapana

naveen.madapana@gmail.com · Website · LinkedIn · GitHub · Scholar

SUMMARY

AI/ML research engineer with a decade of experience taking GenAI and 3D vision from research to production. Drawn to ambiguous, high-stakes problems where rigorous science and solid engineering must come together. Motivated by using technology to solve real-world problems and empower people's lives.

EXPERIENCE

Senior AI/ML Research Engineer · Apple
Mar 2023 – Present · Cupertino, CA

- Led the **end-to-end model lifecycle**, from data to model development to production, and coached engineers
- Delivered face recognition, identity security, and intelligence ML for IDs in Apple Wallet, Apple HomeView, and Face Unlock on iPhone Duo, using face analysis and vision language models
- Built **Safety AI**, including a selfie-based assurance system, to create a safe and trusted Apple ecosystem for kids

Senior Applied Scientist · Amazon Lab126
Feb 2022 – Jan 2023 · Sunnyvale, CA

- Built **generative AI** and 3D morphable models for photorealistic talking avatars with emotion, lip sync, and head motion
- Delivered low-latency on-device avatars in Alexa video calling with engineering teams on data specs and quantization

Research Intern, Mixed Reality · Meta Reality Labs
May – Aug 2021 · Seattle, WA

- Built intent-to-interact models from physiological data, integrated into **Meta Quest** with a demo of future use cases

Research Intern, Robotics · KAIST
May – Jul 2015 · South Korea

Cognitive Neuro-Robotics Lab

- Generated visuomotor data for object manipulation, grasping, and obstacle avoidance on the iCub and NAO humanoids
- Developed deep models coordinating vision, attention, and motor control for object manipulation (Humanoids 2015)

EDUCATION

Ph.D., Computer Vision and Machine Learning · Purdue University
2016 – 2021

Intelligent Systems and Assistive Technologies Lab · Advisor: Dr. Juan Wachs

- Served as teaching assistant for 3D computer vision and generative AI courses with 100+ students
- Developed **zero-shot and one-shot recognition** models for objects, activities, and gestures from few or no examples
- Applied sim-to-real transfer to surgical robots (suturing, needle threading) and 3D manipulation of deformable objects
- Built touchless gesture and voice systems, deployed in neurosurgery rooms, to browse and manipulate MRI scans

Bachelors in Computer Science and Mechanical Engineering · IIT Guwahati
2012 – 2016

Mechatronics & Robotics Lab · Advisor: Dr. S. K. Dwivedy

- Worked as a research scholar on robotics and control systems for the NAO humanoid, including bipedal walking
- Developed object manipulation behaviors and static-gesture control, letting users command the robot with hand poses

SKILLS & TECHNOLOGIES

Generative AI	Multimodal LLMs, vision language models, diffusion models, fine-tuning (LoRA / PEFT), evals
Computer Vision	3D face analysis, face recognition, anti-spoofing, zero-shot video classification
ML Engineering	Contrastive and self-supervised learning; distributed training; model optimization and quantization; on-device and low-latency inference; experiment design and evaluation; security and robustness
Tools & Languages	Python, PyTorch, C/C++, Java, Docker, Git, Linux, algorithms and data structures
Soft Skills	Strategic communication, leadership, coaching, XF collaboration, technical roadmapping, ownership

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SELECTED PUBLICATIONS

1. One-shot image recognition using prototypical encoders with reduced hubness — *WACV* · 2021
2. Agreement study using gesture description analysis — *IEEE THMS* · 2020
3. Gesture agreement assessment using description vectors — *IEEE FG* · 2020
4. Database of gesture attributes: zero shot learning for gesture recognition — *IEEE FG* · 2019
5. DESK: a robotic activity dataset for dexterous surgical skills transfer to medical robots — *arXiv* · 2019
6. Hard zero shot learning for gesture recognition — *ICPR* · 2018
7. ZSGL: zero shot gestural learning — *ACM ICMI* · 2017
8. Achieving "synergy" in cognitive behavior of humanoids via deep learning of dynamic visuo-motor-attentional coordination — *IEEE-RAS Humanoids* · 2015

HOBBIES

Court sports	Badminton, tennis, and basketball: fast, competitive games that keep me active and social
Running	5K, 10K, and half marathons: steady training toward race day builds consistency, patience, and focus