Reshma Panibhate

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EXPERIENCE

Computer Vision Research Assistant, Center for Engagement Science, Arizona State University — Jan 2026 – Present

- Localized gaze to front, midfoot, and heel regions using pixel-based shoe detection and region-of-interest segmentation, generating Gaussian-smoothed heatmaps to visualize product engagement
- Enabled comparison of visual attention across 11 midsole designs by building a Python pipeline that transformed 120 Hz Tobii eye-tracking data into 13 per-image gaze metrics, incorporating participant-specific calibration correction
- Identified an exploratory association between midfoot attention and design preference (Spearman $\rho = 0.61$, $p = .048$) in a 4-participant study; communicated findings through a 22-page report
- Strengthened analysis reliability by identifying and removing a spurious image-file-size predictor and correcting unit inconsistencies and tracker-loss errors

Full-Stack AI Engineer, Monark Health — Feb 2026 – Present

- Automated generation of personalized 90-day nutrition and exercise plans using Claude, calculated clinical targets, and lab markers, with Zod schema validation and PDF export
- Built and deployed a patient care platform connecting a React clinic portal and patient PWA through Node/Express REST endpoints and PostgreSQL/Prisma; production launch pending BAA approval
- Implemented safeguards for sensitive patient data, including AES-256-GCM encryption across 10 clinical fields, role-based access, revocable JWT sessions, rate limiting, and audit logging across 13 action types

Team Lead, Assistive Technology, Tikkun Olam Makers, Arizona State University — Jan – Dec 2025

- Led a 5-person cross-functional team from development through demonstration of a working fall-alert wearable ring prototype, coordinating hardware, firmware, and ML delivery through Agile sprints; showcased on the international Tikkun Olam Makers platform

PROJECTS

Native vs. Invasive Species Classification Across Unseen Islands (camera-trap benchmark) | PyTorch, BioCLIP, SpeciesNet, DINOv2

- Exposed a generalization failure in a fine-tuned SpeciesNet classifier: despite 97.3% in-distribution accuracy, it correctly classified 0 of 21 invasive images from unseen Hawai‘i data, compared with 66.7% for zero-shot BioCLIP
- Built a 43,278-image camera-trap benchmark spanning six countries with camera-disjoint evaluation splits; verified labels against IUCN and government records, corrected two taxonomic mislabels, and compared zero-shot, fine-tuned, and kNN approaches

GraphEQA: Embodied Question Answering with Semantic Mapping | PyTorch, SigLIP2, Habitat Sim, SLURM

- Established a more reliable evaluation across 174,288 chest X-rays by rebuilding an 80/20 patient-level split, revealing that a previously reported 0.89 AUROC reflected a validation-split artifact
- Fine-tuned InternImage for multi-label chest X-ray classification, achieving approximately 0.80 macro AUROC under the corrected evaluation

Computer-Aided Diagnosis: Chest X-Ray Analysis | PyTorch, InternImage, DINOv2, timm

- Fine-tuned InternImage for multi-label chest X-ray classification; rebuilt a patient-level 80/20 split across 174,288 images, exposing a prior 0.89 AUROC as a validation-split artifact and establishing a trustworthy ~0.80 macro AUROC

Degradation-Aware Semantic Mapping for GPS-Denied Environments | Isaac Sim, ROS 2 Jazzy, Python

- Built a simulated perception testbed for a Spot robot in a 48 × 35 m cave, integrating RTX LiDAR and a 500 Hz IMU through Isaac Sim and ROS 2
- Characterized sensor limitations before localization integration: identified a LiDAR minimum-range setting that invalidated all 326 rays and verified noise-free simulated IMU heading stability within 0.21° over 15 seconds

TECHNICAL SKILLS

Computer Vision & Perception: Object Detection, Image Segmentation, Image Classification, Vision-Language Models, Camera Calibration, Semantic Mapping, SLAM, 3D Scene Graphs
Machine Learning: PyTorch, TensorFlow, scikit-learn, Hugging Face, OpenCV, Transformers, Transfer Learning, Fine-Tuning
Robotics & Simulation: ROS 2, Gazebo, Isaac Sim, Nav2, LiDAR, IMU, Path Planning, Forward/Inverse Kinematics
Programming & Tools: Python, C++, SQL, NumPy, Docker, Apptainer, CUDA, SLURM, Git, Linux, MATLAB

EDUCATION

M.S. Robotics & Autonomous Systems (Artificial Intelligence), Arizona State University | GPA 3.67/4.0 — Aug 2024 – May 2026

B.S. Artificial Intelligence & Machine Learning, REVA University, Bangalore | GPA 3.71/4.0 — Aug 2020 – May 2024

PUBLICATION & AWARDS

Publication: Panibhate, R. & Sumesh, A. Computer Vision Based Fruit Grading System Using Machine Learning Techniques. IOSR Journal of Computer Engineering, 2024.
Awards: 1st place, Voxel51 Agents World Visual AI Hackathon (solo, 2026); 2nd globally, SpaceHACK for Sustainability (2026); 2nd, GlobeHacks (2026)