Param Sangani

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Research Interests

Computer Vision, Robotics, Deep Learning, Quantum Computing.

Education

2023 – 2028 (exp.) **Saint Louis University** – St. Louis, MO
Ph.D. in Computer Science.

2023 – 2025 **Saint Louis University** – St. Louis, MO
M.S. in Computer Science.

2022 – 2023 **Saint Louis University** – St. Louis, MO
Master of Health Care Administration.

2018 – 2022 **Saint Louis University** – St. Louis, MO
B.A. in Health Care Administration, Minor in Computer Science.

Experience

2023 – Present **AI in Robotics Lab – Graduate Research Assistant**
Saint Louis University
Research in computer vision, robotics, machine learning, and deep learning. Developed event-camera and rotating-polarizer sensing systems for polarization-aware 3D reconstruction; built ROS2-based shared-autonomy pipelines for Kinova Gen3 manipulation; designed RGB-to-polarization reconstruction pipelines using dense angular supervision and Fourier-based polarization encoding.

2026 – Present **Deep Learning – Graduate Teaching Assistant**
Saint Louis University
Supported graduate coursework in deep learning through recitations, office hours, and project mentoring; developed and graded assignments covering neural network architectures, training, and evaluation.

2024 – 2025 **Algorithms and Software Development – Graduate Teaching Assistant**
Saint Louis University
Supported 100+ graduate students through recitations, demonstrations, and project mentoring; designed and graded assignments and exams; created Python visualization demos and autograding infrastructure.

2020 – 2022 **MedLaunch - Team Lead**
St. Louis, MO
Led healthcare innovation prototypes addressing oncology infusion staffing shortages, nurse burnout, and pregnancy-related measurement challenges; received first place and a $2,500 investment.

2019 – 2021 **Ground Operations & Communication - Space Systems Research Lab**
Saint Louis University
Led development and integration of a satellite deployed from the ISS (2019) to measure radiation across atmospheric layers.

Publications

2026 **DensePol: Dense-Angle Polarization Dataset for Learning-Based Polarimetric Vision**
High-redundancy RGB–polarization dataset from Division-of-Time acquisition (2,018 paired images, 180 analyzer orientations), cutting AoLP deviation from 13.36° to 2.21°; includes a deterministic diffusion RGB-to-polarization framework.
Accepted WACV 2026

2026 **NeuroCommitSSM: Decision-Centric Shared Autonomy for Assistive Manipulation**
EEG–EMG–eye-tracking commit-readiness framework for deciding when a robot should safely execute assistive actions, validated hardware-in-the-loop on a Kinova Gen3 arm with HOLD–ASSIST–COMMIT shared autonomy.
Accepted IROS 2026

2026 **PRoPE: Physics-guided Rolling Polarization Estimation**
Physics-guided linear polarization estimation from three sequential narrow-range analyzer measurements for low-latency capture of dynamic scenes.
Accepted NeurIPS 2026 Workshop on Physical World Models

2026 **Quantum-Enhanced Similarity Measures for Polarimetric Materials Classification**
Hybrid quantum-classical framework using polarization cubes, learned voxel embeddings, and quantum SWAP-test similarity estimation, compared against Optimal Transport, Hungarian matching, and cosine similarity baselines.
arXiv preprint (in preparation)

Selected Research Projects

Decision-Centric Shared Autonomy for Assistive Manipulation
Integrated neural commit-readiness prediction with robot feasibility checks, perception gating, and shared-autonomy supervision. *ROS2, PyTorch, Kinova Gen3.*

Drone Simulation for Emergency Response
Built UAV simulations to analyze human-drone interaction in high-stress emergency response environments. *PX4, AirSim, Unity, Computer Vision.*

Skills

Programming Languages
Python, C++, SQL, MATLAB, R

Machine Learning
PyTorch, TensorFlow, CNNs, Transformers, GNNs, Diffusion Models, Self-Supervised Learning

Computer Vision
Polarization Imaging, Event Cameras, RGB-D Perception, 3D Reconstruction, Surface Normals, Optical Flow

Robotics & Simulation
ROS, ROS2, MoveIt, Kinova Gen3, Arduino, PX4, AirSim, Unity

Tools
Git, Docker, Qiskit, OpenCV, NumPy, Pandas, Linux, VS Code