ASHISH PAKA

+1 (480)-651-5047 | **ashishpaka1998@gmail.com** | **Portfolio Website** ↗ | **Github** ↗ | **LinkedIn** ↗

EDUCATION

M.S. in Robotics and Autonomous Systems | **Arizona State University, Tempe, AZ**
Aug 2023 – May 2025 **GPA - 3.96/4.00**

- **Relevant Coursework**: Linear Algebra, Machine Learning and Deep Learning, Perception in Robotics, AR-VR Systems, Expressive Robotics, Modeling and Control of Robots, Advanced System Modelling Learning, Dynamics and Control, Reinforcement Learning, Multi-Robot Systems

B.Tech. in Mechanical Engineering | **Manipal Institute of Technology, Manipal, India**
July 2016 – June 2020 **GPA - 7.49/10.00**

- **Minor in mechanical design and physics**

PROFESSIONAL EXPERIENCE

1. **Robotics Research Engineer** | **LOGOS Robotics Lab** ↗ | **Arizona State University, Tempe, AZ**
   Jan 2025 – Present
   - Collaborating with Prof. Nakul Gopalan and PhD Weiwei Gu on the CoRL 2024 paper **Continual Skill and Task Learning via Dialogue** ↗ to develop **Cross Embodiment Skill Representation in Robotics** ↗
   - Engaged RL and Trajectory-based unsupervised skill learning using FR3 Franka arm, while also improving the 74.75% on pre-trained skills by integrating CV and Gemini VLM into the dialogue framework to improve contextual understanding
   - Leveraged RH20T dataset to segment demonstrations into skill primitives with semantic labels deploying transformer encoders and ResNet-18 feature extractors & ACT-LoRA transformer for few-shot continual learning
   - Devised a VLM-based alignment model achieving 91.4% confidence in skill matching for cross-embodiment transfer
2. **Mechanical Engineer** | **Larsen & Toubro Technology Services (LTTS)** | **Bangalore, India**
   Sept 2020 – June 2023
   - Led Product development using Creo Parametric, SOLIDWORKS, Autodesk Inventor and Ansys for FEA/CFD for Carrier Transicold, Scania, Eaton Corporation and Cooper Lighting

PROJECTS

1. **Swarm Robotics for Autonomous Collaborative Mapping** ↗ | **Dec 2024**
   - Pioneered collaborative exploration using Voronoi pattern swarm exploration for optimal area coverage and sensor fusion with SLAM (gmapping, Hector SLAM) and ROS2, tested in Gazebo with TurtleBot3
   - Integrated RL (Gymnasium), TOF cameras attaining 5x faster 3D reconstruction compared to sequential approaches
2. **Optimized VoxFormer for Autonomous Driving** ↗ | **May 2024**
   - Designed a lighter and less computation intense VoxFormer - sparse voxel transformer architecture with deformable self-attention and cross-attention mechanisms for 3D semantic occupancy prediction from 2D camera inputs, processing voxelized BEV features through multi-scale deformable attention
   - Trained model on nuScenes (1000 scenes, 1.4M images, 40k keyframes) and KITTI with PyTorch distributed training with mixed precision, accomplishing 10% IoU improvement for occluded voxel estimation
   - Implemented CARLA simulator integration for real-time inference testing at 20 FPS, utilizing TensorBoard for loss visualization, Open3D for 3D voxel rendering, and Weights & Biases for hyperparameter optimization tracking
3. **6 DOF Path Planning for Industrial Robot Arm** ↗ | **Dec 2023**
   - Spearheaded trajectory planning algorithms RRT* and A* path planning and implemented forward/inverse kinematics in 6-DOF manipulator arms with collision-free planning utilizing MoveIt, OMPL libraries and MATLAB

SKILLS

- **Software:** TensorFlow, PyTorch, Git, Docker, OpenAI Gym, Gymnasium, ROS 1/2, Catkin, V-Rep, Gazebo, MoveIt, MuJoCo, Arduino, Pybullet, Linux, Python, C/C++, Java, MATLAB, CARLA, Arduino, MQDH and Unity AR/VR
- **Fields of Interest:** Multi-Robot Systems, Autonomous Systems and Navigation, Computer Vision, Perception in Robotics, Machine Learning, Deep Learning, Reinforcement Learning, AR-VR
- **Robotics:** Robot Kinematics and Dynamics, Sensor Fusion, Motion-Planning, SLAM (Simultaneous Localization and Mapping), Control Systems, Embedded Systems, CUDA Programming
- **Other:** Product Design/Simulation/Life Cycle Management, GPU Programming with CUDA, Material science and composites, Aerospace Design, DFMA, DFMAE, Project Management, Strategy Formulation

ACHIEVEMENTS

1. **Poster Presentation** | **ASU SEMTE 2025:** Cross Embodiment Skill Representation in Robotics
2. **Paper Presentation** | **Southwest Robotics Symposium 2024:** Swarm Robotics for Autonomous Collaborative Mapping
3. **Spot Award for Design** | **SA Cup 2019** | **Rocketry at thrustMIT** ↗ (India's no. 1 Student Rocketry Team 2017-2020)
   - Launched sounding rockets Project Vyom and Arya; Granted **Patent no. 506725** ↗ – "A SYSTEM FROM EJECTION"