# ASHISH PAKA

+1 (480)-651-5047 ashishpaka1998@gmail.com github.com/Ashish-Paka linkedin.com/in/ashish-autonomousrobotics Website

**Robotics Engineer passionate in advanced perception and autonomous systems to shape the future human robot future.**
**Looking for opportunities to work and developing transformative robotics technologies that meaningfully impact life on Earth and drive global progress.**

## EDUCATION

**M.S. in Robotics and Autonomous Systems,** *Arizona State University, Tempe, Arizona, USA* **GPA: 3.96/4.0** August 2023 – May 2025

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

- ✓ LOGOS ROBOTICS LAB - **Research** under **Prof. Nakul Gopalan** to develop a shared action space for human-robot collaboration, enabling robots or humanoids to understand human actions through visual correspondence and execute optimal, task-specific behaviors. The research leverages knowledge in skill learning, computer vision-based environment state and action space contextual understanding for real-time collaboration in adaptive robotics.

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

✓**MAJOR SPECIALIZATION IN MECHANICAL DESIGN**

- **COURSES:** Turbo Machines, Heat Transfer, Fluid Mechanics, FEA, Production Planning and Control, Material science and metallurgy, Thermodynamics, Strength of Materials, CAE, Mechanical Design, Kinematics and Dynamics of Machinery, Tribology, Fatigue and Fracture, IC engines and emissions, Fluid drives and circuits, Physics of materials and Radiation Physics.

**PATENT:** "A SYSTEM FROM EJECTION'
Patent no. **506725**; Application No. **201941044944**

**PROJECTS/EXPERIENCE:**

**Aug 2017 – Sep 2020:**
Rockets **Project Vyom** and **Project Arya** (both launched from **SpacePort America**, New Mexico, USA in 2019 and 2018 during SA Cup by ESRA - Experimental Sounding Rocket Association).

- Worked for 3 years and helped develop "**thrustMIT**" (India's top student rocketry team) as a senior Structures and Composites Member.
- Won the Spot Award for Design for "Project Arya" at SA Cup 2019. Responsible for the complete in-workshop manufacturing of the rocket and complete structural design of the body of the rocket.

**June 2018** (Internship - Summer 2018): Plain Plug Gauge tool development at Bharat Heavy Electricals Limited (BHEL), Hyderabad. Manufacturing design of gas and steam turbines/engines.

**June 2020:** Design and simulation of Total Knee Replacement Implants (Total Knee Arthroplasty).

## PROFESSIONAL EXPERIENCE

**Engineer** **Larsen & Toubro Technology Services (LTTS),** *Bangalore, India* September 2020 – June 2023

- Worked primarily as a **mechanical product design and analysis engineer** using Creo, SOLIDWORKS, CATIA, Autodesk Fusion360 and Inventor for design and ANSYS workbench and APDL for FEA and CFD. Designed products like refrigeration containers, buses, and electronics systems for various clients and collaborated internationally for companies like Carrier Transicold, Scania, Eaton Corporation and Cooper Lighting.
- Joined as an intern and completed 8+ projects for clients to be promoted to "GET", "Associate Engineer" and to "Engineer" in a period of 2 years.

## PROJECTS

- ✓ **Fields of Interest:** Computer Vision/Perception in Robotics, Machine Learning, Deep Learning, Reinforcement Learning, Product development, AR-VR Development
- ✓ **Robotics Skills:** Swarm Robotics and Multi-Robot Systems, Autonomous Systems and Navigation, Expressive Robotics, Robot Kinematics and Dynamics, Motion-Planning, SLAM (Simultaneous Localization and Mapping), 3D printing and rapid prototyping experience
- ✓ **Other Skills:** Mechanical Product Design/Simulation, GPU Programming with CUDA, Material science and composites, Aerospace and rocket Design, DFMA, DFMAE

----------CLICK HEADING for GITHUB

1. **Cross Embodiment Skill Representation in Robotics (LOGOS ROBOTICS LAB – ongoing research with Nvidia Robotics)**
   Novel framework for cross-embodiment skill representation in robotics by leveraging visual-language models (VLMs) to generate structured semantic descriptions from human and robot demonstration videos. By integrating VLM-driven contextual grounding we enable skill differentiation and build a framework to support unsupervised continual learning for robust human-to-robot skill transfer
2. **Swarm Robotics for Autonomous Collaborative Mapping**
   Researched and implemented swarm robotics combined with reinforcement learning, deploying multi-robot systems equipped with TOF cameras and LiDAR for collaborative autonomous exploration and mapping. Presented as a concept at **Southwest Robotics Symposium 2024 at ASU.**
3. **Optimized VoxFormer for Autonomous Driving**
   Designed a sparse voxel transformer-based model for voxelized semantic scene representation using camera only inputs to estimate occluded voxels and improve environmental perception in autonomous driving systems. It helps autonomous systems imagine hidden objects just like a human using occupancy voxels.
4. **Expressive Robot Hand**
   Created a computer vision-enabled robotic hand capable of mimicking human gestures and operating autonomously, enhancing interactive capabilities through dynamic motion tracking and AI-ML-RL integration. Application is human robot interaction based personal assistant.
5. **AR-VR Pass through and Virtual Reality Environment**
   Developed immersive AR and VR applications, including interactive games and environments, utilizing Meta Quest Development Hub and Unity, encompassing both software and hardware components for comprehensive AR/VR system integration.
6. **6-DOF Path Planning for Industrial Robot Arm**
   Algorithm enabling a robotic arm to navigate between 3D coordinates, optimizing trajectory planning for enhanced precision in industrial applications.
7. **Image Recognition based algorithm for e-commerce**
   A ML-DL methods for image recognition/classification of ecommerce product dataset to automatically sort products and personalize user recommendations.

## SKILLS

**Coding:** Python, C/C++, Java, embedded C, CUDA Programming, MATLAB, Arduino, Bash, LaTeX

**Robotics:** ROS 1/2, Catkin, V-Rep, Gazebo, MoveIt, MuJoCo, Arduino, Pybullet, Sensor Fusion, PLC Programming, Arduino and Embedded Systems

**Software:** Tensorflow, Pytorch, Git, Docker, OpenCV, OpenAI Gym, Meta Quest Development Hub for AR/VR, Unity AR/VR, PTC Creo Parametric, AutoCAD, Solidworks, Inventor, CATIA, ANSYS– Static structural/Transient thermal/Fluent/APDL, Fusion360, Microsoft Office, Linux, Windows, Android, iOS

**Certifications:**

- Self-Driving and ROS 2 - Odometry & Control (Antonio Brandi, UDEMY)
- Self-Driving and ROS 2 - Map & Localization (Antonio Brandi, UDEMY)
- Robotics and ROS 2 - Manipulators (Antonio Brandi, UDEMY)
- Introduction to Programming with MATLAB (Vanderbilt University)
- The Complete Python Bootcamp from Zero to Hero in Python (Jose Portilla, UDEMY)
- Autodesk Fusion 360 Integrated CAD/CAM/CAE (Autodesk Inc.)
- Introduction to Digital Manufacturing with Autodesk Fusion 360 (Autodesk Inc.)
- Digital Manufacturing and Design (University at Buffalo, The State University of New York)
- Material Science: 10 Things Every Engineer Should Know (University of California, Davis, CA)