Arjun Murali

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EDUCATION

BITS Pilani, Hyderabad Campus   Aug 2023 – May 2027
B.E. Electronics and Instrumentation (Third Year)   *Hyderabad, India*

TECHNICAL SKILLS

Languages: Python, C++, Java, Dart (Flutter)
Frameworks: ROS 1 & 2, Arduino, Raspberry Pi, Jetson, Gazebo, MoveIt
Design Tools: SolidWorks, Fusion 360
Concepts: SLAM, Computer Vision, Kinematics, Manipulator Dynamics

PROJECTS

GNN-Based Robust Feature Detection for VO | *GNN, Computer Vision*   Jul 2025 – Present
- Designing graph neural networks for robust feature detection in visual odometry, focusing on dynamic environments with moving objects.
- Developing a patch-wise motion scoring mechanism to evaluate feature reliability under motion.
- Implementing adaptive node and edge representations with context-aware graph filters to model inter-feature relationships over time.

Dual-Arm Grasp Synthesis and Coordination | *Manipulators, Computer Vision*   Jul 2025 – Present
- Adapted GraspNet API to generate depth camera image–based datasets for dual-arm grasp synthesis.
- Extending neural grasp distance field–based trajectory optimization from single-arm to dual-arm planning to enable coordinated manipulation of unseen objects from depth camera feeds.

Event-Based Visual Odometry Development | *Event-Based Vision*   Apr 2025 – Present
- Implemented a real-time VO pipeline using asynchronous event data for reliable motion estimation in low-light and high-speed scenarios.
- Used parallelized feature extraction, adaptive patch tracking, and robust feature localization to refine trajectory accuracy.
- Working on sensor-agnostic recurrent encoders and differentiable bundle adjustment for improved robustness.

Beetle – Autonomous 4WD Robot | *SLAM, Path Planning*   Oct 2024
- Designed and built an all-wheel-drive robot capable of handling payloads up to 60 kg.
- Integrated Intel T265, D435, and 2D LiDAR with Jetson Xavier AGX for onboard computation.
- Implemented LiDAR SLAM and RGB-D SLAM pipelines with dynamic path planning using behavior trees.

POSITIONS OF RESPONSIBILITY

President – Automation and Robotics Club, BITS Hyderabad   Apr 2025 – Present
- Spearheading educational initiatives by organizing hands-on workshops on computer vision, CAD design, 3D printing, and microcontrollers, engaging over 150 students.
- Serving as the official representative and primary liaison between the club, faculty, and external organizations.
- Leading a 60-member core team to plan and execute flagship projects, inter-college competitions, and long-term technical goals.