

# Sai Pranay Kumar Nagella

Nellore, Andhra Pradesh, India | +91 6281449747 | [sainagella2811@gmail.com](mailto:sainagella2811@gmail.com)  
<https://www.linkedin.com/in/nagella2811/> | <https://github.com/Sai-Pranay>

## EDUCATION

**B.Tech** : Electronics and Communication Engineering with AIML Specialization 2020 - 2024  
**GITAM Deemed to be University** - Bengaluru | CGPA : **9.33**

- Secured 1<sup>st</sup> place in IoT Workshop
- Best Presentation in Robotics Workshop

## WORK EXPERIENCE

**Research Intern** - GITAM University, Bengaluru 05/2024 - Present

- Conducting comprehensive research in the Software Defined Vehicle (SDV) Lab in the area of AD/ADAS.
- Exploring various SLAM Algorithms and gained expertise on numerous sensors for AD/ADAS Applications.
- Proficient in Linux OS and actively working with ROS (Noetic) & ROS (Humble).
- Integrated various LiDARs (2D & 3D), Cameras, RADARs in ROS (Noetic) & ROS2 (Humble) Frameworks.
- Familiar with dSPACE tools (SCALEXIO, MicroAutoBox III) for Simulation and Validation.
- Mentoring capstone projects and guiding students working in the lab.

## TECHNICAL SKILLS

- Programming** : Python, C++, MySQL
- Tools** : ROS (Noetic), ROS2 (Humble), MATLAB, Simulink, dSPACE (SCALEXIO, MicroAutoBox III), VS Code, Jupyter, Google Colab, Arduino IDE
- Boards** : NVIDIA Jetson AGX Orin, Arduino UNO, ESP8266, Tetrax Prizm | **OS** - Windows, Linux
- Internet of Things (IoT)
- Artificial Intelligence & Machine Learning

## PROJECTS

- Comparison of 2D & 3D LiDAR Based SLAM Techniques** 08/2024 - 11/2024
- Analyzed 2D SLAMs : Gmapping, Hector, Karto, Frontier Exploration.
  - Analyzed 3D SLAMs : FastLIO, LOAM, ISC-LOAM, LIO-SAM, DLO.
  - Evaluated SLAM Algorithms using metrics like CPU Load, RAM Usage, Computation Time, and Map Accuracy.
  - Developed a Computation Profiler for real-time performance analysis.
  - GitHub Repo** : <https://github.com/GITAM-MURTI-SDVLab/Profilers.git>
  - Tools** - ROS (Noetic), Gazebo | **OS** - Linux (Ubuntu 20.04)
  - Libraries** - psutil, rospy
- Gazebo Simulation for Autonomous Navigation** 09/2024 - 11/2024
- Simulated various Robots : Two-Wheeled Differential Drive, Four-Wheeled Skid Steer, and Quadruped (Four-Legged Robot)
  - Integrated LiDAR (2D & 3D), Camera, and IMU Plugins into the robots for sensor data acquisition.
  - Applied SLAM Algorithms to map custom-designed environments.
  - Evaluated the performance of SLAM Methods in diverse simulation scenarios.
  - Tools** - ROS2 (Humble), Gazebo | **OS** - Linux (Ubuntu 22.04)
- CAN Data Visualization using dSPACE MicroAutoBox III** 11/2024
- Configured and interfaced dSPACE MicroAutoBox III to read vehicle CAN Data.
  - Visualized real-time data in dSPACE Control Desk for system monitoring and analysis.
  - Enhanced understanding of vehicle dynamics through parameter visualization.
  - Tools** - dSPACE MicroAutoBox III, Control Desk, Configuration Desk | **OS** - Windows

**Gesture Sense : An Automated Hand Gesture Control**

2023 - 2024

- Explored two approaches for gesture control: OpenCV & deep learning methods using 3D-CNN with LSTM
- Compared the accuracies of both methods in gesture recognition.
- Implemented practical applications including controlling Spotify for music & the Hill Climbing Race game.
- Demonstrated the versatility and efficacy of gesture recognition technology in enhancing human-computer interaction.
- **Tools** - Visual Studio Code (VS Code), Google Colab | **OS** - Windows
- **Libraries** - OpenCV, PyAutoGUI, Mediapipe, Keras

**Face Detection and Tracking**

08/2023

- Implemented face detection and tracking with **KLT** and **CAM Shift** algorithms.
- KLT algorithm detects feature points and tracks them across video frames for accurate face tracking.
- CAM Shift algorithm utilizes color information to track objects by adapting the size and orientation of the search window dynamically.
- Utilized Live Video Acquisition for real-time face tracking.
- **Tools** - MATLAB | **OS** - Windows

**Student Management System**

04/2023

- Developed a student management system GUI using Tkinter for the interface and PyMongo for database interactions.
- Enabled functionalities such as adding, updating, deleting, and retrieving student records.
- Implemented features for efficient data management and user-friendly interaction.
- Ensured seamless integration between the GUI and MongoDB for reliable data storage and retrieval.
- **Tools** - Jupyter Notebook | **OS** - Windows
- **Libraries** - Tkinter, PyMongo

**Smart Home Automation [IoT Workshop]**

09/2022

- Prototyped a Smart Home Automation project by interfacing various sensors for comprehensive home monitoring and control.
- Utilized Blynk Cloud and Blynk IoT mobile app for remote management and automation of home devices.
- Achieved real-time data collection and responsive control through sensor integration.
- Enhanced home automation system's usability and efficiency with intuitive mobile app controls.
- **Tools** - Arduino IDE | **OS** - Windows

INTERNSHIP

**Central Manufacturing Technology Institute - Bengaluru**

05/2023 – 07/2023

- Initiated the development of an Electrowetting System on Dielectric (EWOD) project.
- Conducted comprehensive research into EWOD principles and applications, establishing a strong theoretical foundation for the project
- Designed and fabricated prototypes, demonstrating the system's capabilities in fluid manipulation and microfluidic applications.
- Collaborated with interdisciplinary teams to explore potential applications in fields such as lab-on-a-chip devices and digital microfluidics.

CERTIFICATIONS

**Coursera Courses**

- IBM Machine Learning Professional Certificate03/2023
- Introduction to Databases, Meta10/2022
- Python for Data Science, AI & Development, IBM07/2021
- Introduction to Artificial Intelligence, IBM01/2021
- Introduction and Programming with IoT Boards, POHANG University05/2022
- Introduction to Computer Vision and Image Processing, IBM10/2023