

Gunjan Giri

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EDUCATION

- **Birla Institute of Technology And Science, Pilani** Pilani, India
M.Tech in Software Systems *July 2024 - Ongoing*
- **Odisha University of Technology and Research** Bhubaneswar, India
B.Tech in Electronics and Instrumentation Engineering; CGPA: 9.11 *Aug 2018 - May 2022*
Technical Co-ordinator of Zairza: The Technical Society of OUTR College
- **Dr. A.N.K DAV Public School** Rourkela, India
Higher Secondary in PCMB; Percentage: 82.4 *June 2016 - April 2018*
- **Chinmaya Vidyalaya(E.M)** Rourkela, India
Secondary in Science; Percentage: 90.2 *April 2015 - Feb 2016*

SKILLS SUMMARY

- **Languages:** C++, C++14, C++17, Python, Embedded C, Unix scripting, MATLAB
- **Frameworks and Tools:** ROS, ROS2, Pytorch, Tensorflow, Onnx, TensorRT, Arduino, OpenCV, Keras, Embedded Systems, CUDA, GIT, JIRA, BitBucket, XCode, VsCode, Carla, UnrealEngine, DOORS, Kafka, Agile, DevOps, Autostar
- **Algorithms:** Mapping, Localization, Planner, Behaviour, Controller, SLAM, Perception, Sensor Fusion, Path Planning, Intention Prediction, Visual SLAM
- **Learning Based Approaches:** Deep Learning, Machine Learning, Computer Vision, Artificial Intelligence, LLM's, RAG Models
- **Sensors and Development Boards Used:** Monocular Camera, Stereo Camera, Pinhole Camera, Fisheye Camera, Lidar, Ultrasonic Sensor, Depth Camera, IMU, Wheel Encoders, Automotive Sensor, Arduino Uno, Arduino Mega, ESP32, Raspberry Pi, Jetson Nano, Eagle One-O-One, Tensor Boards, Cuda Drivers, Zed Cameras

EXPERIENCE

- **Bosch Global Software Technologies** Bengaluru, India
Software Engineer *Jan 2024 - Current*
 - **Developing the Buggy Autonomous Vehicle with a Focus on Parking and ADAS Features and Functions:**
 - Working with a team to implement several algorithms on the ROS Platform for the Buggy in order to automate the vehicle at the L3 and L4 levels. The car is equipped with lidar and camera sensors, which collect data and enable autonomous driving. Had previously worked on the Hardware Vercle in the NRCS parking chip and was still going strong.
 - Developing scenarios, intention prediction, and prediction from perception for autonomous vehicles to plan a path of avoidance and nudgeability in L2+ functions.
 - Using learning-based techniques, I worked on monocular per-pixel depth estimation for fisheye and pinhole cameras.
 - Working on Visual SLAM themes for a long time, utilizing both learning-based and traditional methods, and employing fisheye, pinhole, and stereo cameras.
 - Perception, mapping, and relocalization work on the Zed Camera SDK was done. Improved Zed Perception's object detection and custom object detection accuracy.
 - Designed and implemented adaptive cruise control using cameras for a vehicle intended for low speed operation.
 - I worked on the calibration and debugging of ADAS sensors, primarily the camera, lidar, and steering.
 - Developed a 360-degree map surrounding the parking spot and worked on localizing it. Designed a Surround Image System utilizing surround NRCS cameras to identify parking slots for parking functions.
 - Developing the ability to detect parking spaces in both normal and surround camera system images.
 - Worked on a variety of challenging projects, mostly ADAS and parking features and functions, and assisted team in finding solutions.
- **Associate Software Engineer** July 2022 - Dec 2023
 - **Focusing on ADAS and parking features and functions for the buggy autonomous vehicle:**
 - Developed ros packages for odometry based on wheels.

- Worked on combining wheel odometry and IMU to create wheel imu odometry.
- Contributed to Fusion for localization, Visual Slam, and Visual Odometry.
- Dedicated a great deal of time to Carla in order to produce ground truth, simulations, and trajectories for AD operations.
- I worked on developing packages for avoiding obstacles and developing programs for visualizing objects inside my area of expertise.
- Worked heavily on ground truth generation and various AD call of action tasks related to Lidar preprocessing, such as upsampling and downsampling.
- Developed a perception pipeline based on Mono-Nrcs cameras, which includes image and semantic segmentation, distortion correction, bird eye view, camera pre-processing, and 2D and 3D object detection.

• Quin

Embedded Software Developer Intern

Hyderabad, India

March 2022 - June 2022

- **Schematic Design:** Developed the schematics for their cycling and motorcycle helmets.
- **SDK and Protocol:** ESP SDK and BLE Protocol integration were worked on in order to read and write from a service.
- **Sensor:** Developed several Motion Sensors, such as MPU9250 and MPU6050, as well as NFC Chipsets.

• Accio Robotics

Robotics Software Developer Intern

Bengaluru, India

Aug 2021 - Feb 2022

- **Worked on their current product, Bot Alpha, and came up with ideas for a new product:**
 - Dedicated to doing research, refining current algorithms, and ensuring their robustness for both new and current products.
 - Participated in a team that implemented planning and docking algorithms for a smooth robot docking experience. Here, a different algorithm was employed for the identical task, and mapping and localization were used to give the robot a concept before docking.
 - Has experience working with various sensors and implementing code in microcontrollers on the embedded side.

• TechnoYantra

Robotics Developer Intern

Remote, India

Sep 2020 - Dec 2020

- **Developed their current product and added new features for their client:**
 - Developed the robots' docking component.
 - Constructed a pipeline connecting robots and docks.
 - Assisted with data storage in AWS for automated annotation; worked with AWS Robomaker and its tools.

ACADEMIC PROJECTS

- **Visual Follow Line exercise of Robotics Academy by JdeRobot Organization:** The JdeRobot Organization's Visual Follow Line exercise for Robotics Academy was completed as a project for the GSoC Program in 2021. For the robot to follow the line and cover the path, I had implemented the PID algorithm in it.
- **Home Service Robot:** The goal of this project was to build a bot that could easily do the assigned chores and navigate between various surroundings on its own. The path planning approach and the SLAM algorithm are applied here.
- **Amazon Robotics Challenge(2016):** The 2016 Amazon Robotics Challenge was about integrating a whole robotic system, such as picking and placing objects in a factory setting utilizing state machines.
- **ROS simulation of an automobile using a Hokuyo sensor:** This project displays a simulation prototype of how a Hokuyo sensor uses lidar to identify covered and uncovered paths in a road.
- **ReRo:** We made it to the Smart India Hackathon finals with our project. This can be applied to manage the scenarios in disaster management scenarios. Here, OpenCV and SLAM Mapping ideas are applied. The Disaster Management Committee may find it useful to expedite the rescue effort.
- **Map My World:** The goal of this project is to provide a comprehensive map of an unknown environment. Concepts from RTAB Maps and Gmapping are applied here.
- **Self Driving Car:** This project is divided into multiple sections. Initially, I used OpenCV to detect advance lanes in the highway. Next, I used Deep Learning to clone the behavior of the car. Lastly, I used PID Controller to detect turning and errors in the car's path.
- **Sahayak Bot:** For this project, which was assigned by IIT Bombay, I gave a WareHouse Robot the ability to manipulate its arms and employ the SLAM algorithm.

COURSES AND CERTIFICATIONS

- **Computer Vision MasterClass:** Udemy (March '24)
- **Autosar Architecture:** Udemy (Sept '23)
- **Advanced Driver Assistance System(ADAS):** Udemy (May '23)
- **Automotive Camera:** Udemy (Feb '23)
- **Data Fusion with Linear Kalman Filter:** Udemy (Oct '22)
- **Programming Essential in Python:** Cisco Netacad (March '21)
- **DSA using Python:** NPTEL (December '20)

- **Robotics Specialization:** Coursera (Sept '20)
- **Self-Driving Car Specialization:** Coursera (Sept '20)
- **Deep Learning Specialization:** Coursera (July '20)
- **Flying Car and Autonomous Flight Engineer NanoDegree Program:** Udacity (July '20)
- **Self-Driving Car NanoDegree Program:** Udacity (June '20)
- **Robotics Software Engineer:** Udacity (May '20)
- **Algorithmic Toolbox:** UCSan Diego (April '20)

HONORS AND AWARDS

- I was awarded Employee of the Year for my innovative work in the field of camera systems.
- 3* for problem solving and 5* at HackerRank for C++ coding.
- At CodeChef, a 2* coder
- Ranked among the top 30 teams in the Reva University Hacker Earth Hackathon: Smart app to manage crowds at malls.
- Ranked among the top 32 teams in a GE Healthcare-hosted hackathon focused on data science in a hospital.
- Winner of Hack Fest 2.0: Our college hosted this event in order to select SIH 2020.
- Been enrolled in IIT Bombay's Eyantra Stage 2.