

# CHRIS SUNNY THALIYATH

Robotics & Autonomous Systems Engineer

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## Profile

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Robotics software engineer with 7+ years of experience in perception, motion planning, and autonomous systems across ADAS ([Mercedes-Benz](#)), autonomous lawn mowers ([Electric Sheep Robotics](#)), and autonomous golf carts ([Bosch](#)). Expert in multi-modal perception (camera, LiDAR, radar), SLAM, sensor fusion, 6-DOF pose estimation, and real-time distributed systems. Proficient in Python, C++, PyTorch, ROS/ROS2, and simulation platforms including CARLA, Gazebo, Unity, and Isaac Sim. Driven by continuous reinvention, human-centered technology, and values of peace, empathy, and excellence.

## Experience

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### [Rosh.ai](#)

*Oct 2025 – Present*

*Lead Engineer – Autonomy*

- **Team Leadership:** Lead a multi-disciplinary team of 10+ engineers; oversee end-to-end development of autonomous vehicle platforms and industrial mobile robotics.
- **Fleet Conversion:** Architected the autonomy stack for converting **Suzuki Ertiga** and **Tata Punch** platforms into autonomous shuttles, managing the full transition to drive-by-wire.
- **Brownfield Retrofit:** Design modular hardware and embedded software frameworks for retrofitting legacy vehicle systems with modern autonomous capabilities.
- **Trucking & Parking:** Technical lead for **L2/L3 features** in autonomous trucking and a hybrid **USS + Fisheye** based auto-parking solution for passenger vehicles.
- **Robotic Inspection (Rivian Motors Deployment):** Oversee the development of an autonomous **Auto-PDI robot** for automating pre-delivery inspections. Deployed on-site at Rivian Motors in Bloomington, IL(OnSite USA) for 5 weeks to conduct quality inspections for End-of-Line (EoL), HVAC, Noise/Vibration/Harshness (NVH), and steering/pedal returnability KPIs.

### [Mercedes-Benz Research and Development India](#)

*Aug 2022 – Oct 2025 (3.3 Years)*

*Level 3 ADAS – HAF 95 & HAF 135*

- Architected production-ready real-time distributed control modules for L3 ADAS, defining system boundaries, interfaces, and requirements.
- Developed LiDAR-based clustering, tracking, and classification pipelines using Euclidean clustering, Hungarian matching, CenterPoint3D, and PointNet for small object detection.
- Implemented monocular depth estimation and BEV-based perception models (PyTorch, BEVDet) to replace LiDAR with camera-only occupancy grids.
- Hands-on with multi-modal BEVFusion (Camera + LiDAR); explored Vision-Language Models (VLMs) for semantic scene understanding.
- Built multi-LiDAR and multi-camera calibration pipelines using ARUCO markers; implemented ICP/NDT-based alignment and ego-motion estimation.
- Designed SLAM-IMU-GPS fusion achieving centimeter-level localization accuracy.
- Implemented MPC, LQR, Pure Pursuit, and 2-DoF controllers integrated with vehicle dynamics.
- Maintained Gen5 ADAS validation pipelines using Airflow, Docker, CI/CD, and large-scale data replay.
- Deployed perception and planning stacks on NVIDIA Orin (IDC6) optimized with TensorRT and CUDA.
- Developed CAN/CAN-FD drivers, DBC decoding, and ROS interfaces.

### [Electric Sheep Robotics](#)

*July 2021 – Aug 2022 (1.3 Years)*

*Fully Autonomous Lawn Mowers*

- Improved SLAM-based 6-DOF pose estimation using EKF fusion of LiDAR, camera, IMU, and GPS.
- Built navigation pipelines across Isaac Sim, Gazebo, and Unity enabling sim-to-real transfer.
- Designed synthetic data pipelines for Vision-Language Models.

- Integrated Visual Teach & Repeat (VT&R) navigation (Under the guidance of Prof. Tim Barfoot, University of Toronto).
- Deployed autonomy stack on NVIDIA Orin.

## Arway.ai

2020

### *Spatial Computing & AR Platforms*

- Implemented kidnapped-robot relocalization using Bag-of-Words techniques.
- Cross-compiled ORB-SLAM2 C++ binaries for Unity, Android, and iOS.
- Built a custom SLAM-based relocalization system replacing ARKit/ARCore.

## Bosch Global Software Technologies

2020 – August 2021 (1.1 Years)

### *Senior Software Engineer (Promoted from Software Engineer)*

- **High-Definition Mapping:** Engineered a full-pipeline solution for campus-scale navigation by generating **Lanelet2** and **OpenStreetMap (OSM)** compliant maps, enabling lane-level semantic context for autonomous routing.
- **Localization Stack:** Developed and deployed a robust **LiDAR-SLAM** system utilizing Velodyne VLP-16; implemented multi-sensor **EKF fusion** (LiDAR + GPS + IMU) to maintain centimeter-level drift-free localization in GPS-denied environments.
- **Extrinsic Calibration:** Designed and implemented automated calibration routines for **LiDAR-to-LiDAR** and **LiDAR-to-Camera** setups, ensuring precise point-cloud projection and sensor data alignment for downstream perception.
- **Planning & Control:** Built waypoint followers and integrated lane-keep assist (LKA) and adaptive cruise control (ACC) logic tailored for low-speed autonomous golf carts.
- **Hardware Integration:** Developed custom ROS drivers for vehicle interfaces (CAN, Electronic Power Steering, throttle/brake) and environmental sensors (Radar, Ultrasonic).
- **Embedded Deployment:** Optimized and deployed the full autonomy stack on **NVIDIA Drive PX** platforms operating on **RTOS** (QNX and Linux-RT) to meet safety-critical timing requirements.

## Bosch Global Software Technologies

Sept 2018 – 2020 (1.9 Years)

### *Software Engineer – Autonomous Low-Speed Golf Cart*

- **Drive-by-Wire (DBW) Development:** Developed and integrated ROS-compatible drivers for vehicle actuation systems including **EPAS (Electronic Power Assisted Steering)**, electronic throttle, and braking systems.
- **Sensor Integration:** Implemented hardware abstraction layers and drivers for a diverse sensor suite: **Ultrasonic Sensors (USS)**, **Mid-Range Radar (MRR)**, and **Wheel Speed Sensors** for odometry.
- **Communication Protocols:** Developed CAN/CAN-FD interfaces and DBC decoding logic to bridge the gap between low-level vehicle controllers and the high-level ROS navigation stack.
- **Control Theory:** Implemented basic waypoint following and PID-based longitudinal/lateral control integrated with vehicle dynamics.

## Vanora Robots

June 2017 - 2018 March (1 year)

### *Agricultural Autonomous Robot – Rubber Tapping*

- Developed ROS drivers for Sabertooth 2x32 motor controllers on Raspberry Pi.
- Programmed embedded controllers (Arduino, STM32) for real-time motor control.
- Implemented encoder-based odometry integrated with ROS navigation stack.
- Built Visual SLAM pipelines using depth camera (Xbox Kinect) fused with odometry.
- Designed ArUco marker-based auto-docking for wireless charging.

## Education

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### M.Tech in Artificial Intelligence & Machine Learning

2023 – 2025

#### Indian Institute of Technology Jammu

- Driver drowsiness detection using Android, DLIB facial landmarks, and CNNs.
- End-to-end L3 autonomous vehicle stack using BEV fusion and MPC.

- Built CNC machines, drones, lane-following and self-balancing robots.
- Designed Shazam-like audio recognition using FFT-based fingerprints.
- Automated greenhouse system using Arduino, Raspberry Pi, OpenCV, and web UI.

## **Skills**

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| • Perception, SLAM, Localization, Mapping  | • ROS, ROS2, DDS                       |
| • Motion Planning (MPC, LQR, Optimization) | • Python, C++, CUDA                    |
| • Multi-modal Sensor Fusion                | • CARLA, Isaac Sim, Gazebo, Unity      |
| • PyTorch, TensorFlow, OpenCV              | • Git, Docker, CI/CD, JIRA, Confluence |

## **Patents**

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- [DE102024133915A1](#) – [Method and device for reconstructing missing road lanes using LiDAR technology](#). Inventors: Patnaikuni Srihar, Aswathy Radhakrishnan, **Chris Sunny Thaliyath**. Assignee: Mercedes-Benz Group AG.

## **Awards**

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- First Place – Lane Following Competition, Galgotias University (2014)
- Second Place – Lane Following Competition, IIT Delhi (2015)
- Qualified – University Rover Challenge (2017)
- Bosch Appreciation – ROS vs Adaptive AUTOSAR Technical Talk
- Bosch Appreciation – Top Cycle-to-Work Candidate

## **Leadership**

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Head of Robotics Club, Shiv Nadar University (2016–2017). Mentored junior engineers at Bosch and Mercedes-Benz. Leadership philosophy rooted in empathy, truth, and collective growth.

## **Personal Traits**

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Curiosity, Integrity, Courage, Empathy, Self-Reflection, Discipline, Patience, Faith, and Love for Humanity.