

VIVEK KUMAR JAISWAL

B-111, NR Royal Manor, Royal Enclave, Jakkur, Bengaluru – 560064, Karnataka, India

Contact No: +91-8092610351; Email: vivekjaiswal.iitdhn@gmail.com

[Linked in](#) [GitHub](#)

ACADEMIC QUALIFICATION

B.Tech in Electrical Engineering, **Indian Institute of Technology (ISM)**, Dhanbad; CGPA: 8.12/10; 2014-18

WORK EXPERIENCE

Senior Engineer, L&T Technology Services, Bangalore (Aug'18-Present)

- Awarded '**STAR of the Month** – July'19'
- Developed a simulation environment for testing autonomous vehicle algorithms in CARLA.
- Currently, working on developing Sensor fusion (Radar + Camera) algorithm.

TECHNICAL SKILLS

- **Programming languages:** C, C++, Python
- **Packages:** MATLAB & Simulink, PSpice, Eagle PCB, dSPACE, Atmel Studio, Proteus, Mplab IDE, Keil uVision, PSim, ROS.

INDUSTRIAL PROJECTS

1. **Title:** Radar + Camera Sensor Fusion based Object Tracker

Duration: Mar'20-May'20

Language/ Libraries Used: C++, OpenCV, Point Cloud Library, YOLO

Brief Description: A sensor fusion algorithm was designed to relate the classification and visual data from the camera to radar data of the object and then using the fused data for the update to the tracker.

Individual Role: This algorithm can be explained in two parts: Fusion & Tracking:

Fusion: Each image frame is passed through YOLO to obtain bounding box of each Vehicle in the scene. And then radar data is projected on the image and then each bounding box is associated with its unique radar data cloud. Now, each image frame is passed through keypoints and descriptors finding algorithms and again these keypoints and descriptors are associated with individual bounding boxes. These keypoints and descriptor combinations used to associate Bounding boxes from one frame to another using the matching algorithm.

Tracking: Each bounding box has a unique UKF tracker. As Bounding boxes are matched the associated radar points are used for updating the UKF. If any bounding box couldn't find a match in the next frame it is dropped out of traffic list and if there are new bounding boxes in the next image then new UKFs are initialized for them.

2. **Title:** Radar + Lidar Sensor Fusion

Duration: Mar'20-Apr'20

Language/ Libraries Used: C++

Brief Description: LiDAR & Radar have relative advantages over each other. LiDAR has better resolution but is not useful in dusty and rainy scenarios. Whereas, Radar has relatively less resolution but is quite ubiquitous with respect to the number of situations it can be used as it is immune to dust and rain. Fusion of both sensors would result in a more robust detection and tracking system.

Individual Role: UKF was used to track the objects. It oscillates between both Radar and LiDAR data for the measurement update of each tracked object.

3. **Title:** Radar Simulation

Duration: Mar'20-Mar'20

Language/ Libraries Used: MATLAB

Brief Description: A simulation environment is created in MATLAB using Automated Driving Toolbox and then vehicle tracking is done using Kalman filter utilizing simulated RADAR data for measurement update.

4. **Title:** Radar based Object Tracker using Unscented Kalman Filter

Duration: Feb'20-Mar'20

Language/ Libraries Used: C++, Point Cloud Library

Brief Description: This algorithm relies only on radar data for tracking the objects. UKF is utilized for tracking and Global Nearest Neighbor (GNN) algorithm relate radar data from one frame to another

5. **Title:** Simulation Environment in CARLA for Autonomous Vehicle Feature Testing

Duration: Nov'19-Jan'20

Language/ Libraries Used: Python, CARLA Simulator

Brief Description: A simulation environment was created in CARLA simulator for testing of various autonomous vehicle features like Object avoidance, object tracking, etc.

Individual Role: Different scenarios were created to test algorithms in different conditions. Moreover, a bridge program was also created to convert the simulation sensor data to the required format for our algorithms.

6. **Title:** Digital Control Logic for Autonomous Vehicle

Duration: Apr'19-Jul'19

Language/ Libraries Used: C++

Brief Description: A PID-Fuzzy logic control was designed for lateral control of the autonomous vehicle.

ACADEMIC PROJECTS

1. **Title:** Bi-Directional DC-DC LLC Resonant Converter

Duration: Jul'17-May'18

Brief Description: A 1kW bidirectional LLC Resonant DC-DC converter was designed for energy storage applications. The novel designing methodology for bi-directional LLC resonant converter was theorized.

Individual Role: Simulation Study in PSIM, Magnetics Designing, Control Designing- Implemented Simplified Optimal Trajectory Control (SOTC) for transient state and PID control for steady-state control.

2. **Title:** Notch Filter

Duration: Jun'16-July'17

Brief Description: A filtering technique based on wavelet transform and statistical curve fitting was developed, to denoise the notches from the variable frequency non-stationary synchronizing power signal.

Individual Role: Modelling and Simulation of the Power system and filter logic in the Simulink. Also carried out the experimental study using dSpace 1104 interface.

3. **Title:** Autonomous Robot Using Image Processing in MATLAB

Duration: July-Oct'15

Team Size: 3

Brief Description: Designed an autonomous robot using Arduino Due, which could find the shortest path in a multicolored grid. Dijkstra's algorithm was used to find the shortest path in the grid. The project won 3rd prize at Annual Technology Management Fest at IIT Guwahati among 12 participating teams

PUBLICATIONS

- V. K. Jaiswal and Anirban Ghoshal, 'A Design Methodology of Bidirectional LLC Resonant Converter for Energy Storage Systems,' in *2019 IEEE Transportation Electrification Conference Asia-Pacific*, Korea, (2019). [[link](#)]
- V. K. Jaiswal, 'A Novel Notch Filter Using Wavelet Transform and Statistical Curve Fitting', in *2018 IEEMA International Engineer Infinite Conference*, Noida (2018). [[link](#)]

AWARDS & ACHIEVEMENTS

- Recipient of 'Star of the Month-July' for playing a key role in delivering the project at L&T, Bangalore (2019).
- Ranked 3rd in the event 'Economic Crosscut' held at the Annual Technology Management Fest of Indian Institute of Technology, Guwahati - 'Techniche 2015'.

INTERNSHIPS

Intern, Defence Research and Development Organisation, New Delhi (May – Jul'17)

- Designed 1.5kW constant current power supply for high power LASERs based on LLC resonant topology and simulated in Simulink.
- PI controller was tuned using the small-signal model of the converter.
- Power Factor Corrector (PFC) and Inrush current limiter were also designed.

Intern, Cirkittree Pvt. Ltd., (Startup), New Delhi (Dec'16 – Jan'17)

- Developed DIY kits for electronics enthusiasts based on various microcontroller platforms—AVR, Microchip PIC, and TI.
- Designed and simulated the circuits Proteus and designed Printed Circuit Boards in EaglePCB.

TRAINING ATTENDED

- 'MATLAB & Image Processing' at RoboSpecies Pvt. Ltd., New Delhi (May– Jun'15).
- 'PCB & Circuit Designing' at RoboSpecies Pvt. Ltd., New Delhi (May – Jun'15).

EXTRACURRICULAR ACTIVITIES

- Represented India in the Cultural Exchange at the University of Brawijaya, Indonesia (Jun – Jul'15).
- As a member at National Service Scheme (NSS) participated in various social awareness campaigns for women and child education. (Jul'14 – Jun'18).
- Volunteered to teach Physics at Kartavya, an NGO in Dhanbad to around 120 underprivileged students (May'15 – Jun'18).
- Organized 'Concetto 2015', an Annual Techno-Management Fest of IIT (ISM), Dhanbad (2015).