VIVEK KUMAR JAISWAL

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LinkedIn GitHub

ACADEMIC QUALIFICATION

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

TECHNICAL SKILLS

Programming languages: C, C++, Python
Packages: ROS, OpenCV, PyTorch, TensorFlow, Point Cloud Library, CARLA
Software Tools: MATLAB/Simulink, PSpice, Eagle PCB, dSPACE, Proteus, PSim, ESP-IDF

WORK EXPERIENCE

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

- Awarded '**STAR of the Month** – July'19'
- Currently working on developing Sensor fusion (Radar + Camera) algorithm.
- Integration and calibration of Continental ARS-404 and ARS-408 radars.
- Developed warning system in case of a malfunctioning modules for effective debugging.
- Developed data logger for the whole software stack of autonomous vehicle for post run system analysis.
- Developed Drive-By-Wire architecture.
- Conducted comparison study on embedded platforms for autonomous vehicles.
- Conducted market study on simulation platforms for autonomous vehicles
- Trained recruits on control systems and stereo camera based odometry.

INDUSTRIAL PROJECTS

- **Radar + Camera Sensor Fusion based Multi-Object Tracker** [Mar-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. Objects in consecutive frames are related using a Matching algorithm based on Keypoint-Descriptor matching across images. Unscented Kalman Filter (UKF) is used for tracking. Each object in the traffic has a unique UKF assigned.

- **Radar based Object Tracker using Unscented Kalman Filter** [Feb-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 & Global Nearest Neighbour (GNN) algorithm for data association between frames.

- **Simulation Environment in CARLA for Autonomous Vehicle Feature Testing** [Nov'19-Jan'20]

  Language/ Libraries Used: Python, CARLA Simulator

  Brief Description: Multiple custom scenarios were created in CARLA simulator to test various autonomous vehicle features like Object avoidance, object tracking, etc.

- **Digital Control Logic for Autonomous Vehicle** [Apr-Jul'19]

  Language/ Libraries Used: C++

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

INDIVIDUAL PROJECTS

- **Self-Balancing Autonomous Robot (SBAR)** [May-Oct'20]

  Language/ Libraries Used: C++, Arduino-ESP32, Python, OpenCV

  Brief Description: Two ESP32-Cam modules were used as a stereo camera setup. And a separate ESP32 development board was used for the self-balancing functioning. All the sensor data was communicated to the remote PC wirelessly, and the processed decisions were also transmitted to the robot wirelessly.

ACADEMIC PROJECTS

- **Bi-Directional DC-DC LLC Resonant Converter** [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.

- **Notch Filter** [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.

- **Autonomous Robot Using Image Processing in MATLAB** **[**July-Oct'15]

  Brief Description: Designed an autonomous robot using Arduino Due, to travel on most economical 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. [link]
- V. K. Jaiswal, 'A Novel Notch Filter Using Wavelet Transform and Statistical Curve Fitting', in 2018 *IEEMA International Engineer Infinite Conference*, Noida. [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.
  - PID controller was tuned using the small-signal model of the converter.
- **Intern, Cirkitree Pvt. Ltd., (Startup), New Delhi** [Dec'16 – Jan'17]
  - Developed DIY kits for electronics enthusiasts based on various microcontroller platforms –AVR, Microchip PIC, & TI.
  - Designed and simulated the circuits Proteus and designed Printed Circuit Boards in Eagle PCB.

TRAINING ATTENDED

- 'Sensor Fusion-NanoDegree' at Udacity [Jan-Mar'20]
- **'**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 of the 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]