

# Harsh Ramniklal Kasundra

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GitHub: [github.com/dcetin](https://github.com/dcetin)



## EDUCATION

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### **TU Dortmund**

M.S. in Automatin and Robotics

Dortmund, DE

2023–2025

- Thesis: “Reinforcement Learning for Docking of the chronos Car with Trailer”

### **Dharmsinh Desai University**

B.tech. in Instrumentation and control Engineering,

Nadiad, IN

2019–2023

- Thesis: “ Remote PLC Control and SCADA Monitoring for Color Blending Process”

## TECHNICAL SKILLS

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- **Programming:** Python, Matlab, C/C++
- **Frameworks & Libraries:** ROS2, PyTorch, TensorFlow, openCV ,SB3
- **Tools/Techs:** Gazebo, RViz, Mujoco, LaTeX, Git, conda, CMake, Docker
- **Languages:** English(Native), Hindi (Native), German (A2)

## EXPERIENCE

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### **Forvia Hella**

Research & Dev Intern at L-LAB

Lippstadt, DE

Summer 2019

- Researched and implemented event–RGB sensor fusion techniques for object detection for autonomous systems
- Developed multi-modal sensor fusion system using event and RGB cameras in DSEC setup, achieving 30% improved object detection in low-light conditions.
- Custom YOLO models trained for cyclist recognition with 85% precision in real world traffic scenarios.
- Implemented cross-modal bounding box transfer algorithms to map detection results from RGB frames to event camera data using geometric transformations.
- Developed data processing pipeline converting raw event data to H5 format and evaluated performance across ETRAM, RVT, RED, NER-Net and LEOD architectures

### **Masibus Automation And Instrumentation**

Research & Dev Intern

Gandhinagar, IND

Summer 2017

- Optimized industrial control systems
- Identified root causes of system failures through in-depth analysis, resulting in a 15% reduction in downtime and a 20%increase in overall system efficiency.
- Managed and executed control system upgrades and modifications, ensuring seamless integration and minimal disruption to ongoing operations.

## PROJECTS

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See full list of projects on [dcetin.me/projects](https://dcetin.me/projects)

### Reinforcement Learning for Docking of the Chronos Car with Trailer

[github link](#)

- Developed a Reinforcement Learning-based control framework for autonomous trailer docking, integrating deep learning, simulation, and real-world deployment.
- Implemented a Deep Deterministic Policy Gradient (DDPG) agent for precise and stable trailer maneuvering.
- Designed a multi-objective reward function balancing accuracy, efficiency, safety, and smooth control.
- Built a simulation-to-real transfer pipeline using PyTorch and OpenAI Gym, validated in Real world using motion capture and ROS2 framework.
- Applied curriculum and transfer learning techniques to enhance convergence speed and robustness across varied configurations.

### Hybrid Point-Grid RadarNet

[github link](#)

- Implemented a novel hybrid architecture combining point-based and grid-based neural networks for enhanced radar object detection in autonomous vehicles using OpenPCDet framework
- Achieved improved object orientation estimation by integrating point-wise feature extraction before grid rendering.
- Replicated the paper's architecture achieving up to 19.7% higher mean Average Precision (mAP) for vehicle detection compared to baseline methods.
- Utilized radar point cloud processing techniques including Graph Neural Networks (GNN) and Kernel Point Convolutions (KPConv).
- Trained and validated models on the VoD autonomous driving dataset.

### Development of Local and Global Path Planners for TurtleBot

Gandhinagar, IND

- Developed and implemented Global and local path planner for static environment
- Develop a global path planner that computes an optimal path from the start to the goal position within a static environment, ensuring that the route avoids obstacles and minimizes travel distance.
- Create a local path planner that operates in real-time, adjusting the robot's path to avoid dynamic obstacles and navigate around any unexpected changes in the environment.
- Implement the developed path planners on a TurtleBot, demonstrating their effectiveness in navigating a static environment.