

# Computer Vision In Autonomous Driving

## Introduction

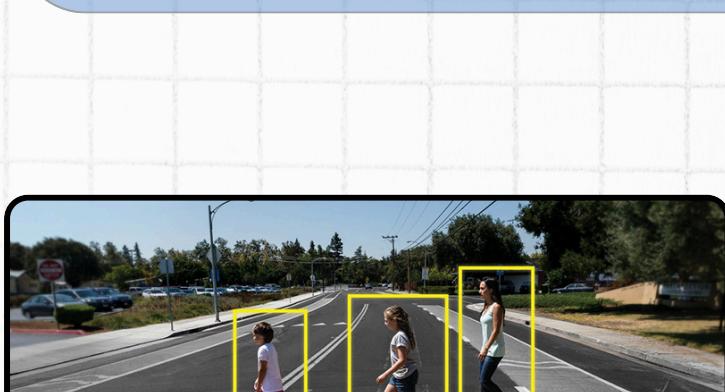
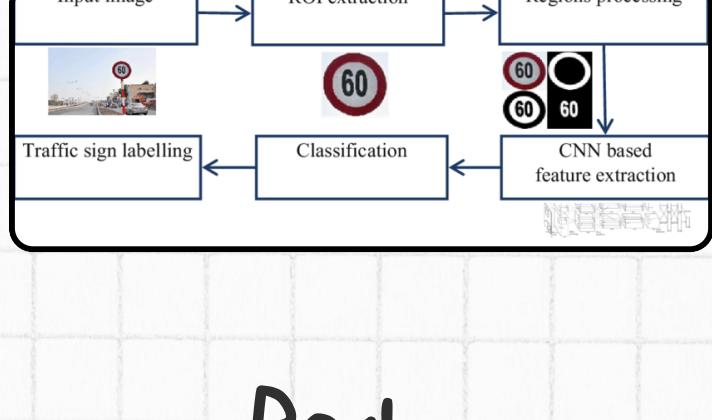
Autonomous driving relies a lot on computer vision to understand the surroundings. Important tasks like lane detection, traffic sign recognition, and pedestrian detection help vehicles drive safely and effectively.



## Traffic Sign Recognition

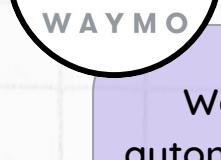
Traffic sign recognition is important for following traffic rules and keeping the roads safe. Convolutional Neural Networks (CNNs) are trained on datasets like GTSRB (German Traffic Sign Recognition Benchmark) to correctly identify and classify traffic signs. This helps vehicles respond properly to speed limits, warnings, and other traffic signs.

Lane detection helps self-driving cars stay in their lanes and drive safely. Algorithms like the Hough Transform and Canny Edge Detection are often used to find lane boundaries. Newer methods use deep learning models to make lane detection more accurate and reliable.



## Pedestrian Detection

Pedestrian detection helps self-driving cars see and react to people on the road. Techniques like YOLO (You Only Look Once) and Faster R-CNN detect pedestrians in real-time with high accuracy. These models help prevent accidents and improve the safety of self-driving cars.



## Real-World Example

Waymo, a subsidiary of Alphabet Inc., is a leading company in autonomous vehicle technology. Their self-driving cars are equipped with such advanced computer vision systems that enable them to navigate safely and efficiently in various real-world scenarios.