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Acronyms Used

4G Fourth Generation Mobile Network

4WD Four-Wheel Drive

5G Fifth Generation Mobile Network

5V-EN 5 Volt Enable

ADC Analog-to-Digital Converter

AI Artificial Intelligence

ADAS Advanced Driver-Assistance Systems

AMIs Amazon Machine Images

APIs Application Programming Interfaces

Arduino IDE Arduino Integrated Development Environment

ASCII American Standard Code for Information Interchange

AWS Amazon Web Services

awbgains Auto White Balance Gains (Camera settings)

BAC Blood Alcohol Concentration

BDD100K Berkeley DeepDrive 100,000 Dataset

BLE Bluetooth Low Energy

BO Bayesian Optimization

CAN Controller Area Network

CCTV Closed-Circuit Television

CNN Convolutional Neural Network

CoreML Core Machine Learning (Apple’s ML framework)

CSPDarknet Cross Stage Partial Darknet (YOLO Backbone)

CSPNet Cross Stage Partial Network

DC Direct Current

Dlib C++ Toolkit for Machine Learning and Computer Vision

EAR Eye Aspect Ratio (used in drowsiness detection)

EasyOCR Easy Optical Character Recognition (Python Library)

ECHO Echo Pin (in ultrasonic sensors)

ENA Enable A (Motor Driver)

ENB Enable B (Motor Driver)

ESC Electronic Speed Controller

ESP32 Espressif Systems 32-bit Microcontroller

FPS Frames Per Second

GND Ground

GPIO General Purpose Input/Output

GPS Global Positioning System

GPU Graphics Processing Unit

GTSRB German Traffic Sign Recognition Benchmark

HDR High Dynamic Range

HC-SR04 Ultrasonic Distance Sensor

HOG Histogram of Oriented Gradients

HTTP Hypertext Transfer Protocol

IMU Inertial Measurement Unit

Imutils Image Processing Convenience Functions (Python)

IoT Internet of Things

IoU Intersection over Union

IR Infrared

ITS Intelligent Transportation System

LED Light Emitting Diode

L298N Dual H-Bridge Motor Driver Module

LaneNet Lane Detection Neural Network

LIDAR Light Detection and Ranging

LSTMs Long Short-Term Memory Networks

macOS Macintosh Operating System

mAP Mean Average Precision

MATLAB Matrix Laboratory (MathWorks software)

MPC Model Predictive Control

MTL Multi-Task Learning

MQTT Message Queuing Telemetry Transport

MXNet Apache MXNet (Deep Learning Framework)

MQ3 Gas Sensor (for alcohol detection)

NodeMCU Node Microcontroller Unit (IoT Board based on ESP8266)

NEO-6M GPS Module (u-blox brand)

OLED Organic Light Emitting Diode

ONNX Open Neural Network Exchange

OpenCV Open-Source Computer Vision Library

OS Operating System

PANet Path Aggregation Network

PC Personal Computer

PID Proportional–Integral–Derivative (Controller)

PlatformIO Development Environment for IoT

PWM Pulse Width Modulation

R-CNN Region-based Convolutional Neural Networks

RADAR Radio Detection and Ranging

RC Car Remote Control Car

RCV Receive

RF Radio Frequency

RGB Red Green Blue (color model)

Rpi Raspberry Pi

RPLIDAR Robotic Platform LIDAR Sensor

ROI Region Of Interest

ROS Robot Operating System

RRT Rapidly-exploring Random Tree (path planning algorithm)

RSU Road Side Unit

RTX Ray Tracing Texel Extreme (NVIDIA GPU Series)

RX Receive

SOTA State of The Art

SCNN Spatial Convolutional Neural Network

SciPy Scientific Python Library

SD Card Secure Digital Card

SGD Stochastic Gradient Descent

SLAM Simultaneous Localization and Mapping

SPP Serial Port Profile (Bluetooth profile)

SVM Support Vector Machine

TensorRT Tensor Runtime (NVIDIA Deep Learning Optimizer)

TRIG Trigger Pin (often used in sensors)

TX Transmit

UART Universal Asynchronous Receiver-Transmitter

UDP User Datagram Protocol

USB Universal Serial Bus

V2X Vehicle-to-Everything Communication

VCC Voltage Common Collector (power supply)

WLAN Wireless Local Area Network

Wi-Fi Wireless Fidelity

YOLO You Only Look Once

YOLOv5 You Only Look Once version 5

YOLOv5n YOLOv5 Nano variant

YOLOv5s YOLOv5 Small variant

YOLOv5x YOLOv5 Extra Large variant

YOLOv6 You Only Look Once version 6

YOLOv7 You Only Look Once version 7

YOLOv8 You Only Look Once version 8