

The background is a deep blue gradient with a subtle pattern of white dots. Overlaid on the left side are several concentric circles and arcs in a lighter blue color. Some of these arcs have degree markings, such as 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, and 260. There are also small white arrows pointing in various directions, suggesting a sense of rotation or movement.

# OBJECT-DETECTION

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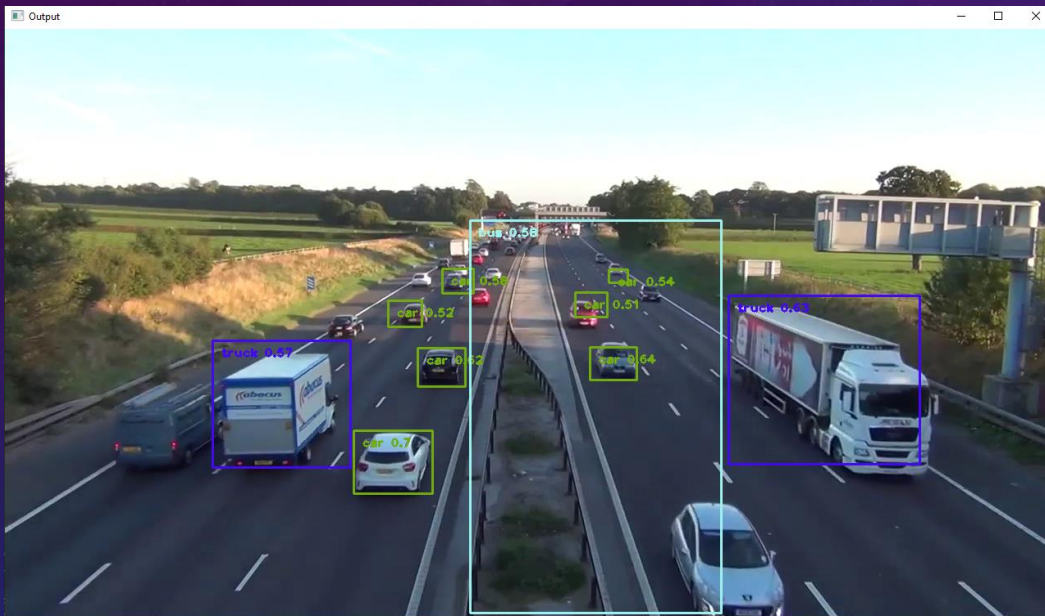
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# INTRODUCTION TO OPENCV

OpenCV (Open Source Computer Vision Library: <http://opencv.org>) is an open-source library that includes several hundreds of computer vision algorithms. The document describes the so-called OpenCV 2.x API, which is essentially a C++ API, as opposed to the C-based OpenCV 1.x API (C API is deprecated and not tested with "C" compiler since OpenCV 2.4 releases).

# WHAT IS OBJECT DETECTION?

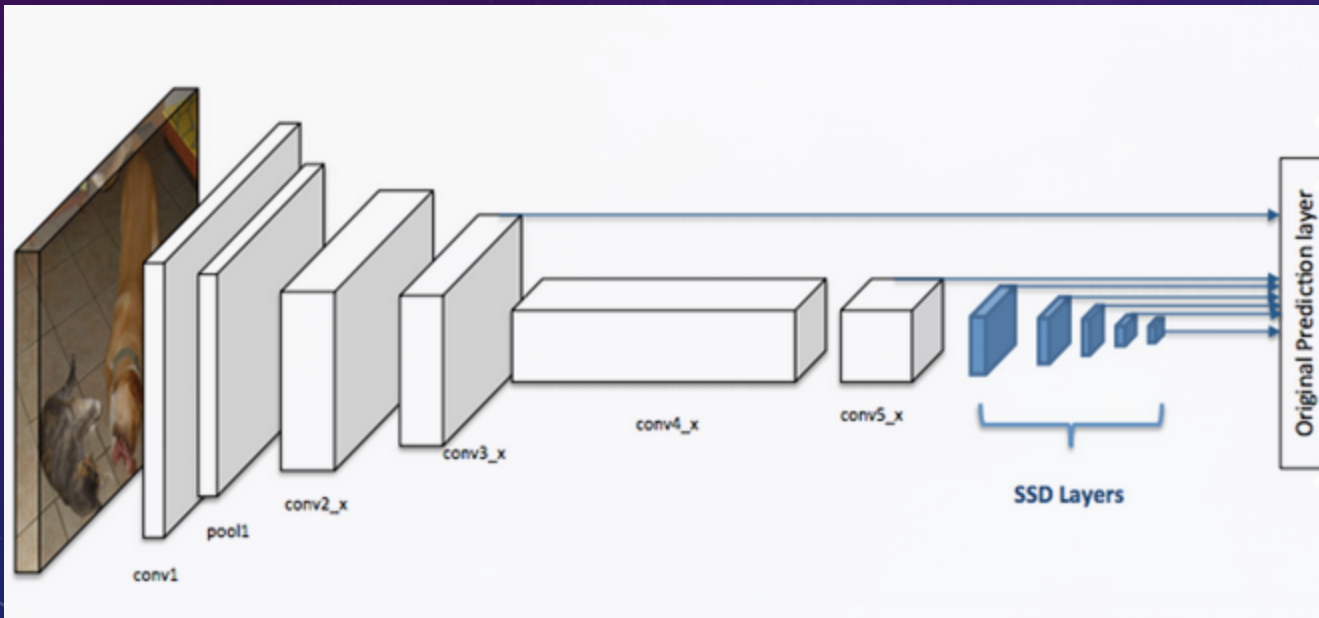


- Object detection is a computer vision technique that allows us to identify and locate objects within an image or video. It involves not only classifying what the object is (e.g., car, person, bicycle), but also determining where it is located by drawing a bounding box around it.



# SINGLE SHOT DETECTOR MOBILENET V3

- The SSD (Single Shot Detector) MobileNet v3 architecture is a highly efficient and effective approach for object detection, particularly suited for real-time applications and deployment on resource-constrained devices.



## Key Components:

**Single Shot Detector (SSD):** SSD is a one-stage object detection framework that directly predicts bounding box coordinates and class probabilities for multiple objects in a single forward pass of the network. This makes it faster than two-stage detectors like Faster R-CNN.

**MobileNet v3:** MobileNet v3 is a lightweight convolutional neural network architecture designed for mobile and embedded vision applications. It emphasizes efficiency by using depthwise separable convolutions, inverted residual blocks, and a novel activation function called the hard swish (h-swish).

# CONCLUSION

- This project demonstrates the power and versatility of object detection using OpenCV and deep learning. While our current implementation is a solid foundation, there's immense potential for further exploration and enhancement. By incorporating techniques like object tracking, action recognition, or 3D pose estimation, we can build even more sophisticated systems capable of understanding and interacting with the visual world in a truly meaningful way.