# Smart-YOLO: A Light-Weight Real-time Object Detection Network

[Reference link](https://www.researchgate.net/publication/349018297_Smart-YOLO_A_Light-Weight_Real-time_Object_Detection_Network)

# Abstract:

YOLO, due to its speed limitation, is not suitable for scenes that require extremely strict real-time performance.

A new lightweight algorithm based on the YOLO framework which uses inverted bottleneck blocks and deep-wise separable convolution.

Compared with YOLOv3, the accuracy of our model was reduced by about 21%, but achieved up to 4.5 times speedup and the model size is ⅛ of the original.

This shows that, the new modified model is smaller, faster and more suitable for real

time object detection.

# Introduction:

Human beings can easily detect and identify the surrounding objects in real time, and it takes almost time to react. However, using a computer to detect and recognize the same object requires a lot of calculation and processing, and consumes a lot of time to extract the information of the object. But in some edge devices (such as smart cameras), the speed and real-time requirements are extremely strict. Therefore, it is of great significance to accelerate and compress the object detection model.

Based on the YOLO framework, our model replaces the backbone network with an inverted bottleneck structure, and modified loss functions. Finally, a real-time lightweight object detection model is obtained which can indeed strike a better trade-off between accuracy and efficiency.

# Smart YOLO model:

## Backbone networks:

Smart-YOLO uses the inverted residual with a linear bottleneck as the backbone.

## Depth-wise separable convolution:

# 

