# YOLOV1 Telegram bot

Idea description:

The project aims to implement the YOLO (You Only Look Once) object detection algorithm from scratch using PyTorch, a widely-used open-source machine learning library for Python. Object detection algorithms, such as YOLOV1, are used in various applications to automatically identify and locate objects in images or videos. After train and evaluation model will be integrated to telegram bot using Telegram API for simplicity of use.

Background information on the problem or idea:

YOLO (You Only Look Once) is a real-time object detection algorithm that was first introduced in 2015 by Joseph Redmon et al. It is a single-stage detector that uses a convolutional neural network (CNN) to predict object bounding boxes and class probabilities directly from full images in one pass.

One of the key advantages of YOLO is its fast detection speed, which is achieved through the use of a fully convolutional network and predictions made at multiple scales. YOLO also utilizes anchor boxes, which are predefined bounding box shapes, to handle object scale variations and enable the model to detect objects of different shapes.
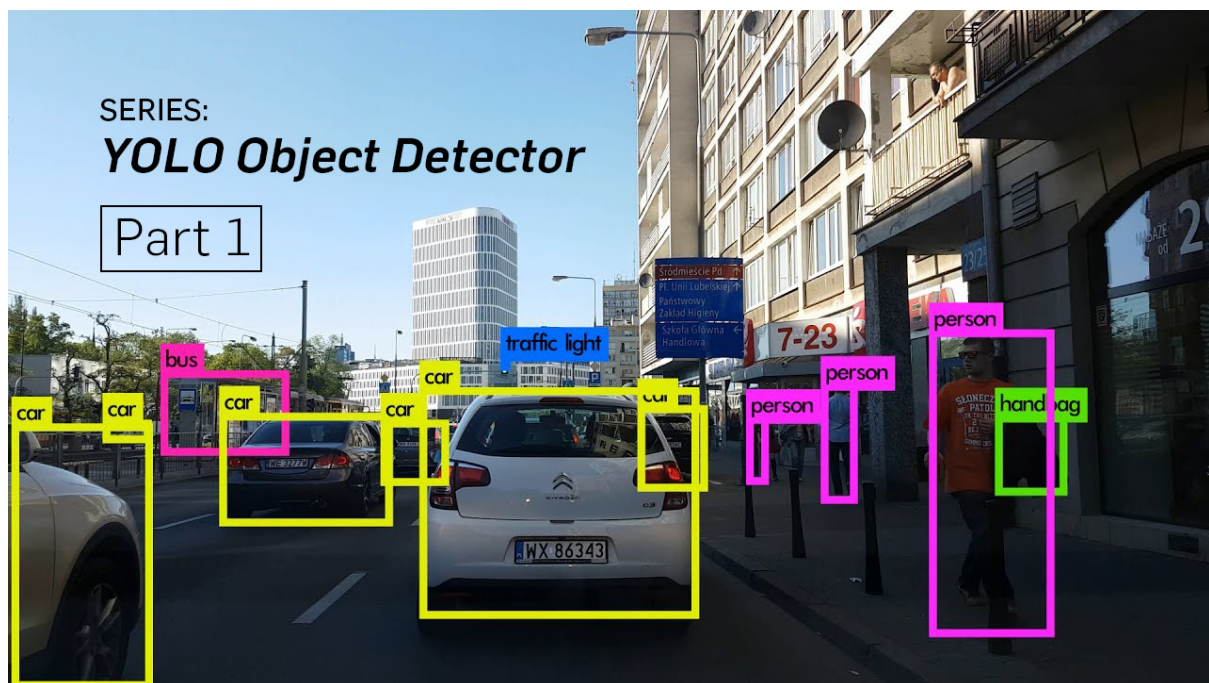
Available solutions with links:

There are several available solutions for implementing the YOLOV1 object detection algorithm, including:

- Redmon, J., Divvala, S., Girshick, R., & Farhadi, A. (2015). You only look once: Unified, real-time object detection. arXiv preprint arXiv:1506.02640.
- The original YOLO implementation in C++ by Joseph Redmon et al. (https://pjreddie.com/darknet/yolo/)

How to get the data:

The PASCAL Visual Object Classes (VOC) dataset is a widely-used benchmark dataset for object detection and classification tasks. It was developed by the PASCAL network, a European network for research in computer science, and consists of images from 20 object classes such as cars, airplanes, and dogs.

The PASCAL VOC dataset is organized into five sets: the training set, validation set, test set, and two additional sets for detection. The training and validation sets are used for training and evaluating object detection models, and the test set is used for final evaluation. Each image in the dataset is annotated with bounding boxes and class labels for the objects present in the image.
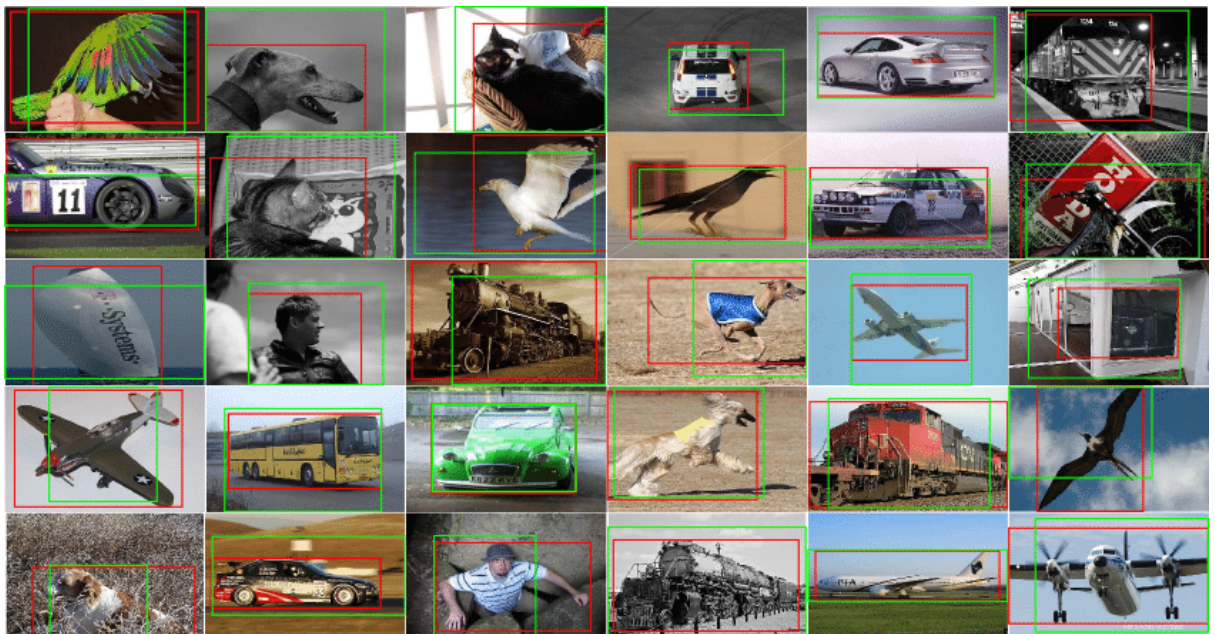
Brief description of your solution:

In this project YOLOV1 will be implemented from scratch using Python package PyTorch. Utils, loss, data set and model will be in different files. Model will written using a t*orch..nn.Model.* After training and evaluation will be visualization of metrics. All implementations will be taken from the original paper. Train and evaluation will be in the IPYNB file. For implementation into Telegram bot will be used Telebot library.

Tech stack that will be used:

Python 3.9.12
PyTorch 1.12.1
Pandas
Numpy
Matplotlib
Telegram