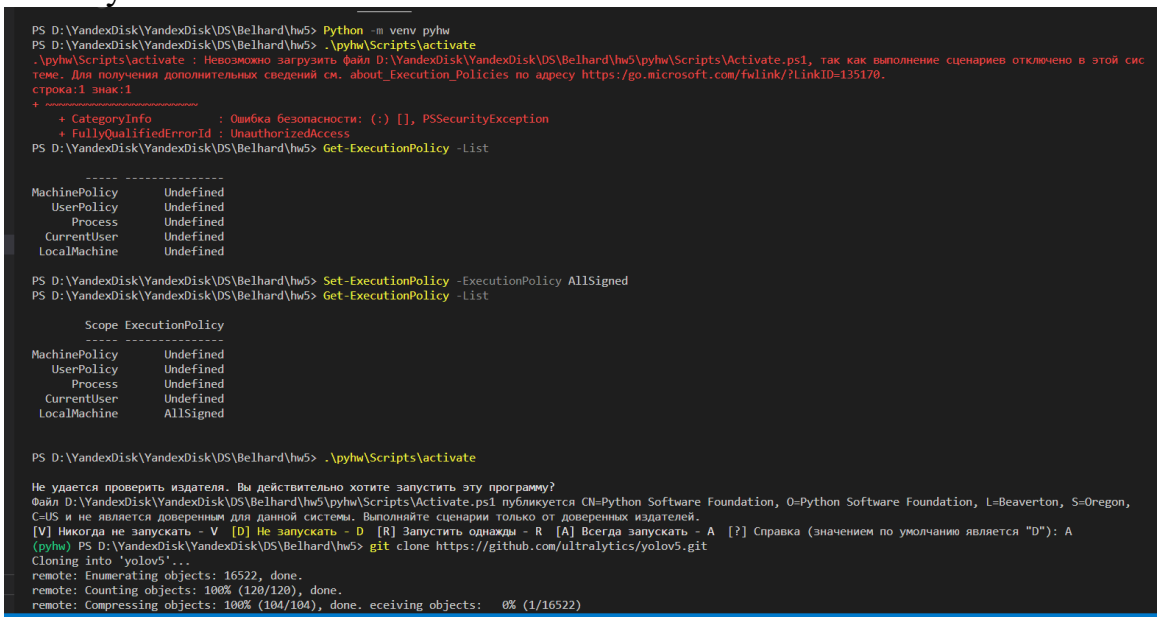
Создание и запуск виртуального окружения для работы Python 3.11
Были проблемы с execution policy, пришлось поменять на AllSigned и виртуальное окружение запустилось

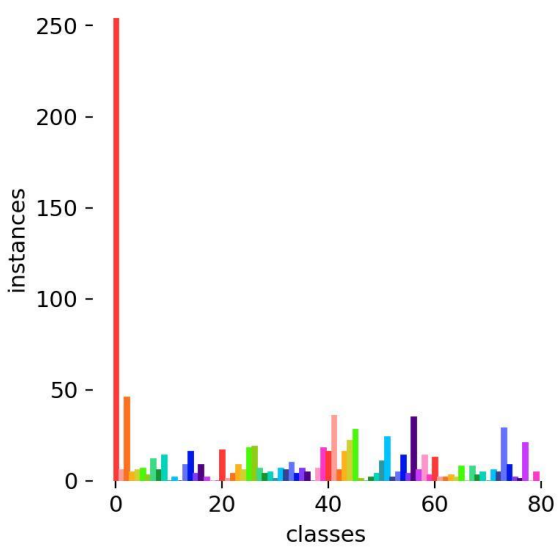


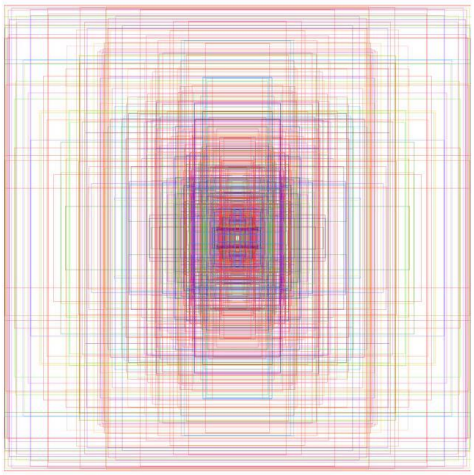
После виртуального окружения был клонирован git репозиторий YOLOV5

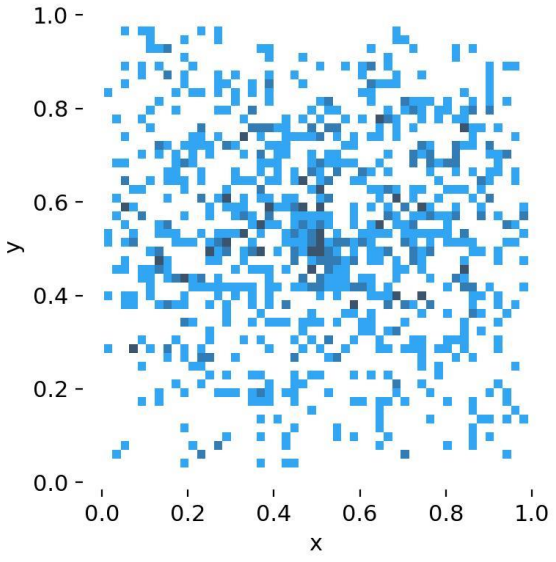
Перейдя в директорию yolov5 были проинсталлированы все дополнительные библиотеки указанные в requirements.txt

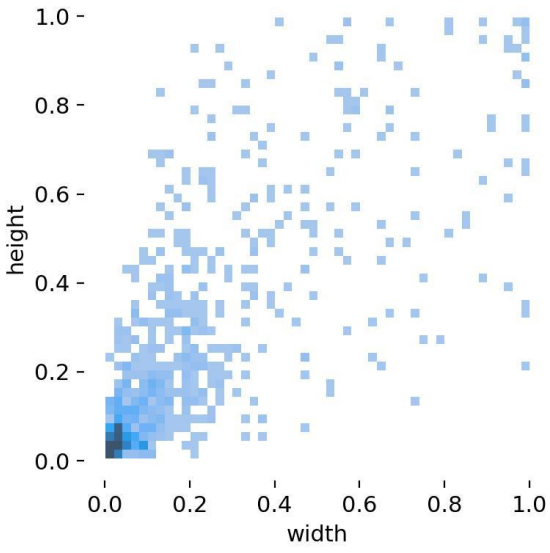
```
-0.1.1.post2209072238 torch-2.2.1 torchvision-0.17.1 tqdm-4.66.2 typing-extensions-4.10.0 tzdata-2024.1 ultralytics-8.1.34 urllib3-2.2.1
(pyhw) PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5> cd yolov5
(pyhw) PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5\yolov5> pip install -r requirements.txt
Collecting gitpython>=3.1.30 (from -r requirements.txt (line 5))
  Downloading GitPython-3.1.42-py3-none-any.whl.metadata (12 kB)
Requirement already satisfied: matplotlib>=3.3 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 6)) (3.8.3)
Requirement already satisfied: numpy>=1.23.5 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 7)) (1.26.4)
Requirement already satisfied: opencv-python>=4.1.1 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 8)) (4.9.0.80)
Requirement already satisfied: Pillow>=9.4.0 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 9)) (10.2.0)
Requirement already satisfied: psutil in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 10)) (5.9.8)
Requirement already satisfied: PyYAML>=5.3.1 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 11)) (6.0.1)
Requirement already satisfied: requests>=2.23.0 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 12)) (2.31.0)
Requirement already satisfied: scipy>=1.4.1 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 13)) (1.12.0)
Requirement already satisfied: thop>=0.1.1 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 14)) (0.1.1.post2209072238)
Requirement already satisfied: torch>=1.8.0 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 15)) (2.2.1)
Requirement already satisfied: torchvision>=0.9.0 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 16)) (0.17.1)
Requirement already satisfied: tqdm>=4.64.0 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 17)) (4.66.2)
Requirement already satisfied: ultralytics>=8.0.232 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 18)) (8.1.34)
Requirement already satisfied: pandas>=1.1.4 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 27)) (2.2.1)
Requirement already satisfied: seaborn>=0.11.0 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 28)) (0.13.2)
Collecting setuptools>=65.5.1 (from -r requirements.txt (line 42))
  Using cached setuptools-69.2.0-py3-none-any.whl.metadata (6.3 kB)
Collecting wheel>=0.38.0 (from -r requirements.txt (line 50))
  Using cached wheel-0.43.0-py3-none-any.whl.metadata (2.2 kB)
Collecting gitdb<5,>=4.0.1 (from gitpython>=3.1.30->-r requirements.txt (line 5))
  Downloading gitdb-4.0.11-py3-none-any.whl.metadata (1.2 kB)
Requirement already satisfied: contourpy>=1.0.1 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from matplotlib>=3.3->-r requirements.txt (line 6)) (1
.2.0)
Requirement already satisfied: cycler>=0.10 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from matplotlib>=3.3->-r requirements.txt (line 6)) (0.12.
1)
Requirement already satisfied: fonttools>=4.22.0 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from matplotlib>=3.3->-r requirements.txt (line 6)) (
4.50.0)
Requirement already satisfied: kiwisolver>=1.3.1 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from matplotlib>=3.3->-r requirements.txt (line 6)) (
1.4.5)
Requirement already satisfied: packaging>=20.0 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from matplotlib>=3.3->-r requirements.txt (line 6)) (24
.0)
Requirement already satisfied: pyparsing>=2.3.1 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from matplotlib>=3.3->-r requirements.txt (line 6)) (3
.1.2)
Requirement already satisfied: python-dateutil>=2.7 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from matplotlib>=3.3->-r requirements.txt (line 6)
) (2.9.0.post0)
```

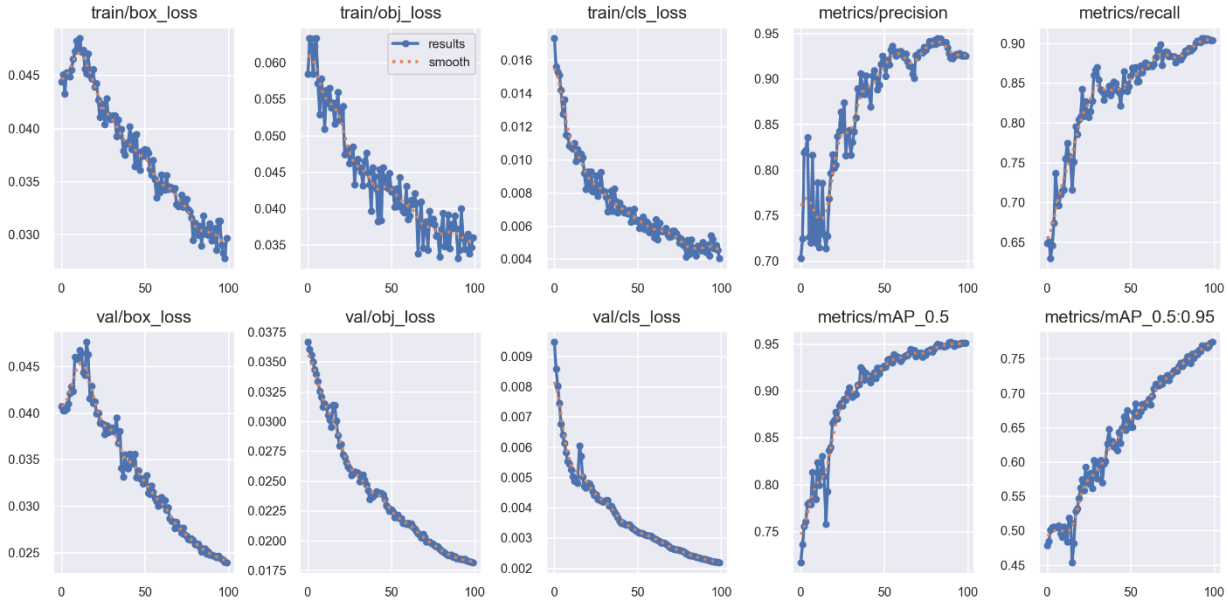
Для теста скорости изначально было запущенно обучение с 10 эпохами. Результат показал хорошее время (около 15 минут), после чего запуск провелся уже со 100 эпохами (В результате время было около 2-3 часов)

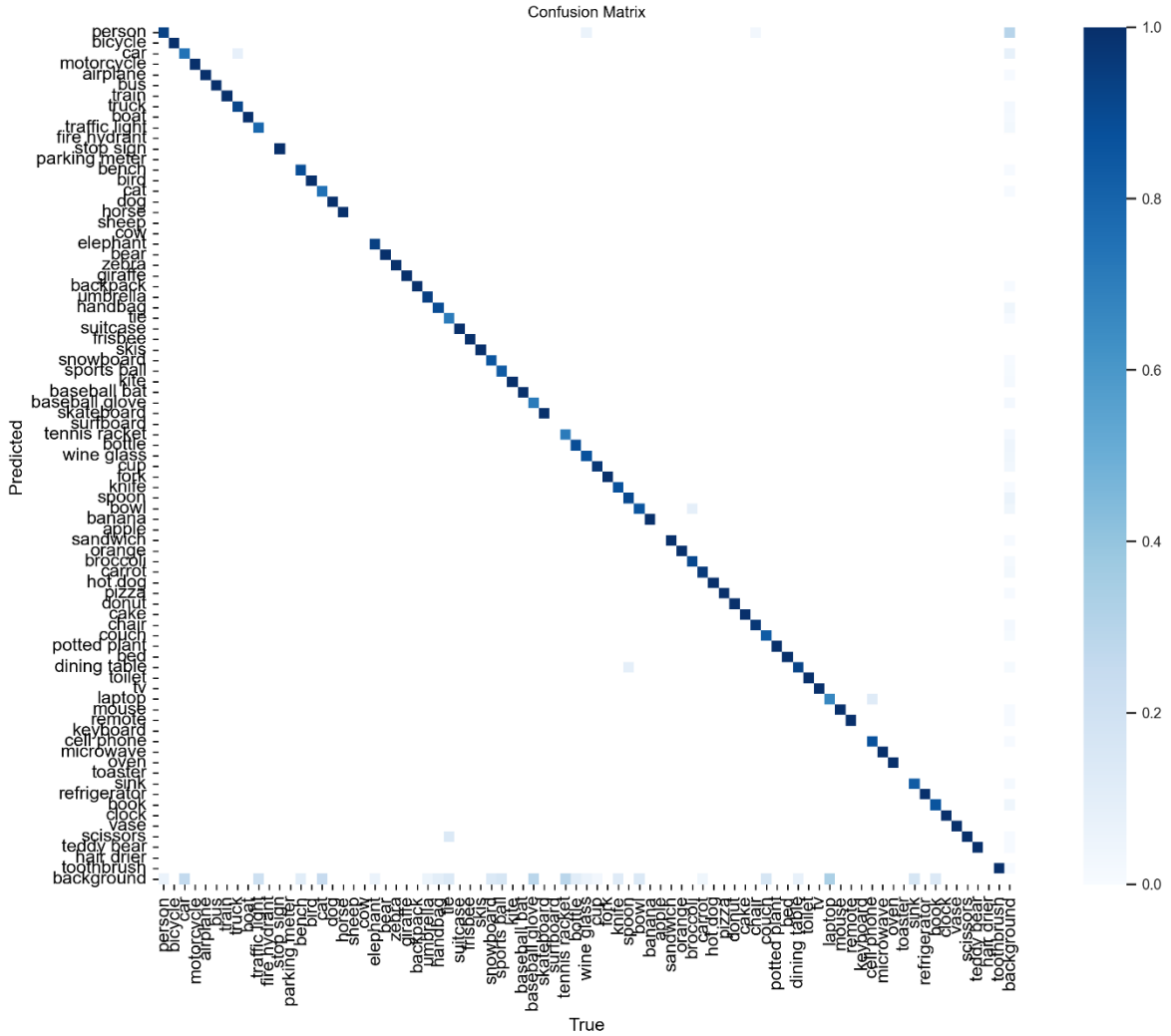


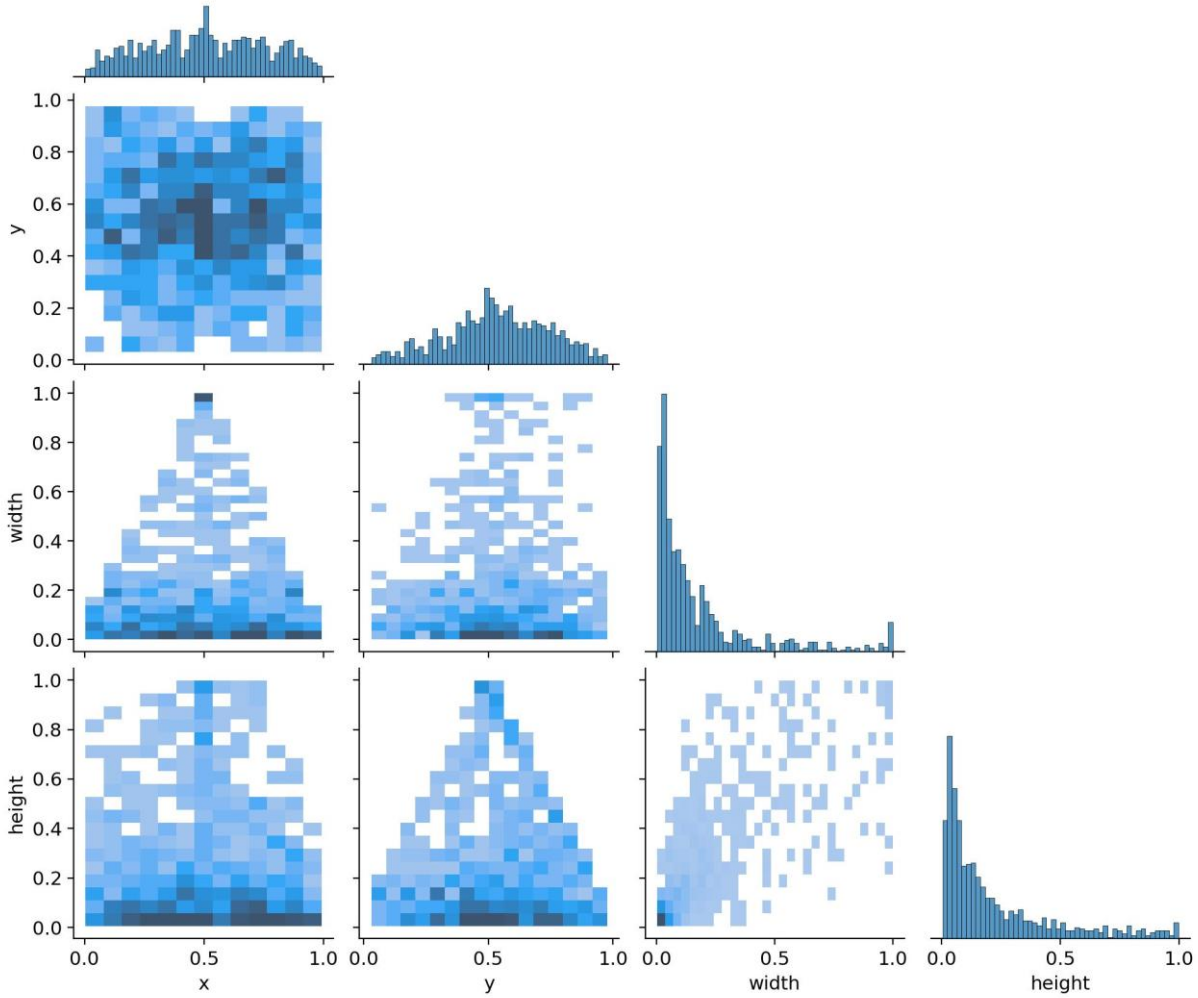




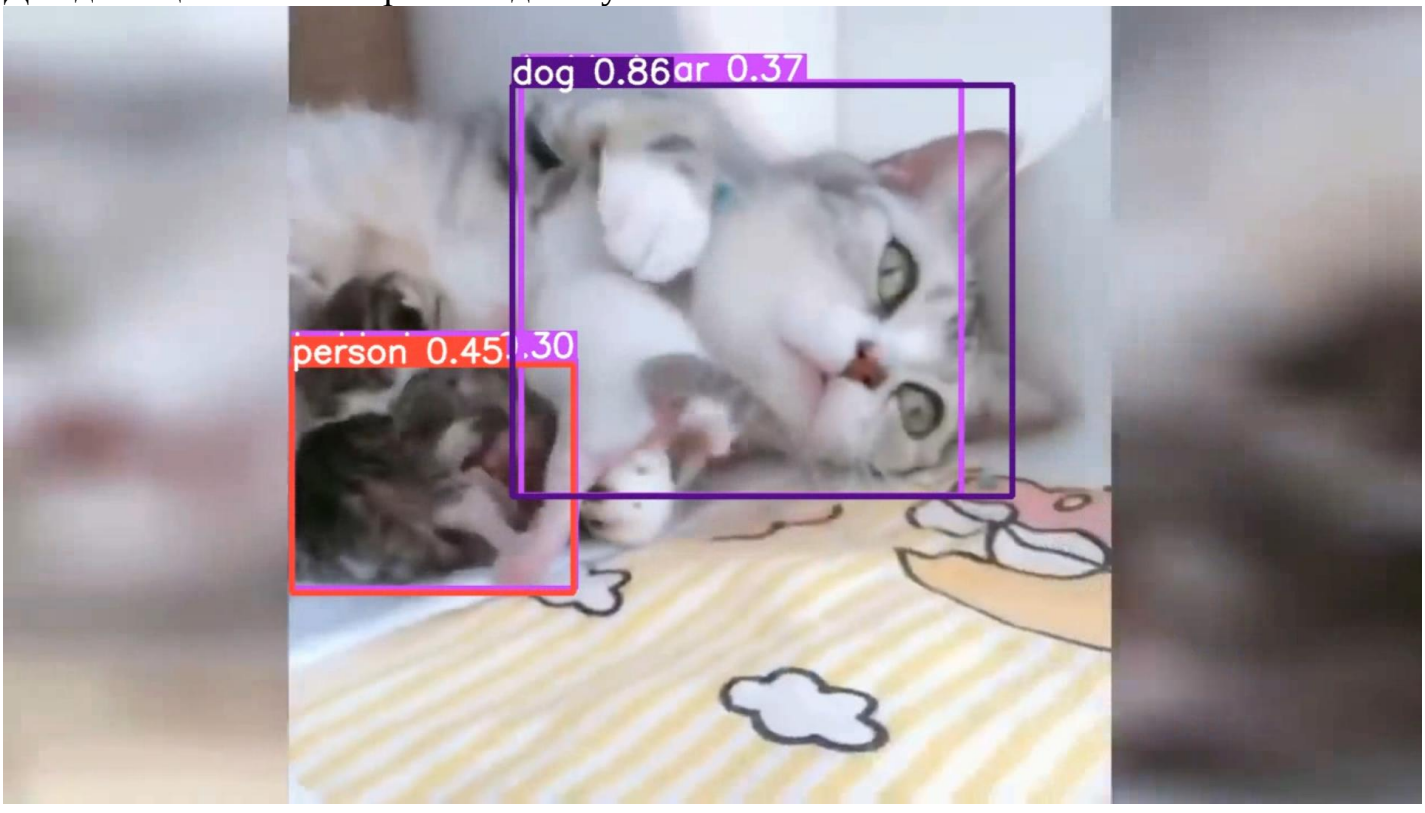


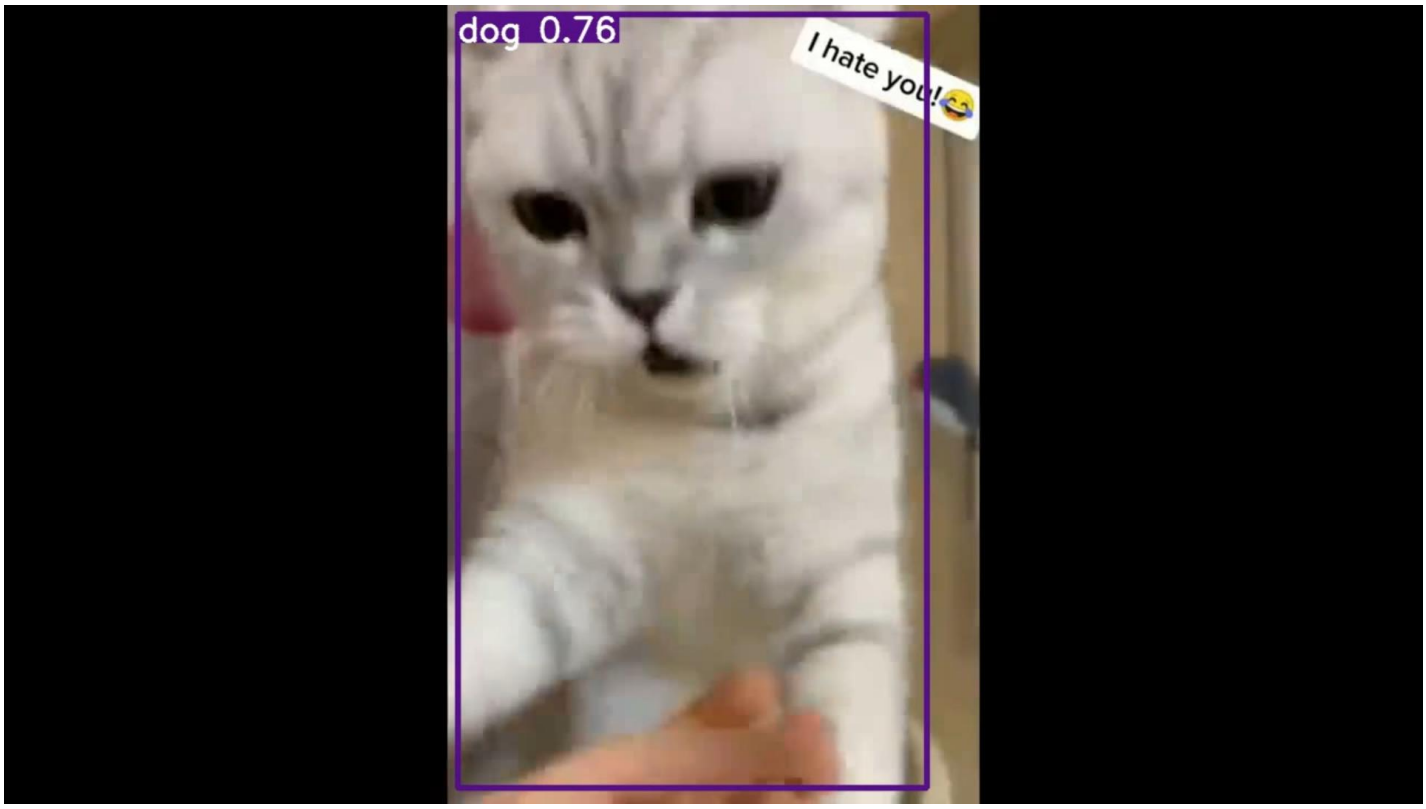

train/box_loss
train/obj_loss
results
smooth
train/cls_loss
metrics/precision
metrics/recall
val/box_loss
val/obj_loss
val/cls_loss
metrics/mAP_0.5
metrics/mAP_0.5:0.95

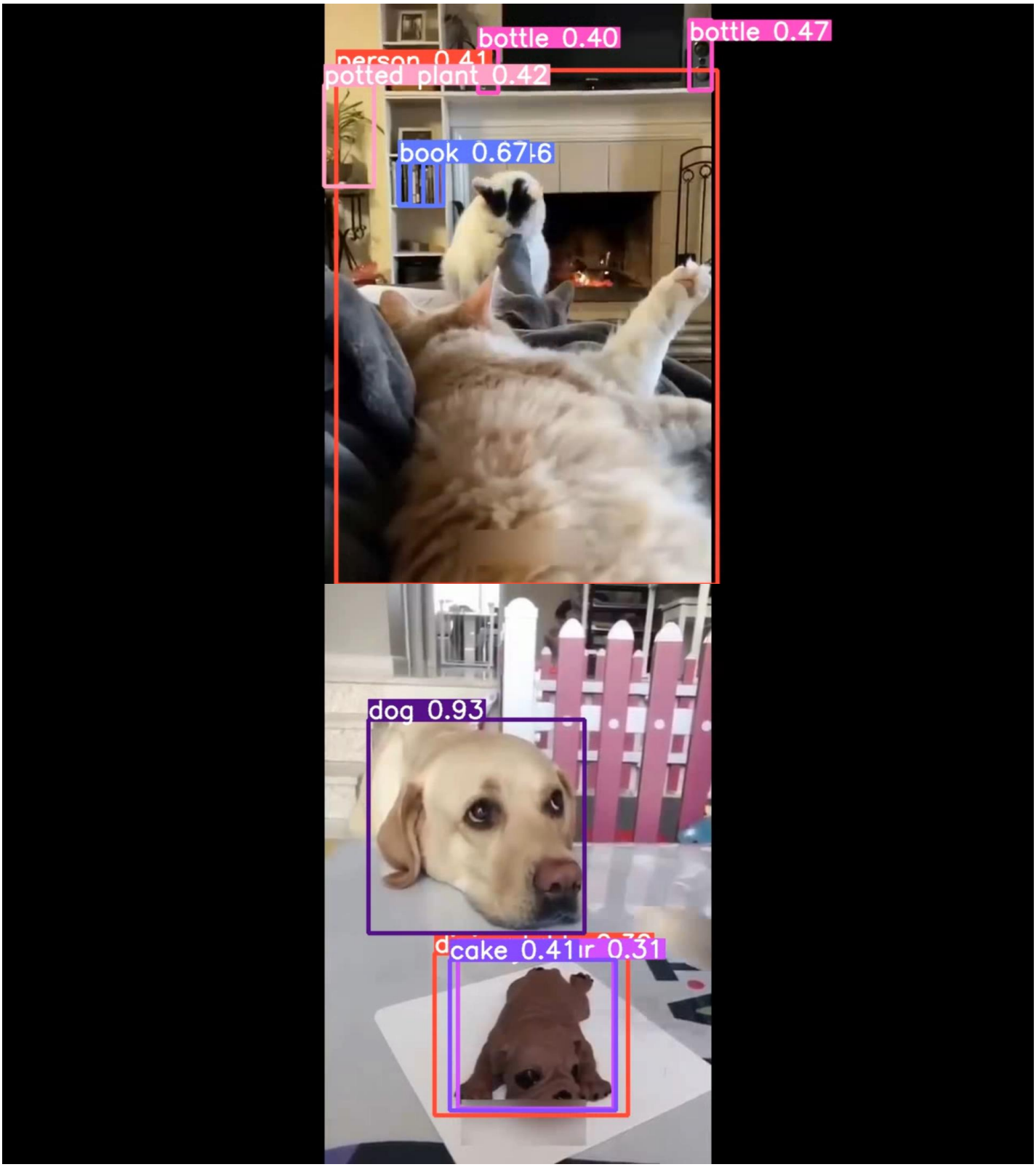

Confusion Matrix
Predicted
True
person
bicycle
car
motorcycle
airplane
bus
train
truck
boat
traffic light
fire hydrant
stop sign
parking meter
bench
bird
cat
dog
horse
sheep
cow
elephant
bear
zebra
giraffe
backpack
umbrella
handbag
tie
suitcase
frisbee
skis
snowboard
sports ball
kite
baseball bat
baseball glove
skateboard
surfboard
tennis racket
bottle
wine glass
cup
fork
knife
spoon
bowl
banana
apple
sandwich
orange
broccoli
carrot
hot dog
pizza
donut
cake
chair
couch
potted plant
bed
dining table
toilet
tv
laptop
mouse
remote
keyboard
cell phone
microwave
oven
toaster
sink
refrigerator
book
clock
vase
scissors
teddy bear
hair drier
toothbrush
background
1.0
0.8
0.6
0.4
0.2
0.0

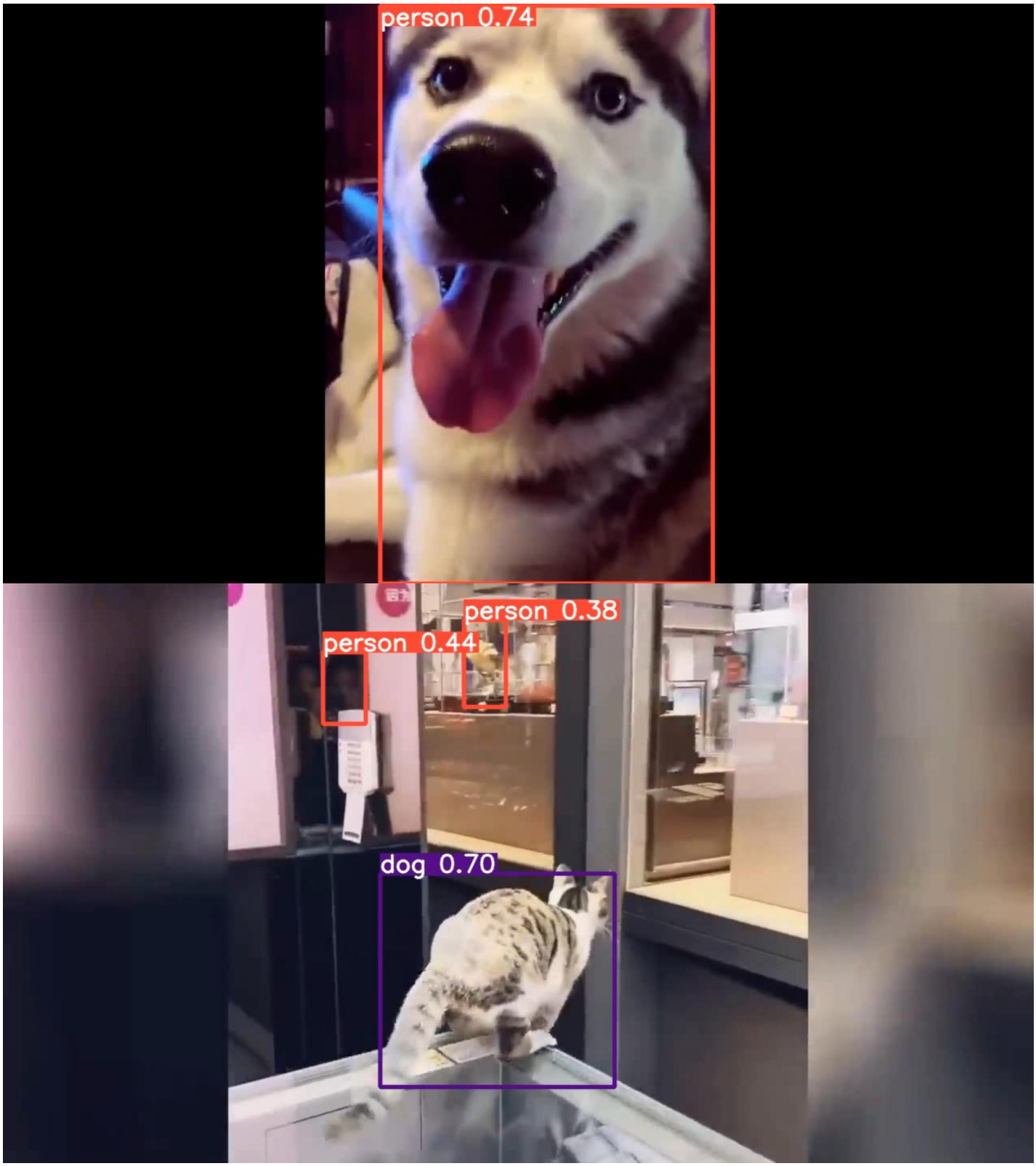


Для детекции были выбраны видео с youtube




dog 0.76
I hate you!


bottle 0.40
bottle 0.47
potted plant 0.42
book 0.67
dog 0.93
cake 0.41


person 0.74
person 0.38
person 0.44
dog 0.70

Было замечено что нередко обученная модель путает кота с собакой