

Создание и запуск виртуального окружения для работы Python 3.11

Были проблемы с execution policy, пришлось поменять на AllSigned и виртуальное окружение запустилось

```
PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5> Python -m venv pyhw
PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5> .\pyhw\Scripts\activate
.\pyhw\Scripts\activate : Невозможно загрузить файл D:\YandexDisk\YandexDisk\DS\Belhard\hw5\pyhw\Scripts\Activate.ps1, так как выполнение сценариев отключено в этой сис-
теме. Для получения дополнительных сведений см. about_Execution_Policies по адресу https://go.microsoft.com/fwlink/?LinkID=135170.
строка:1 знак:1
+ ~~~~~
+ CategoryInfo          : Ошибка безопасности: (:) [], PSSecurityException
+ FullyQualifiedErrorId : UnauthorizedAccess

PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5> Get-ExecutionPolicy -List

-----
MachinePolicy          Undefined
UserPolicy             Undefined
Process               Undefined
CurrentUser            Undefined
LocalMachine           Undefined

PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5> Set-ExecutionPolicy -ExecutionPolicy AllSigned
PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5> Get-ExecutionPolicy -List

-----
Scope      ExecutionPolicy
-----
MachinePolicy          Undefined
UserPolicy             Undefined
Process               Undefined
CurrentUser            Undefined
LocalMachine           AllSigned

PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5> .\pyhw\Scripts\activate

Не удается проверить издателя. Вы действительно хотите запустить эту программу?
Файл D:\YandexDisk\YandexDisk\DS\Belhard\hw5\pyhw\Scripts\Activate.ps1 публикуется CN=Python Software Foundation, O=Python Software Foundation, L=Beaverton, S=Oregon,
C=US и не является доверенным для данной системы. Выполняйте сценарии только от доверенных издателей.
[V] Никогда не запускать - V [D] Не запускать - D [R] Запустить однажды - R [A] Всегда запускать - A [?] Справка (значением по умолчанию является "D"): A
(pyhw) PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5> git clone https://github.com/ultralytics/yolov5.git
Cloning into 'yolov5'...
remote: Enumerating objects: 16522, done.
remote: Counting objects: 100% (120/120), done.
remote: Compressing objects: 100% (104/104), done. eceiving objects: 0% (1/16522)
```

После виртуального окружения был клонирован git репозиторий YOLOV5

```
Cloning into 'yolov5'...
remote: Enumerating objects: 16522, done.
remote: Counting objects: 100% (120/120), done.
remote: Compressing objects: 100% (104/104), done. eceiving objects: 0% (1/16522)
remote: Total 16522 (delta 50), reused 52 (delta 16), pack-reused 16402
Receiving objects: 100% (16522/16522), 15.17 MiB | 9.92 MiB/s, done.
Resolving deltas: 100% (11307/11307), done.
(pyhw) PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5> pip install ultralytics
Collecting ultralytics
  Downloading ultralytics-8.1.34-py3-none-any.whl.metadata (40 kB)
Collecting matplotlib>=3.3.0 (from ultralytics)
  Downloading matplotlib-3.8.3-cp311-cp311-win_amd64.whl.metadata (5.9 kB)
Collecting opencv-python>=4.6.0 (from ultralytics)
  Downloading opencv_python-4.9.0.80-cp37-ab13-win_amd64.whl.metadata (20 kB)
Collecting pillow>=7.1.2 (from ultralytics)
  Downloading pillow-10.2.0-cp311-cp311-win_amd64.whl.metadata (9.9 kB)
Collecting pyyaml>=5.3.1 (from ultralytics)
  Downloading PyYAML-6.0.1-cp311-cp311-win_amd64.whl.metadata (2.1 kB)
Collecting requests>=2.23.0 (from ultralytics)
  Downloading requests-2.31.0-py3-none-any.whl.metadata (4.6 kB)
Collecting scipy>=1.4.1 (from ultralytics)
  Downloading scipy-1.12.0-cp311-cp311-win_amd64.whl.metadata (60 kB)
Collecting torch>=1.8.0 (from ultralytics)
  Downloading torch-2.2.1-cp311-cp311-win_amd64.whl.metadata (26 kB)
Collecting torchvision>=0.9.0 (from ultralytics)
  Downloading torchvision-0.17.1-cp311-cp311-win_amd64.whl.metadata (6.6 kB)
Collecting tqdm>=4.64.0 (from ultralytics)
  Downloading tqdm-4.66.2-py3-none-any.whl.metadata (57 kB)
Collecting psutil (from ultralytics)
  Downloading psutil-5.9.0-cp37-ab13-win_amd64.whl.metadata (22 kB)
Collecting py-cpuinfo (from ultralytics)
  Downloading py_cpuinfo-9.0.0-py3-none-any.whl.metadata (794 bytes)
Collecting thop>=0.1.1 (from ultralytics)
  Downloading thop-0.1.1.post2209072238-py3-none-any.whl.metadata (2.7 kB)
Collecting pandas>=1.1.4 (from ultralytics)
  Downloading pandas-2.2.1-cp311-cp311-win_amd64.whl.metadata (19 kB)
Collecting seaborn>=0.11.0 (from ultralytics)
  Downloading seaborn-0.11.0 (from ultralytics)
  Using cached seaborn-0.13.2-py3-none-any.whl.metadata (5.4 kB)
Collecting contourpy>=1.0.1 (from matplotlib>=3.3.0->ultralytics)
  Downloading contourpy-1.2.0-cp311-cp311-win_amd64.whl.metadata (5.8 kB)
Collecting cycler>=0.10 (from matplotlib>=3.3.0->ultralytics)
  Downloading cycler-0.12.1-py3-none-any.whl.metadata (3.8 kB)
Collecting fonttools>=4.22.0 (from matplotlib>=3.3.0->ultralytics)
  Downloading fonttools-4.50.0-cp311-cp311-win_amd64.whl.metadata (162 kB)
Collecting kiwisolver>=1.3.1 (from matplotlib>=3.3.0->ultralytics)
  Downloading kiwisolver-1.4.5-cp311-cp311-win_amd64.whl.metadata (6.5 kB)
Collecting numpy<2,>=1.21 (from matplotlib>=3.3.0->ultralytics)
  Downloading numpy-1.26.4-cp311-cp311-win_amd64.whl.metadata (61 kB)
Collecting packaging>=20.0 (from matplotlib>=3.3.0->ultralytics)
  Downloading packaging-24.0-py3-none-any.whl.metadata (3.2 kB)
Collecting pyparsing>=2.3.1 (from matplotlib>=3.3.0->ultralytics)
  Downloading pyparsing-3.1.2-py3-none-any.whl.metadata (5.1 kB)
Collecting python-dateutil>=2.7 (from matplotlib>=3.3.0->ultralytics)
  Downloading python_dateutil-2.9.0.post0-py2.py3-none-any.whl.metadata (8.4 kB)
Collecting pytz>=2020.1 (from pandas>=1.1.4->ultralytics)
  Downloading pytz-2024.1-py2.py3-none-any.whl.metadata (22 kB)
Collecting tzdata>=2022.7 (from pandas>=1.1.4->ultralytics)
  Using cached tzdata-2024.1-py2.py3-none-any.whl.metadata (1.4 kB)
Collecting charset-normalizer<4,>=2 (from requests>=2.23.0->ultralytics)
  Downloading charset_normalizer-3.3.2-cp311-cp311-win_amd64.whl.metadata (34 kB)
Collecting idna<4,>=2.5 (from requests>=2.23.0->ultralytics)
  Downloading idna-3.6-py3-none-any.whl.metadata (9.9 kB)
Collecting urllib3<3,>=1.21.1 (from requests>=2.23.0->ultralytics)
  Downloading urllib3-2.2.1-py3-none-any.whl.metadata (6.4 kB)
Collecting certifi>=2017.4.17 (from requests>=2.23.0->ultralytics)
  Downloading certifi-2024.2.2-py3-none-any.whl.metadata (2.2 kB)
Collecting filelock (from torch>=1.8.0->ultralytics)
  Using cached filelock-3.13.1-py3-none-any.whl.metadata (2.8 kB)
Collecting typing-extensions>=4.8.0 (from torch>=1.8.0->ultralytics)
  Using cached typing_extensions-4.10.0-py3-none-any.whl.metadata (3.0 kB)
Collecting sympy (from torch>=1.8.0->ultralytics)
```

```

Using cached filelock-3.13.1-py3-none-any.whl.metadata (2.8 kB)
Collecting typing_extensions>=4.8.0 (from torch>=1.8.0->ultralytics)
Using cached typing_extensions-4.10.0-py3-none-any.whl.metadata (3.0 kB)
Collecting sympy (from torch>=1.8.0->ultralytics)
Using cached sympy-1.12-py3-none-any.whl.metadata (12 kB)
Collecting networkx (from torch>=1.8.0->ultralytics)
Using cached networkx-3.2.1-py3-none-any.whl.metadata (5.2 kB)
Collecting Jinja2 (from torch>=1.8.0->ultralytics)
Downloading Jinja2-3.1.3-py3-none-any.whl.metadata (3.3 kB)
Collecting fsspec (from torch>=1.8.0->ultralytics)
Using cached fsspec-2024.3.1-py3-none-any.whl.metadata (6.8 kB)
Collecting colorama (from tqdm>=4.64.0->ultralytics)
Downloading colorama-0.4.6-py2.py3-none-any.whl.metadata (17 kB)
Collecting six>=1.5 (from python-dateutil>=2.7->matplotlib>=3.3.0->ultralytics)
Downloading six-1.16.0-py2.py3-none-any.whl.metadata (1.8 kB)
Collecting MarkupSafe>=2.0 (from Jinja2->torch>=1.8.0->ultralytics)
Downloading MarkupSafe-2.1.5-cp311-cp311-win_amd64.whl.metadata (3.1 kB)
Collecting mpmath>=0.19 (from sympy->torch>=1.8.0->ultralytics)
Using cached mpmath-1.3.0-py3-none-any.whl.metadata (8.6 kB)
Downloading ultralytics-8.1.34-py3-none-any.whl (723 kB)
723.1/723.1 kB 9.1 MB/s eta 0:00:00
Downloading matplotlib-3.8.3-cp311-cp311-win_amd64.whl (7.6 MB)
7.6/7.6 MB 19.5 MB/s eta 0:00:00
Downloading opencv_python-4.9.0-80-cp37-abi3-win_amd64.whl (38.6 MB)
38.6/38.6 MB 14.5 MB/s eta 0:00:00
Downloading pandas-2.2.1-cp311-cp311-win_amd64.whl (11.6 MB)
11.6/11.6 MB 21.8 MB/s eta 0:00:00
Downloading pillow-10.2.0-cp311-cp311-win_amd64.whl (2.6 MB)
2.6/2.6 MB 20.9 MB/s eta 0:00:00
Downloading PyYAML-6.0.1-cp311-cp311-win_amd64.whl (144 kB)
144.7/144.7 kB ? eta 0:00:00
Downloading requests-2.31.0-py3-none-any.whl (62 kB)
62.6/62.6 kB 3.3 MB/s eta 0:00:00
Downloading scipy-1.12.0-cp311-cp311-win_amd64.whl (46.2 MB)
46.2/46.2 MB 14.9 MB/s eta 0:00:00
Using cached seaborn-0.13.2-py3-none-any.whl (294 kB)
Downloading thop-0.1.1.post2209072238-py3-none-any.whl (15 kB)
Downloading torch-2.2.1-cp311-cp311-win_amd64.whl (198.6 MB)
198.6/198.6 MB 3.5 MB/s eta 0:00:00
Downloading torchvision-0.17.1-cp311-cp311-win_amd64.whl (1.2 MB)
1.2/1.2 MB 3.4 MB/s eta 0:00:00
Downloading tqdm-4.66.2-py3-none-any.whl (78 kB)
78.3/78.3 kB 4.3 MB/s eta 0:00:00
Downloading psutil-5.9.8-cp37-abi3-win_amd64.whl (255 kB)
255.1/255.1 kB 5.3 MB/s eta 0:00:00
Downloading py_cpuinfo-9.0.0-py3-none-any.whl (22 kB)
Downloading certifi-2024.2.2-py3-none-any.whl (163 kB)
163.8/163.8 kB 10.2 MB/s eta 0:00:00
Downloading charset_normalizer-3.3.2-cp311-cp311-win_amd64.whl (99 kB)
99.9/99.9 kB ? eta 0:00:00
Downloading contourpy-1.2.0-cp311-cp311-win_amd64.whl (187 kB)
187.6/187.6 kB 11.1 MB/s eta 0:00:00
Downloading cycler-0.12.1-py3-none-any.whl (8.3 kB)
Downloading fonttools-4.50.0-cp311-cp311-win_amd64.whl (2.2 MB)
2.2/2.2 MB 6.1 MB/s eta 0:00:00
Downloading idna-3.6-py3-none-any.whl (61 kB)
61.6/61.6 kB 3.2 MB/s eta 0:00:00
Downloading kiwisolver-1.4.5-cp311-cp311-win_amd64.whl (56 kB)
56.1/56.1 kB 3.1 MB/s eta 0:00:00
Downloading numpy-1.26.4-cp311-cp311-win_amd64.whl (15.8 MB)
15.8/15.8 MB 4.2 MB/s eta 0:00:00
Downloading packaging-24.0-py3-none-any.whl (53 kB)
53.5/53.5 kB 2.7 MB/s eta 0:00:00
Downloading pyparsing-3.1.2-py3-none-any.whl (103 kB)
103.2/103.2 kB 5.8 MB/s eta 0:00:00
Downloading python_dateutil-2.9.0.post0-py2.py3-none-any.whl (229 kB)
229.9/229.9 kB 4.7 MB/s eta 0:00:00
Downloading pytz-2024.1-py2.py3-none-any.whl (505 kB)
505.5/505.5 kB 4.0 MB/s eta 0:00:00
Using cached typing_extensions-4.10.0-py3-none-any.whl (33 kB)
Using cached tzdata-2024.1-py2.py3-none-any.whl (345 kB)
Downloading urllib3-2.2.1-py3-none-any.whl (121 kB)
121.1/121.1 kB 3.6 MB/s eta 0:00:00
Downloading colorama-0.4.6-py2.py3-none-any.whl (25 kB)
Using cached filelock-3.13.1-py3-none-any.whl (11 kB)
Using cached fsspec-2024.3.1-py3-none-any.whl (171 kB)
171.1/171.1 kB 3.8 MB/s eta 0:00:00
Installing collected packages: pytz, py_cpuinfo, mpmath, urllib3, tzdata, typing_extensions, sympy, six, pyyaml, pyparsing, psutil, pillow, packaging, numpy, networkx, MarkupSafe, kiwisolver, idna, fsspec, fonttools, filelock, cycler, colorama, charset-normalizer, certifi, tqdm, scipy, requests, python-dateutil, opencv-python, Jinja2, contourpy, torch, pandas, matplotlib, torchvision, thop, seaborn, ultralytics
Successfully installed MarkupSafe-2.1.5 certifi-2024.2.2 charset-normalizer-3.3.2 colorama-0.4.6 contourpy-1.2.0 cycler-0.12.1 filelock-3.13.1 fonttools-4.50.0 fsspec-2024.3.1 idna-3.6 Jinja2-3.1.3 kiwisolver-1.4.5 matplotlib-3.8.3 mpmath-1.3.0 networkx-3.2.1 numpy-1.26.4 opencv-python-4.9.0.80 packaging-24.0 pandas-2.2.1 pillow-10.2.0 psutil-5.9.8 py_cpuinfo-9.0.0 pyparsing-3.1.2 python-dateutil-2.9.0.post0 pytz-2024.1 pyyaml-6.0.1 requests-2.31.0 scipy-1.12.0 seaborn-0.13.2 six-1.16.0 sympy-1.12 thop-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
(pyfw) PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5 >

```

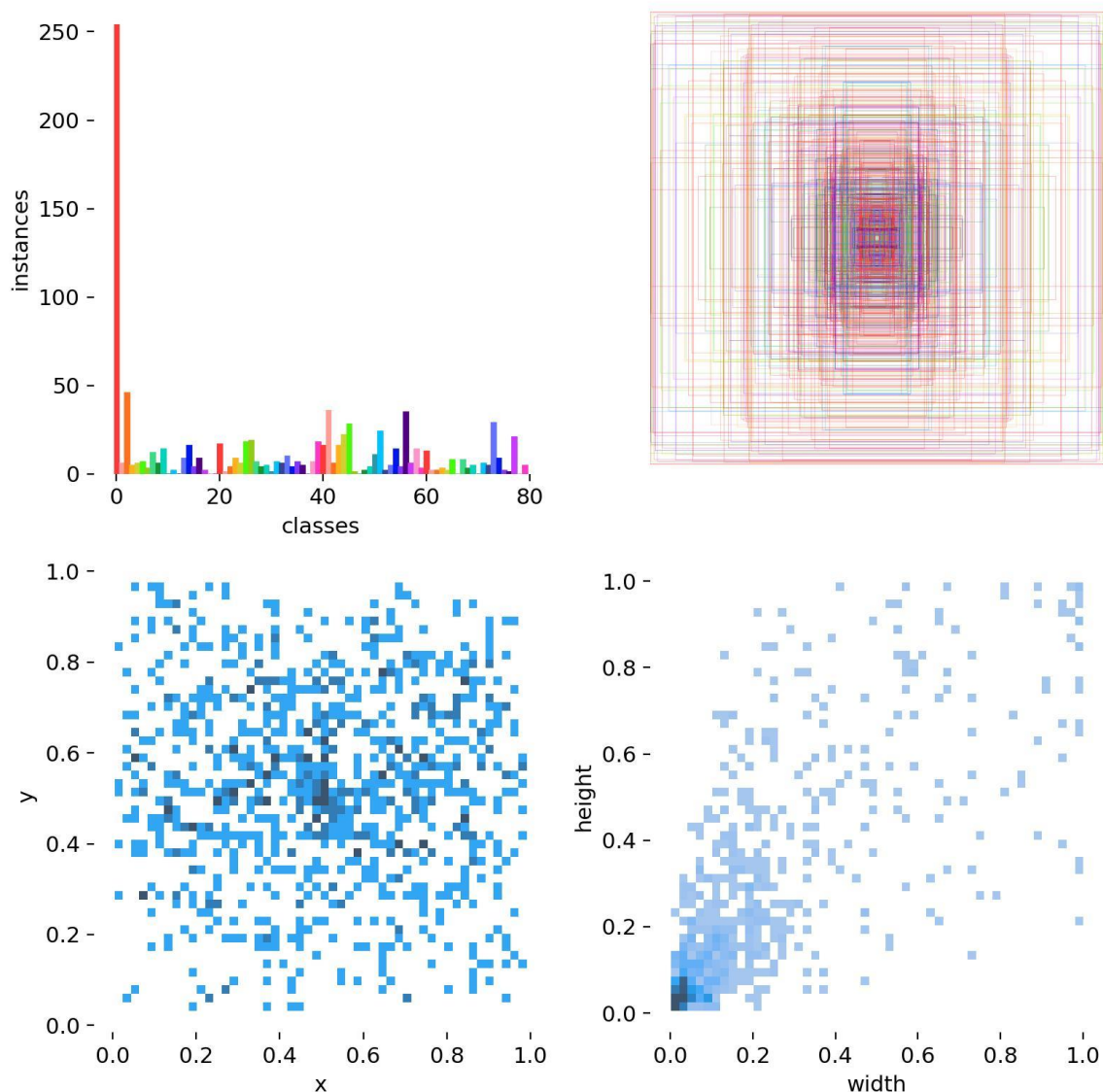
Перейдя в директорию yolov5 были проинсталлированы все дополнительные библиотеки указанные в requirements.txt

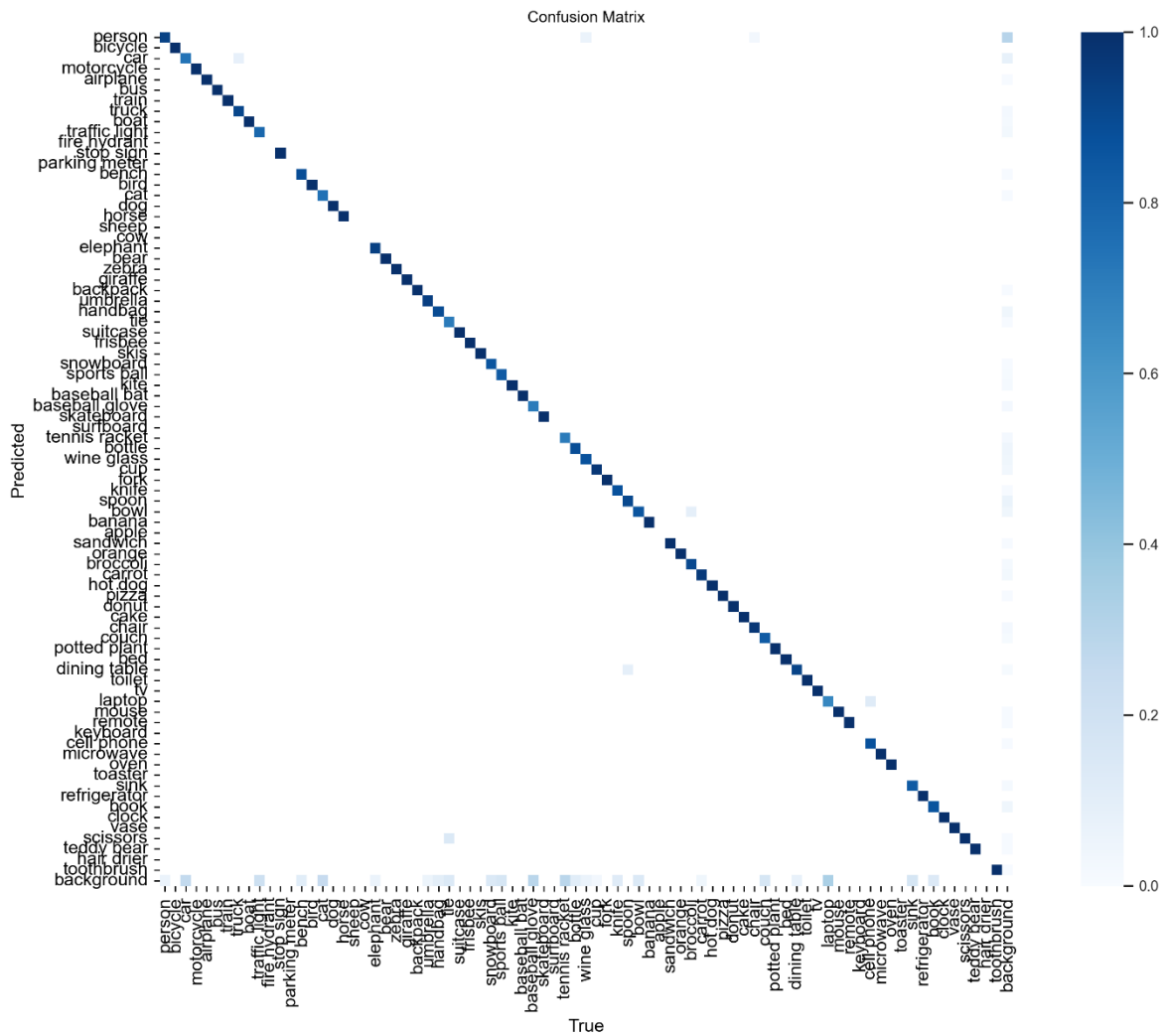
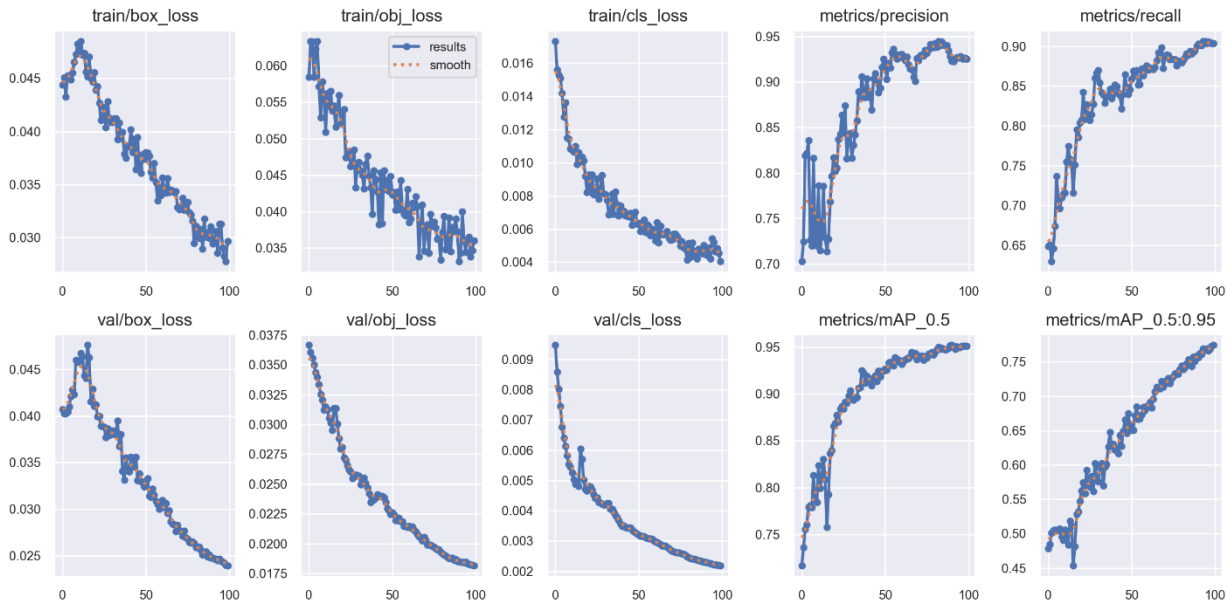
```

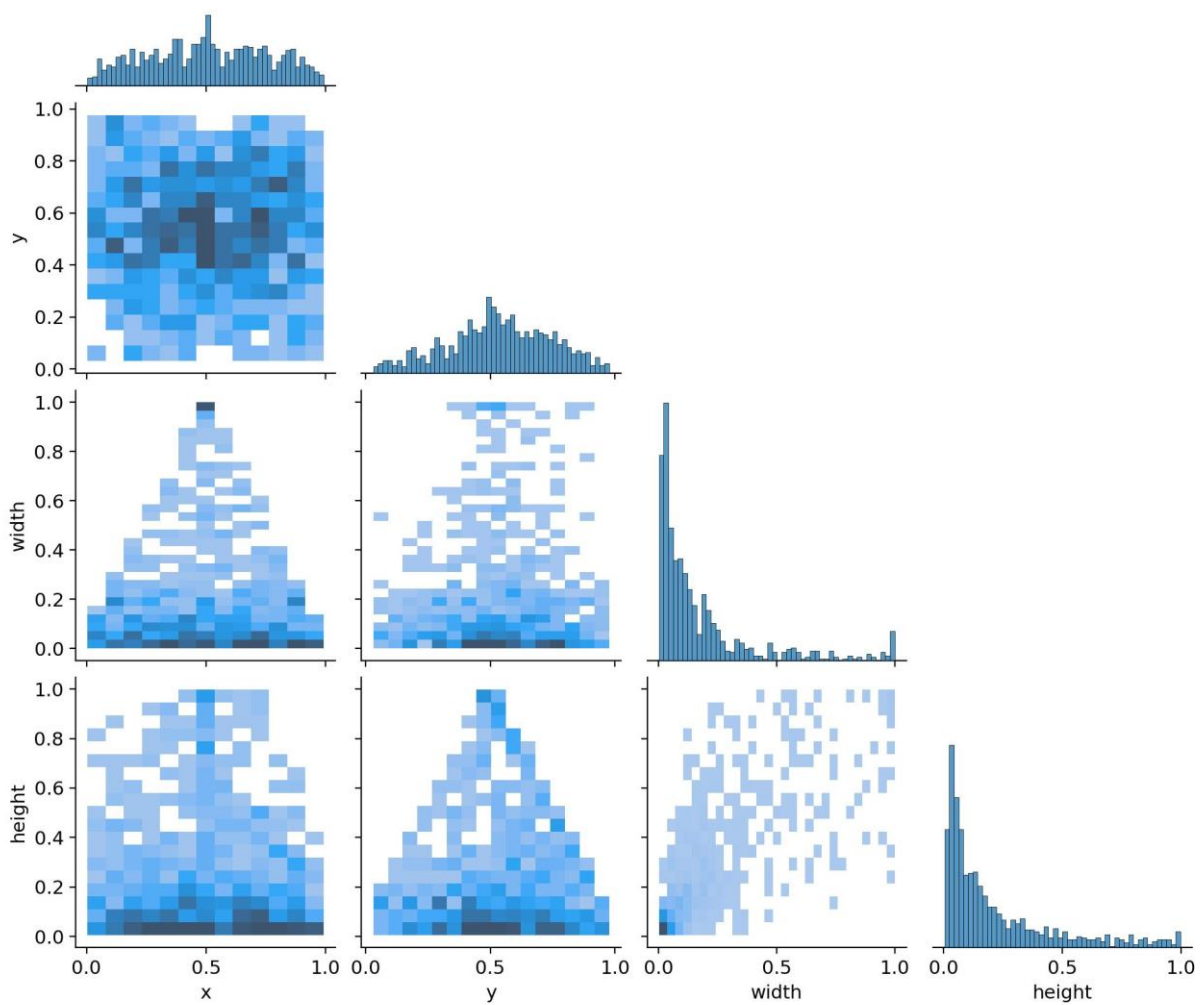
-0.1.1.post2209072238 torch-2.2.1 torchvision-0.17.1 tqdm-4.66.2 typing-extensions-4.10.0 tzdata-2024.1 ultralytics-8.1.34 urllib3-2.2.1
(pyhw) PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5> cd yolov5
(pyhw) PS D:\YandexDisk\YandexDisk\DS\Belhard\hw5\yolov5> pip install -r requirements.txt
Collecting gitpython>=3.1.30 (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: torchvision>=0.9.0 in d:\yandexdisk\yandexdisk\ds\belhard\hw5\pyhw\lib\site-packages (from -r requirements.txt (line 14)) (0.17.1)
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: 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)

```

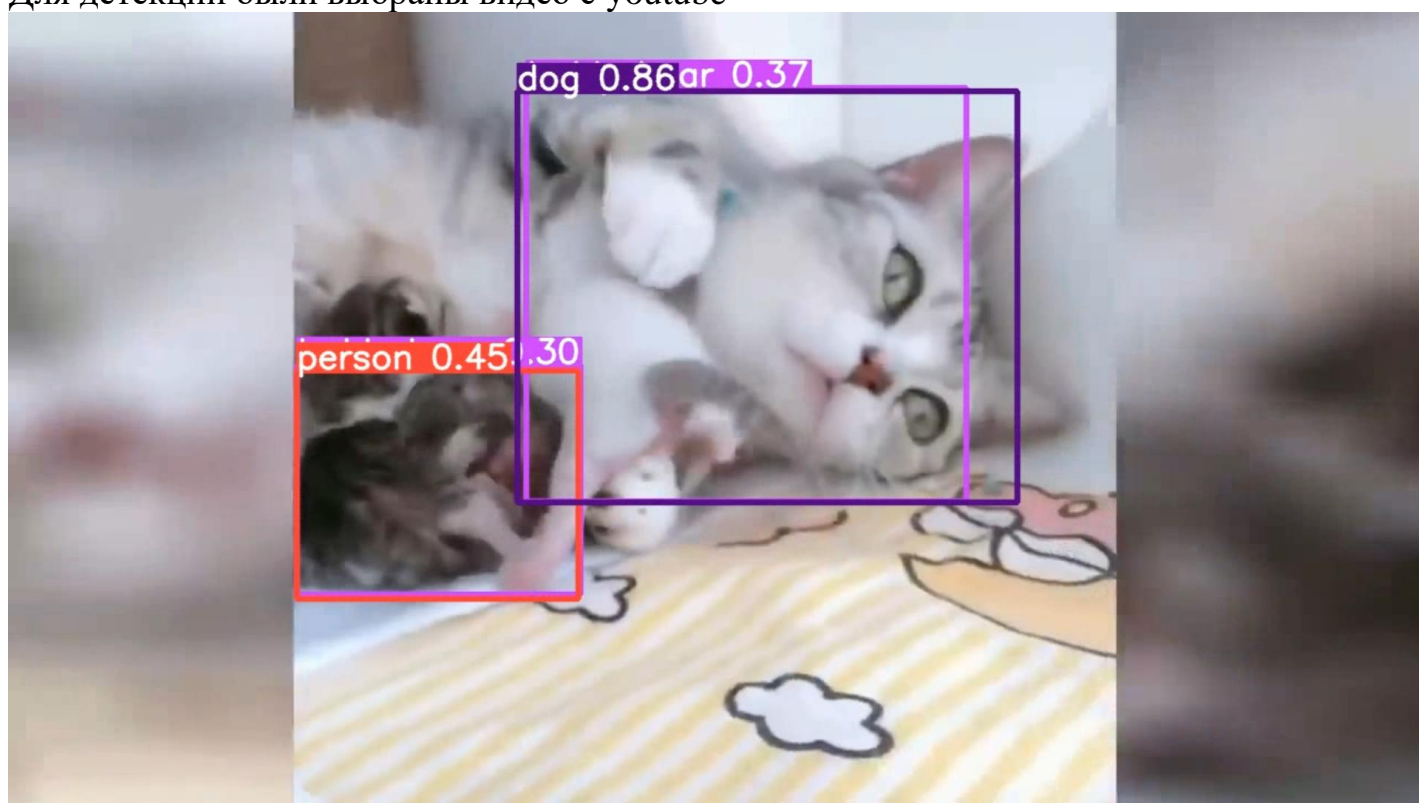
Для теста скорости изначально было запущено обучение с 10 эпохами. Результат показал хорошее время (около 15 минут), после чего запуск проводился уже со 100 эпохами (В результате время было около 2-3 часов)





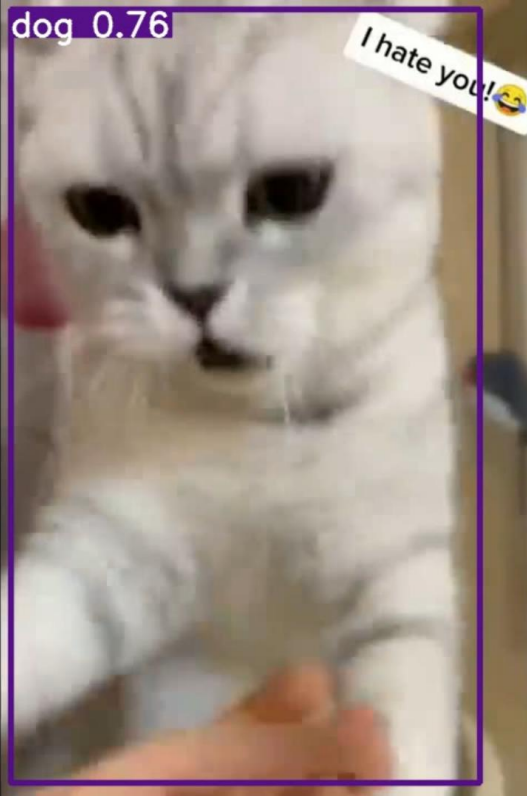


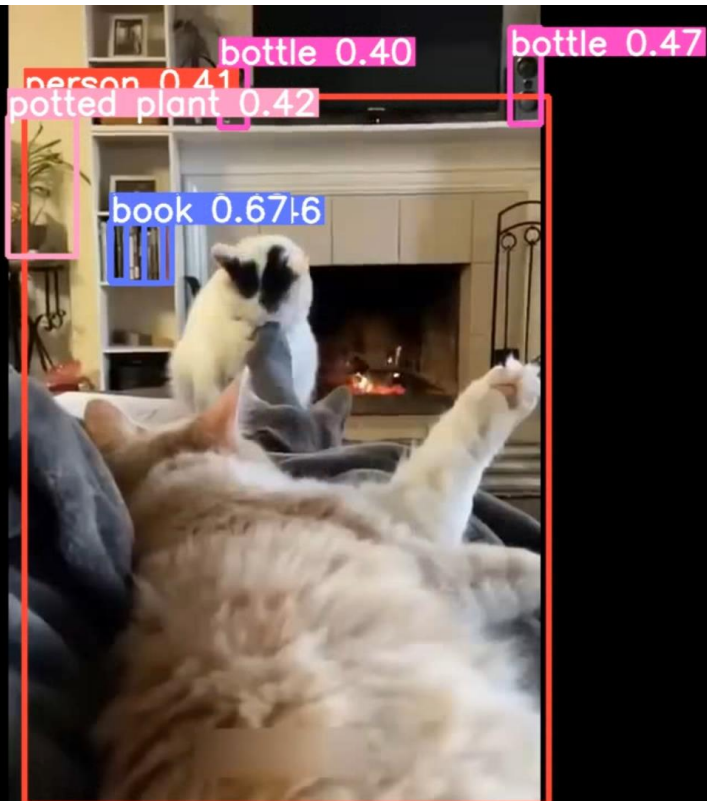
Для детекции были выбраны видео с youtube

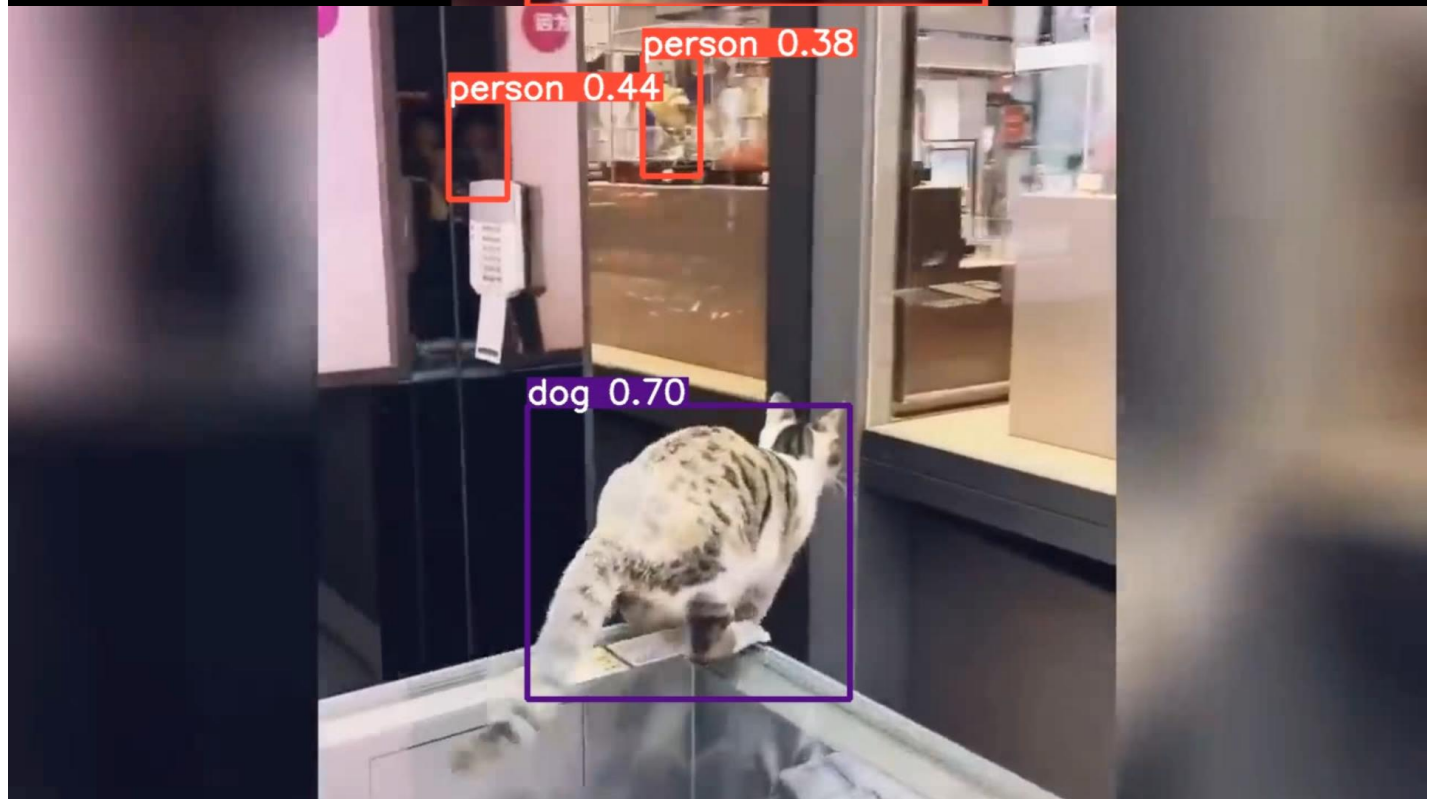
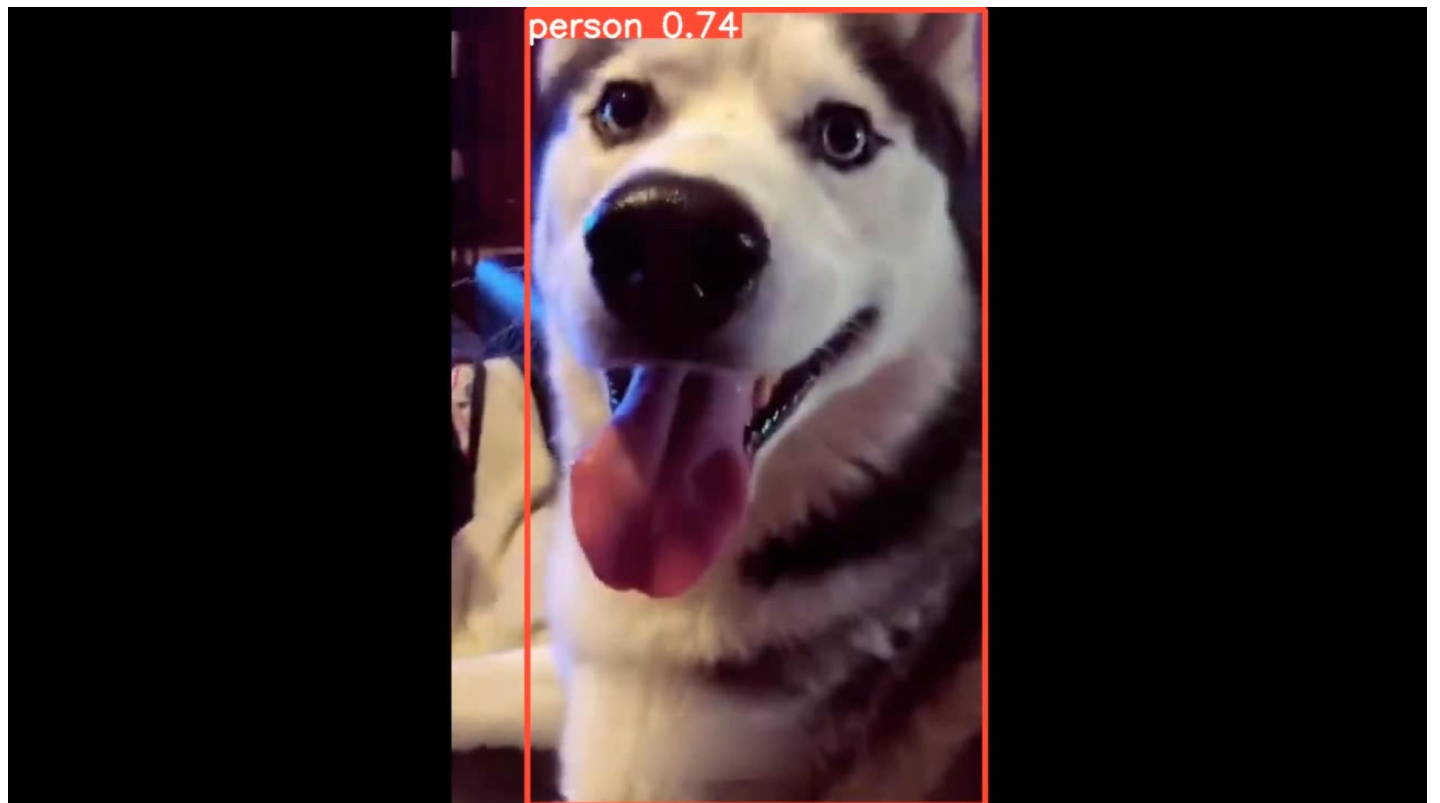


dog 0.76

I hate you! 😂









Было замечено что нередко обученная модель путает кота с собакой