

# Preparatory stage

## 1. Download weight files

### Please download weight files below

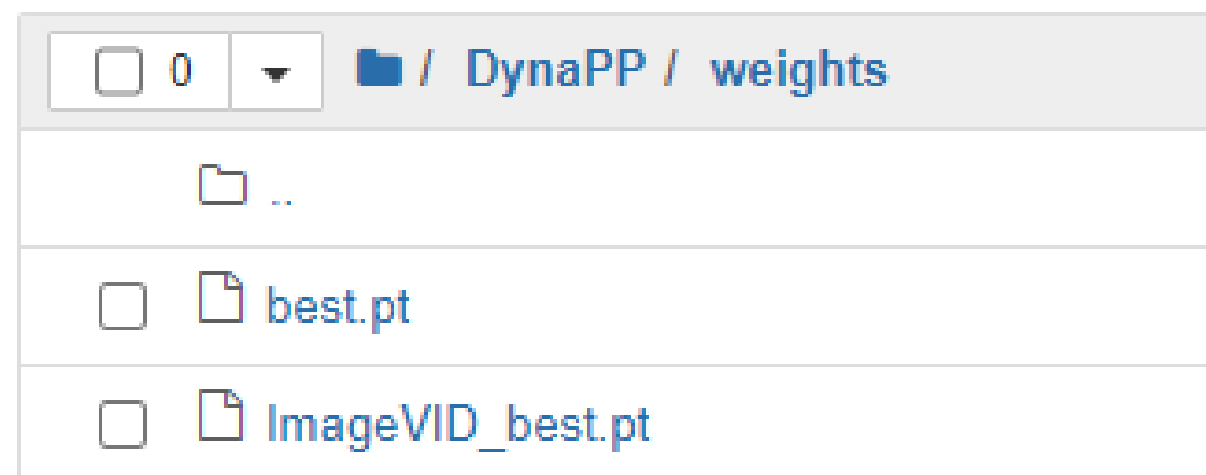
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(Put the files in 'weights' folder)

[https://drive.google.com/file/d/1LTSKE19bpygugylP9jMk2dtjdgcQZ1vu/view?usp=share\\_link](https://drive.google.com/file/d/1LTSKE19bpygugylP9jMk2dtjdgcQZ1vu/view?usp=share_link)

[https://drive.google.com/file/d/19zIMTZzF9tqOnpDBxMkoKz6u7S3-x7CW/view?usp=share\\_link](https://drive.google.com/file/d/19zIMTZzF9tqOnpDBxMkoKz6u7S3-x7CW/view?usp=share_link)

## 2. Put those files in 'weights' folder.



## 3. Download datasets

Put the files in directory you want.

### Please download datasets below

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(Put the files in directory you want, and modify the code inside 'Run.ipynb')

AUAIR

[https://drive.google.com/file/d/1syHeOWTO5clw3pjE68TWQdhzZPFTsHTv/view?usp=share\\_link](https://drive.google.com/file/d/1syHeOWTO5clw3pjE68TWQdhzZPFTsHTv/view?usp=share_link)

VisDrone

[https://drive.google.com/file/d/1f02BSNxu0QAkimABYEJeLMSR01Tk1Tnr/view?usp=share\\_link](https://drive.google.com/file/d/1f02BSNxu0QAkimABYEJeLMSR01Tk1Tnr/view?usp=share_link)

UAVDT

[https://drive.google.com/file/d/1MpPPzEgjuRH3DjwFE0jhDxscSzqMjPpW/view?usp=share\\_link](https://drive.google.com/file/d/1MpPPzEgjuRH3DjwFE0jhDxscSzqMjPpW/view?usp=share_link)

ImageVID

[https://drive.google.com/file/d/1w\\_K7uV4C\\_VxM5NryFpJFQC8OtSZbPlde/view?usp=share\\_link](https://drive.google.com/file/d/1w_K7uV4C_VxM5NryFpJFQC8OtSZbPlde/view?usp=share_link)

# Test hardware

1. Run 'Test your hardware.ipynb'

2. Check files in 'hardware\_support'

- Nano.png : inference time checking  
 $960 \times 960 \rightarrow \dots \rightarrow 40 \times 40$
- not\_square\_Nano.png :  
 $960 \times 96 \rightarrow \dots \rightarrow 40 \times 96$
- Nano.png :  
 $2560 \times 2560 \rightarrow \dots \rightarrow 80 \times 80$
- not\_square\_Nano.png :  
 $2560 \times 256 \rightarrow \dots \rightarrow 80 \times 256$

Note that depending on the hardware, the inference time may not be accelerated as much as the operation costs reduction.

Therefore, we strongly recommend using **Jetson Nvidia TX2** and **Jetson Nano** or with hardware of a similar specification for reproducing our experiments.

However, if there is none, please experiment with existing hardware and refer to the result of acceleration indirectly with average resolution in 'excel\_results/files'.

# Evaluate (DynaPP / baseline / Pack and Detect)

1. Go to 'Run.ipynb'

**!! Please write the directory you put datasets in.**

2. Write dataset directory

```
In [ ]: # Please modify.  
UAVDT_directory = '../data/datasets/UAVDT/UAV-benchmark-M'  
VisDrone_directory = '../data/datasets/VisDroneVID/sequences'  
AUAIR_directory = '../data/datasets/AUAIR/videos'  
ImageVID_directory = '../data/datasets/ImageVID_yolo_form'
```

3. Run the code

4. Results are saved in excel inside 'excel\_result' folder.

## AUAIR

DynaPP

Square  
Baseline

Pack and  
Detect

```
# Run YOLOv5x on AUAIR  
for idx, video in enumerate(AUAIR_video_list):  
    AUAIR_change_yaml(video)  
    # The following runs DynaPP, Baseline, Pack and Detect  
  
    !python3 val.py --pack --dataset_name 'AUAIR'  
    !python3 val.py --dataset_name 'AUAIR' --  
    # !python3 val_packanddetect.py --pack --
```

# Result Analysis

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Videos	Baseline mAP	DynaPP mAP		Baseline inference time	DynaPP inference time		Baseline mAP average	DynaPP mAP average		acceleration		average acceleration	mAP loss
2								#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
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Copy and paste  
the data

Copy and paste  
the data

Here, results  
are pop up

# Ablation Study

soon updated

# Where to check our code write

- canvas\_DynaPP.py
  - : Check all
- canvas\_packanddetect.py
  - : Check all
- val.py
  - : Check line 26-34, 102-105, 118-290, 307-314, 393-402, 429-455, 522-526
- val\_packanddetect.py
  - : Check line 26-34, 102, 115-220, 236-242, 324-332, 359-385, 452-456
- models/common.py
  - : Check class Focus, class Concat
- models/yolo.py (Ablation study)
  - : Check class Detect, class Model inside start from *if isinstance(m, Detect)*
- SSD\_to\_Dynamic/SSD\_utils.py
  - : Check line 227, 239-240, 261, 282-286, 299-338
- SSD\_to\_Dynamic/SSD\_model.py
  - : Check line 109-110