

Code address: <https://github.com/ziqionglu00/Cropyieldprediction>

Data and checkpoint.pth address:

https://drive.google.com/drive/folders/1NVrN8MkSlzBm-WzfYcbp9ncII_4QdOPd?usp=sharing

Step1: Create a new virtual environment using conda

entering “conda create -n yieldprediction python=3.10” in the terminal:

```
Anaconda Prompt
(base) C:\Users\luziq>conda create -n yieldprediction python=3.10

The following NEW packages will be INSTALLED:

bzip2                anaconda/pkg/main/win-64::bzip2-1.0.8-h2bbff1b_6
ca-certificates      anaconda/pkg/main/win-64::ca-certificates-2025.11.4-haa95532_0
expat                anaconda/pkg/main/win-64::expat-2.7.3-h9214b88_0
libffi               anaconda/pkg/main/win-64::libffi-3.4.4-hd77b12b_1
libzlib              anaconda/pkg/main/win-64::libzlib-1.3.1-h02ab6af_0
openssl              anaconda/pkg/main/win-64::openssl-3.0.18-h543e019_0
pip                  anaconda/pkg/main/noarch::pip-25.3-pyhc872135_0
python               anaconda/pkg/main/win-64::python-3.10.19-h981015d_0
setuptools           anaconda/pkg/main/win-64::setuptools-80.9.0-py310haa95532_0
sqlite               anaconda/pkg/main/win-64::sqlite-3.51.0-hda9a48d_0
tk                   anaconda/pkg/main/win-64::tk-8.6.15-hf199647_0
tzdata               anaconda/pkg/main/noarch::tzdata-2025b-h04d1e81_0
ucrt                  anaconda/pkg/main/win-64::ucrt-10.0.22621.0-haa95532_0
vc                   anaconda/pkg/main/win-64::vc-14.3-h2df5915_10
vc14_runtime         anaconda/pkg/main/win-64::vc14_runtime-14.44.35208-h4927774_10
vs2015_runtime       anaconda/pkg/main/win-64::vs2015_runtime-14.44.35208-ha6b5a95_10
wheel                anaconda/pkg/main/win-64::wheel-0.45.1-py310haa95532_0
xz                   anaconda/pkg/main/win-64::xz-5.6.4-h4754444_1
zlib                 anaconda/pkg/main/win-64::zlib-1.3.1-h02ab6af_0

Proceed ([y]/n)? y

The following NEW packages will be INSTALLED:

bzip2                anaconda/pkg/main/win-64::bzip2-1.0.8-h2bbff1b_6
ca-certificates      anaconda/pkg/main/win-64::ca-certificates-2025.11.4-haa95532_0
expat                anaconda/pkg/main/win-64::expat-2.7.3-h9214b88_0
libffi               anaconda/pkg/main/win-64::libffi-3.4.4-hd77b12b_1
libzlib              anaconda/pkg/main/win-64::libzlib-1.3.1-h02ab6af_0
openssl              anaconda/pkg/main/win-64::openssl-3.0.18-h543e019_0
done
#
# To activate this environment, use
#
#     $ conda activate yieldprediction
#
# To deactivate an active environment, use
#
#     $ conda deactivate

install successfully
```

Step2: Activate the new environment

entering “conda activate yieldprediction” in the terminal:

```
(base) C:\Users\luziq>conda activate yieldprediction
(yieldprediction) C:\Users\luziq>
```

Step3: Complete the remaining configuration in the new environment

entering "pip install -r ****\yieldprediction\requirements.txt" in the terminal

(The absolute path to the requirement.txt)

```
(yieldprediction) C:\Users\luziq>pip install -r D:\PHD\TA\yieldpredicion\requirements.txt
Collecting torch>=2.1.1 (from -r D:\PHD\TA\yieldpredicion\requirements.txt (line 1))
  Downloading torch-2.9.1-cp310-cp310-win_amd64.whl.metadata (30 kB)
Collecting torchvision>=0.16.1 (from -r D:\PHD\TA\yieldpredicion\requirements.txt (line 2))
  Downloading torchvision-0.24.1-cp310-cp310-win_amd64.whl.metadata (5.9 kB)
Collecting torchaudio>=2.1.1 (from -r D:\PHD\TA\yieldpredicion\requirements.txt (line 3))
```

```
Anaconda Prompt - "D:\Progr...
Downloading charset_normalizer-3.4.4-cp310-cp310-win_amd64.whl (107 kB)
Downloading idna-3.11-py3-none-any.whl (71 kB)
Downloading rsa-4.9.1-py3-none-any.whl (34 kB)
Downloading smmap-5.0.2-py3-none-any.whl (24 kB)
Downloading sqlalchemy-2.0.44-cp310-cp310-win_amd64.whl (2.1 MB)
  2.1/2.1 MB 13.2 MB/s 0:00:00
Downloading sqlparse-0.5.3-py3-none-any.whl (44 kB)
Downloading starlette-0.50.0-py3-none-any.whl (74 kB)
Downloading anyio-4.11.0-py3-none-any.whl (109 kB)
Downloading typing_extensions-4.15.0-py3-none-any.whl (44 kB)
Downloading urllib3-2.5.0-py3-none-any.whl (129 kB)
Downloading uvicorn-0.38.0-py3-none-any.whl (68 kB)
Downloading waitress-3.0.2-py3-none-any.whl (56 kB)
Downloading opencv_python-4.12.0.88-cp37-abi3-win_amd64.whl (39.0 MB)
  39.0/39.0 MB 18.9 MB/s 0:00:02
Downloading pillow-12.0.0-cp310-cp310-win_amd64.whl (7.0 MB)
  7.0/7.0 MB 22.7 MB/s 0:00:00
Using cached einops-0.8.1-py3-none-any.whl (64 kB)
Downloading annotated_doc-0.0.4-py3-none-any.whl (5.3 kB)
Using cached annotated_types-0.7.0-py3-none-any.whl (13 kB)
Downloading blinker-1.9.0-py3-none-any.whl (8.5 kB)
Downloading certifi-2025.11.12-py3-none-any.whl (159 kB)
```

Step4: Run Code

Method1: entering "pip install -r ****\yieldprediction\test.py" in the terminal

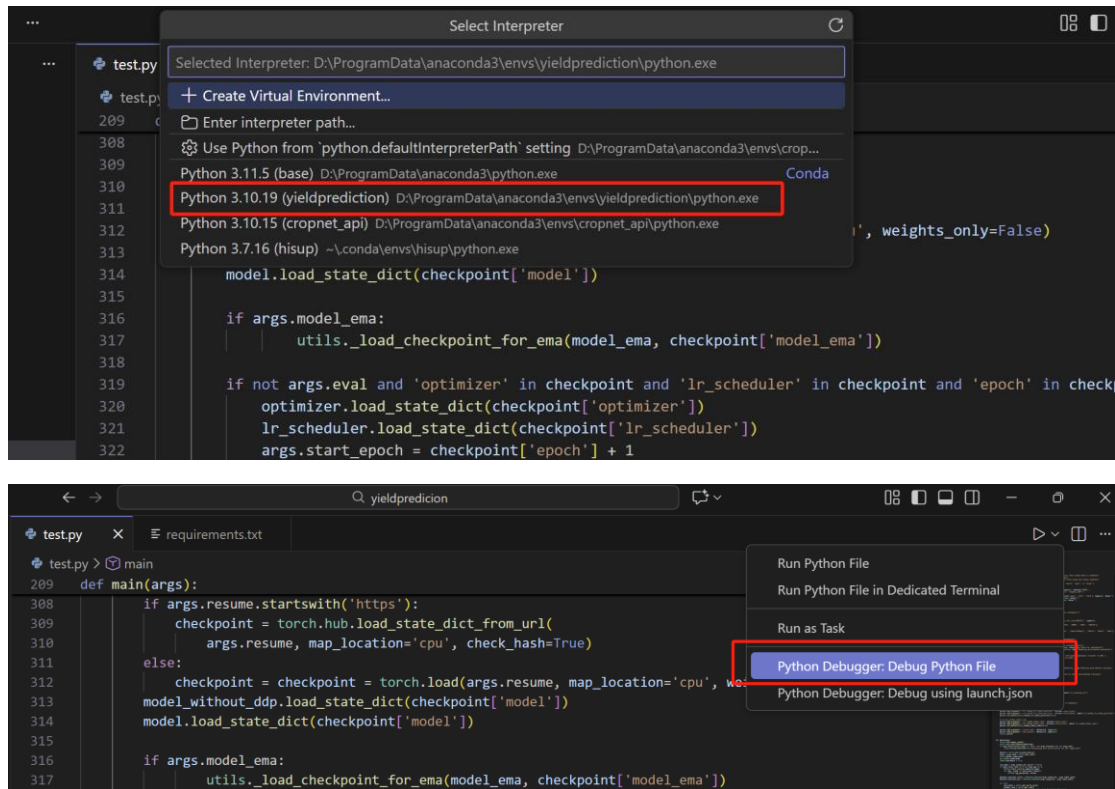
```
(yieldprediction) C:\Users\luziq>python D:\PHD\TA\yieldpredicion\test.py
↓
the absolute path to the test.py
```

Method2(option): Run it directly using the Python interpreter

```
File Edit Selection View Go Run ...
yieldprediction
test.py X requirements.txt
test.py > main
209 def main(args):
308     if args.resume.startswith('https'):
309         checkpoint = torch.hub.load_state_dict_from_url(
310             args.resume, map_location='cpu', check_hash=True)
311     else:
312         checkpoint = torch.load(args.resume, map_location='cpu', weights_only=False)
313     model_without_ddp.load_state_dict(checkpoint['model'])
314     model.load_state_dict(checkpoint['model'])
315
316     if args.model_ema:
317         utils.load_checkpoint_for_ema(model_ema, checkpoint['model_ema'])
318
319     if not args.eval and 'optimizer' in checkpoint and 'lr_scheduler' in checkpoint and 'epoch' in checkpoint:
320         optimizer.load_state_dict(checkpoint['optimizer'])
321         lr_scheduler.load_state_dict(checkpoint['lr_scheduler'])
322         args.start_epoch = checkpoint['epoch'] + 1
323     if args.model_ema:
324         utils.load_checkpoint_for_ema(model_ema, checkpoint['model_ema'])
325     if 'scaler' in checkpoint and args.if_amp: # change loss_scaler if not amp
326         loss_scaler.load_state_dict(checkpoint['scaler'])
327     elif 'scaler' in checkpoint and not args.if_amp:
328         loss_scaler = 'none'
329     lr_scheduler.step(args.start_epoch)
330
331     test_stats = evaluate(model, data_loader_sentinel_val, device, args)
332     #print(f'rmse of the network on the {len(data_loader_sentinel_val)} test images: {test_stats['rmse']:.1f}%')
333
334     # RMSE, R_Squared, Corr
335     best_metrics = [float("inf"), 0, 0]

PROBLEMS
WARNING: Importing from timm.models.layers is deprecated, please import via timm.layers
[ 4 / 6 ] yield gap: 3.9879989624823438 outputs:68.78800201416816 gt:64.80000305175781
[ 5 / 6 ] yield gap: -13.077396392822266 outputs:52.82260513305664 gt:65.9000015258789
[ 6 / 6 ] yield gap: -3.082592010498047 outputs:57.2174872265625 gt:68.29999923706055
train rmse: 5.91839806439209
PS D:\PHD\TA\yieldpredicion>

Ln 330, Col 9 Spaces: 4 UTF-8 LF Python Finish Setup 3.10.19 (yieldprediction)
```



Assignment Requirement

(deadline: 23:59 04/12/2025)

1. Successfully execute the test.py file and submit a screenshot confirming the successful execution. For example:

```
[ 2 / 6] yeild gap: -3.8551864624023438 outputs:62.24481201171875 gt:66.0999984741211
[ 3 / 6] yeild gap: -5.430263519287109 outputs:52.36973571777344 gt:57.79999923706055
[ 4 / 6] yeild gap: 3.9879989624023438 outputs:68.78800201416016 gt:64.80000305175781
[ 5 / 6] yeild gap: -13.077396392822266 outputs:52.82260513305664 gt:65.9000015258789
[ 6 / 6] yeild gap: -3.082592010498047 outputs:57.2174072265625 gt:60.29999923706055
train_rmse:5.910398006439209
test successfully
PS D:\PHD\TA\yieldprediction> |
```

2. Analyse each step of the ConvLSTM model within the ConvLSTM.py file (lines 57–153 of the code), and provide a commentary in the form of annotations appended to the code in ConvLSTM.py. For example:

```
def forward(self, input_tensor, cur_state):
    h_cur, c_cur = cur_state
    combined = torch.cat([input_tensor, h_cur], dim=1) # Concatenation of input features with hidden state
    combined_conv = self.conv(combined)

    cc_i, cc_f, cc_o, cc_g = torch.split(combined_conv, self.hidden_dim, dim=1)

    i = torch.sigmoid(cc_i)
```

3. Place the screenshots and the ConvLSTM.py file within a single folder. The folder should be named in the format 'UID_Name'. Compress this folder and submit it to ziqionglu@connect.hku.hk and immortal@hku.hk.