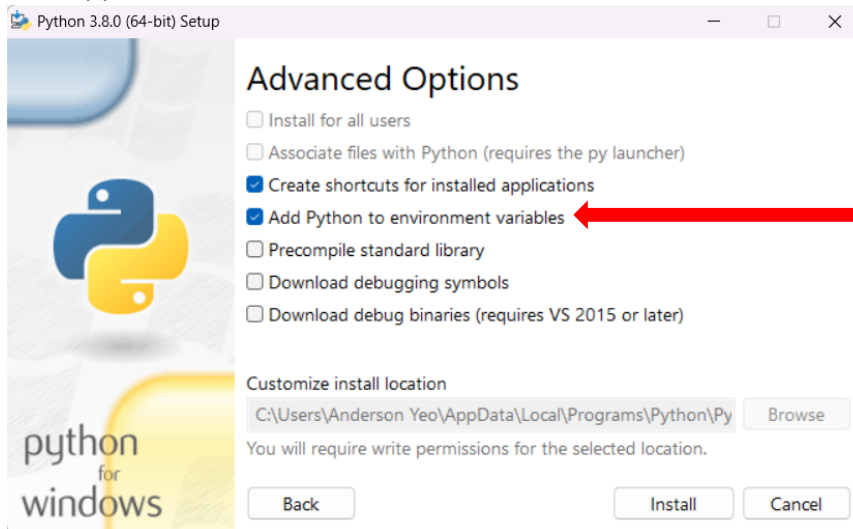


User manual for Fundus_Image_Classification.pynb training file:

1. Use **python version 3.8.0** because python 3.12 still have certain incompatibilities that cannot run some of the of the code.
 - Uninstall your python version 3.12
 - Download python 3.8 from here <https://www.python.org/downloads/release/python-380/>
 - Install python 3.8



- In VS code, select python 3.8.0 as interpreter (when running the code).
- Open VS code terminal, type this to install the libraries: **pip install —upgrade tensorflow**
- and: **pip install numpy scipy matplotlib scikit-learn streamlit**

2. Change all the **paths of dataset** to your own path in your pc

Load train path, test path, data augmentation

```
train_path = r"C:\Users\Anderson Yeo\Downloads\CS LAB PROJECT\OCT2017\train"
test_path = r"C:\Users\Anderson Yeo\Downloads\CS LAB PROJECT\OCT2017\test"
```

3. Change the **paths** to **save your epoch log, history log, checkpoint**. Give the filename at the end, eg: epoch_log.json, history_log.json, model.weights.h5
For checkpoint_path, the filename must end with **.weights.h5**

Custom Callbacks

```
epoch_log_path = r'C:\Users\Anderson Yeo\Downloads\CS LAB PROJECT\OCT2017\epoch_log(2349spe).json'
history_log_path = r'C:\Users\Anderson Yeo\Downloads\CS LAB PROJECT\OCT2017\history_log(2349spe).json'
checkpoint_path = r"C:\Users\Anderson Yeo\Downloads\CS LAB PROJECT\OCT2017\model_vgg16_trained(2349spe).weights.h5"
```

4. Can change **epoch number** here

```
# Create the callback instance
initial_epoch = load_last_completed_epoch()
epoch_history_callback = EpochLoggingCallback(epoch_log_path, history_log_path, initial_epoch)

total_epochs = 5
remaining_epochs = total_epochs - initial_epoch
```

The higher the number of epoch the better

Load model weights before resume training

5. Change [steps per epoch](#) here

Training the modified VGG16 model on our data

NOTE: Numbers are kept lower than predicted because of lower computational power and resource a

```
history = model.fit(  
    train_batches,  
    steps_per_epoch=200,  
    epochs=remaining_epochs,  
    verbose=1,  
    validation_data=valid_batches,  
    validation_steps=128,  
    shuffle=True,  
    class_weight=class_weights_dict,  
    callbacks=[checkpoint_callback, CustomEpochCallback(initial_epoch, total_epochs), epoch_h  
)
```

Change to 4696

Formula to calculate steps per epoch

= Number of images ÷ batch size

= 75138 ÷ 16

= 4696

6. [Start training](#) by running all the code

User manual for [predictionapp.py](#) file:

1. Change the path to the [path same as checkpoint_path](#)

```
# Load the weights  
weights_path = r"C:\Users\Anderson Yeo\Downloads\CS LAB PROJECT\OCT2017\model_vgg16_trained(2349spe)2.weights.h5"  
try:  
    model.load_weights(weights_path)  
except Exception as e:  
    st.error(f"Error loading weights: {e}")
```

2. To [run the app](#):

- Go to windows terminal by clicking (**Windows button + R**) then type **cmd**, then **enter**.
- Go to the **directory of the folder** where your predictionapp.py file is saved. Eg: cd Downloads/CS LAB PROJECT
- Type: **streamlit run predictionapp.py** to run the app. The app will open in the browser.
- Example:

```
C:\WINDOWS\system32\cmd  x  +  v  
Microsoft Windows [Version 10.0.22631.3593]  
(c) Microsoft Corporation. All rights reserved.  
  
C:\Users\Anderson Yeo>cd Downloads/CS LAB PROJECT  
  
C:\Users\Anderson Yeo\Downloads\CS LAB PROJECT>streamlit run predictionapp.py  
  
You can now view your Streamlit app in your browser.  
  
Local URL: http://localhost:8501  
Network URL: http://192.168.68.117:8501
```

