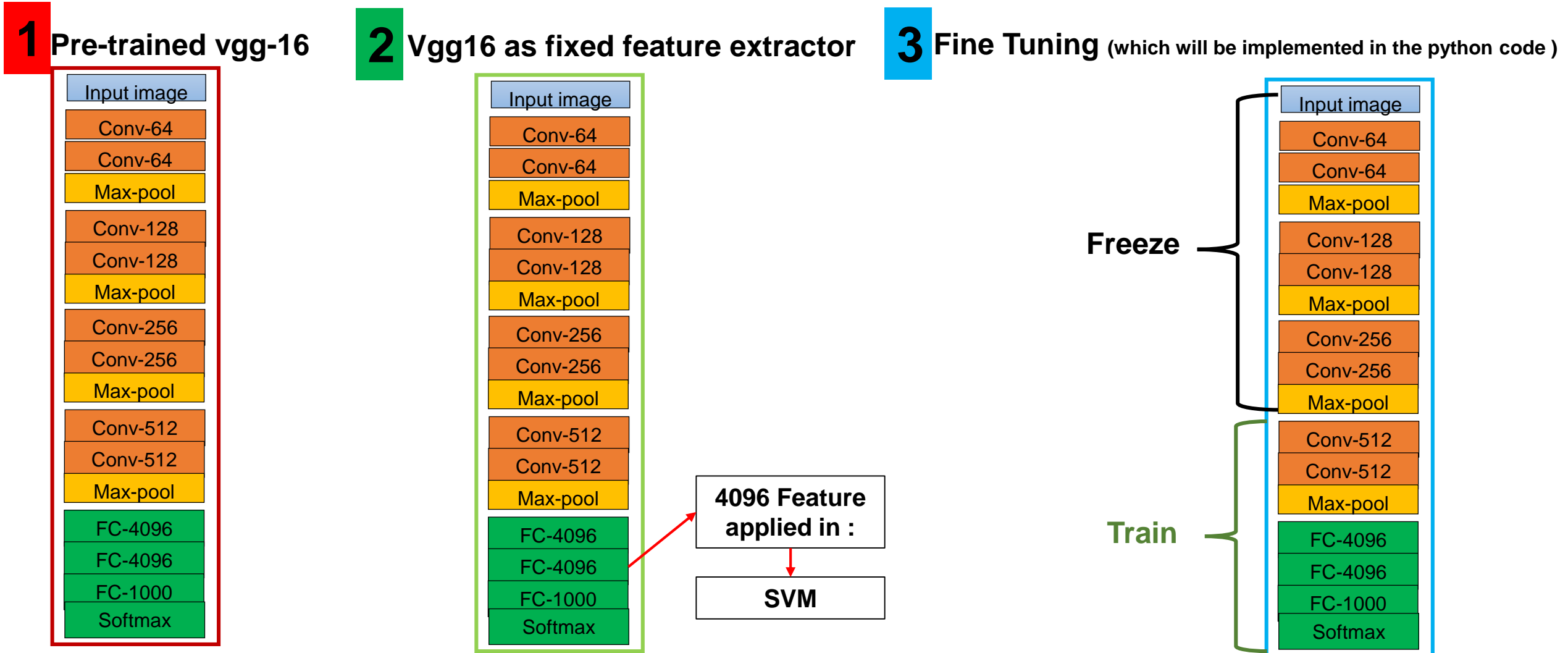# Transfer Learning (TL) using VGG16

GHNAMI Helmi

Transfer Learning (TL) using VGG16

There are three methods for TL using VGG16 architecture:

1 **Pre-trained vgg-16**

2 **Vgg16 as fixed feature extractor**

3 **Fine Tuning** (which will be implemented in the python code)

Freeze

Train

4096 Feature applied in :

SVM

1 **Pre-trained vgg-16**   **2** **Vgg16 as fixed feature extractor**   **3** **Fine Tuning** (which will be implemented in the python code)

Trained on Image-net

If we have small dataset, we fixe all weight (treat the CNN as fixed feature extractor), then retrain only the classifier

If we have medium sized dataset, we use this strategies of TL: use the old weights as initialization, then we train the full network or only some of the higher layers

➢ In the example developed in this repertory , we have 4 images classes, Therefore we use the TL method **fine tune** as illustrated in this figure :

Freeze

Train

| Input image |
| Conv-64 |
| Conv-64 |
| Max-pool |
| Conv-128 |
| Conv-128 |
| Max-pool |
| Conv-256 |
| Conv-256 |
| Max-pool |
| Conv-512 |
| Conv-512 |
| Max-pool |
| FC-128 |
| FC-128 |
| FC-4 |
| Softmax |