

Practical Machine Learning

Pre-Trained Models

Pre-Trained Models

Larger general models help to get started training and reduce training time.

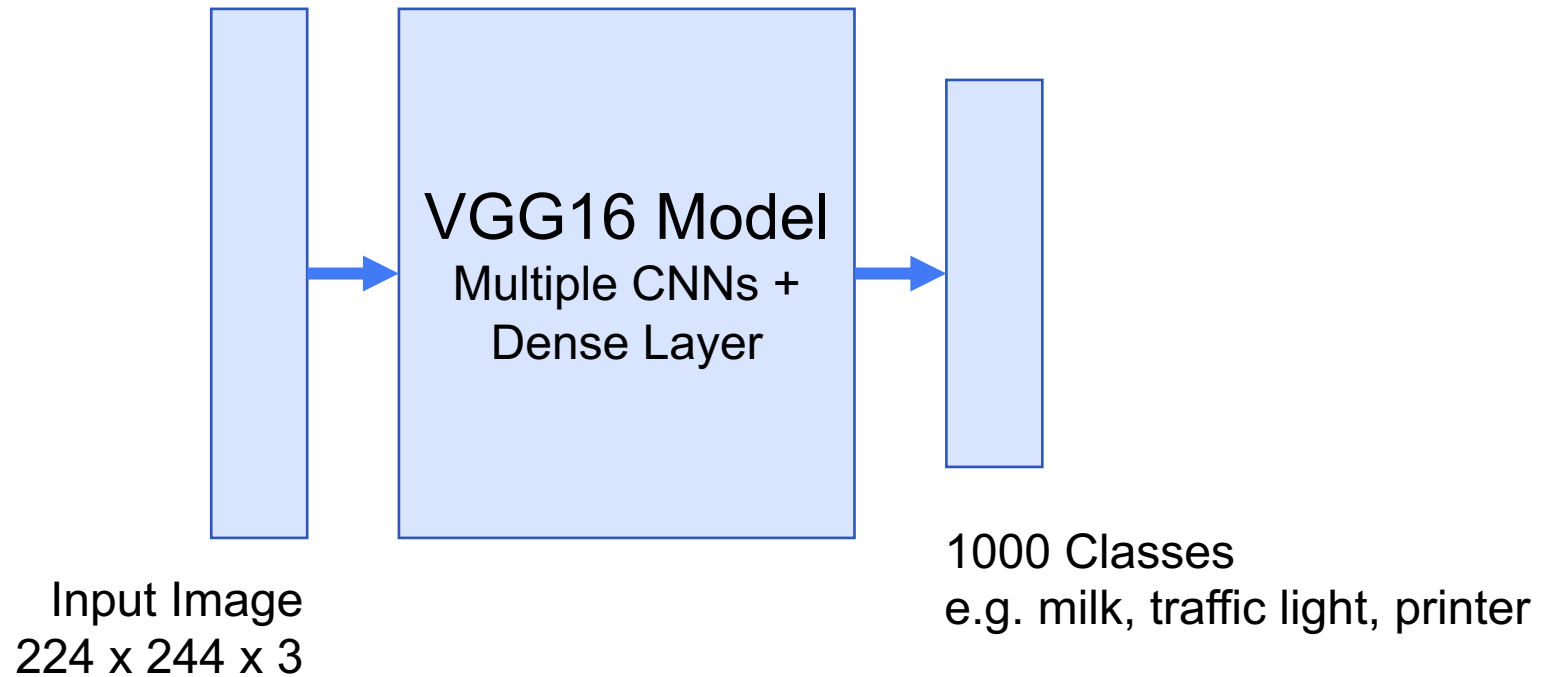
- Good starting point – domain knowledge
- Reduces training time
- Reduces computational complexity
- Allows to train with less data – “fine tuning”

Pre-Trained Models

- Reducing the output classes
 - 1000 -> 5
- Used as feature extraction
 - Fitting the model to new classes

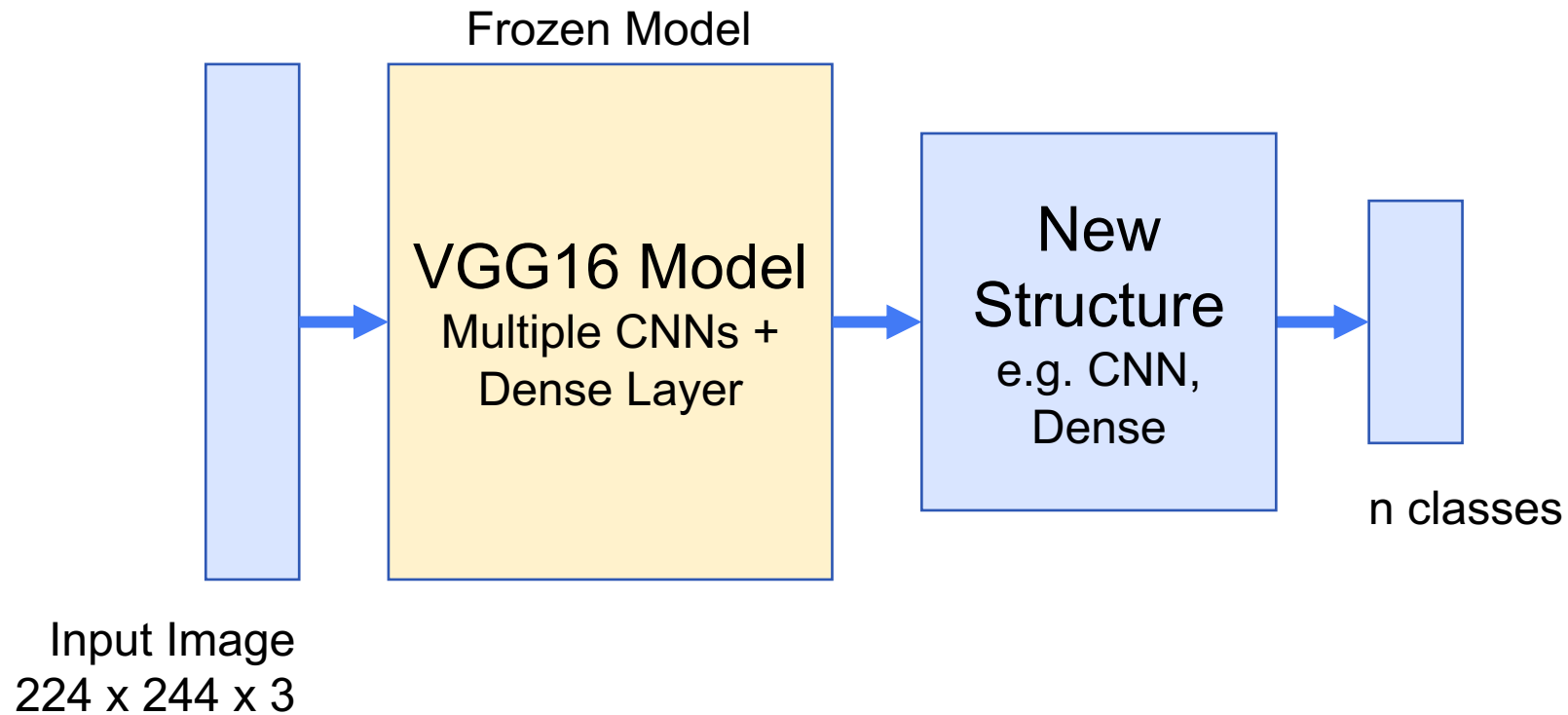
Pre-Trained Models

VGG16 Example



Pre-Trained Models

VGG16 Frozen Model + New Structure



Example Model

```
model = Sequential()  
model.add(Input((224, 224, 3), name="Input"))  
  
vgg = tf.keras.applications.VGG16(  
weights='imagenet', include_top=False)  
model.add(vgg)  
  
model.add(Flatten())  
model.add(Dense(1024, activation='relu'))  
model.add(Dropout (0.5))  
model.add(Dense, 5, activation='softmax'))
```

Models

- Various Model in TensorFlow
 - https://www.tensorflow.org/api_docs/python/tf/keras/applications
- All models can be included like this
 - Models from your own work
 - Models from prior research
 - Any open source model

Conclusion

Pre-Trained Models

- Feature reduction using pre-trained models
- Any trained model can act as such a “layer”

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