

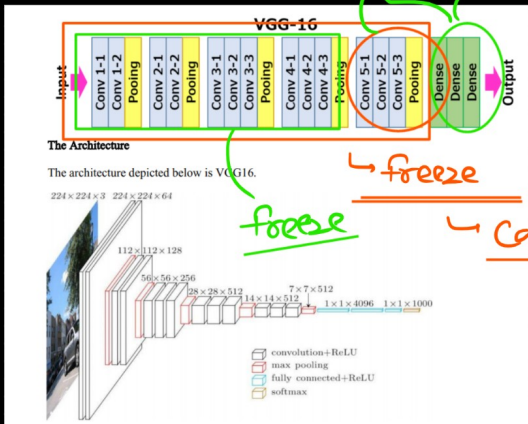
# Transfer Learning



Transfer learning (TL) is a technique in machine learning (ML) in which knowledge learned from a task is re-used in order to boost performance on a related task. [1] For example, for image classification, knowledge gained while learning to recognize cars could be applied when trying to recognize trucks. This topic is related to the psychological literature on transfer of learning, although practical ties between the two fields are limited. Reusing/transferring information from previously learned tasks to new tasks has the potential to significantly improve learning efficiency. [2]

- ① feature Extraction ↗ cat vs dog  
↳ Pre-trained model as a fixed feature extractor without updating the weights

- ② fine tuning ↗ for learning of edges, shapes  
Dataset ↗ we pre-trained model  
fully connected layers ↗ animals  
freeze ↗ but allow some layers to update  
conv ↗ Domain Knowledge (Manual resources)



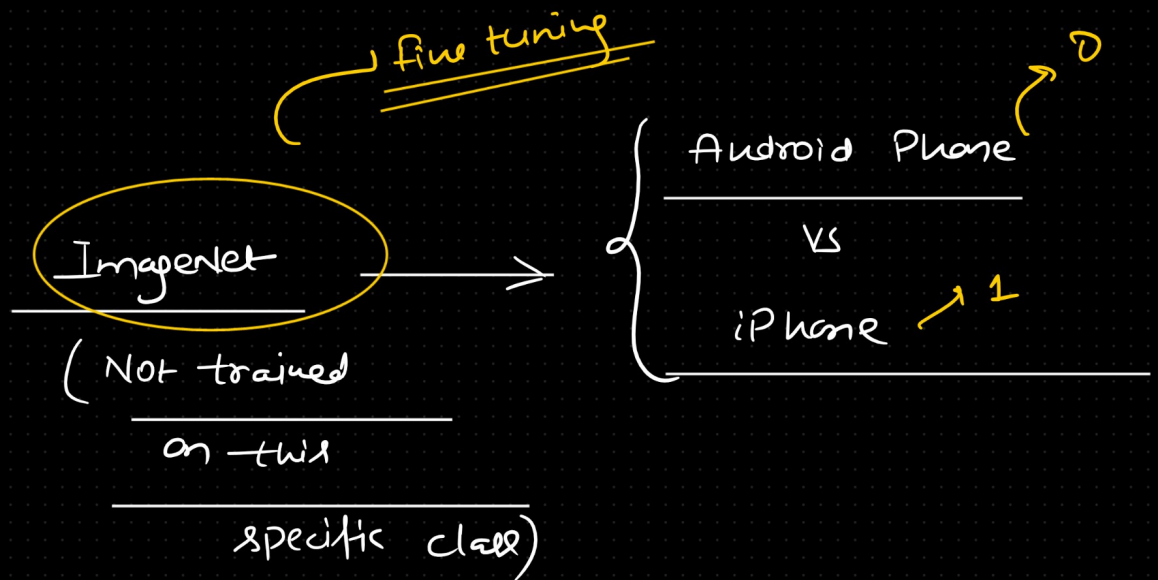
Problem to train model from scratch:

- ① Data hungry (labelled data)
- ② lot of time & resource

Pre-trained models (huge amount of data)

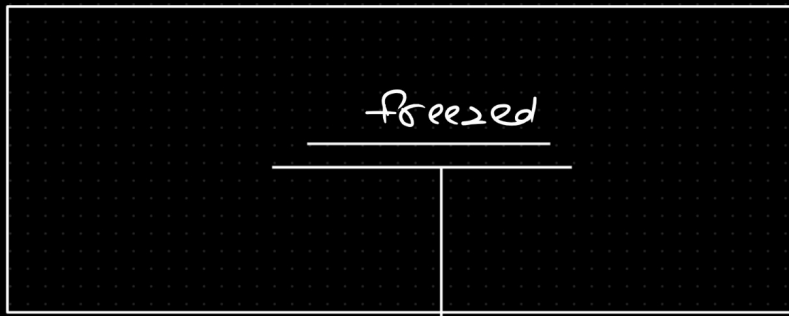
VGG16 → Pretrained model (Image Classification)  
↳ ImageNet data

A pre-trained model is a saved network that was previously trained on a large dataset, typically on a large-scale image-classification task.



# feature Extraction

Conv - VGG16



weights

( Extract

meaningful

feature)