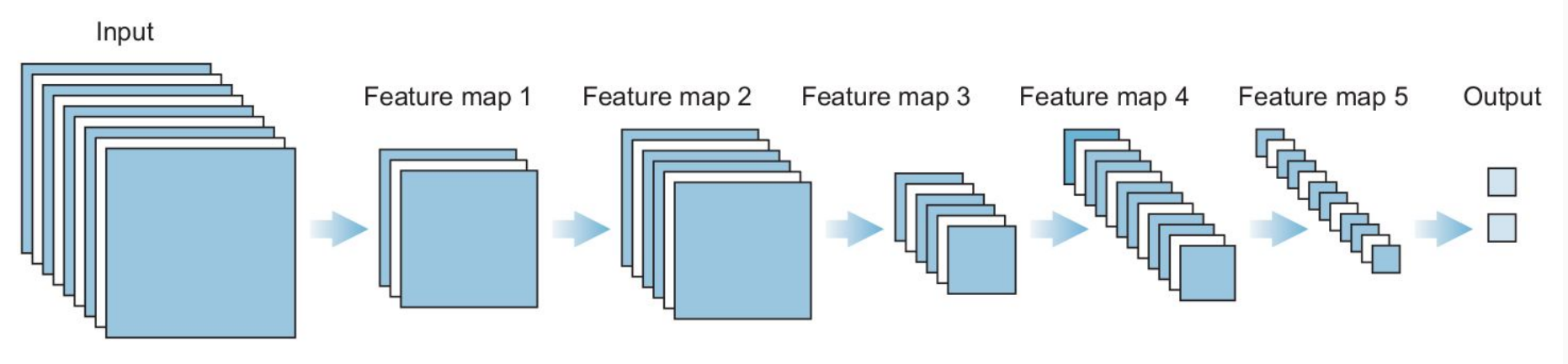
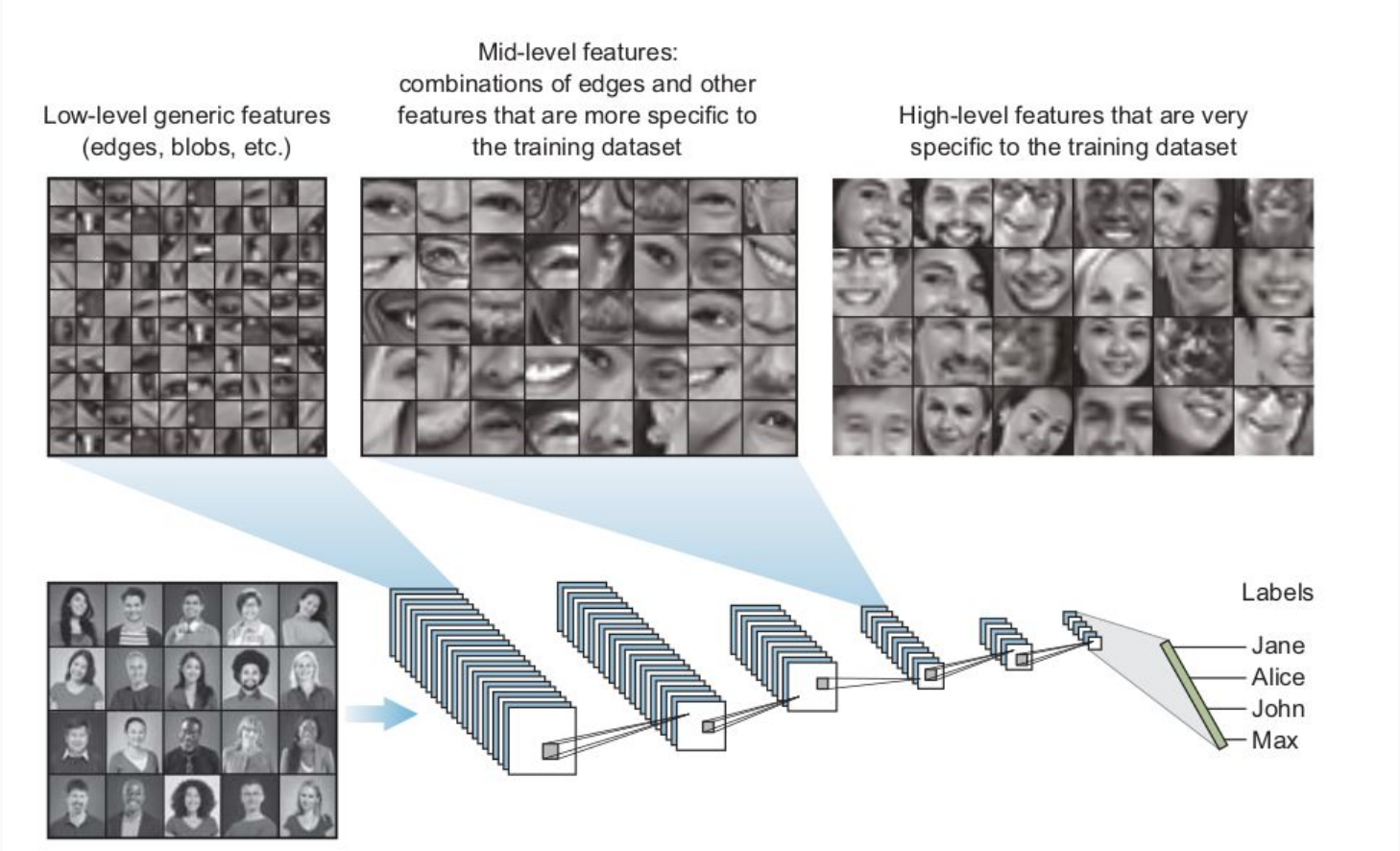
Transfer Learning

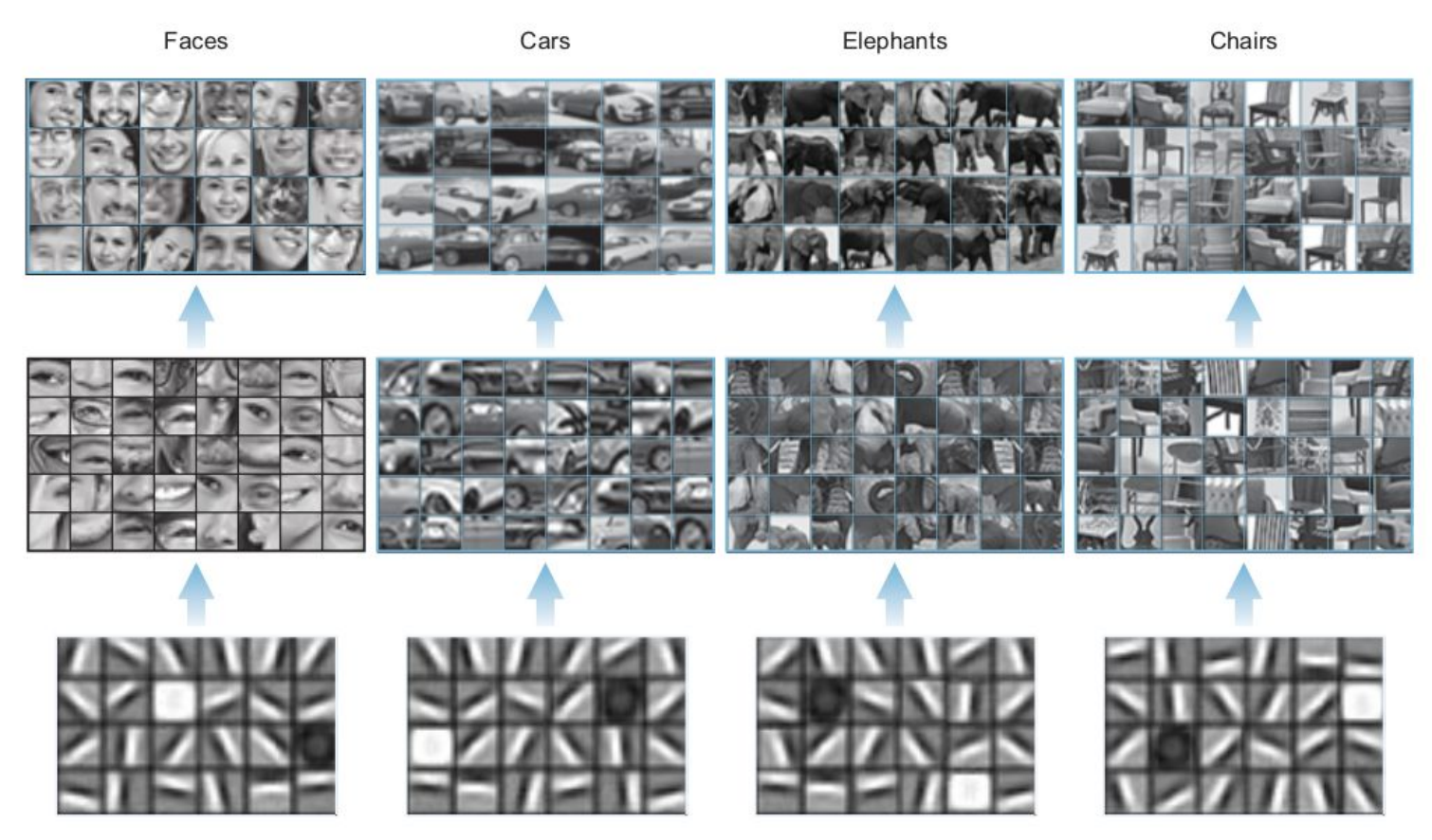
Deep Learning Architectures



Learned Features



Utility of Learned Features for other Applications



How about the Transferability of Features Extracted at Later Layers?

How to Reuse Features Learned for new Applications

- Use a trained network without any changes (limited to the same or very similar domains)
- Using a pretrained network as a feature extractor and train the classifier
- Fine-tune the feature extractor and the learn the classifier

Which one Should be used?

- The target dataset is small and similar to the source dataset.
- The target dataset is large and similar to the source dataset.
- The target dataset is small and very different from the source dataset.
- The target dataset is large and very different from the source dataset.

Size of the target data	Similarity of the original and new datasets	Approach
Small	Similar	Pretrained network as a feature extractor
Large	Similar	Fine-tune through the full network
Small	Very different	Fine-tune from activations earlier in the network
Large	Very different	Fine-tune through the entire network