

EVML

TRAINING DEEP NETS

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AGENDA

- Avoiding exploding/vanishing gradients
- Avoiding overfitting
- Using the Keras tuner
- Transfer Learning and Tensorflow hub

EXERCISE: AVOIDING EXPLODING/VANISHING GRADIENTS

- Add batch normalization to the model in your MNIST example and study the effects with tensorboard, see Géron 10.2.7, 11.1.3
- Clip the gradient of the optimizer in your MNIST fashion exercise and study the effects with tensorboard, see Géron 10.2.7, 11.1.4

EXERCISE: AVOIDING OVERFITTING

- Try dropout regularization on your MNIST example and study the effects with tensorboard, see Géron 10.2.7, 11.4.2

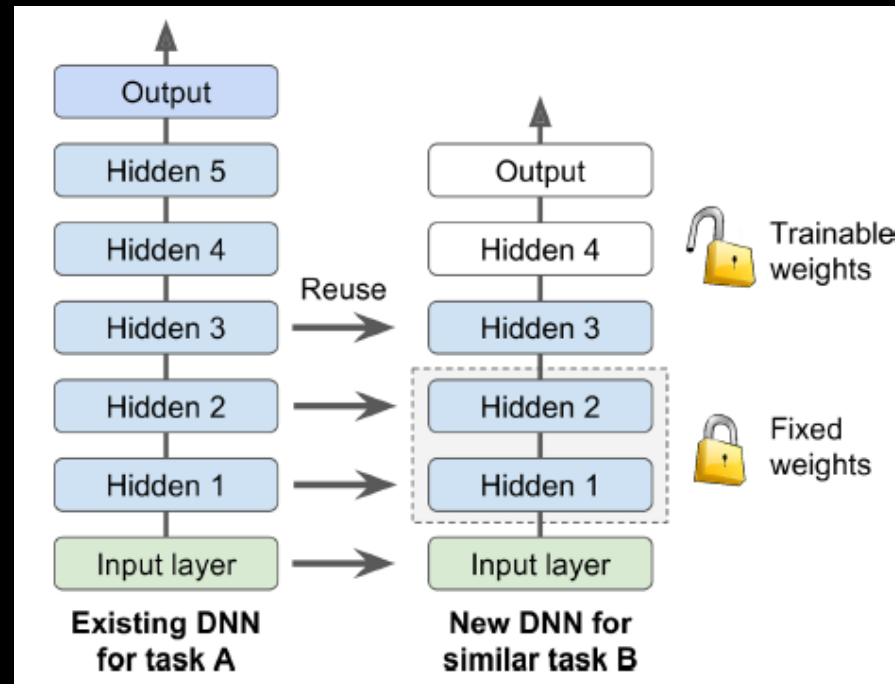
USING THE KERAS TUNER

- Please study:
https://www.tensorflow.org/tutorials/keras/keras_tuner
- Additional resources:
<https://www.youtube.com/watch?v=O85gh3Ozlul>

EXERCISE: FINE TUNING

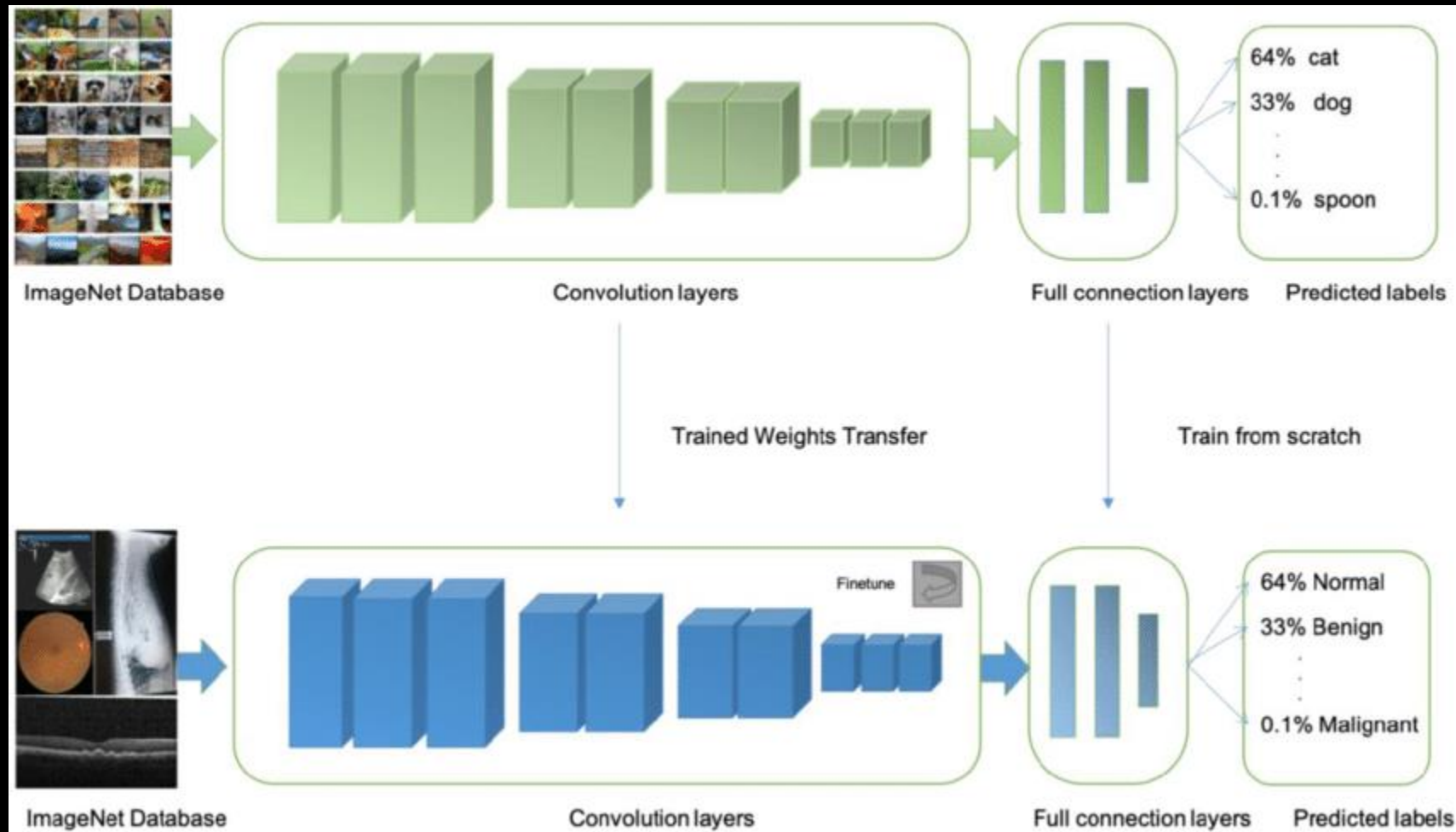
- Try finetuning on your MNIST example and study the effects with tensorboard, see Géron 10.2.7, 10.3

TRANSFER LEARNING



```
model_A = keras.models.load_model("my_model_A.h5")
model_B_on_A = keras.models.Sequential(model_A.layers[:-1])
model_B_on_A.add(keras.layers.Dense(1, activation="sigmoid"))
```

TRANSFER LEARNING



EXERCISE: USING PRETRAINED LAYERS

- Try transfer learning with Keras on your MNIST example and study the effects with tensorboard, see Géron 10.2.7, 11.2.1

TENSORFLOW HUB

- Download and reuse trained models in your TensorFlow program with a minimum amount of code.
- <https://www.tensorflow.org/hub>

INSPIRATION

- <https://www.tensorflow.org/hub>
- <https://keras.io/api/applications/>
- <https://www.kaggle.com/>
- <https://google.github.io/mediapipe/>
- <https://developer.ibm.com/articles/transfer-learning-for-deep-learning/>