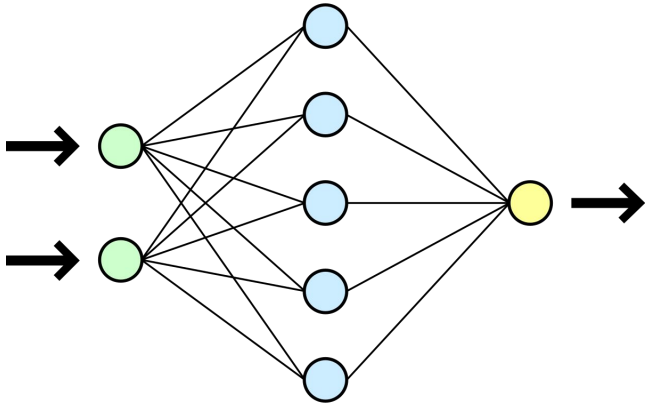


THE CODING LIBRARY

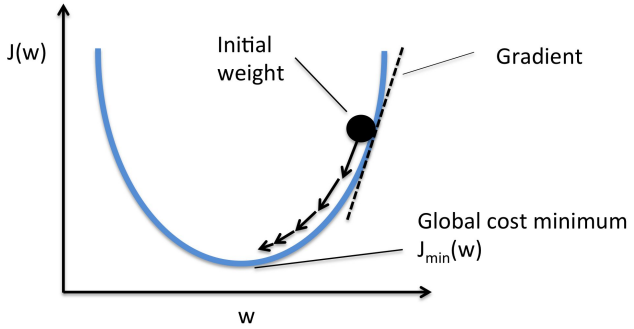
Neural Networks

Training, Validation and Test Set

Recap - Last Video

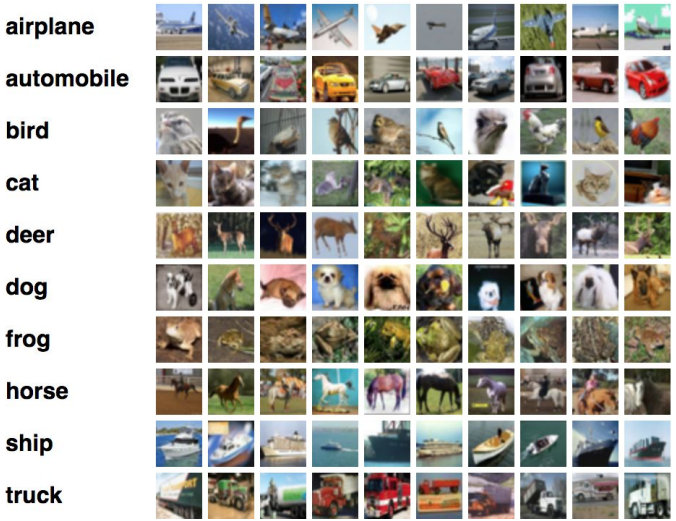
THE CODING LIBRARY

- Loss and Loss Functions
  - What is it and what is it used for?
  - Different types of loss functions in Neural Networks
- Optimization
  - What is it and what is it used for?
  - Optimizers in Neural Networks
- Learning Rate
  - How does it affect the Neural Network during training?

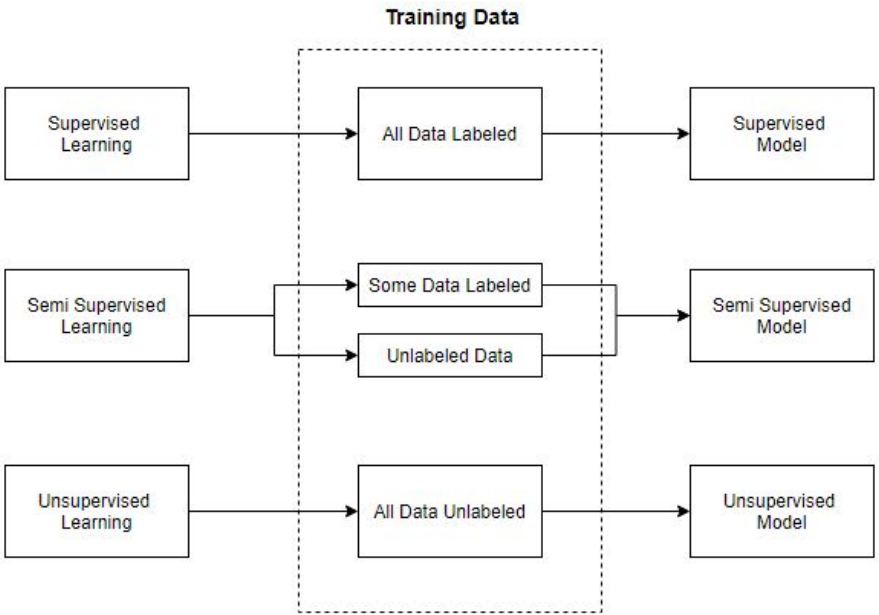


Datasets for Neural Networks

- Numerical data
- Images
- Training Set
- Validation Set
- Test Set



Datasets for Different Types of Learning



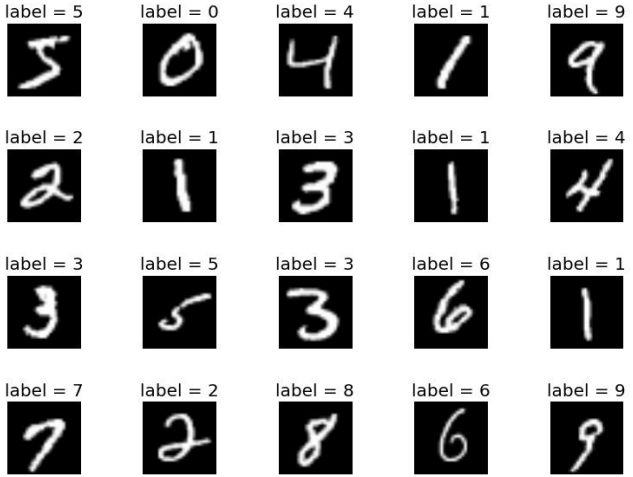
Why is a Validation Set Necessary?

- To validate that the model can predict on unseen data
- Possible to see if the model is overfitting or underfitting
- In Keras we can use a proportion of the training data as validation data
- Used to tell if the model performs good or it needs optimization and tuning

```
Model.fit(
    x=None,
    y=None,
    batch_size=None,
    epochs=1,
    verbose=1,
    callbacks=None,
    validation_split=0.0,
    validation_data=None,
    shuffle=True,
    class_weight=None,
    sample_weight=None,
    initial_epoch=0,
    steps_per_epoch=None,
    validation_steps=None,
    validation_batch_size=None,
    validation_freq=1,
    max_queue_size=10,
    workers=1,
    use_multiprocessing=False,
)
```

How to create your own Datasets?

- Random Numerical Data
  - We will have an example at the end of the video in code
- Numerical Data from different sources
- A lot of images for image classification problems
- Labeling of the data
- Takes a lot of time to create your own dataset for larger projects - Find a way to automate it
- Label some of the data and use NN to label the rest of the dataset
- Data Augmentation



Where to get Datasets?

- Google
- ImageNet
- Google Open Images
- Built-In Datasets
- A lot more available Datasets

MNIST digits classification dataset

- load_data function

CIFAR10 small images classification dataset

- load_data function

CIFAR100 small images classification dataset

- load_data function

IMDB movie review sentiment classification dataset

- load_data function
- get_word_index function

Reuters newswire classification dataset

- load_data function
- get_word_index function

Fashion MNIST dataset, an alternative to MNIST

- load_data function

Boston Housing price regression dataset

- load_data function

Example data:

- An experiemental drug was tested on individuals from ages 13 to 100 in a clinical trial.
- The trial had 2100 participants. Half were under 65 years old, half were 65 years or older.
- 95% of patients 65 or older experienced side effects.
- 95% of patients under 65 experienced no side effects.