Künstliche Intelligenz im Browser?!

Wie auch du diese Technologie ohne tiefes Verständnis nutzen kannst.

Max Rose

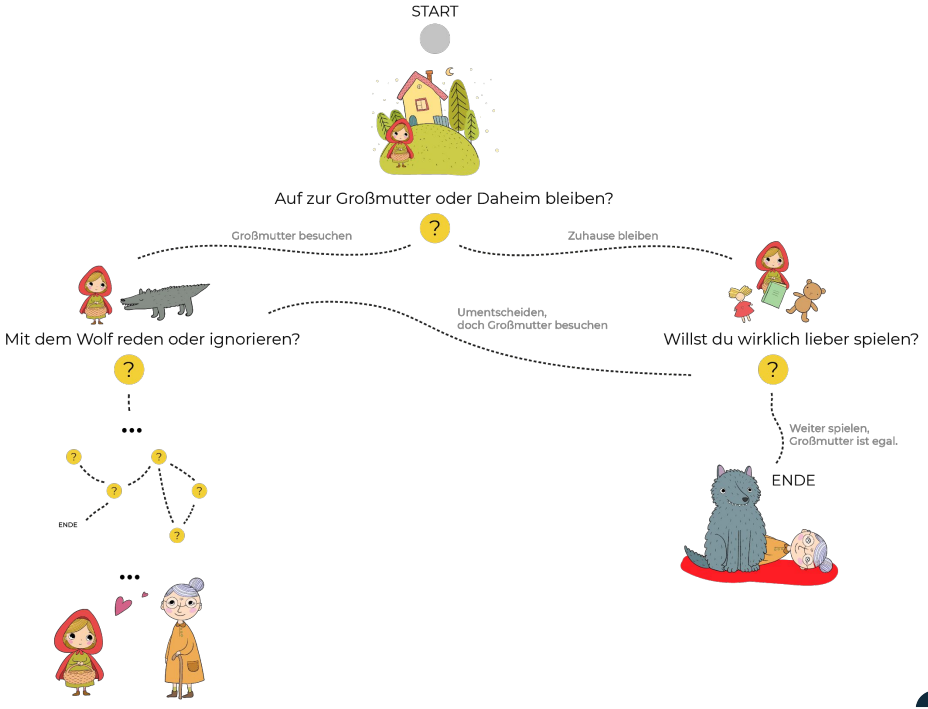
B. Sc. Angewandte Informatik

Schwerpunkt: Virtuelle Realität

Interesse: Künstliche Intelligenz

Gründer von audory

audory - Deine Plattform für interaktive Hörspiele



audory - Deine Plattform für interaktive Hörspiele

Ziele des Talks

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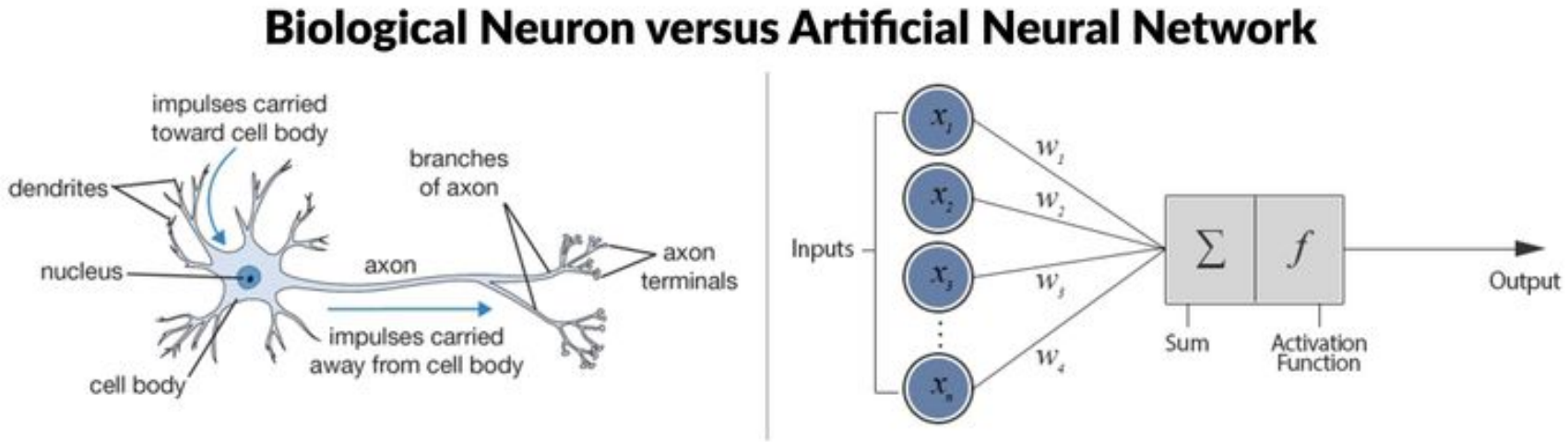
1. Grundlagen verstehen
2. Startpunkt bekommen
3. Motivation zur Anwendung

Gliederung

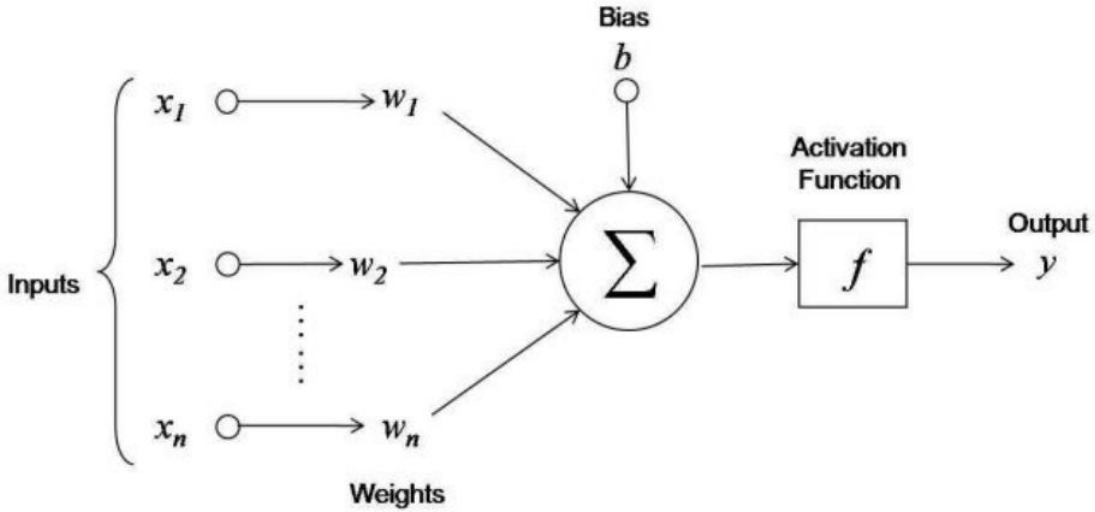
1. Grundlagen Neuronale Netze
    a. Aufbau/Funktion eines Neurons
    b. Architektur von Neuronalen Netzen
2. Training von Neuronalen Netzen
    a. Daten sammeln & aufbereiten
    b. Architektur designen
    c. Model trainieren/testen
3. Umsetzung mit Tensorflow.js
    a. Vorstellung Tensorflow.js
    b. Teachable Machine Live Demo
4. Ausblick
    a. Weitere Projektideen
5. Diskussion

Grundlagen Neuronale Netze

Aufbau/Funktion eines Neurons



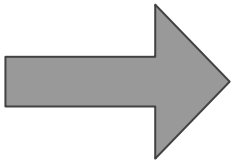
Aufbau/Funktion eines Neurons



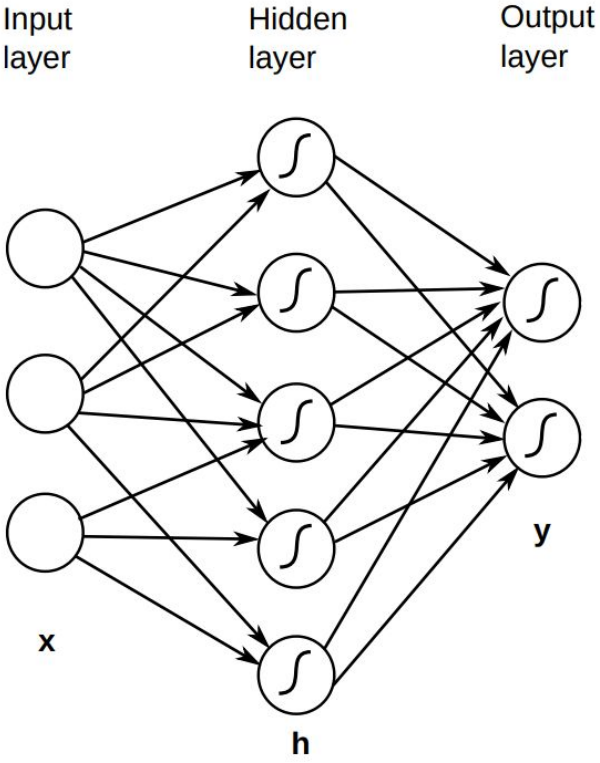
$$y = f(\langle \mathbf{w}.\mathbf{x} \rangle + b) = f(\sum_{i=1}^{N} w_i \, x_i + b)$$

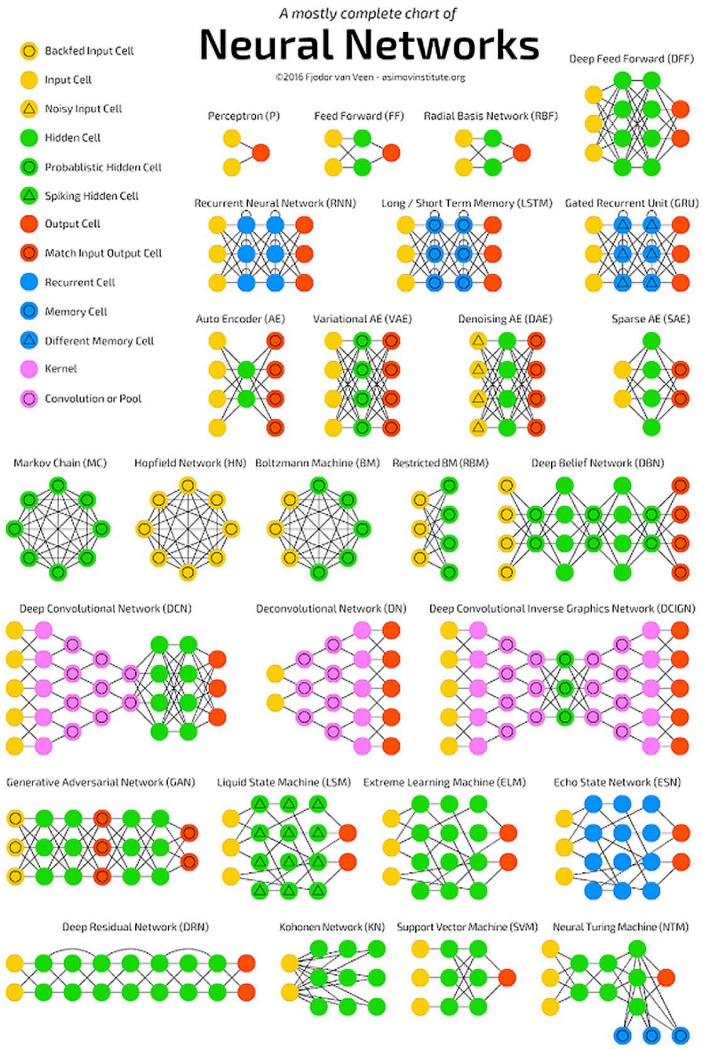
Architektur von Neuronalen Netzen

Architektur von Neuronalen Netzen

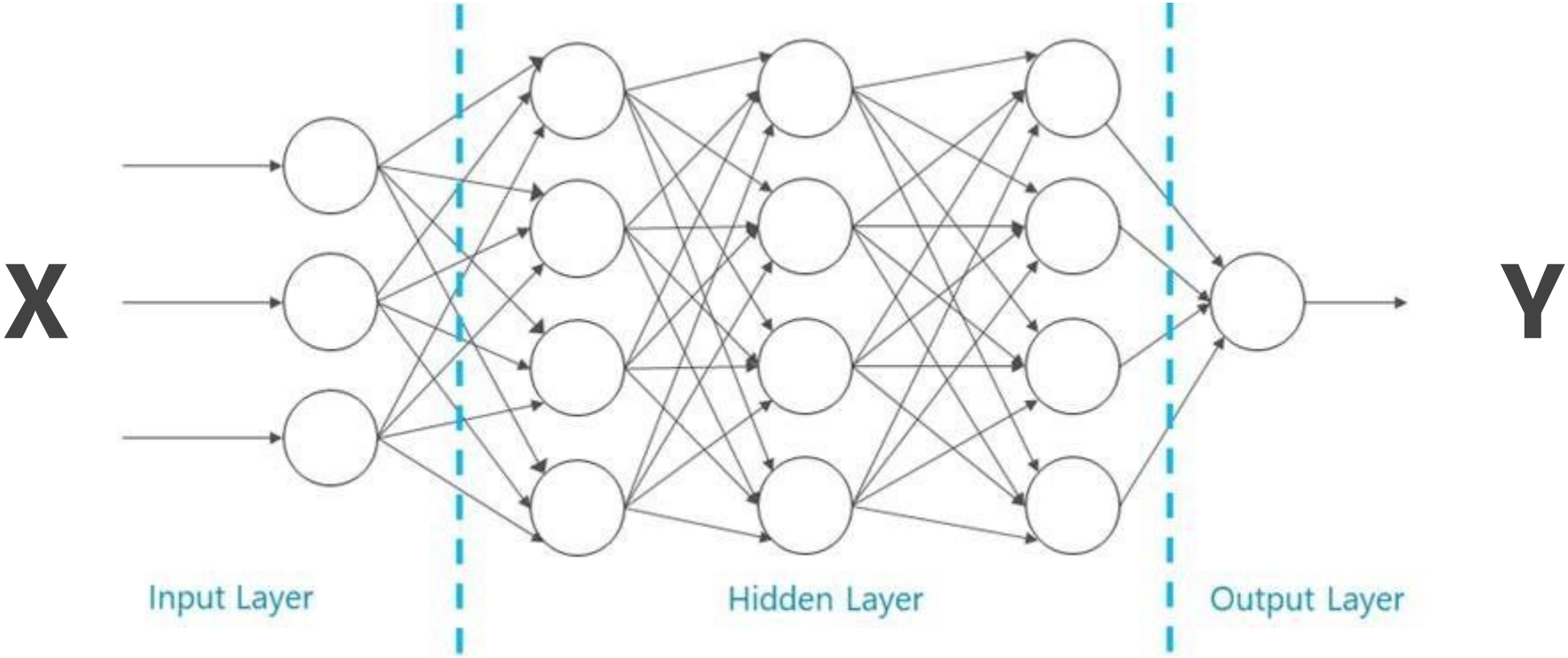


Architektur von Neuronalen Netzen



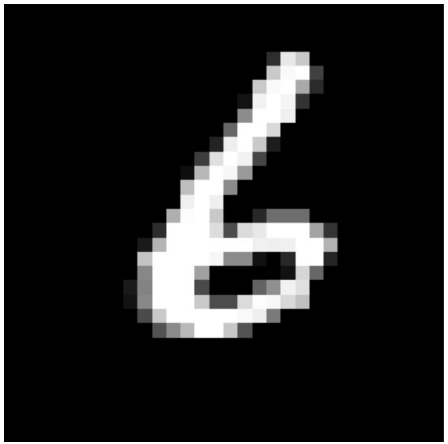


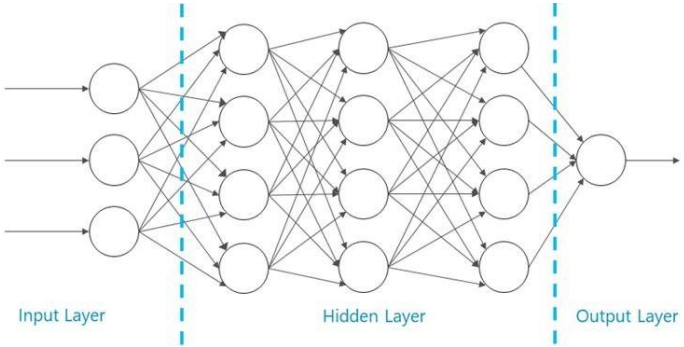
Architektur von Neuronalen Netzen



Training von Neuronalen Netzen

Beispiel





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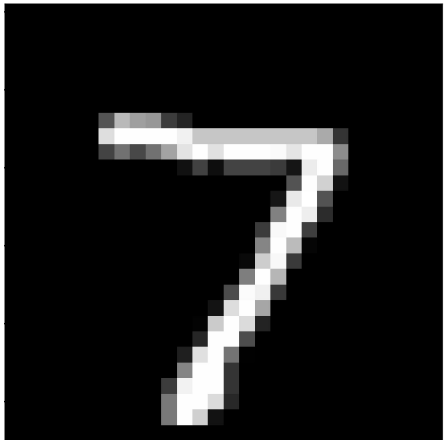
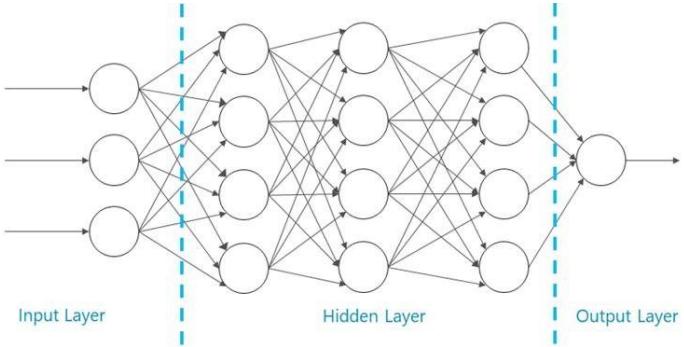
Beispiel





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Daten sammeln & aufbereiten

Input

Output (Label)

0

1

2

3

4

5

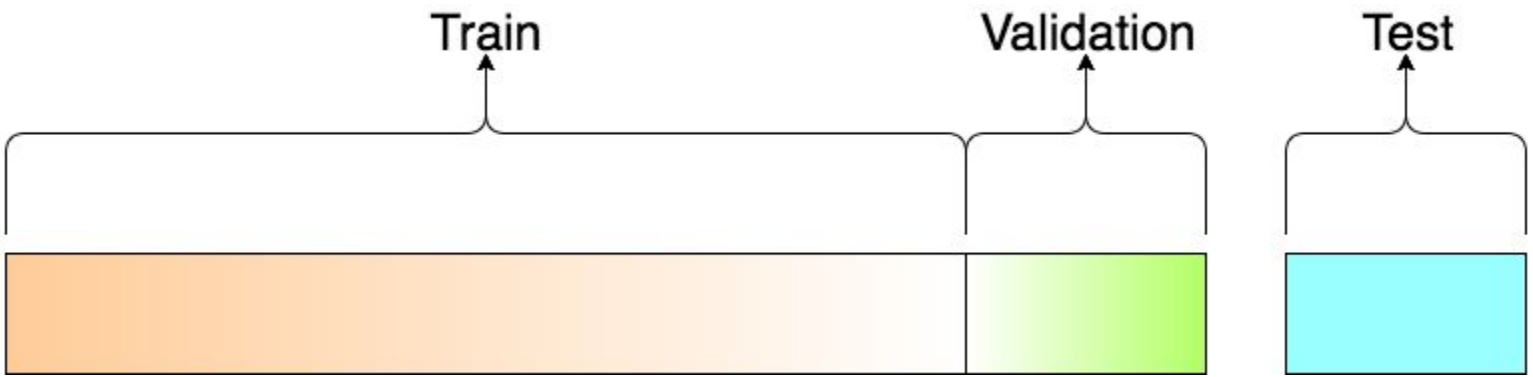
6

7

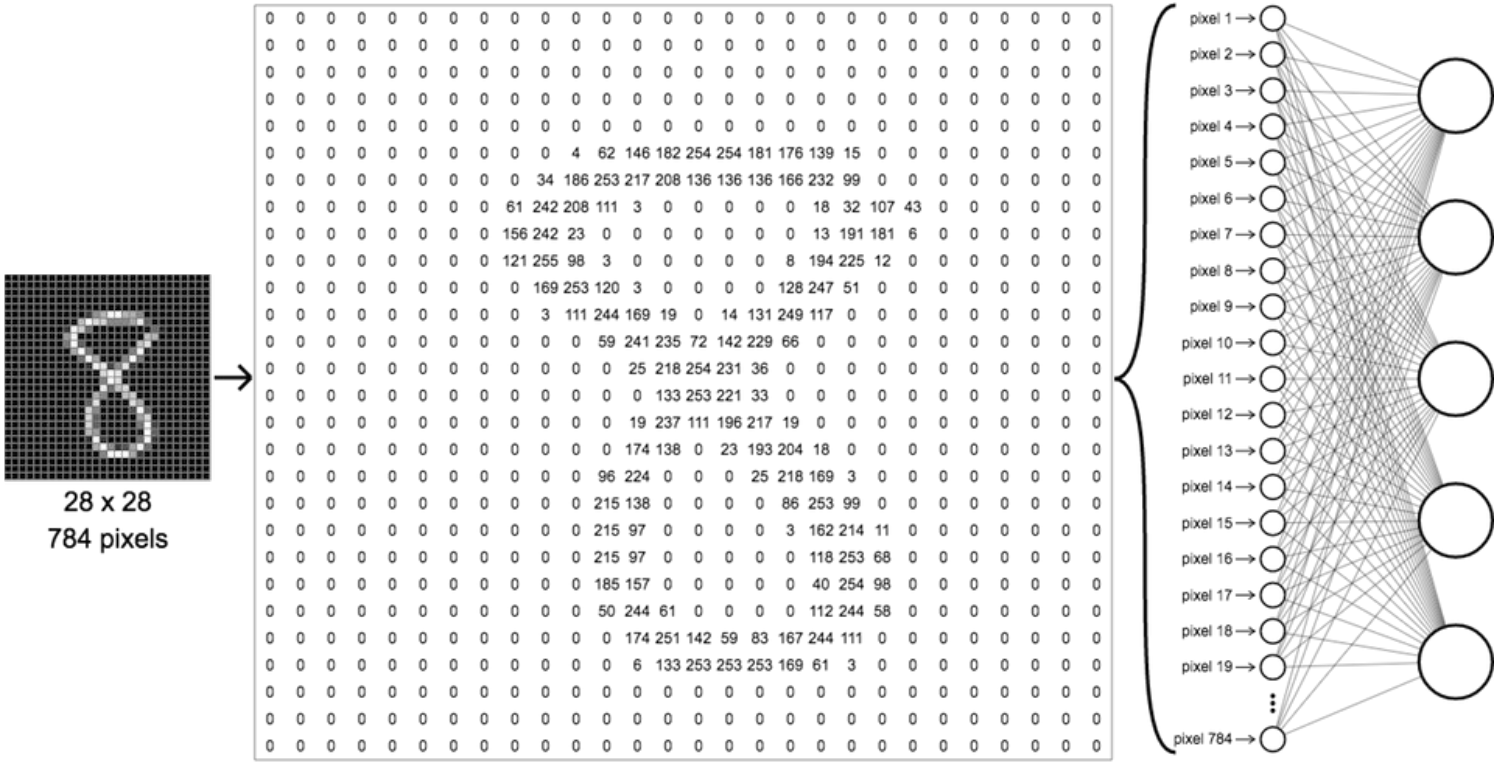
8

9

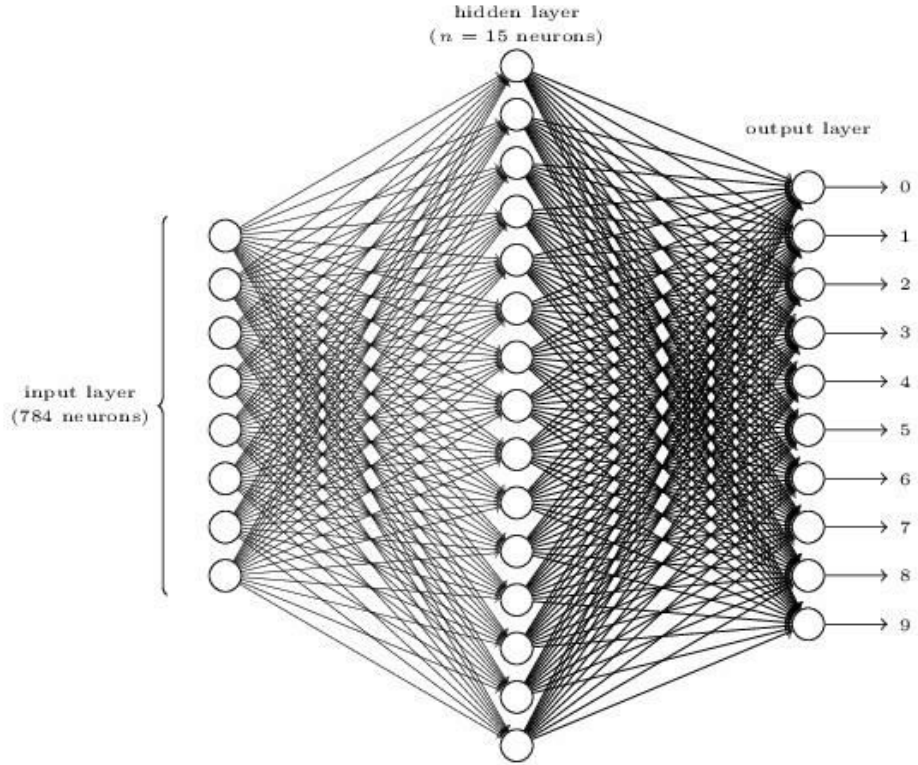
Daten sammeln & aufbereiten



Daten sammeln & aufbereiten



Architektur designen



Architektur designen

1. Umso komplexer das Problem -> Umso mehr Neuronen nötig
2. Umso mehr Neuronen -> Umso komplexer das Model
3. Umso komplexer das Model -> Umso mehr Trainingsdaten

Model trainieren/testen

```
model.fit(X, Y);
```

Model trainieren/testen

```
Y = model.predict(X);
```

So you just stack some stupid layers, train on some GBs of data and it works better than handcrafted techniques?

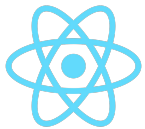
YES

Umsetzung mit Tensorflow.js

Vorstellung Tensorflow.js

`https://www.tensorflow.org/js/`

```
yarn add @tensorflow/tfjs
```



Vorstellung Tensorflow.js


```
const tf = require('@tensorflow/tfjs');


// Train a simple model:
const model = tf.sequential();
model.add(tf.layers.dense({units: 15, activation: 'relu', inputShape: [784]}));
model.add(tf.layers.dense({units: 10, activation: 'sigmoid'}));
model.compile({optimizer: 'sgd', loss: 'meanSquaredError'});

const xs = tf.randomNormal([100, 784]);
const ys = tf.randomNormal([100, 10]);

model.fit(xs, ys, {
  epochs: 100,
  callbacks: {
    onEpochEnd: (epoch, log) => console.log(`Epoch ${epoch}: loss = ${log.loss}`)
  }
});
```

Teachable Machine

DEMO

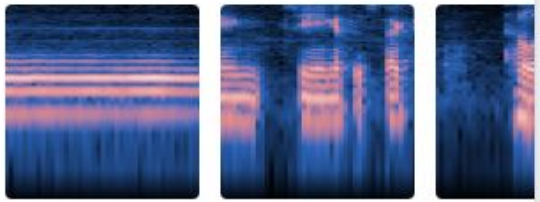
https://teachablemachine.withgoogle.com/

Ausblick

Weitere Projektideen

Image Project

Teach based on images, from files or your webcam.



Audio Project

Teach based on one-second-long sounds, from files or your microphone.

Pose Project

Teach based on images, from files or your webcam.

Weitere Projektideen

https://thecodingtrain.com/

ML5 BEGINNERS GUIDE

Beginners Guide to Machine Learning in JavaScript

A BEGINNER'S GUIDE TO MACHINE LEARNING WITH ML5.JS

31 Jul 2018

Welcome to “A Beginner’s Guide to Machine Learning in JavaScript”! In this series, I’ll teach the concepts behind machine learning using the ml5.js library. #machinelearning #javascript #ml5 #p5js.

ML5.JS: IMAGE CLASSIFICATION WITH MOBILENET

01 Aug 2018

In this video, I use the “pre-trained” MobileNet model to classify the content of an image. #machinelearning #mobilenet #imageclassification #ml5 #p5js.

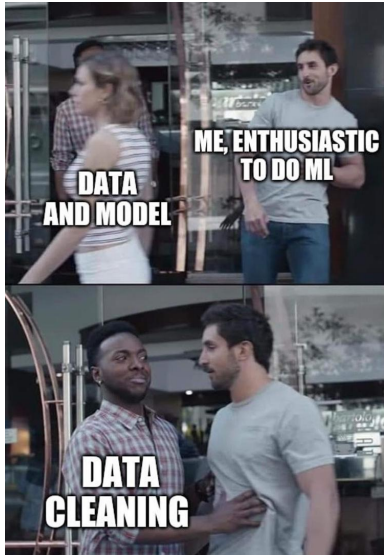
ML5.JS: WEBCAM IMAGE CLASSIFICATION

02 Aug 2018

In this video, I discuss image classification with MobileNet using real-time video. #machinelearning #mobilenet #imageclassification #ml5 #p5js #webcam.

Diskussion


Benedict Evans
@benedictevans
This is why we train autonomous cars in San Francisco
Traducir Tweet
3:38 p. m. · 17 sep. 19 · Twitterrific for iOS


DATA AND MODEL
ME, ENTHUSIASTIC TO DO ML
DATA CLEANING


Tinder isn't a dating app
Tinder was only made to train ugly vs. attractive binary classification models

max.rose

xamesor

Max Rose