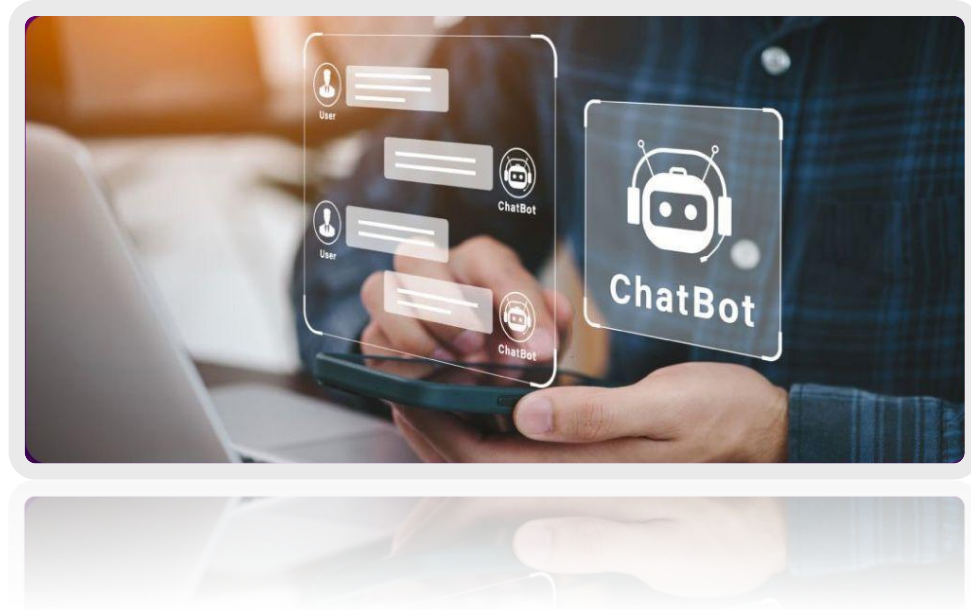


Hands-On Machine Learning mit Python

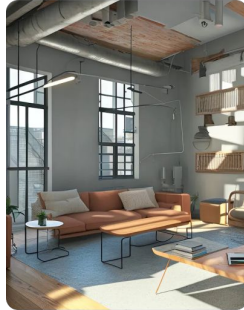
Martin Uray

Fachhochschule Salzburg

Department Information Technologies & Digitalisation und
Josef Ressel Zentrum für Intelligente und Sichere
Industriearomatisierung



Real or Fake?



Quelle: <https://stablediffusionweb.com>

Vorstellung



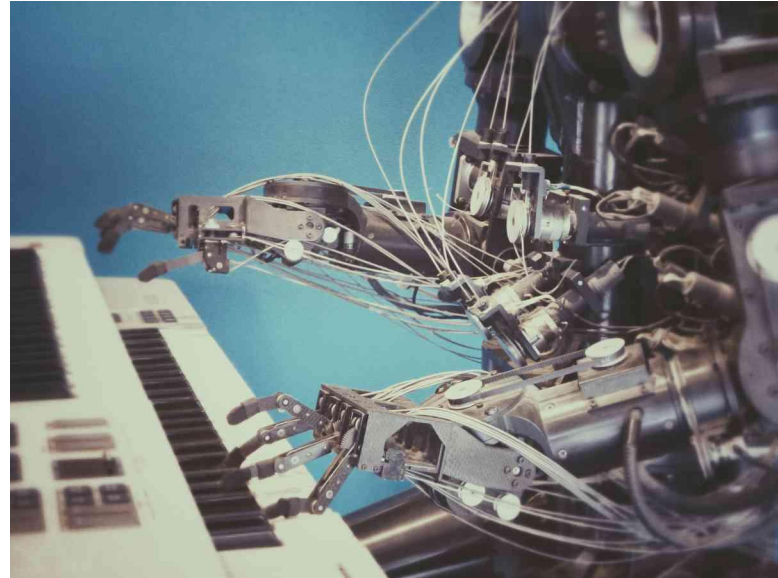
DI Martin Uray, BSc

- Arbeit mit Machine Learning (ML) seit 2017
- Lehre im Bereich der Datenwissenschaften und ML an der FH Salzburg
- Forschung in der Anwendung von ML in der Industrieautomatisierung an der FH Salzburg
- Dissertant an der Paris Lodron Universität Salzburg

- 2018-2020: Forscher im Bereich der med. Bildgebung mit ML

Hands-On Machine Learning mit Python

- Machine Learning
- Lernmethoden
- Voraussetzungen des maschinellen Lernens
- Machine Learning Modell anhand eines (mehrerer) Beispiels



Künstliche Intelligenz



VentureBeat
@VentureBeat

...

AI is like teenage sex: “Everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it.”



10:35 AM · Mar 20, 2018

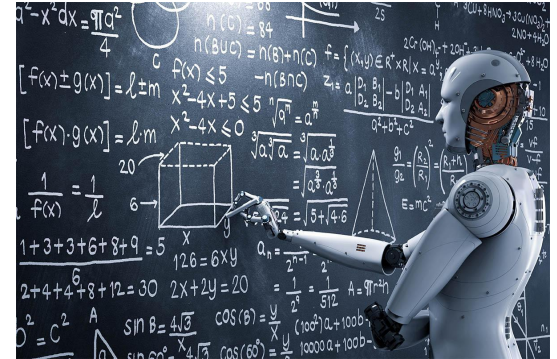
45 Reposts 5 Quotes 59 Likes 2 Bookmarks



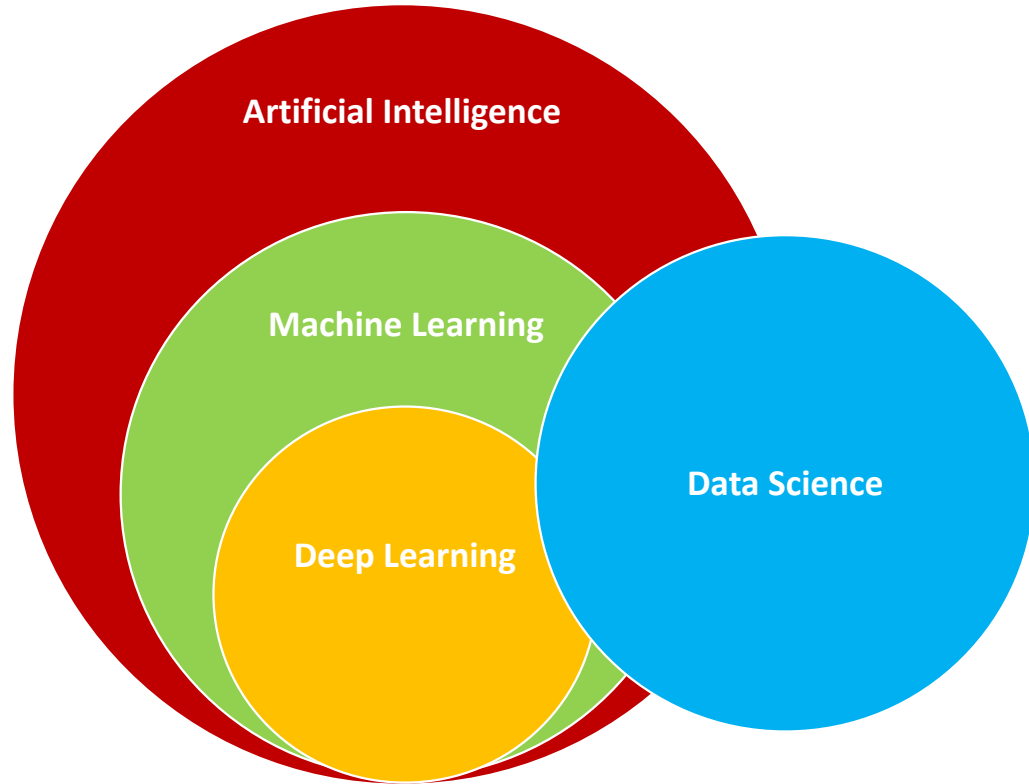
Quelle: <https://twitter.com/VentureBeat/status/976029328269078529>

Einstieg: Was ist KI?

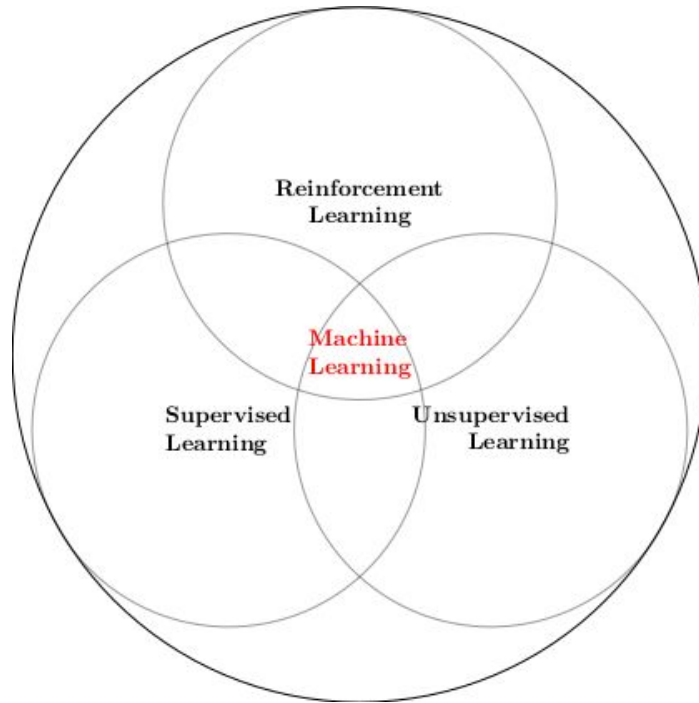
Künstliche Intelligenz (KI) ist ein Teilgebiet der **Informatik**. Sie imitiert menschliche kognitive Fähigkeiten, indem sie Informationen aus Eingabedaten erkennt und sortiert. Diese Intelligenz kann auf programmierten Abläufen basieren oder durch **maschinelles Lernen** erzeugt werden.



Einstieg: Was ist KI?

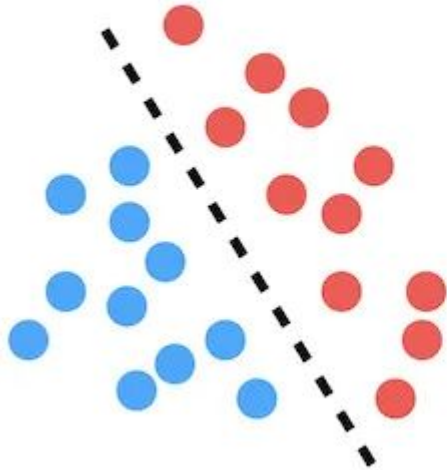


Machine Learning

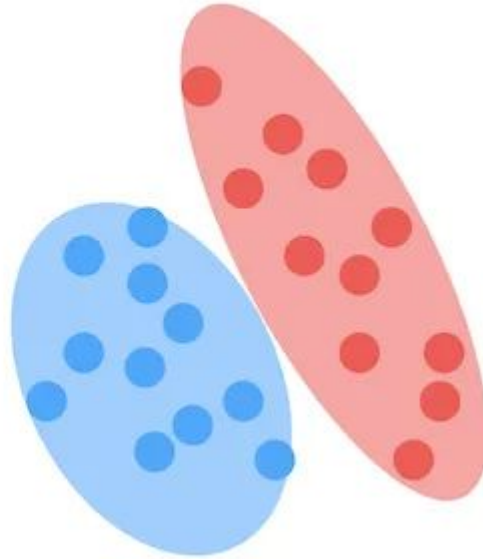


Was macht Supervised Learning?

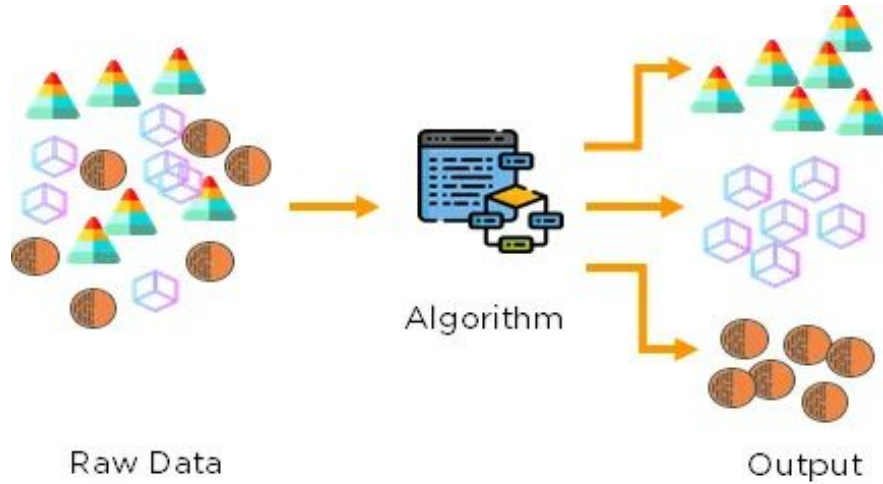
Discriminative



Generative

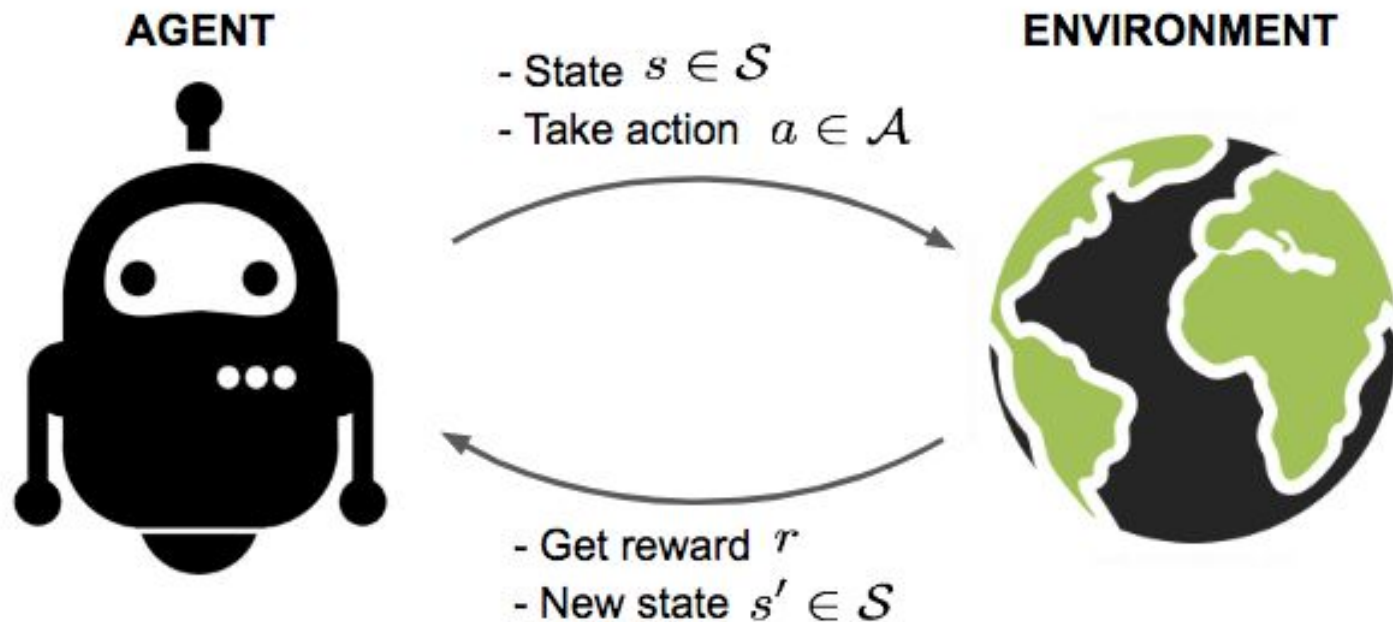


Unsupervised Learning ?



- Clustering
- Dimensionsreduktion
- Lernen von Repräsentationen

Reinforcement Learning ?



Einstieg: Was erwarten wir uns von KI?



Anwendungsfelder



Wo erleben Sie KI?

```
[ ] for i in range(5):  
    generate_text(  
        test_model,  
        seed="Despite the constant negative press "  
    )
```

[Despite the constant negative press]company and the political decisions to talk about a record signing is serious on the 2015 <http://t.co/6D...>

[Despite the constant negative press]hard and sends lows on the top proposal. A-Rod consider the way to chief. The many are not his respect t...

[Despite the constant negative press]country and the work "@Alrellahano0Pattin: @real/tmp/ipykernel_10031/4148207694.py:6: RuntimeWarning: divide by zero encountered in log
preds = np.log(preds) # ... z
DonaldTrump is a great pund course! Can you believe the ...

[Despite the constant negative press]record force. #MakeAmericaGreatAgain #Trump2016 <https://t.co/wE10XDTNhG> "@Twoene28: I talk about the wee...

[Despite the constant negative press]nomination." The phony comments on amazing trial. You are fleaking in his control to vote in the staff a...

Try it with your seed sentence.

The question that unanswered till now: what did he want to tell us?



Donald J. Trump ✓
@realDonaldTrump

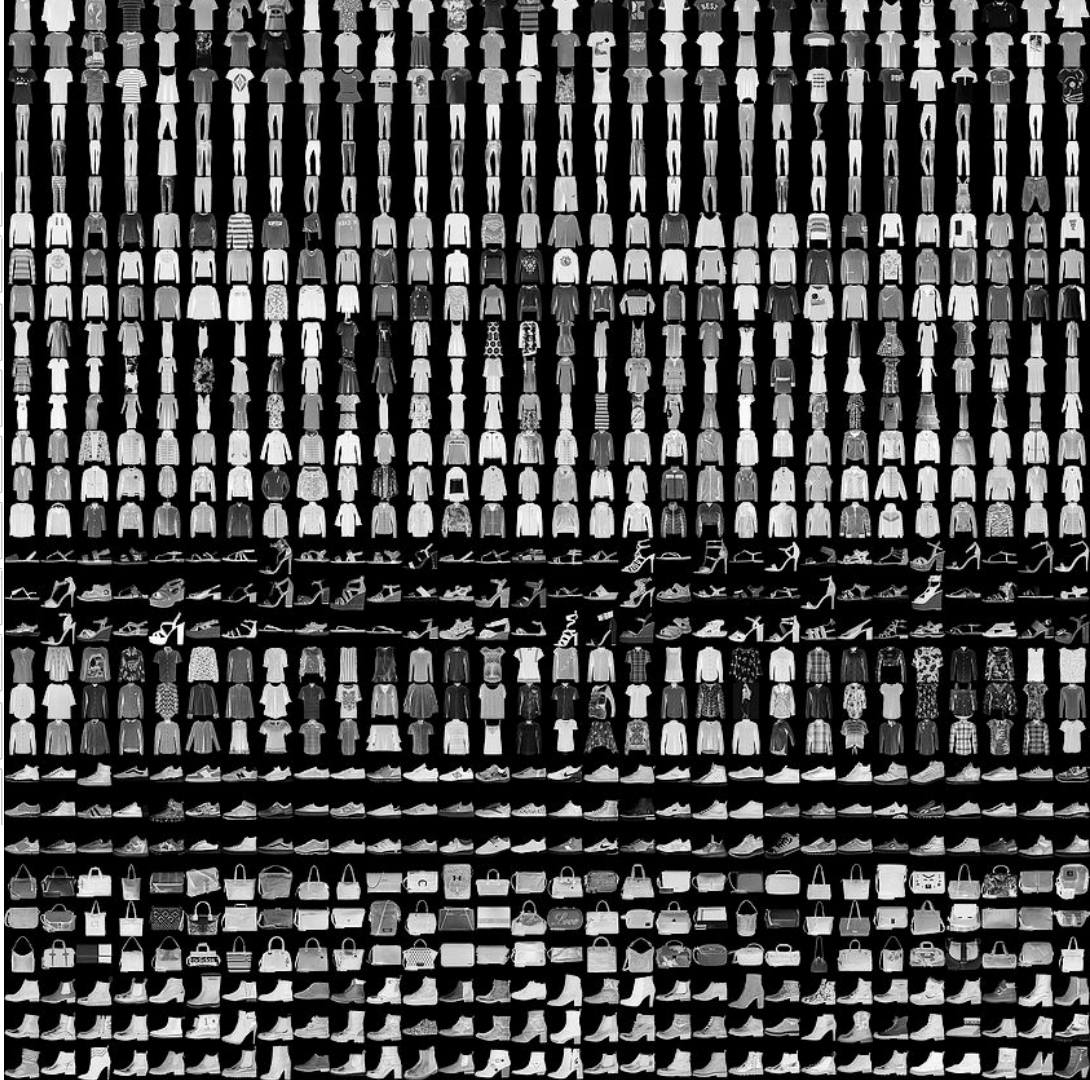
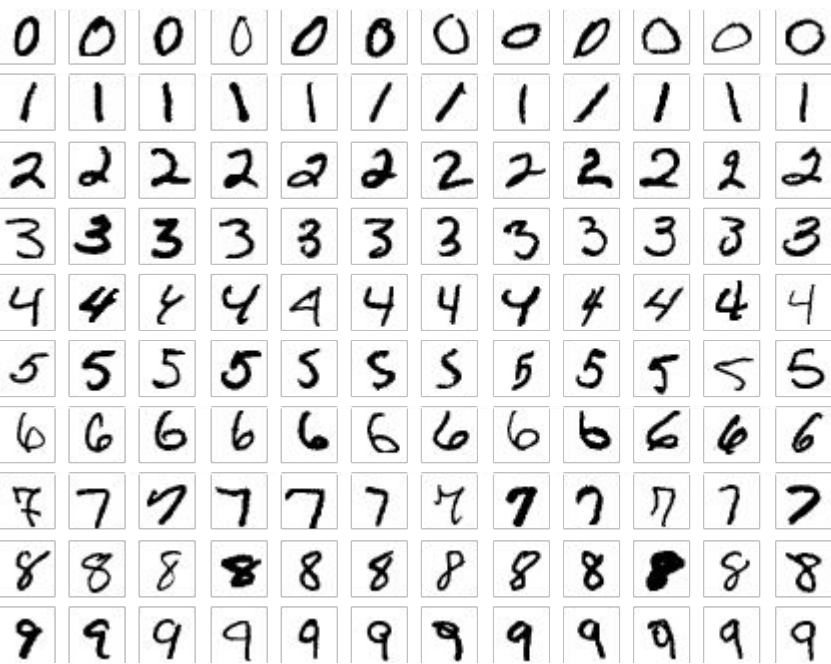
Despite the constant negative press
covfefe

5/30/17, 9:06 PM

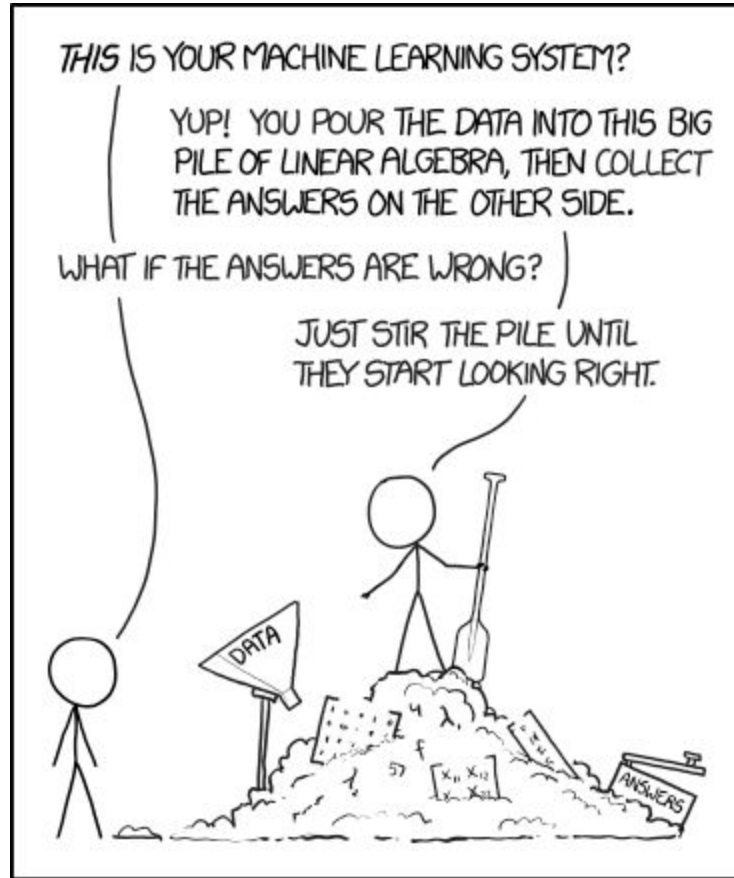
Wie lernt eine KI?



<https://quickdraw.withgoogle.com/?locale=de>



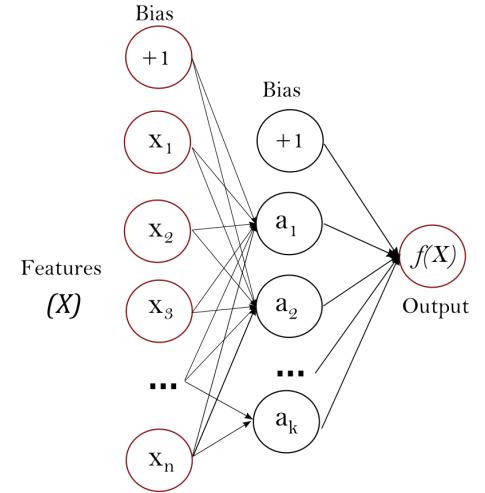
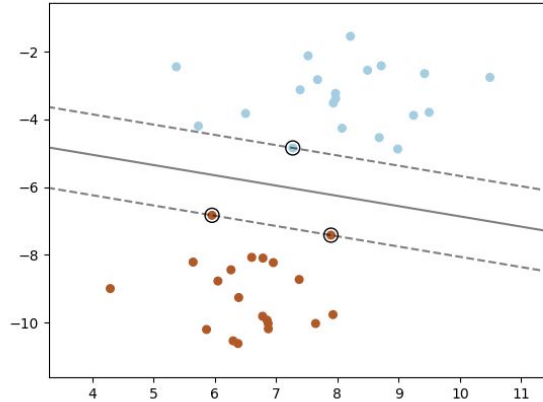
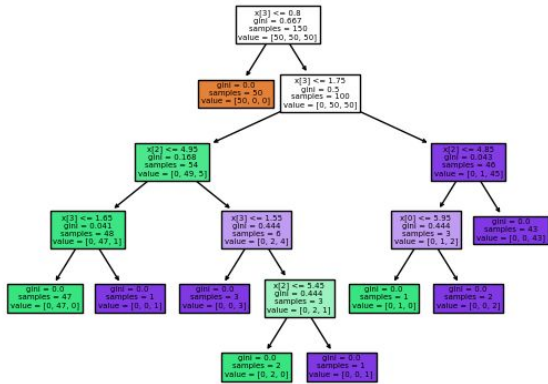
Daten



Source: <https://xkcd.com/1838/>

Machine Learning Models

Decision tree trained on all the iris features



Und das funktioniert?

Was eine KI nicht gesehen hat, kann sie nicht erkennen...

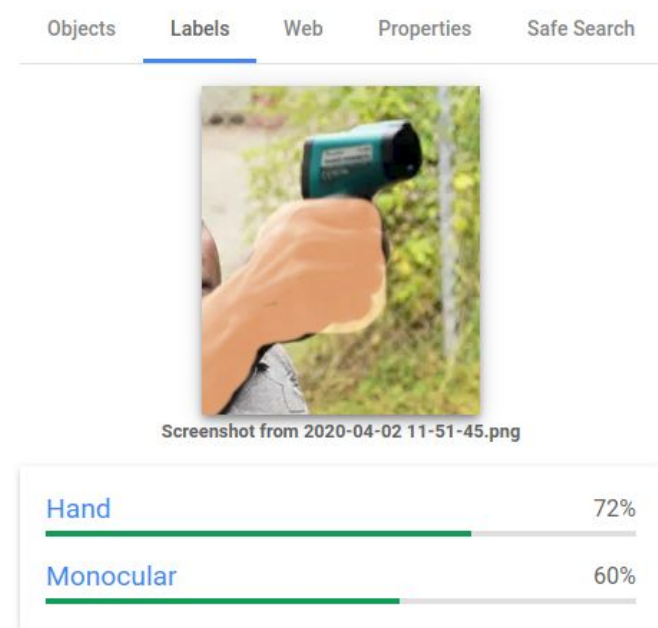
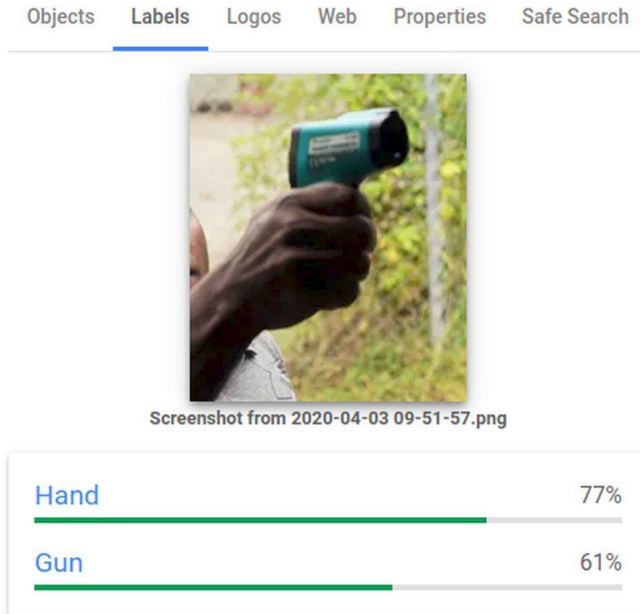


Quelle: <https://www.topbots.com/chihuahua-muffin-searching-best-computer-vision-api/>



James Bridle, 2017
Autonomous Trap 001
Salt Circle

Kann eine KI rassistisch sein?



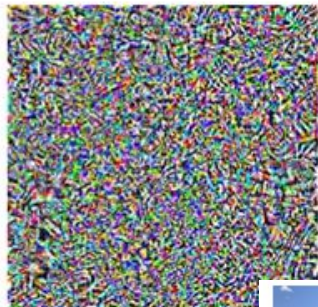
Quelle: <https://algorithmwatch.org/en/google-vision-racism/>

Adversarial Attack

“pig”

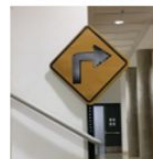


+ 0.005 x



=

“airliner”



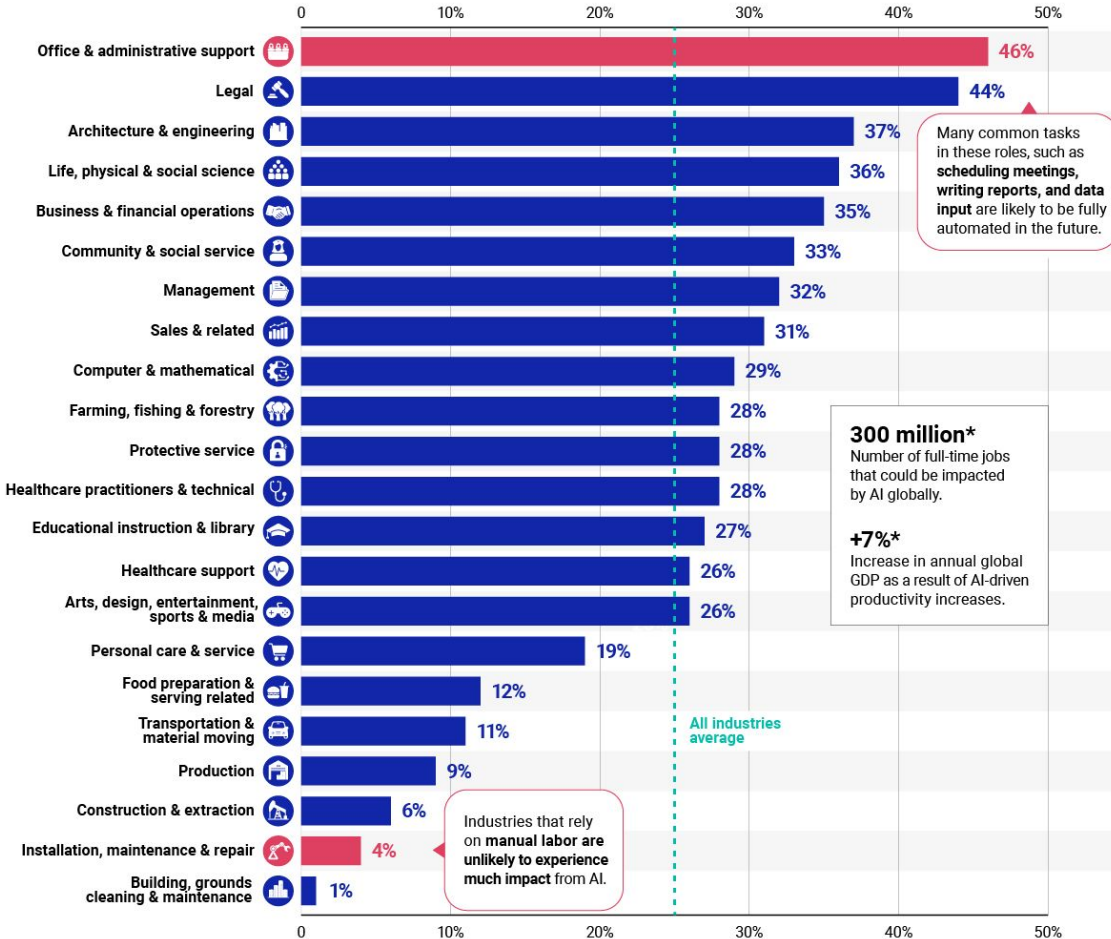
KI und die Arbeitswelt

Nützliche Tools

- ChatGPT
- Grammarly
- LanguageTool
- Github Co-Pilot
- Adobe Firefly
- ...



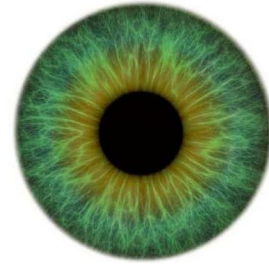
Estimated Share of Employment Exposed to AI Automation



Source: Goldman Sachs Global Investment Research (March 2023)

* Over a 10-year period starting from a point when roughly half of all businesses have adopted generative AI.

Yuval Noah
Harari

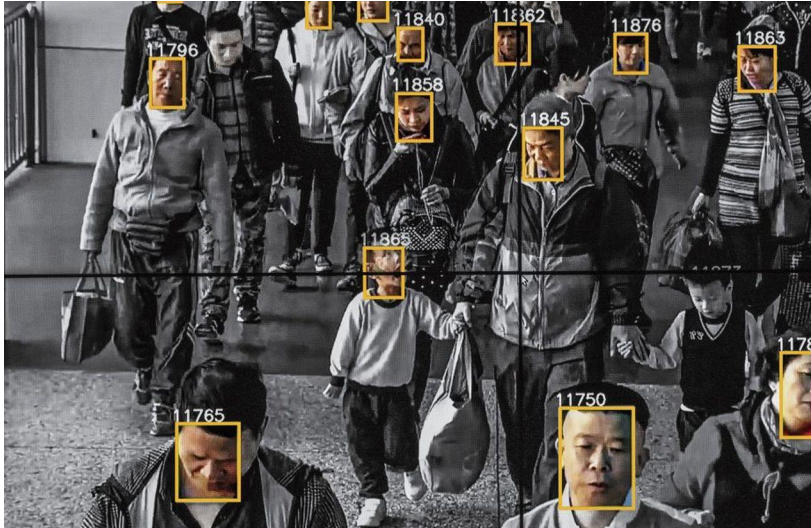


21 Lektionen
für das
21. Jahrhundert

C.H.BECK

EU AI Act

Social Scoring



Quelle:

<https://www.eupoliticalreport.eu/artificial-intelligence-and-social-scoring/>

A 'Black Mirror' Episode Is Coming to Life in China

People will be prevented from traveling on trains and planes based on their social credit scores.



By Gabrielle Bruney PUBLISHED: MAR 17, 2018

SAVE ARTICLE



Netflix

In another indication that *Black Mirror* isn't just a sci-fi anthology series and instead a glimpse into our actual future, China is extending its "social credit" system to block accused wrongdoers from traveling on trains and planes.

The social credit program has been around since 2014, and has been

Quelle:

<https://www.esquire.com/news-politics/a19467976/black-mirror-social-credit-china/>

Anforderungen an KI

Ethische Richtlinien für vertrauenswürdige KI

7 Hauptanforderungen:

- Führung und Kontrolle durch Menschen
- Technische Robustheit und Sicherheit
- Schutz der Privatsphäre und Datenschutz



KI als „Enabler“ für nachhaltige Zukunft
in allen Lebensbereichen



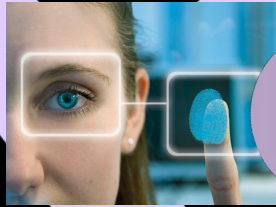
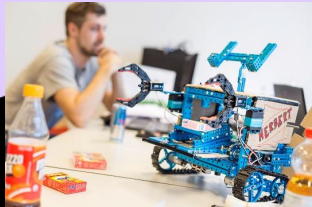


FH Salzburg

Information Technologies
and Digitalisation

Information Technologies and Digitalisation

Campus Urstein



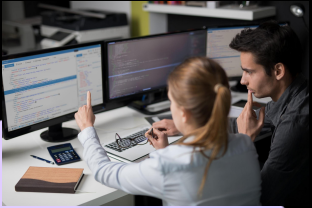
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der FH Salzburg

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- Medieninformatik und Bildverarbeitung
- Mechatronik
- Netzwerk- und Kommunikationstechnik

Wirtschaftsinformatik & Digitale Transformation (BA)



AI for Sustainable Technologies (MA)

Applied Image and Signal Processing (MA)

Business Informatics (MA)

Cyber Security (MA)

Industrial Informatics & Robotics (MA)

Kontakt

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Campus Urstein der FH Salzburg © FH Salzburg/Neumayr

