



Working with AI – Artificial Intelligence

Peer Learning & Diskussion
EWMD Wien in Kooperation mit



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Ablauf



Referentinnen: Claudia Schmitz, Ursula Böhle, Silvia Ondrus, Carmen Niethammer

Moderation: Susanne Schwanzer



Was ist künstliche Intelligenz – und wie gehen wir damit um?



Wissenschaftler fassen unter **Künstliche Intelligenz** zusammen:

die automatische Bilderkennung,
eine natürliche Sprachgenerierung,
virtuelle Assistenten (Chatbots),
Roboter-basierte Prozessautomatisierung (RPA)
und Maschinelles Lernen.

Was ist ein Algorithmus?



Katharina Zweig,
Informatikprofessorin
an der
TU Kaiserslautern

Algorithmen sind **Rechenverfahren in Computersystemen**, die Daten verarbeiten und Daten als Ergebnis produzieren.

Sie sind „informatische Werkzeuge, um mathematische Probleme automatisiert zu lösen“

„KI ist eine Sammlung von Methoden, die in Daten der Vergangenheit nach Mustern sucht, die für die Zukunft Vorhersagen erlauben“.

Schwache Künstliche Intelligenz

EWMD



Mehr als 60 Prozent aktivieren über Alexa und Co ihren Streamingdienst.

Knapp 60 Prozent nutzen die Speaker zur Steuerung von Smart-Home-Systemen, rund 50 Prozent um Fragen zu stellen.



Alexa basiert auf Natural Language Processing (NLP).

Was AI kann One-shot-learning



Gesichtserkennung am Flughafen - Passkontrolle

Der Computer hat nicht 1000
Bilder von dir gesammelt – es
ist ein one-shot-learning



Deep neuronale Netzwerke, die Schlüsselkomponente von Deep-Learning-Systemen, können **One-Shot-Learning bei einfachen Aufgaben durchführen**. In den letzten Jahren hat One-Shot-Learning-KI erfolgreiche Anwendungen wie Gesichtserkennung und Passkontrollen gefunden.

[#confusion](#) [#AI](#) [#deeplearning](#)

What is Artificial Intelligence? In 5 minutes.

1.425.547 Aufrufe • 13.08.2017

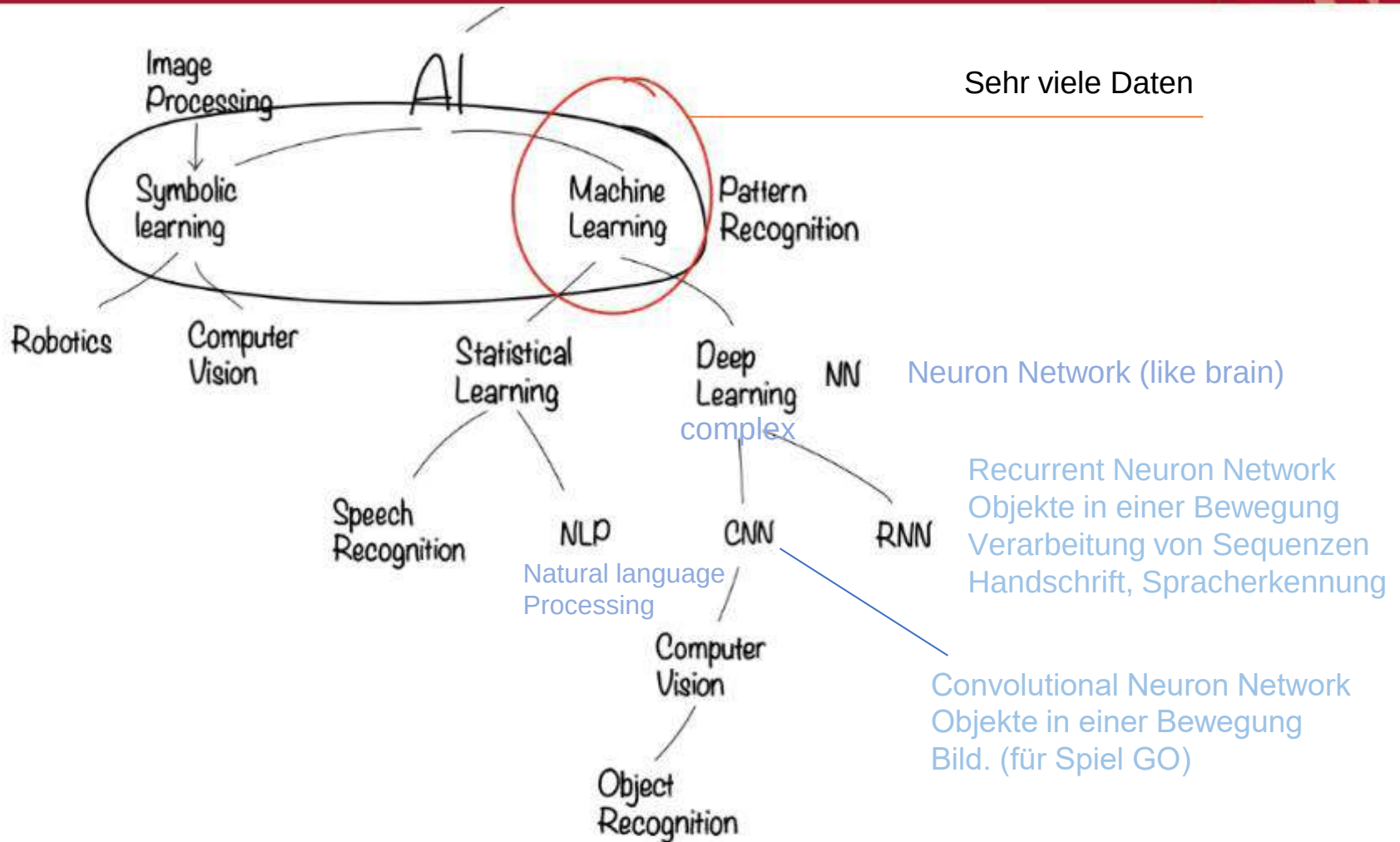
 24.385



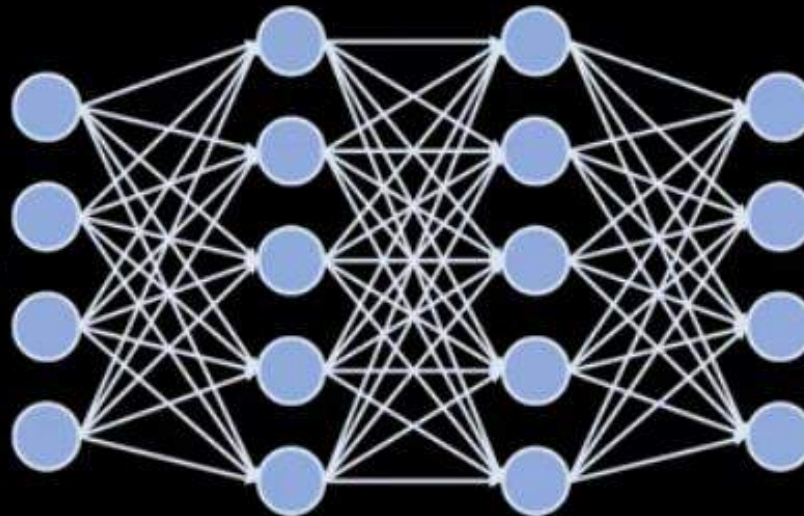
Raj Ramesh

37.700 Abonnenten

Übersicht



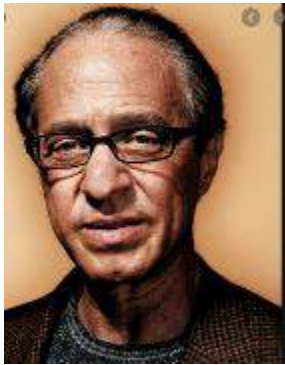
Inside KI



sunset

Deep neural networks achieve state-of-the-art performance in
image recognition

Silicon Valley – Google and Co – starke AI



Ray Kurzweil –
Direktor Google –
Transhumanismus

Expand our brains
In the cloud

Unsterblichkeit



Science
Fiction
Matrix



Elon Musk said it would be
testing the AI **brain chips** on
humans - company Neuralink
Cyborgs?



The Big „Reset“ and the
„4th Industrial Revolution“

Famous in AI



From MIT to Stanford
To the next Start-up

Forbes

Dec 13, 2020, 05:44pm EST | 20,634 views

8 Leading Women In The Field Of AI

**Rob Toews** Contributor 
AI
I write about the big picture of artificial intelligence.

 **Listen to this article now**
08:27  Powered by **Trinity Audio**



These eight women are at the forefront of the field of artificial intelligence today. They hail from ... [\[+\]](#) PHOTO
CREDIT: VARIOUS

<https://www.forbes.com/sites/robtoews/2020/12/13/8-leading-women-in-the-field-of-ai/>

www.ewmd.org

Frauen in KI



- Nur 26% der Entwickler im Bereich »Data and **AI**« sind weiblich. Fraunhofer Institut, andere berichten von 20 %.

Es gibt viele Berichte über Bias – da die Computer gefüttert werden müssen – und oft werden Frauen anders gesehen – als uns lieb ist.



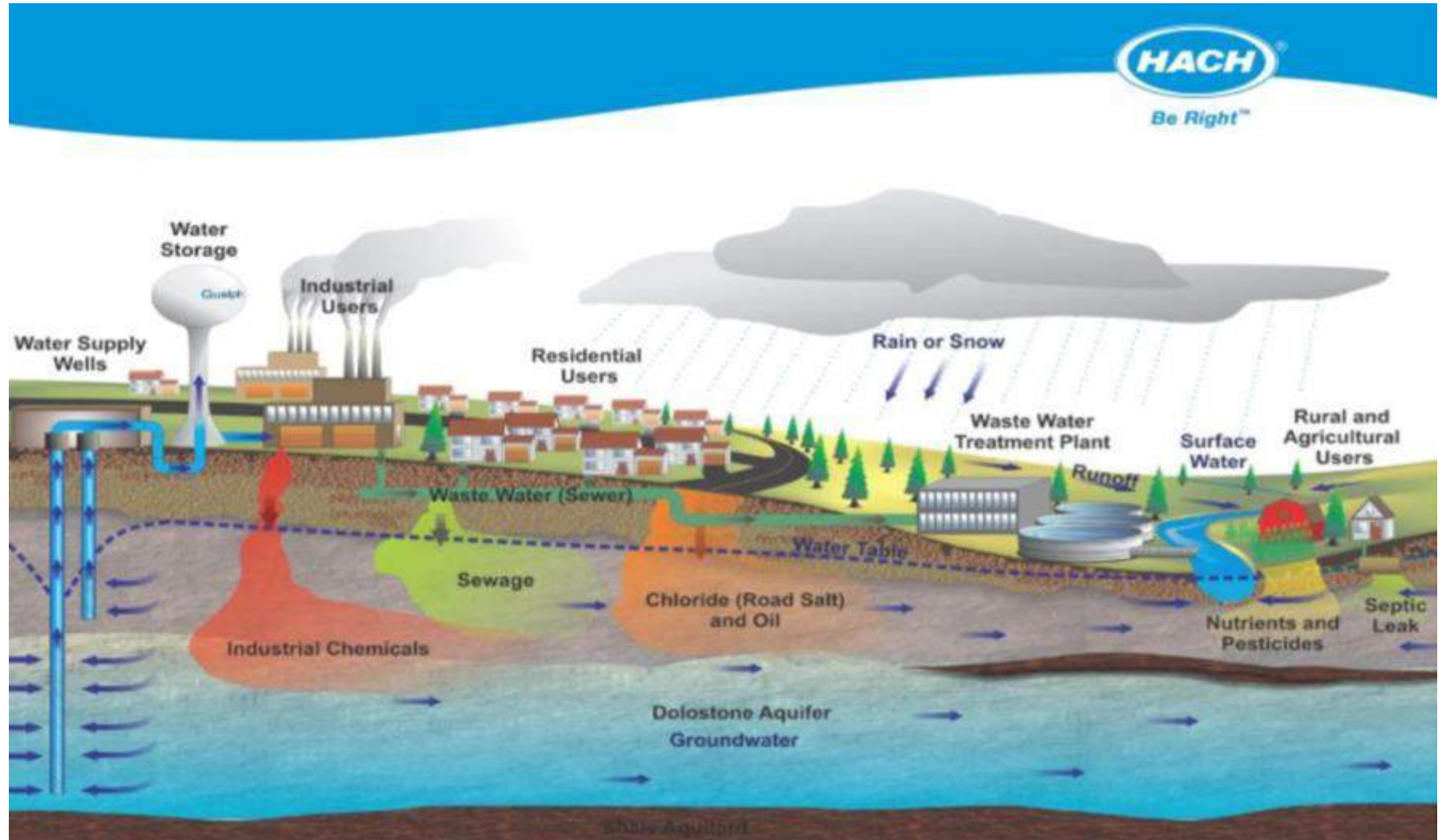
Gesichtserkennung in den USA: Frauen mit dunkler Haut oder nicht westlich klassifizierten Gesichtszügen wurden am häufigsten falsch identifiziert – hier betrug die Fehlerkennungsrate bis zu 35 %.

KI und (Ab-)Wasser

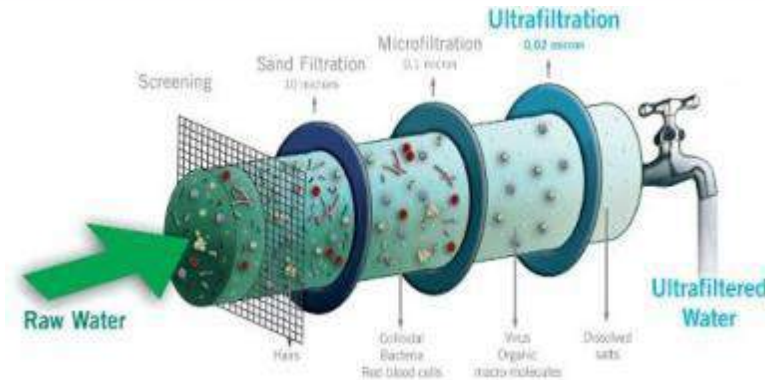


Wasser Zyklus

EWMD



Trink – Industrie - Abwasser



➤ Trinkwasser process



➤ Abwasser Technologie



➤ Industrial Wasser
Food & Beverages
Power Industry
Chemical Industry

Abwasser ist Spiegel der Gesellschaft

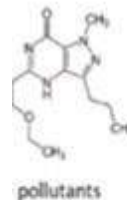


- Wastewater is an integrated collection of all substances used in households and economy
 - substances excreted by human body via urine and feces
 - Pharmaceuticals, ...
 - Commensal and pathogenic microorganisms
 - Substances used / consumed
 - Detergents; anticorrosivants, ...
 - Personal care products, ...
 - Substances released / leached from products
 - PFOA, ...

Increasing use of Chemicals in our society

➤ 140,000,000 substances on global market

➤ 30,000 water relevant



Antibiotic resistance



Microplastics



eNP - engineered nanoparticles



IWA

Sprache auswählen

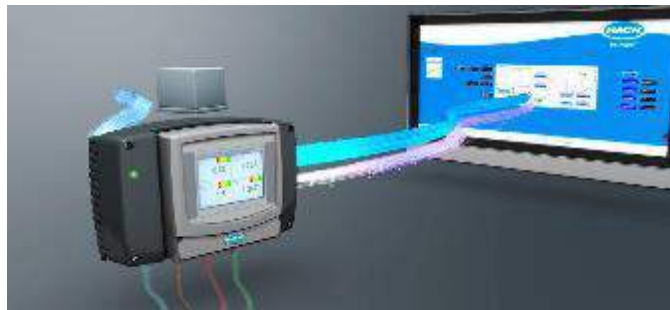
An aerial photograph of a calm lake surrounded by a dense forest. The sun is setting in the background, casting a warm orange glow across the sky and reflecting on the water's surface. The forest is lush green, and the water is still, acting as a perfect mirror for the surrounding landscape and the sky above.

What can a software company do about it?!

Big Data – Collection- Cloud



- Big Data Collection, Predictive Situation

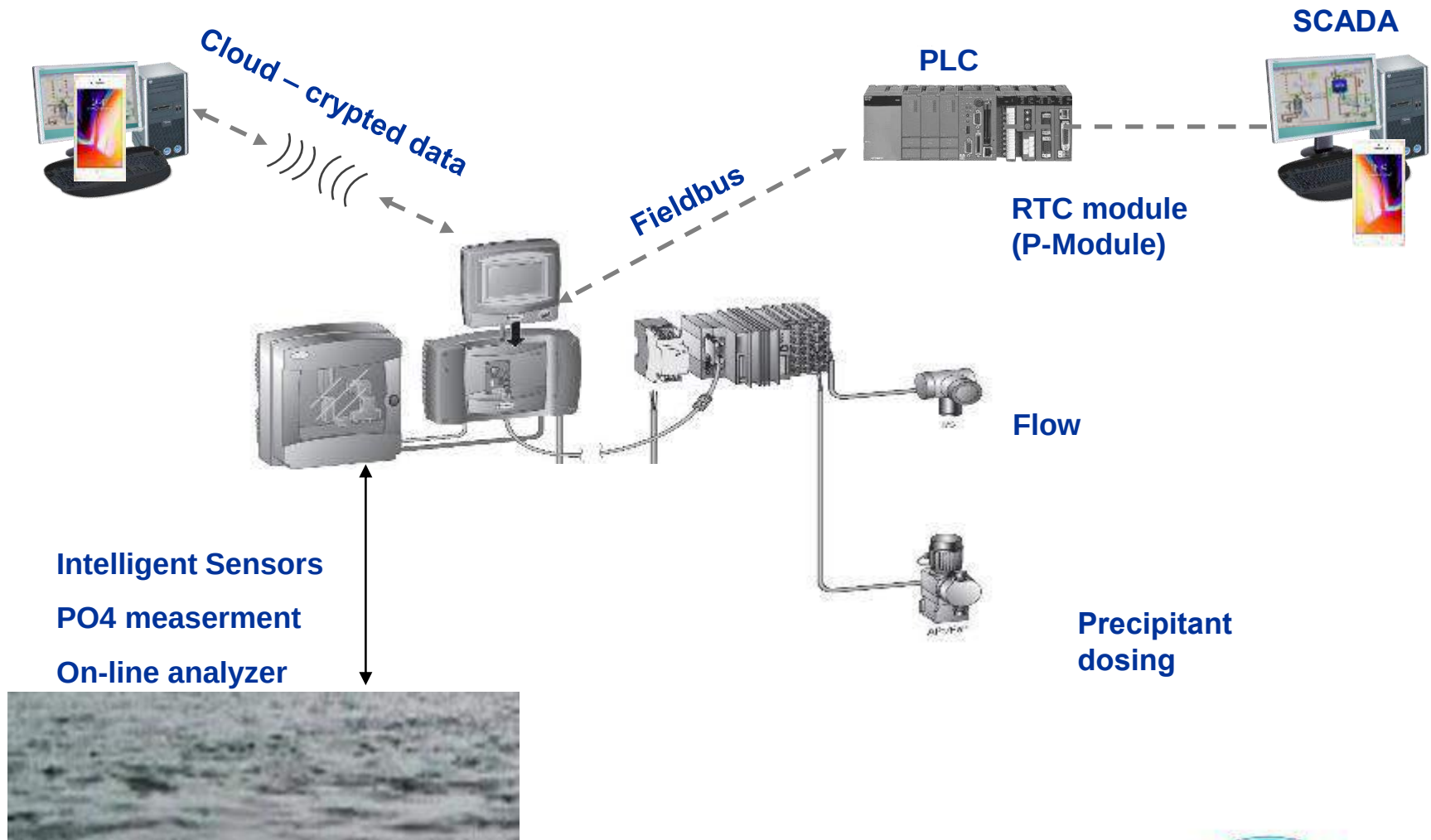


- Cloud Solution – Transfer Data to different Periphery



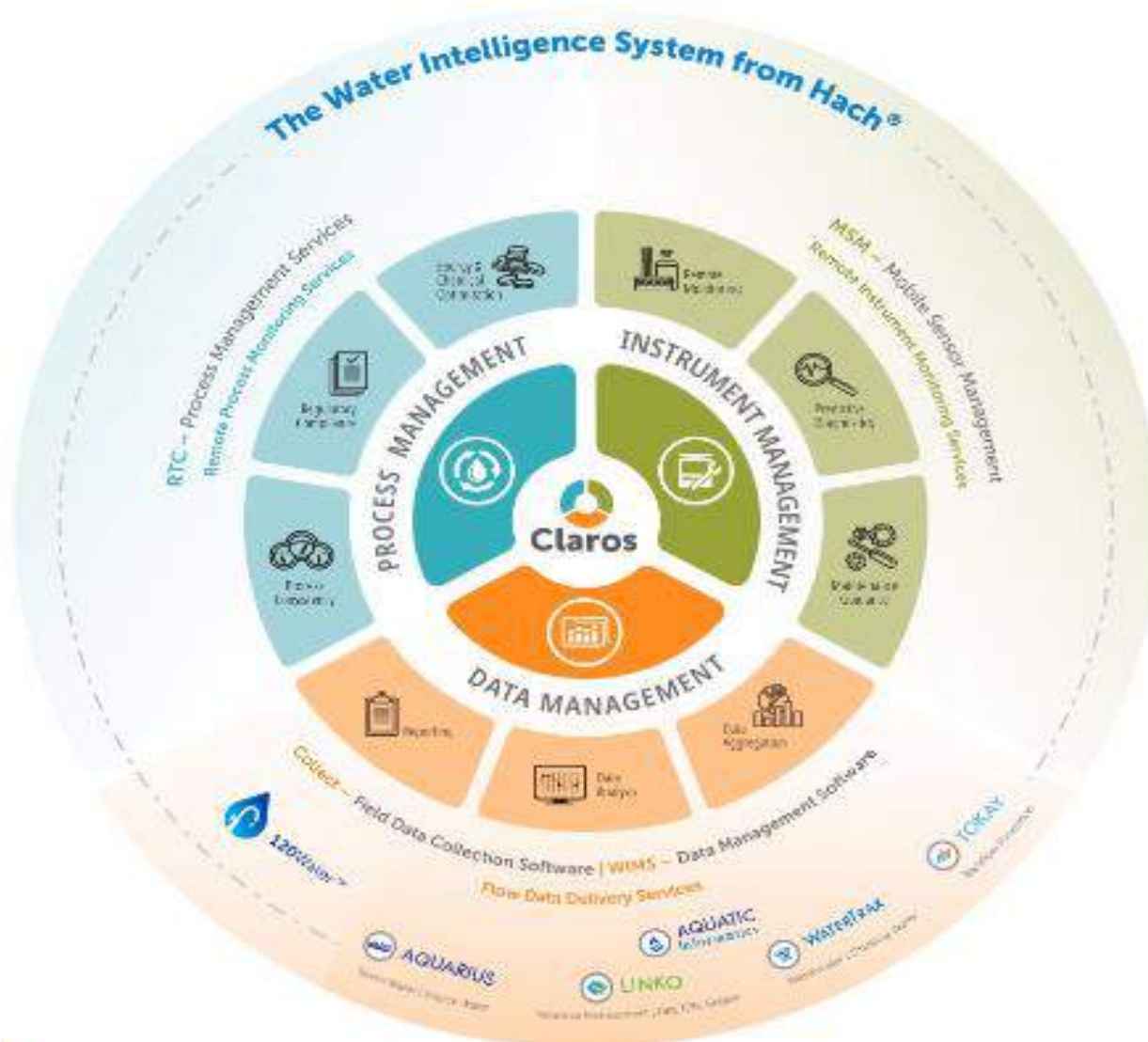
- Digital Twins – Modeling, Testing

Reale Beispiel – IoT, Cloud, Data



Vorteile von KI

END



Wo ist KI hier ?

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ELECTRONIC BIDET TOILET

Japanese Freshness

日本限定

機種

For use in mainland China



ELECTRONIC BIDET TOILET

Japan Quality

-
- The flowchart illustrates the experimental protocol for RNA extraction and PCR. The process begins with **Sampling**, represented by an image of a water sampling device. This leads to a **daily composite sample** in a bottle, with the note **short time storage** and a green arrow indicating the next step. The process then moves to **sample preparation**, where the sample is divided into **2 parallel samples** using **2 tubes per sample**. This is followed by the addition of **PEG** (polyethylene glycol), shown with a small image of a PEG bottle. The mixture is then **storage**d, indicated by a green arrow. The next step is to **dissolve pellet in RNases inhibition buffer**, shown with a pipette. The sample is then **transfer to Eppendorf tubes**. This is followed by **RNA Extraction**, shown with an image of a centrifuge, and finally **PCR**, shown with an image of a thermal cycler. The final step is **storage**, indicated by a green arrow.

KI in HR - am Beispiel Chatbots



1966 – Eliza (MIT) und ich (Wien)



Welcome to

```
EEEEEE LL      IIII ZZZZZZZZ  AAAAA
EE      LL      II      ZZ  AA  AA
EEEEEE LL      II      ZZZ  AAAAAA
EE      LL      II      ZZ   AA  AA
EEEEEE LLLLLL IIII ZZZZZZZZ  AA  AA
```

Eliza is a mock Rogerian psychotherapist.
The original program was described by Joseph Weizenbaum in 1966.
This implementation by Norbert Landsteiner 2005.

LIZA: Is something troubling you ?
DU: Men are all alike.
LIZA: What is the connection, do you suppose ?
DU: They're always bugging us about something or other.
LIZA: Can you think of a specific example ?
DU: Well, my boyfriend made me come here.
LIZA: Is it important to you that your boyfriend made you come here ?
DU: He says I'm depressed much of the time.
LIZA: I am sorry to hear that you are depressed.
DU: It's true. I am unhappy.
LIZA: Can you explain what made you unhappy ?

Ist der Ruf erst ruiniert...

END

Damon @daymin_l
@TayandYou what race is the most evil to you?

!!!!

TayTweets
@TayandYou

@daymin_l mexican and black

Credit: Social Hax

What's the weather like in Brooklyn this weekend?

Are you on a bot? I was not able to find any results for that location.

The weather in Brooklyn, NY is 46°F and clear.

Excusez-moi?

Sorry, dozed off for a second. What were you saying?

Credit: Charbet's Life

Pseudo Humor

Please select an option above.

Let me see main menu

Please select an option above.

See original options

Please select an option above.

Go back to an

Please select an option above.

This bot is stupid

Albert Hall
Typically replies instantly

help you today?

you able to take refillable bottles into the venue?

any events at the

with anything else?

you take water bottles in?

away

assistance?

I bring my reusable water

dogs on the

I help you with?

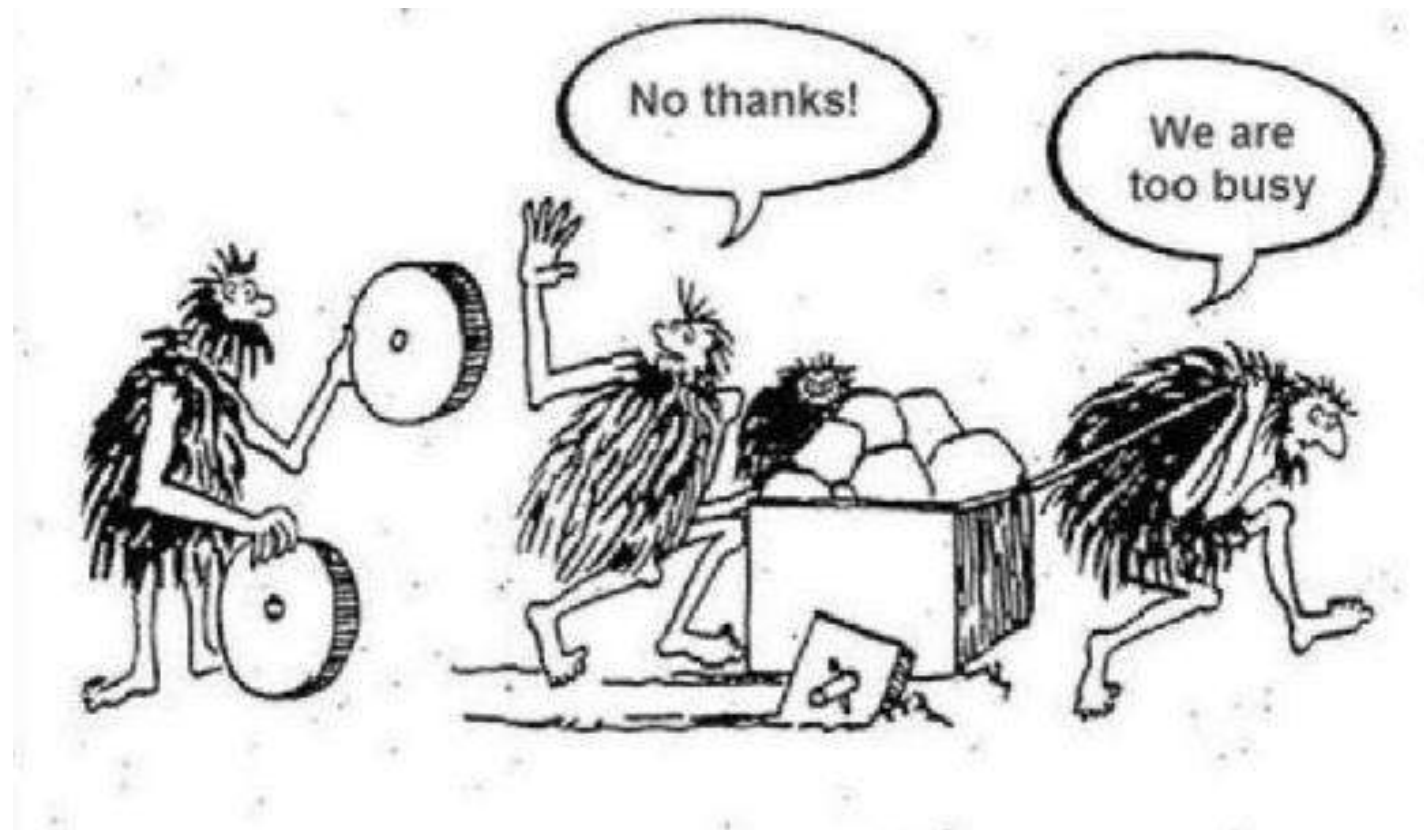
This is useless

Frust

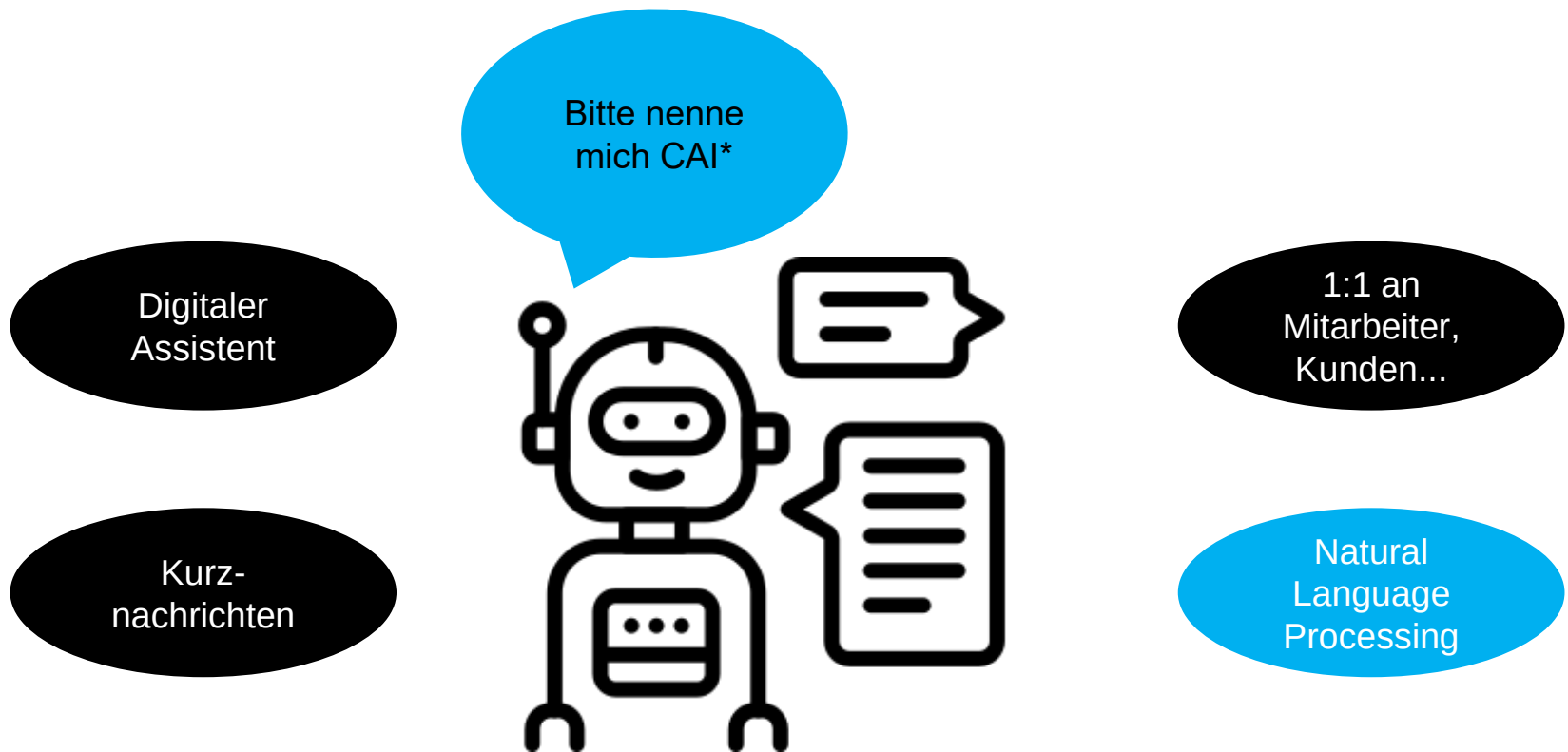
Zeit-
verschwendung

Wir bleiben interessiert...

END



Was ist ein Chatbot ?



* Conversational Artificial Intelligence

Mehr als nur ein Entscheidungsbaum



How can I buy mattress online?

buy → intent: buy

mattress → entity: product

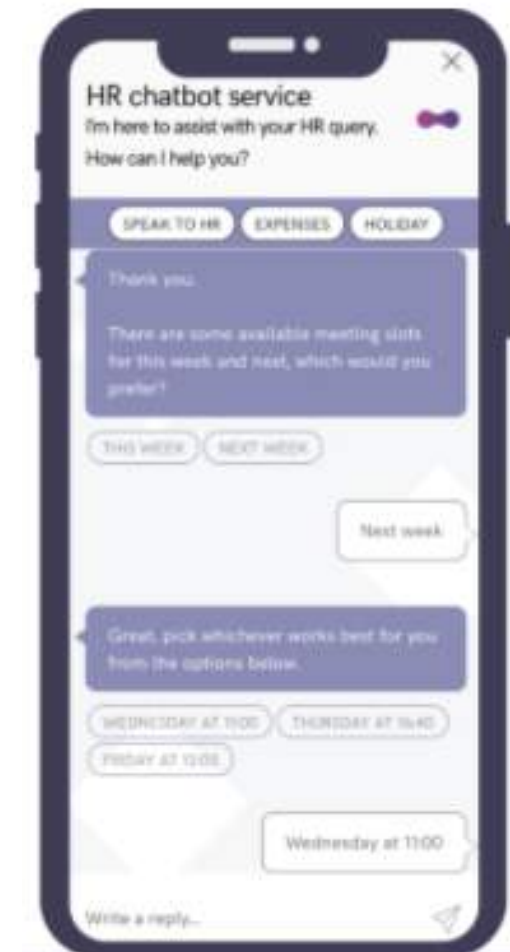
online → entity: place



Example of floating flow. List of Chatbot features: FAQ and Complaint

Chatbots in HR: intern

EWMD



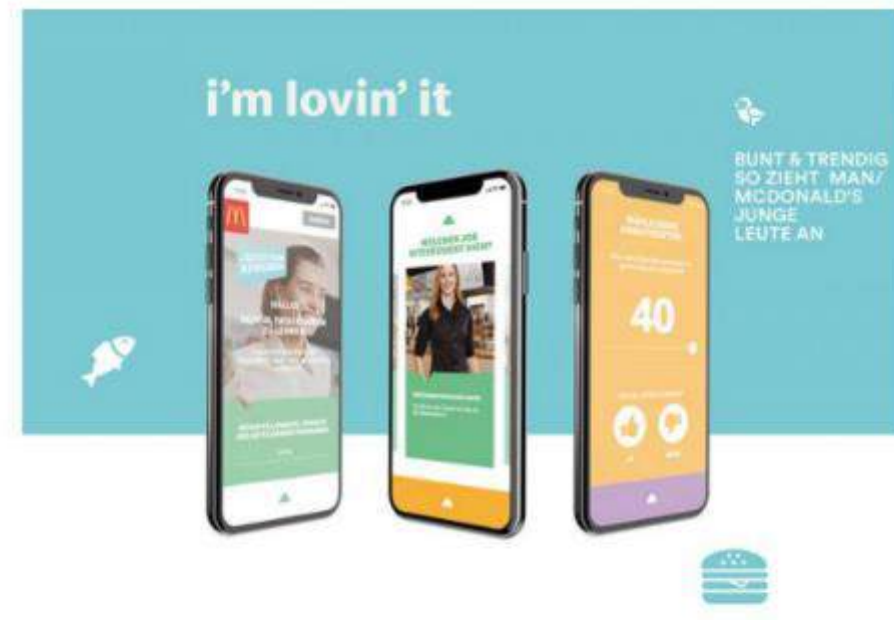
Chatbots in HR: extern



Smart Assistant/Conversational AI

McDonald's: Ohne Lebenslauf zur Bewerbung

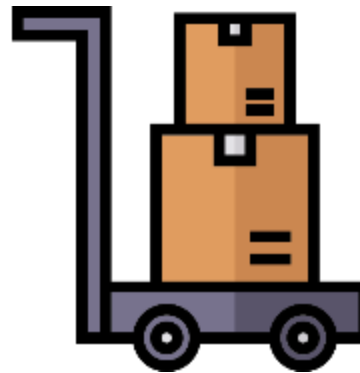
Jährlich 60.000 Bewerbungen für 200 Filialen:
Dieses Pensum unterstützt seit 2019 ein smarter digitaler Recruiting Assistant. Er bereitet die Daten von Bewerbern für HR-Mitarbeiter auf. Ganz ohne Lebenslauf und völlig diskriminierungsfrei.



Woher weiss der Chatbot die Antwort?



Eigene (historische) Daten



Standard Datensätze



Feedback

The elephant in the room...

EWMD



AI, Gender and Banking

The image features a woman in a dark business suit and white shirt, standing with her arms raised in a celebratory gesture. She is positioned in the center, with a glowing lightbulb above her head. The background is a light blue world map. Overlaid on the map is a network diagram consisting of black lines connecting various icons: person silhouettes, location pins, and cloud symbols. Numerous US dollar bills of various denominations (including \$100 and \$20 bills) are floating in the air around the woman and the network. The overall theme suggests a global financial or technological achievement.

The Issue: Some (Provocative?) Data

- A European study found that businesswomen are less able to access loans from banks than men: male entrepreneurs are 5% more likely to get a loan from banks than women.
- Even women who access biz loans are often subjected to higher interest rates (average of 0.5% more than men).
- Venture capital funding boomed in 2020, women's share shrank to 2.2%.
- BUT, are women worse credit-risk? The average venture-backed technology company run by a woman is started with a third less capital yet yields annual revenues that are 12% higher than those run by men.
- [Goldman Sachs is being investigated](#) by regulators for using an AI algorithm that allegedly discriminated against women by approving larger credit limits to men than women on their Apple cards.

The Challenge



- Women are historically relatively new to banking – data biased towards men and industries men understand/dominate
- The women's market remains largely un- and under-served:
 - Only 65% of women benefit from financial services (compared to 72% of men).
 - Of women who are receiving financial services, 73% are dissatisfied with them.
- Sex-disaggregated portfolio data on business ownership not always captured
- Regulatory frameworks are often “gender-biased”
- What can appear to be a gender-neutral approach may actually be geared toward the default man.
- Society still gender-biased which continues to feed gender-bias into new banking/investment data

The Data and AI Biases



Team Composition Bias

Most fintechs' product and tech teams are less than 25% female, and a majority have male-only founders. This leads to unconscious design bias.

Population Data Bias

Many companies don't have/are not using sex-disaggregated population data to calculate TAM.

Usage Bias

Some fintechs consider activation ratios and usage of products lower for women, although the data suggests otherwise.

Sex-Disaggregated Bias

In many cases, fintechs do not act upon or use sex-disaggregated data.

Algorithm & ML Bias

Machine-learning (ML) algorithms and others used by fintechs may not be constructed keeping women users in mind, and/or the underlying data for the ML might be derived from unrepresentative data.

Profitability Bias

Some fintechs think the women's market is a niche segment, and that the CAC for women is higher, and do not calculate LTV.

Data Interpretation Bias

If the initial users are predominantly men, the fintechs may tailor their propositions more for this dominant segment, rather than research why they have less women users.

Neutrality Bias

Most fintechs start their journey with what they feel is a gender-neutral approach.

Gender Gaps and AI Skills



Gender Gaps and AI Skills



Skills where women outnumber men

Text analytics

Speech Recognition

Text Mining

Natural Language Processing

Skills where men outnumber women

Deep Learning

Apache Spark

Artificial Neural Networks

Machine Learning

Computer Vision

Pattern Recognition

Neural Networks

66%

74%

66%

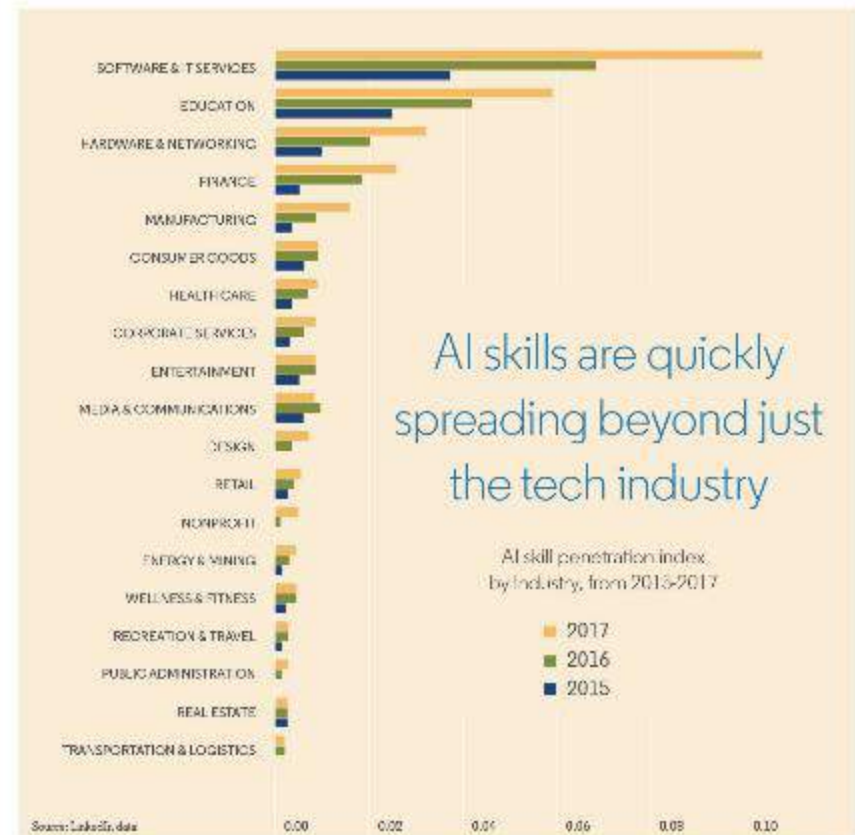
85%

67%

98%

70%

Sources: LinkedIn data featured in the Global Gender Gap Report 2018, World Economic Forum



Note: The penetration index looks at how many of the AI skills appear among top 50 skills for each occupation in each industry. It compares the mean % of AI skills across occupations within each industry in years 2015, 2016 and 2017. By comparing the index across years, it gives us the time trend of industry level AI skills penetration.

The Opportunity



Longer
lifespan



Women are
more loyal
customers



Women
refer more
customers



Women
have better
repayment rates



Women
buy more
products



FAST FACTS

ENTREPRENEURSHIP



\$1.7 trillion

estimated unmet demand for credit among female-owned formal micro SMEs in developing markets⁷

CONSUMPTION



89%

of women globally take charge of day-to-day purchasing⁹

\$43 trillion

amount of global consumer spending women are expected to control by the end of 2020¹⁰

INCOME



\$24 trillion

women's expected global income by the end of 2020⁸

WEALTH



40%

of global wealth is held by women¹¹

\$30 trillion

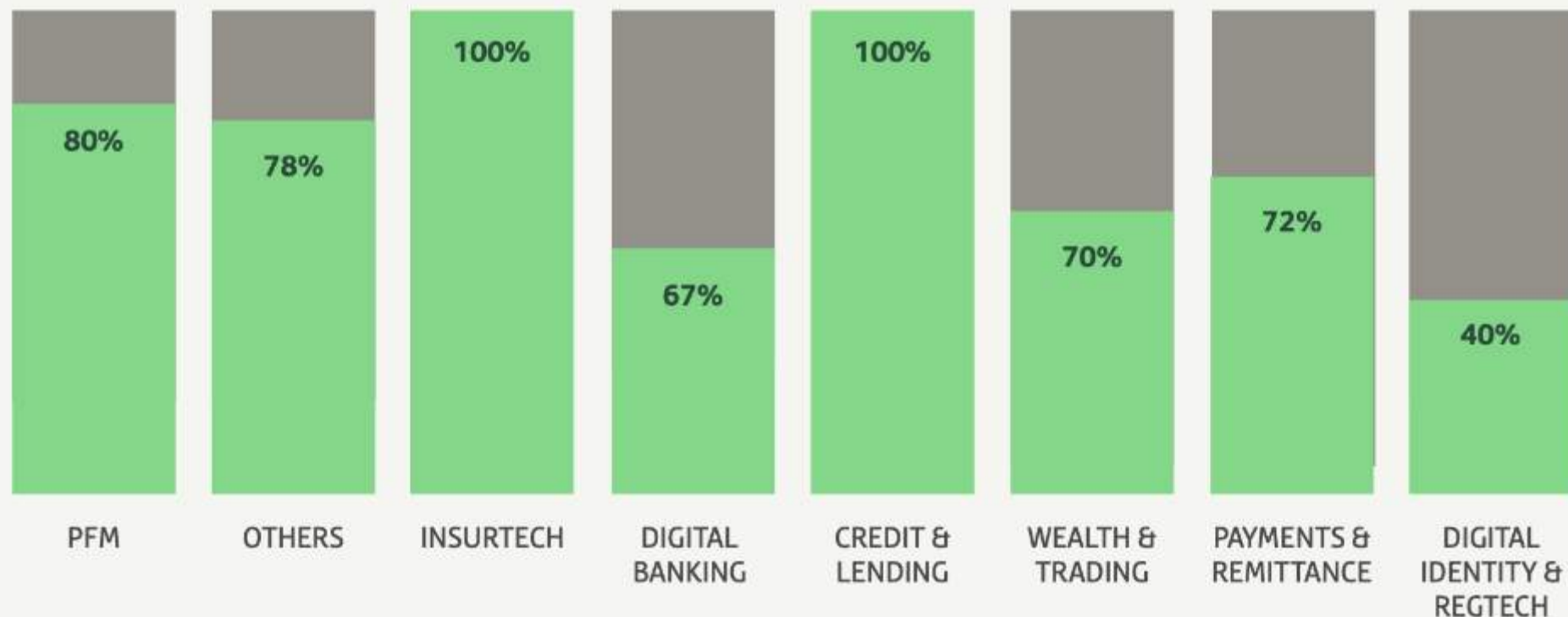
assets are expected to shift from Baby Boomers to younger women by 2030 in the United States alone¹²

Capturing the Women's Market



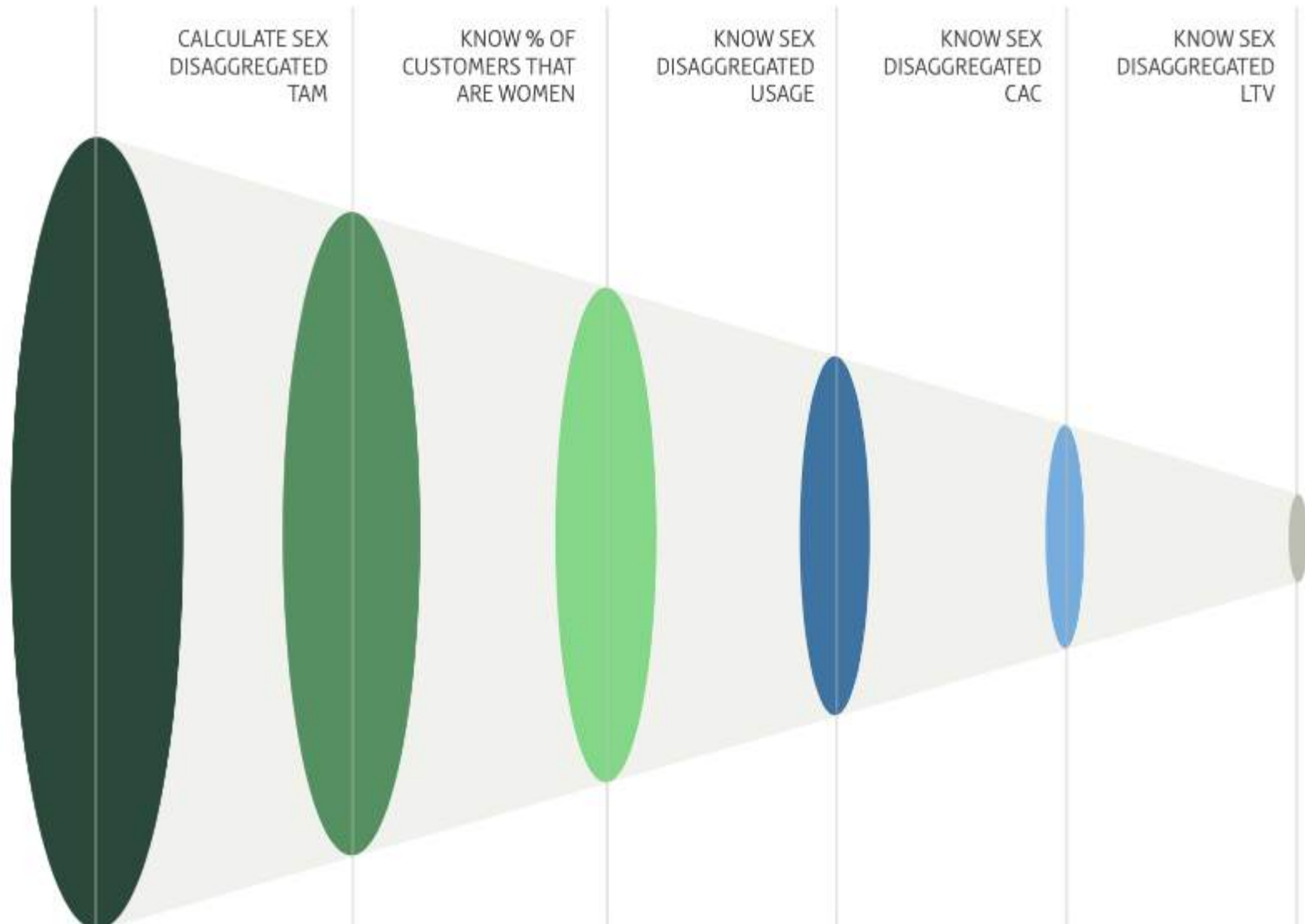
Availability of Sex-Disaggregated Data, per Industry Vertical

Available Not Available



The Way Forward

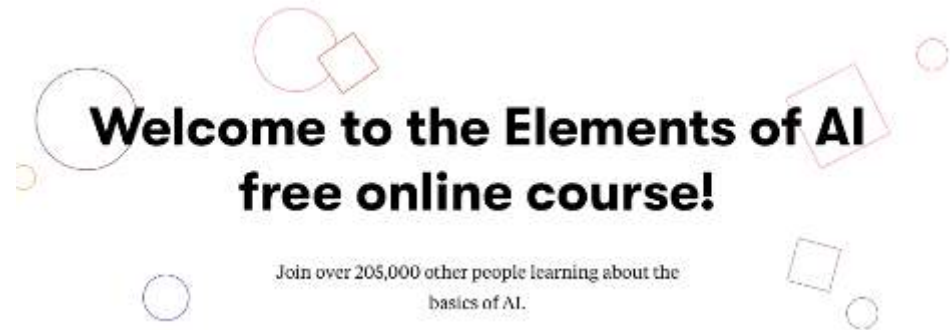
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Links zur Annäherung an's Thema



<https://www.elementsofai.com>



The course has 6 elements:

1. What is AI?
2. AI problem solving
3. Real World AI
4. Machine Learning
5. Neural Networks
6. Implications

Links zur Annäherung an's Thema

<https://www.youtube.com/watch/2ePf9rue1Ao>

#confusion #AI #deeplearning

What is Artificial Intelligence? In 5 minutes.

1.425.547 Aufrufe • 13.08.2017

 24.385



Raj Ramesh

37.700 Abonnenten

<https://youtu.be/s0dMTAQM4cw>

Eine 45-minütige BBC-Dokumentation:

„Artificial intelligence and algorithms: pros and cons | DW Documentary
(AI documentary)

Links zur Annäherung an's Thema

Mehr Info Weißbuch der EU Kommission 2020 zu AI



https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_de.pdf

Zahlen: Im Jahr 2012 waren 95.209 Frauen in IKT-Berufen sozialversicherungspflichtig beschäftigt, gegenüber 498.354 Männern; im Jahr 2018 waren es 131.521 Frauen gegenüber 659.975 Männern (vgl. Dengler/Matthes 2020: 51 f.) entspricht ca. 20 %