



AI = Alien Intelligence

Dr. Aljoscha Burchardt

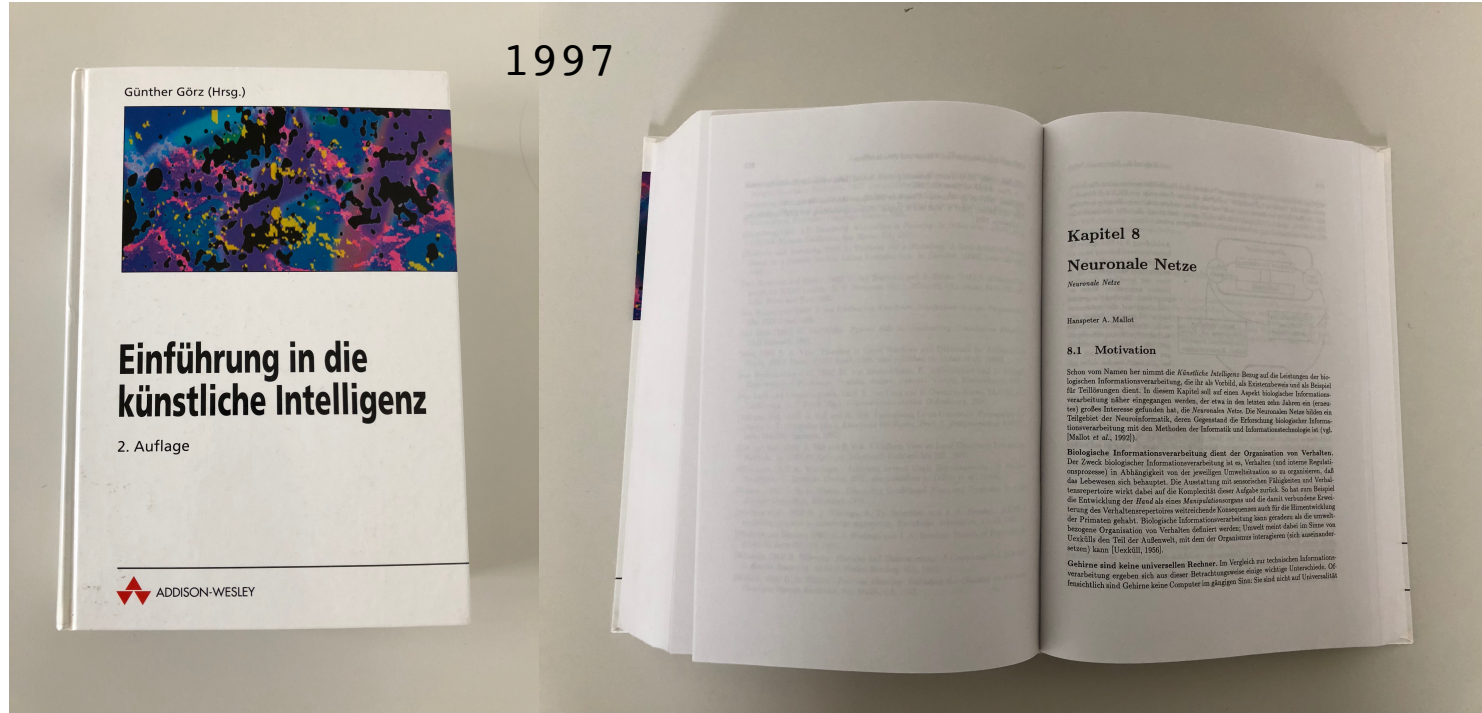
German Research Center for Artificial Intelligence

AI Monday Berlin,
September 17, 2018

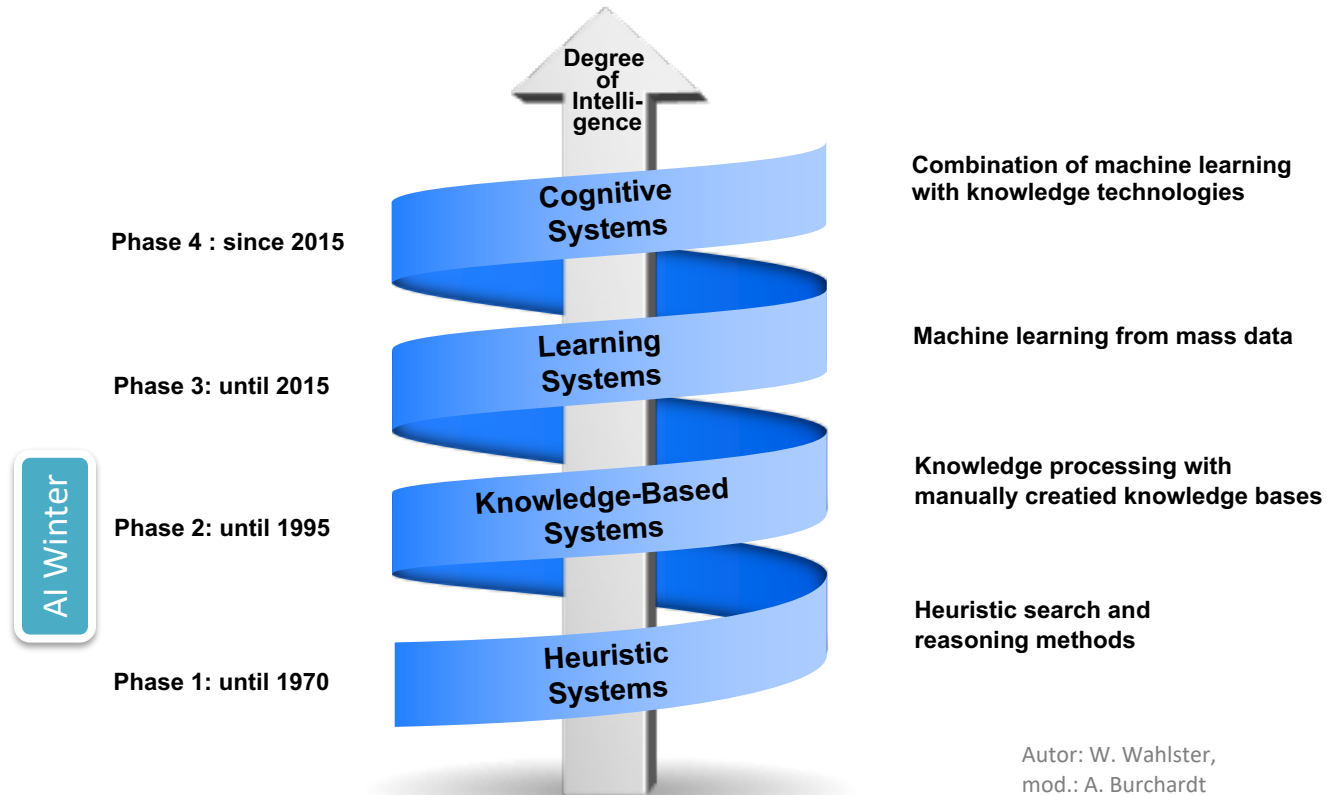
Changes



The temporal dimension

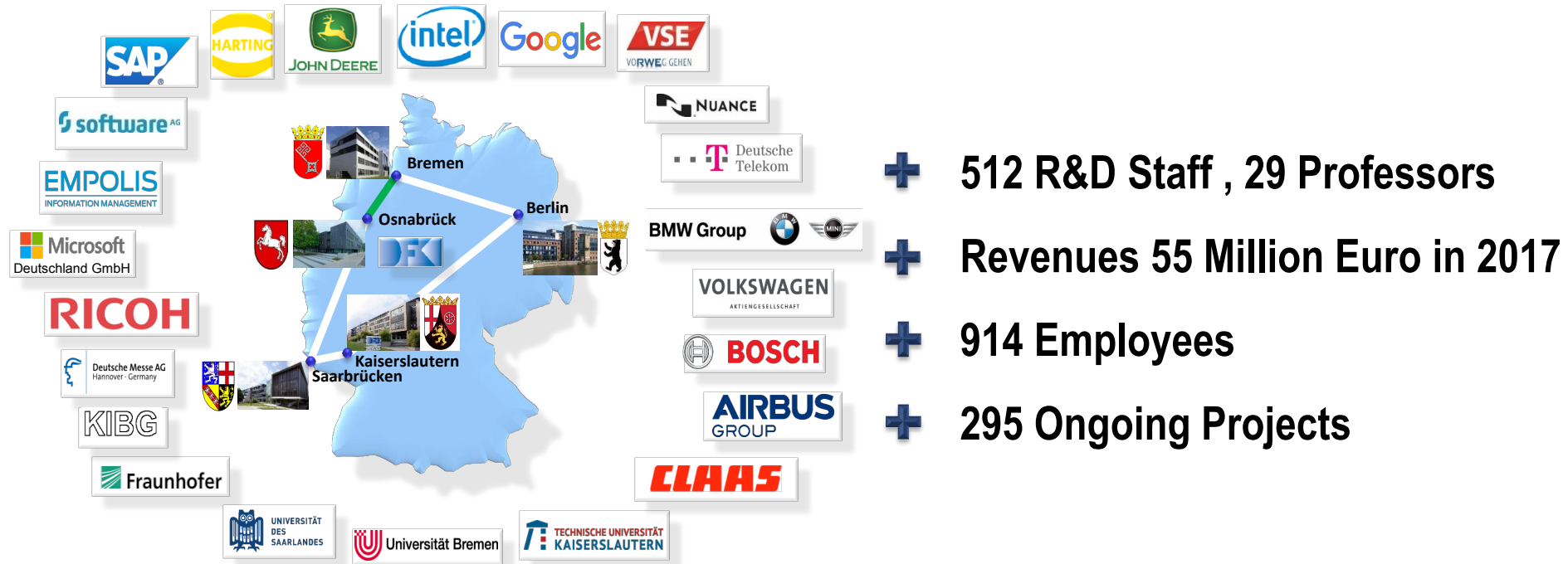


The Four Phases of AI Research



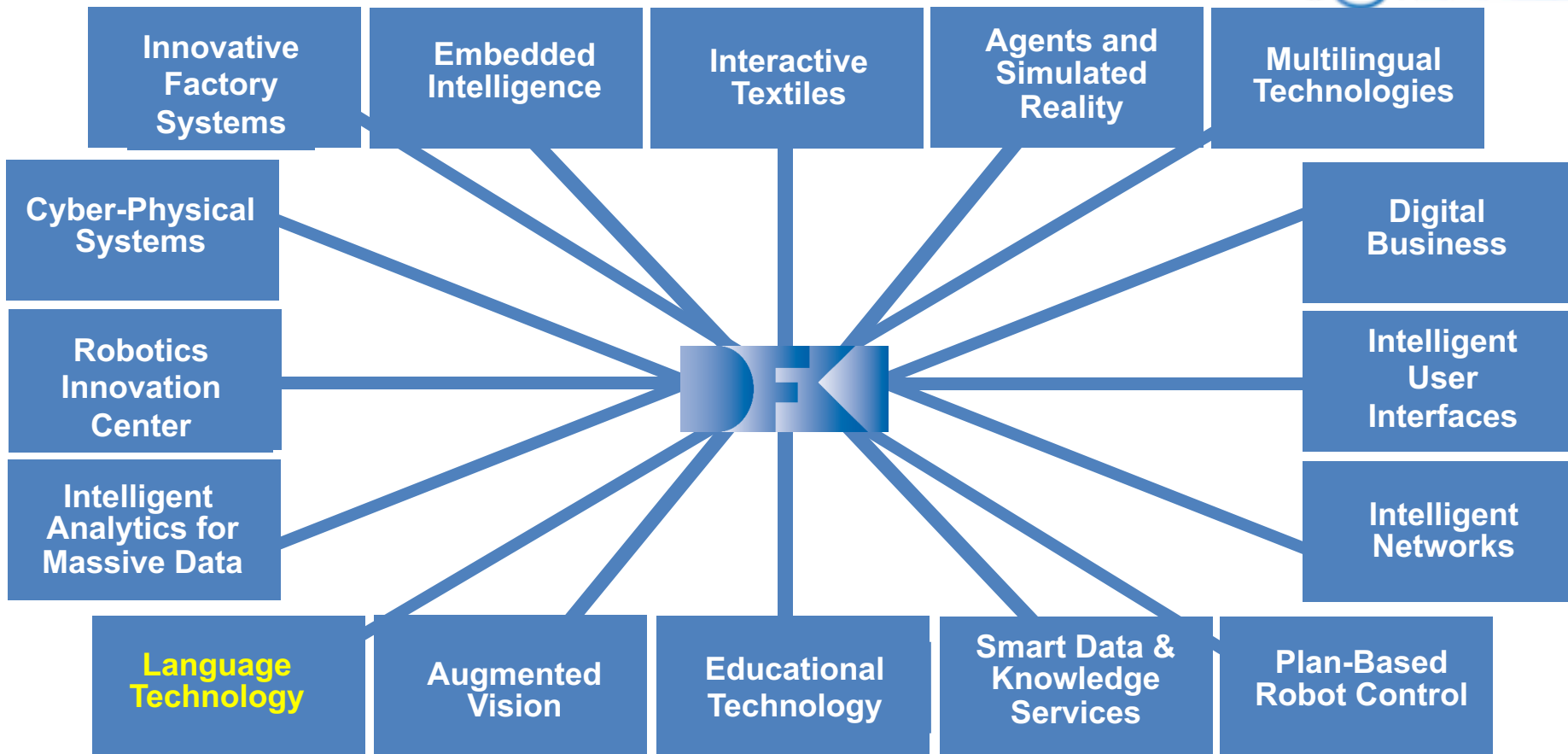
Autor: W. Wahlster,
 mod.: A. Burchardt

DFKI as the World's Largest PPP for AI Research



DFKI as a career springboard: > 80 CEOs of AI Start-ups, > 90 AI Professors, > 30 Managers of Industrial AI Departments

The R&D Departments and Groups of DFKI



DFKI Has Created 3200 New Jobs in IT Industry and More than 80 Startup and Spin-Off Companies



SELECTED SPIN-OFFS OF DFKI BERLIN

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Acrolinx Helps Government Address Three Big Challenges



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Leverton



LEVERTON PROJECT COMPANY CLIENT PARTNER RISK DATA

- Real estate leases**
 - ↳ Landlord Name
 - ↳ Mutual Rent
 - ↳ Termination Right
- Purchase sale agreements**
 - ↳ Effective Date
 - ↳ Buyer Name
 - ↳ Purchase Price
- Title insurance documents**
 - ↳ Policy Number
 - ↳ Policy Amount
 - ↳ Deductible Amount
- Certificates of insurance**
 - ↳ Type of Insurance
 - ↳ Policy Effective Date
 - ↳ Policy Expiry Date
- Mortgage documents (beta)**
 - ↳ Mortgage Name
 - ↳ Principal Loan
 - ↳ Property Address
- Loan agreements (beta)**
 - ↳ Borrower Name
 - ↳ Loan Amount
 - ↳ Payment Date

LEVERTON Assessment_EN - LEVERTON GmbH

00:12 h 82% done

APPROVE ALL R1 REPORT REASSIGN TO R1 FINISH R2

Extracts

General information

Date of lease: 01/05/2010

Parties to the contract

Landlord

Name: Leverton GmbH

Additional address n/a details: n/a

Street: Alt-Moabit

Street no.: 91d

Postal code: 10559

City: Berlin

Country: Germany

Company number: n/a

Representative: n/a

Tenant

Rental premises

Further address details: n/a

Street: Mudfog Street

Street no.: 1

Posta code: NN1 1DF

City: Northampton

EN_Lease commercial

PARTICULARS

LANDLORD	Leverton GmbH
Registered office	Alt-Moabit 91d, 10559 Berlin, Germany
TENANT	Oliver Twist
Registered office	Mudfog Street 1, NN1 1DF Northampton, United Kingdom
BUILDING	Buckingham Palace, Constitution Hill, SW1A 1AA London, United Kingdom
PREMISES	Office nr. 108 and 111 on the 1 st floor of the Building
TERM GRANTED	15 years from and including 3 rd day of May 2010 (the Term Commencement Date) and expiring on and including 2 nd day of May 2025 (Expiration Date)
RENT	One hundred and eight thousand pounds (£108,000) per annum (exclusive of Value Added Tax), subject to review
RENT COMMENCEMENT DATE	3 rd day of May 2010
RENT REVIEW DATES	3 rd day of May 2015 and every fifth anniversary of that date
BREAK DATES	the fifth and tenth anniversaries of the Term Commencement Date
PREMISES USE	Use in accordance with Planning (Use Class B1) of the Schedule

2 of 7 75%

Debatoo



<p>DEBATOO FOR EVERYONE</p> 	<p>Kostenfreies Diskussionstool für jedermann. Egal ob im Familienkreis, unter Freunden, Kollegen, im Chor oder Fußballverein: Debatoo for Everyone ermöglicht Diskussionen und Abstimmungen mit bis zu 50 Teilnehmern</p>
<p>DEBATOO OPEN</p> 	<p>Diskussionsplattform im Internet. Ständig neue Diskussionen zum aktuellen Zeitgeschehen</p>
<p>DEBATOO ENTERPRISE</p> 	<p>Tool für strukturierte Diskussionen in Teams. Automatisierte Zusammenfassung und Entscheidungsvorbereitung in Echtzeit</p>
<p>DEBATOO PUBLIC</p> 	<p>Online-Plattform zur verlässlichen und transparenten Unterstützung öffentlicher Infrastrukturvorhaben und anderer Formen der Bürgerbeteiligung</p>
<p>DEBATOO CUSTOM</p> 	<p>Online-Plattform und Tools, die zielgenau auf den Bedarf der Kunden zugeschnitten sind bzw. besonderen Vorgaben entsprechen</p>

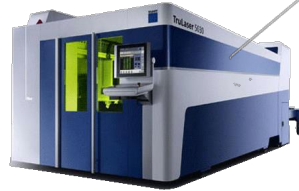
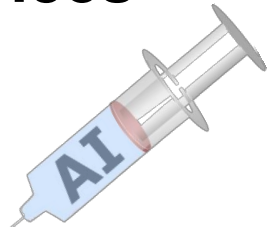


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Disrupting German Economy by Injecting AI: Transforming Premium Products Into Smart Products and Smart Services



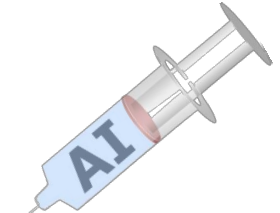
Cars



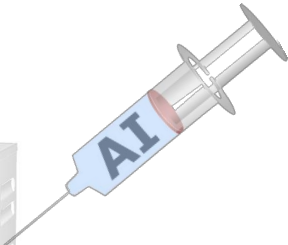
Manufacturing Equipment



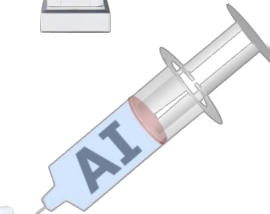
Medical Equipment



Home Appliances



Agricultural Machinery



End-to-End Demonstration in Seven Living Labs



Innovative Retail Lab (IRL)



Advanced Driver Assistance Systems Lab (ADAS)



Bremen Ambient Assistance Living Lab (BAALL)



Smart Factory



Robotic Innovation Center (RIC)



Smart City Living Lab



Smart Office Space

Today

- Digital Transformation
- Artificial Intelligence
- Maschine Learning

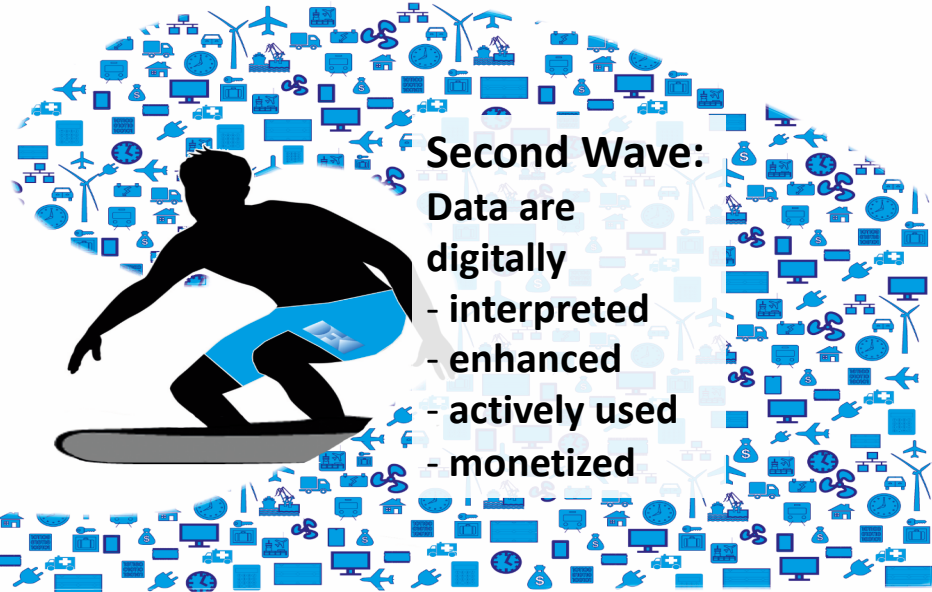
DIGITAL TRANSFORMATION

AI for the Second Wave of Digital Transformation

First Wave:

Data are digitally

- acquired
- stored
- transmitted
- processed



Second Wave:

Data are digitally

- interpreted
- enhanced
- actively used
- monetized

Machine readable data:
Internet and cloud
technologies

Machine understandable
data: AI and machine
learning

ARTIFICIAL INTELLIGENCE

Working Definition

Artificial Intelligence (AI) is the property of IT systems to demonstrate abilities similar to human cognition.

The single ability can exist only to some extent, such as the dialog capability of today's smartphones. However, it can also show a performance way beyond human capabilities as in scanning tens of thousands of MRI scans.

AI systems have different proportions of certain core skills such as situational perception, planning, communication, acting, reasoning or learning.

(Pre-)Translated with www.DeepL.com/Translator



Assistance for physical and mental work

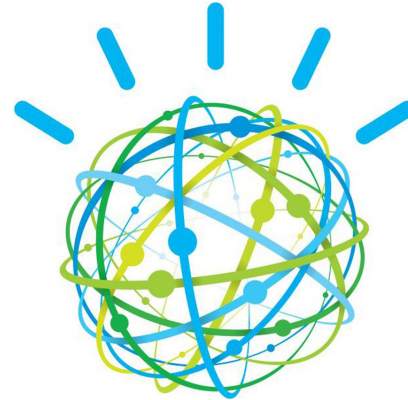
Assistance with physical work
by **collaborative** AI robots



e.g.: AILA collaborative DFKI robot

Man-robot collaboration, standby robots,
team robotics

Assistance with mental work
through **cognitive** AI systems

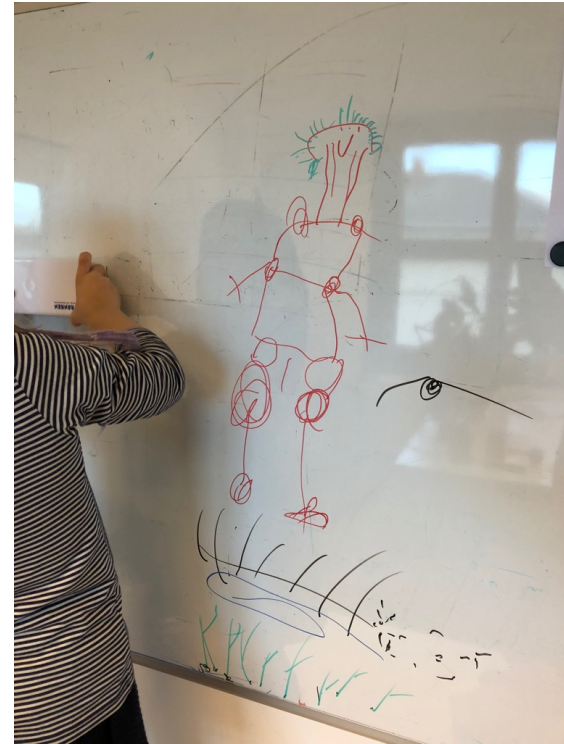


e.g.: DFKI Spin-Off LEVERTON using
Deep Learning in Legal Tech

Banking advice, legal advice,
personnel consulting, etc.

Digital Transformation vs. AI

“I never want my decisions to be dominated by a machine.”



From Information to Knowledge: Who is Wolfgang Dauner?

🔍

Alle
News
Videos
Bilder
Shopping
Mehr
Einstellungen
Tools

Ungefähr 135.000 Ergebnisse (0,50 Sekunden)

Wolfgang Dauner – Wikipedia
https://de.wikipedia.org/wiki/Wolfgang_Dauner ✦
 Wolfgang Dauner (* 30. Dezember 1935 in Stuttgart) ist ein deutscher Keyboarder, Jazzpianist und Filmmusikkomponist. Inhaltsverzeichnis. [Verbergen]. 1 Leben; 2 ...
[Leben](#) - [Werk](#) - [Preise und Auszeichnungen](#) - [Diskografie \(Auszug\)](#)

Wolfgang Dauner
www.dauner-around.de/ ✦
 Die offizielle Site des Pianisten und Komponisten bietet Biographisches, eine Diskografie, eine Fotogalerie und eine Auswahl von Noten.

Wolfgang Dauner zum 75.: "Ich hab den Urschrei in mir" | ZEIT ONLINE
www.zeit.de - DIE ZEIT Archiv - Jahrgang 2010 - Ausgabe: 52 ✦
 23.12.2010 - Der Jazzpianist Wolfgang Dauner, der einst mit Sarah Lander und Marika Rokk sang, über brennende Kaviere, Musik als Therapie und Koks ...


Zwischennruf von Wolfgang Dauner: Bezahlt die Jazzmusiker besser ...
www.stuttgarter-zeitung.de/inhalt/zwischenruf-von-wolfgang-dauner-bezahlt-die-jazzmu...
 Von Wolfgang Dauner 24. März 2016 - 10:05 Uhr. Eine aktuelle Umfrage ergibt, dass die meisten Jazzmusiker in Deutschland weniger als 12 500 Euro im Jahr ...

Wolfgang Dauner - Jazz Fun
www.jazz-fun.de/wolfgang-wolfgang.html ✦
 Biographie. Wolfgang Dauner (* 30. Dezember 1935 in Stuttgart) ist ein deutscher Keyboarder, Jazzpianist und Filmmusikkomponist. Wolfgang Dauner hatte bereits ...

Wolfgang Dauner-Diskographie auf Discogs

Wolfgang Dauner

Keyboarder



Verfügbar bei

- YouTube
- Spotify
- Deezer

Wolfgang Dauner ist ein deutscher Keyboarder, Jazzpianist und Filmmusikkomponist. [Wikipedia](#)

Geboren: 30. Dezember 1935 (Alter 81), Stuttgart

Alben: [Dauner / Dauner](#), [Rischka's Soul](#), [The Omlets](#), [Free Action](#), [mehr](#)

Kinder: [Flo Dauner](#)

Filmmusik-Mitwirkende: [Fautl – eine deutsche Volksage](#), [Tatort: Nebengeschäfte](#), [Grandison](#)

Musikgruppen: [United Jazz](#) ✦ [Rock Ensemble](#), [El Cetera](#), [German Jazz Masters](#)

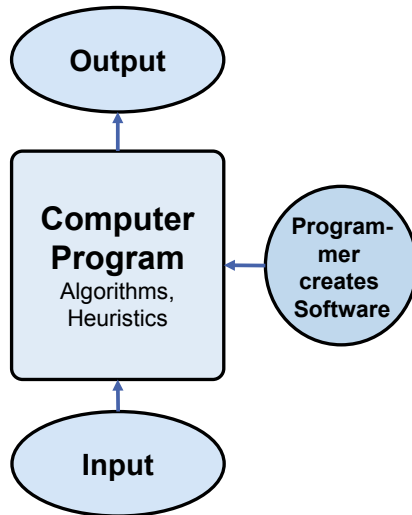
17.09.2018

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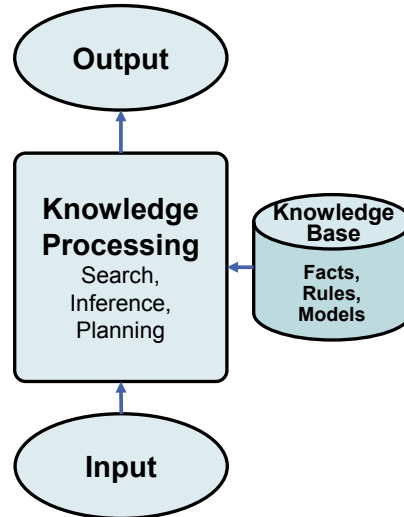
MACHINE LEARNING

How to make machines smart



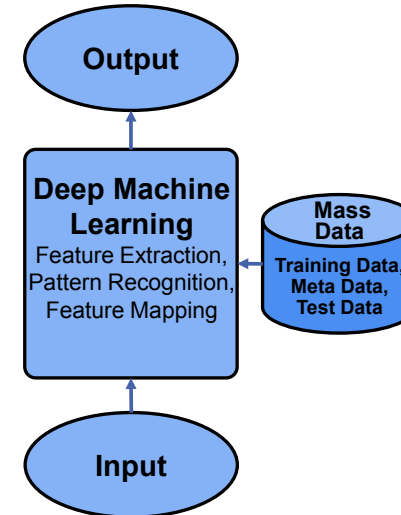
Bottleneck: Programmer

- high development costs
- restricted adaptability
- weak explanation capabilities



Bottleneck: Knowledge Base

- huge development effort
- high maintenance costs
- + good explanation capabilities



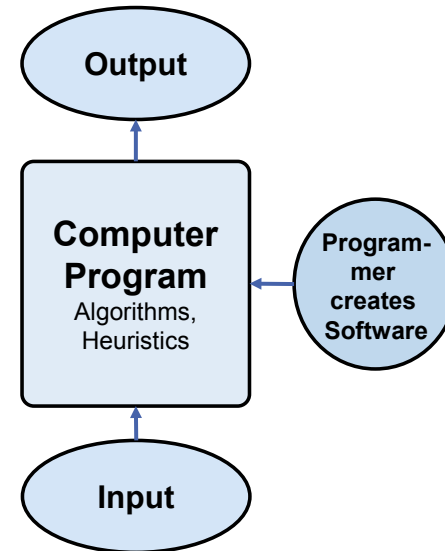
Bottleneck: Training Data

- + minimal development effort
- + good adaptability
- no explanation capabilities

1. Programming



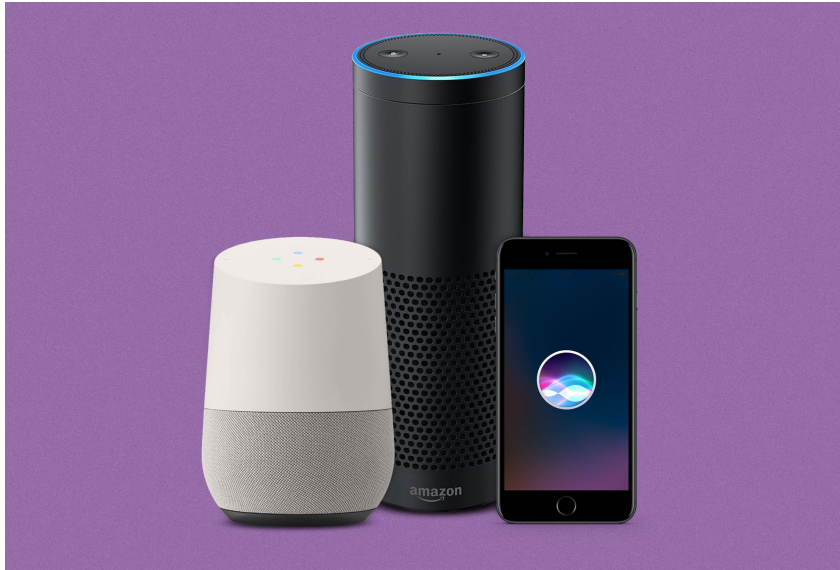
Bild: www.connox.at



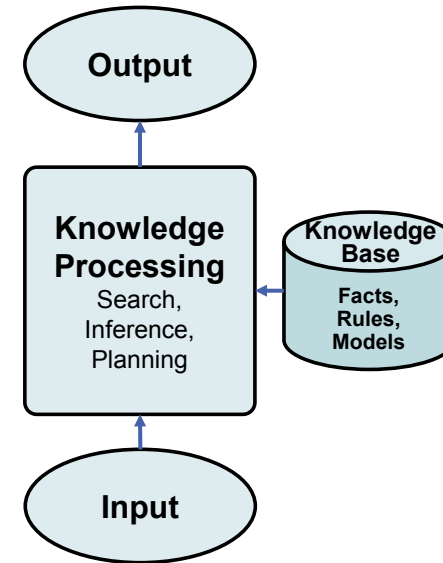
Bottleneck: Programmer

- high development costs
- restricted adaptability
- weak explanation capabilities

2. Building up Expert Knowledge



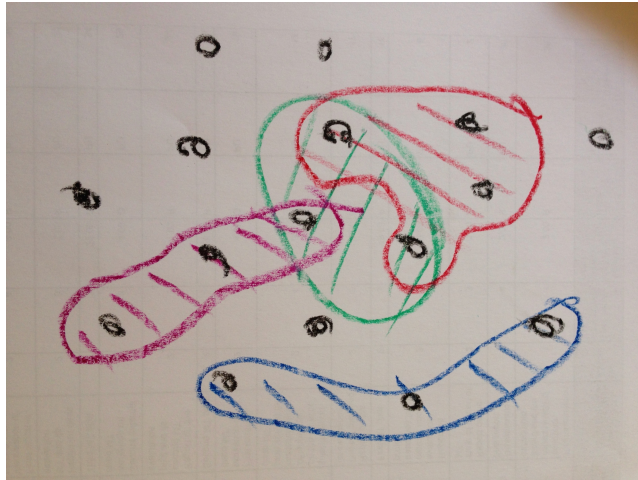
<https://gearpatrol.com/2017/07/19/how-does-a-virtual-assistant-work/>



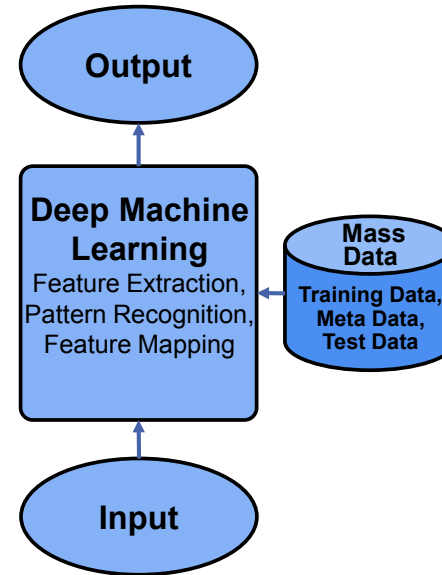
Bottleneck: Knowledge Base

- huge development effort
- high maintenance costs
- + good explanation capabilities

3. Machine Learning



- Automatic clustering for recommendations
- Machine Translation
- Control car
- Go Play
- Composing like Bach



- Bottleneck: Training Data**
- + minimal development effort
 - + good adaptability
 - no explanation capabilities

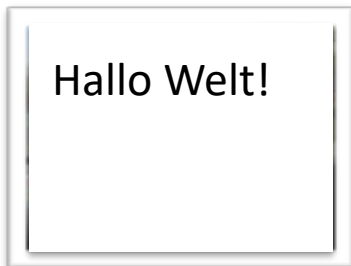
Learning from humans



“flower”



Drive carefully due to the traffic situation



“Hello world!”

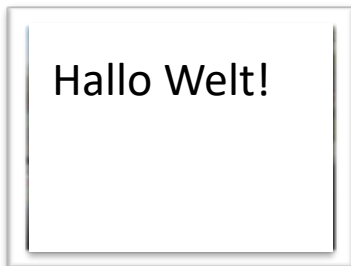
Deep Machine Learning



“flower”



Drive carefully due to the traffic situation



“Hello world!”

Machine Learning – Style Imitation



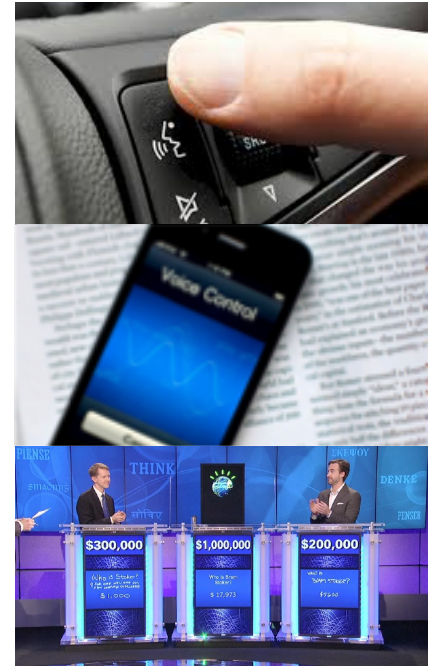
A Neural Algorithm of Artistic Style, L. Gatys, A. Ecker, M. Bethge, Universität Tübingen, 2015

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EXAMPLE: LANGUAGE TECHNOLOGY

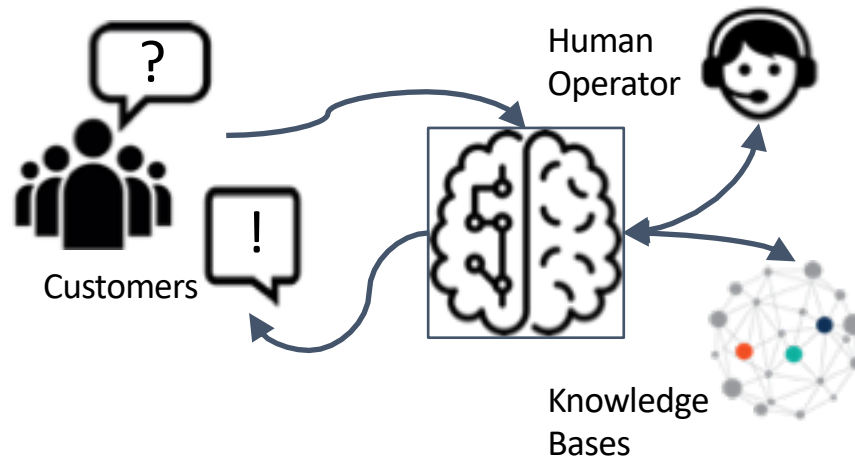
Language Technology (Almost) Everywhere

- Spelling Correction
- OCR (optical character recognition)
- Web search with Google
- Language learning programs
- Machine Translation
- Recommendations, “Did you mean, ...“
- Voice control and dialogue: Apple Siri, Amazon Alexa, ...
- IBM Watson



Chatbots for Customer Support

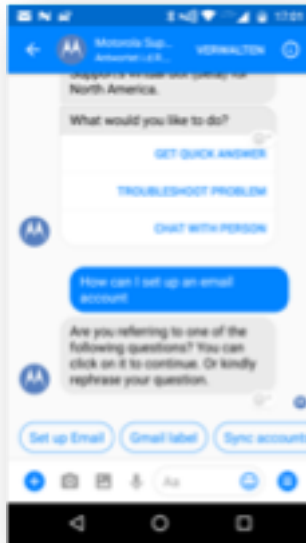
- Collaborative development of a chat bot to support call center agents through suggestions from FAQs and (product-) data bases
- Text analysis for the development of knowledge graphs about products, components, customer problems.



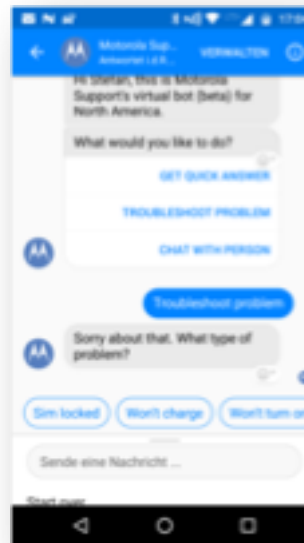
Customer	System
Hi	
	Hi Paul
	How can I help you?
Can you explain me how to setup an email account on my Moto Z?	
	In order to help you I need to know your email provider?
It's a Gmail account	
	Ok. Here's what you need to do ...
	Did this solve your problem?
Yes, thanks!	

- Necessary resources
 - Existing dialogues, the more the better
 - Annotated dialogs (e.g. customer requests categorized by CSA)
 - Existing knowledge bases (e.g. documentation, FAQs, call center knowledge base)
- And training data – in the Lenovo project
 - for correct answer from FAQ - 7272 existing dialogs
 - for intent - 39139 user turns labelled (ca. 60 types)
 - for question type - 80216 user turns labelled (3 types)
 - same for slots, etc.

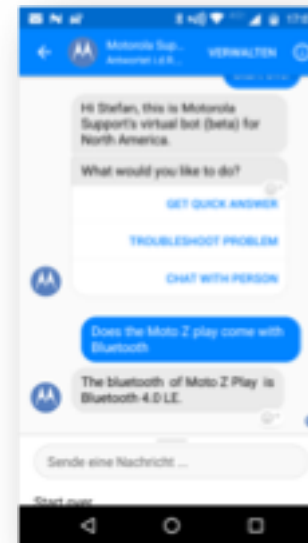
The Moli Chatbot – Types of Dialogs



How To Questions



Troubleshooting



Facts

How can I help you?

Q1 I dropped my **phone** and the screen shattered, and the battery hasn't been holding a charge well for a couple of months. I have all of the information to **send it in for repair**, but I was **wondering if a reset would have to be done** on it. There are some things on the phone I need to keep if at all possible.

Central Concepts

- Digital Transformation
 - Second Wave: From Information Storage to Knowledge Source
- Artificial Intelligence
 - Learning, language comprehension, planning, interference, situational context
- Machine Learning
 - Recognizing characteristics and patterns
 - Often on manually edited/created training data (supervised)
 - Powerful, but "reactive", no explanations / decision support, no dynamic interaction

Thank you!



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