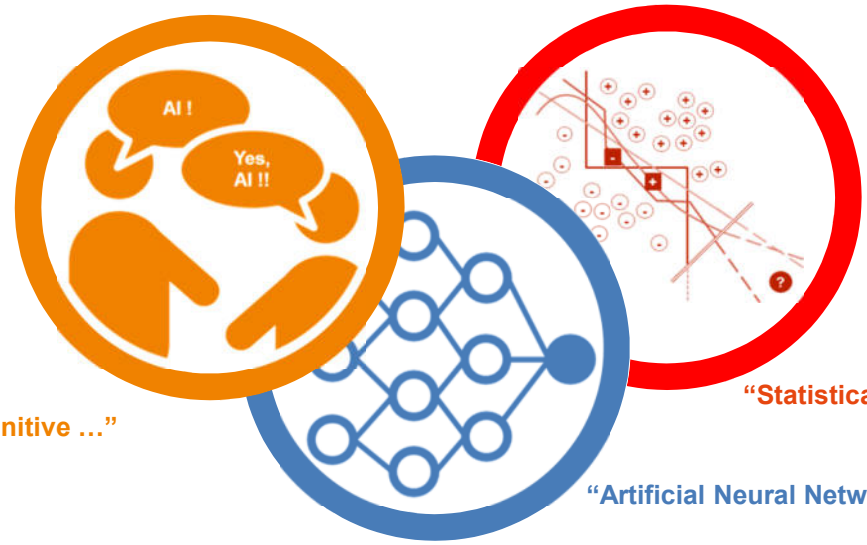
watchit
Expertenforum

Demythifizierung von „Artificial Intelligence“

Dr. Udo Milkau; Chief Digital Officer,
Transaction Banking, DZ BANK
Mosbach, 21. März 2019

21. März 2019

Perception of AI (Often as a Mirror of Individual Fears)



“Cognitive …”

“Statistical Classifiers”

“Artificial Neural Networks”

DHBW Duale Hochschule Baden-Württemberg Mosbach
DZ BANK Die Initiativbank

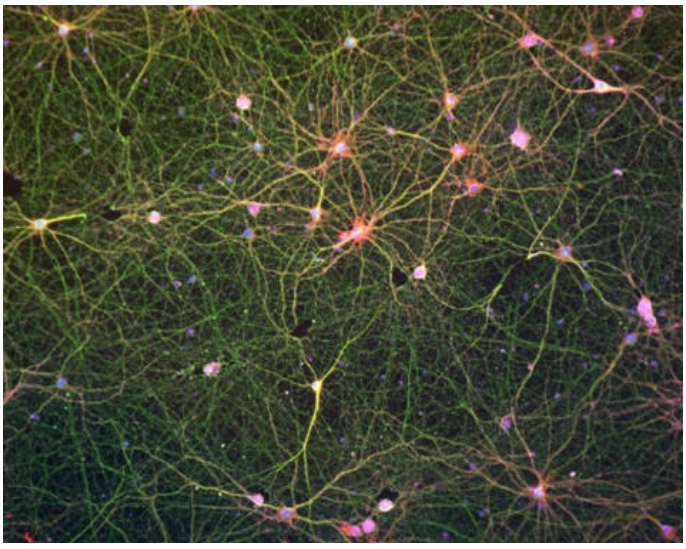
Artificial Intelligence is NOT Ccognitive!

Human Beings were Cognitive 40.000 years ago!

*) idea taken from: Judea Pearl (with Dana Mackenzie) “The Book of Why”, Basic Books/Hachette Book Group, N.Y., 2018 (15.5.2018)
**) graphic: http://www.loewenmensch.de/figur_2.html
Der Löwenmensch wurde am 25. August 1939 bei den Ausgrabungen in der Stadel-Höhle am Hohlenstein auf der Mittleren Schwäbischen Alb entdeckt. Für die Fundstelle des Löwenmenschen konnten neuerdings Daten gewonnen werden, die ein Alter von 35 000 bis 40 000 Jahren anzeigen. Ulmer Museum (Hrsg.): Die Rückkehr des Löwenmenschen – Geschichte Mythos Magie. Ulm 2013

DHBW Duale Hochschule Baden-Württemberg Mosbach
DZ BANK Die Initiativbank

Artificial Neural Networks (ANN) are not Brains !



*) figure taken from: https://assets.thermofisher.com/TFS-Assets/BID/figures/Cortical_2_RGB.jpg-650.jpg

DHBW Duale Hochschule Baden-Württemberg Mosbach
DZ BANK Die Initiativbank

Science

AI researchers allege that machine learning is alchemy

By Matthew Hutson | May. 3, 2018 , 11:15 AM

Ali Rahimi, a researcher in artificial intelligence (AI) at Google in San Francisco, California, took a swipe at his field last December—and received a 40-second ovation for it. Speaking at an AI conference, Rahimi charged that machine learning algorithms, in which computers learn through trial and error, **have become a form of "alchemy."** Researchers, he said, do not know why some algorithms work and others don't, nor do they have rigorous criteria for choosing one AI architecture over another. Now, in a paper presented on 30 April at the International Conference on Learning Representations in Vancouver, Canada, Rahimi and his collaborators **document examples** of what they see as the alchemy problem and offer prescriptions for bolstering AI's rigor.

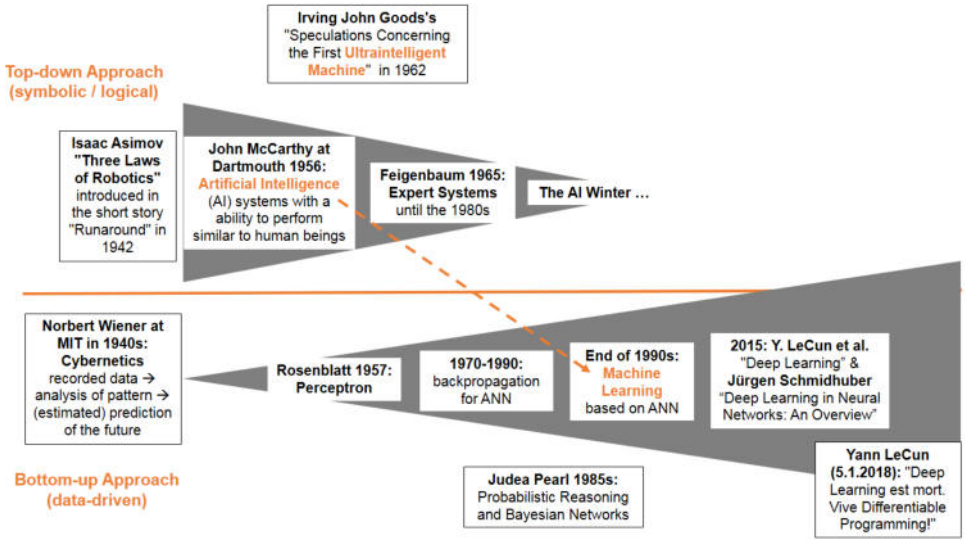
"There's an anguish in the field," Rahimi says. "Many of us feel like we're operating on an alien technology."

The issue is distinct from **AI's reproducibility problem**, in which researchers can't replicate each other's results because of inconsistent experimental and publication practices. It also differs from the "black box" or "interpretability" problem in machine learning: the difficulty of **explaining how a particular AI has come to its conclusions**. As Rahimi puts it, "I'm trying to draw a distinction between a machine learning system that's a black box and an entire field that's become a black box."

Source: http://www.sciencemag.org/news/2018/05/ai-researchers-allege-machine-learning-alchemy
Remark: This is additional to the problems of explainability, acceptance by public, and the fairness/justice question.

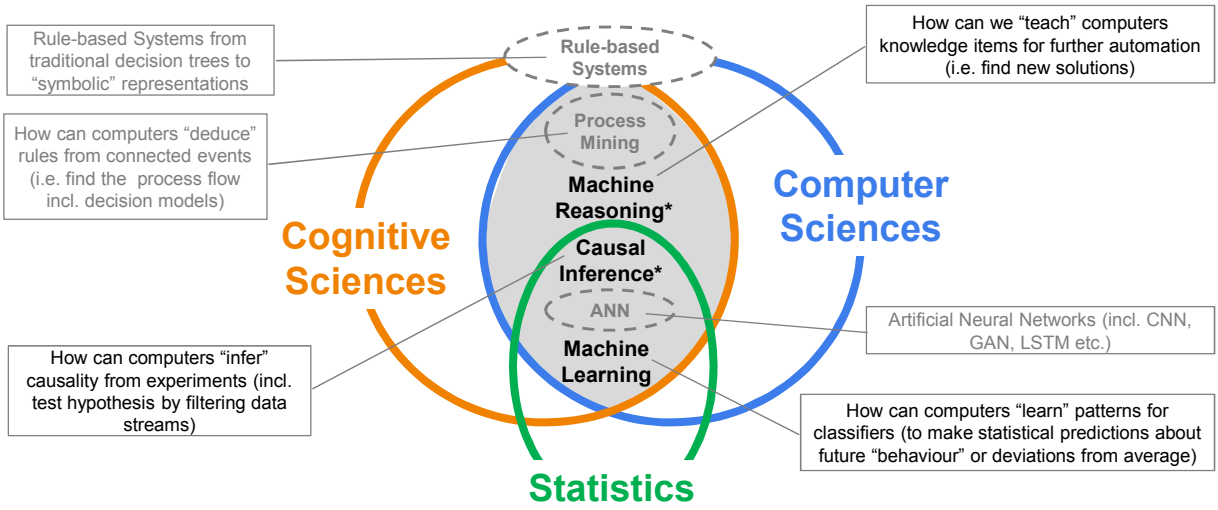
DHBW Duale Hochschule Baden-Württemberg Mosbach | DZ BANK Die Initiativbank

The Term „Artificial Intelligence“ has a Legacy.

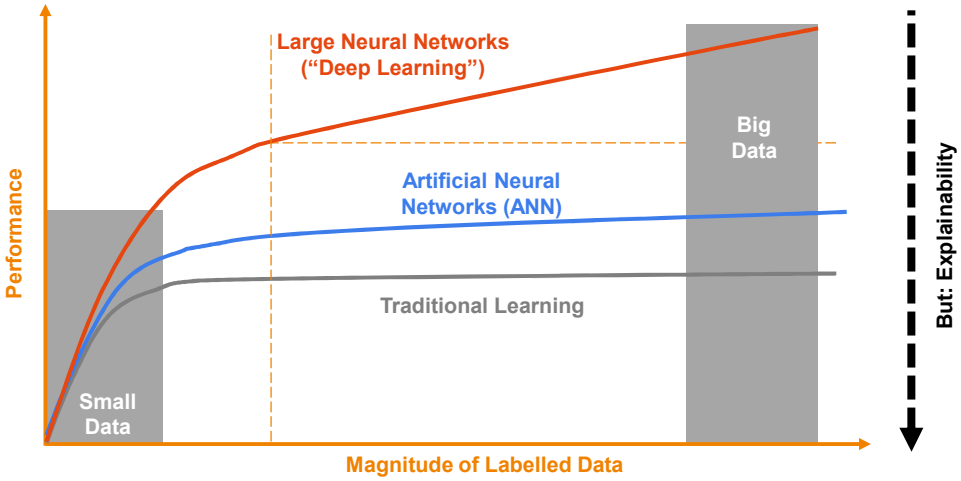


DHBW Duale Hochschule Baden-Württemberg Mosbach | DZ BANK Die Initiativbank

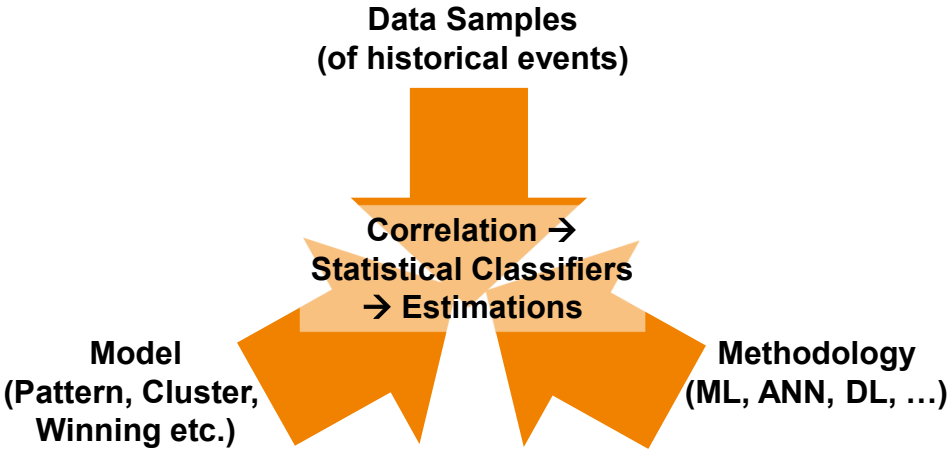
An Attempt of Classification …



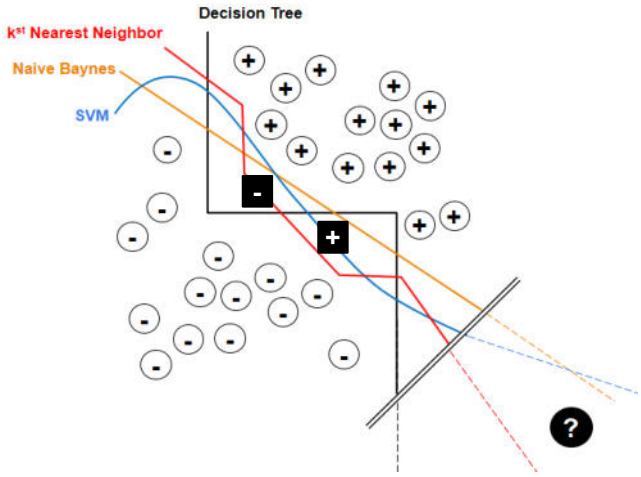
The Reason for Deep Learning – and the Challange



Elements of „Artificial Intelligence“ as Statistical Classifiers: Machines do not “understand”, they fit functions to data points.

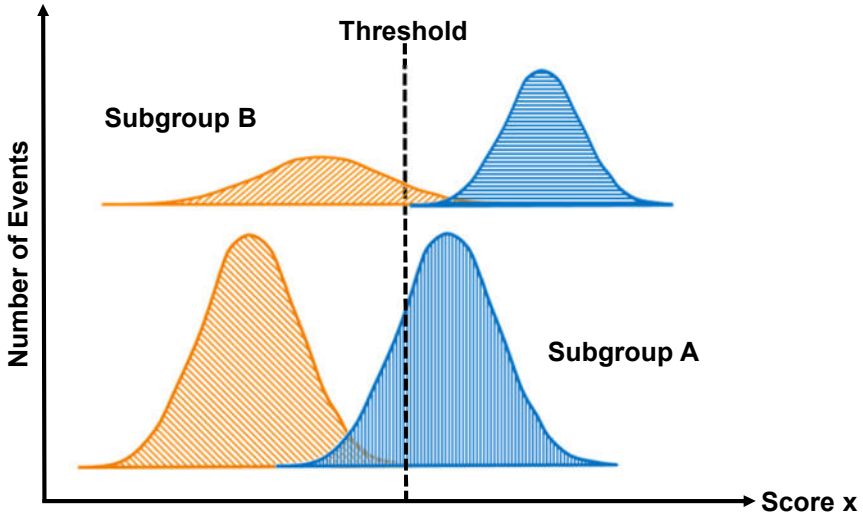


Current „Artificial Intelligence“ Tools are Statistical Classifiers … … with the Limitations of Statistics (false pos. / false neg.)



*) Figure originally taken from: Domingos, Pedro. 2012. A few useful things to know about machine learning. Communications of the ACM CACM Homepage archive, Volume 55 Issue 10, pp 78-87.

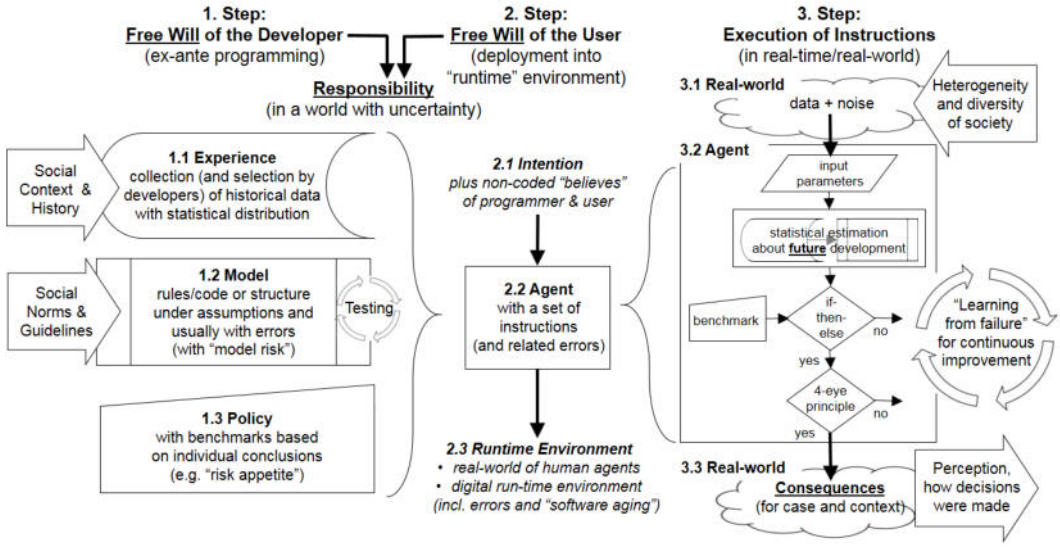
Current „Artificial Intelligence“ Tools are Statistical Classifiers …
… and the Problem of „Hidden“ Context Taken as Control



DHBW DZ BANK Die Initiativbank

A Last Remark

Process of Decision-Making with Instructed Agents



Udo Milkau "Decision-Making with Instructed Agents in the Social Context - Responsibility, Technology and Perception", to be published, 2019

DHBW DZ BANK Die Initiativbank