



Dati, Computer Quantistici ed Intelligenza Artificiale: dalla computazione alla comprensione

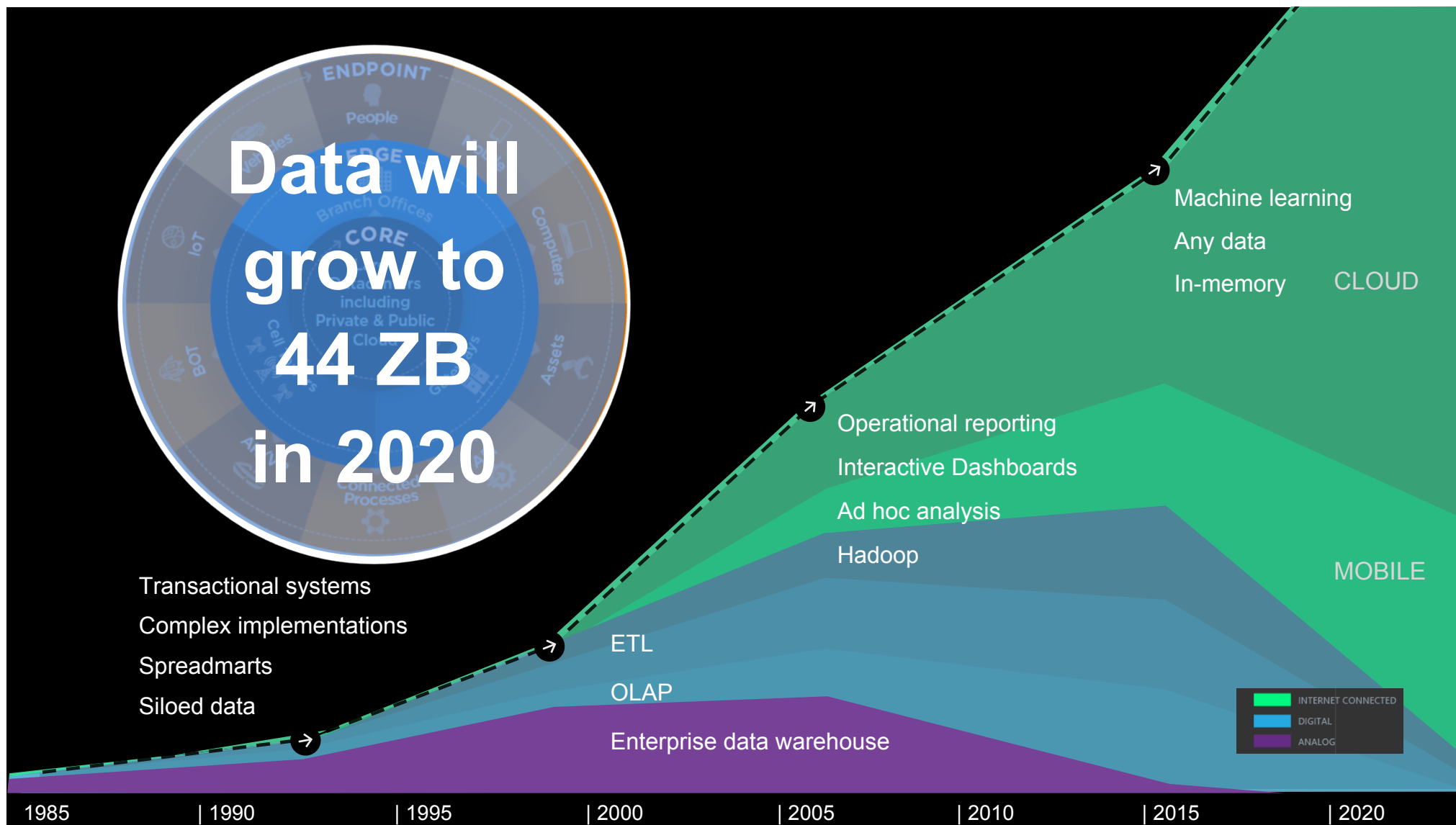
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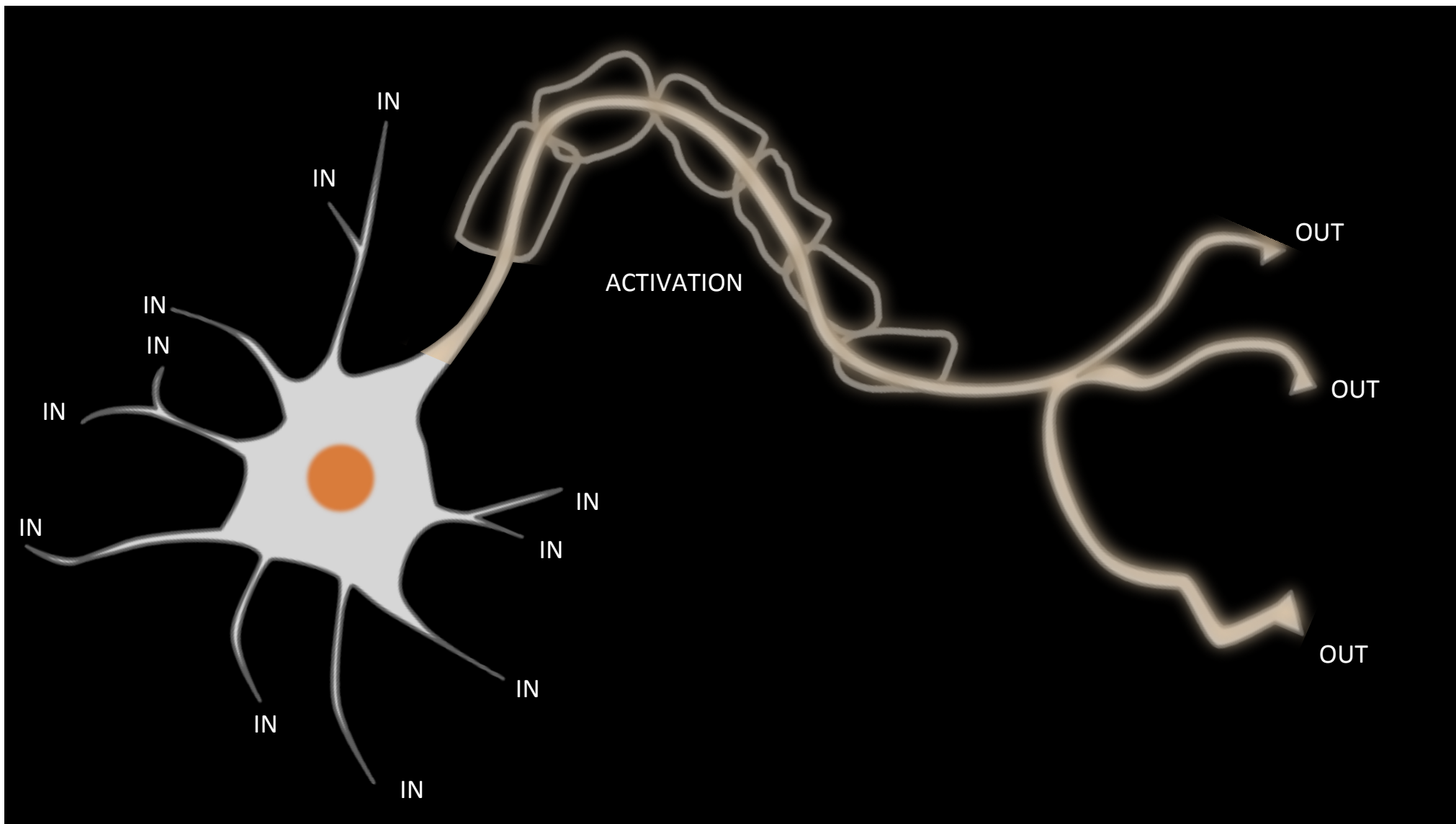


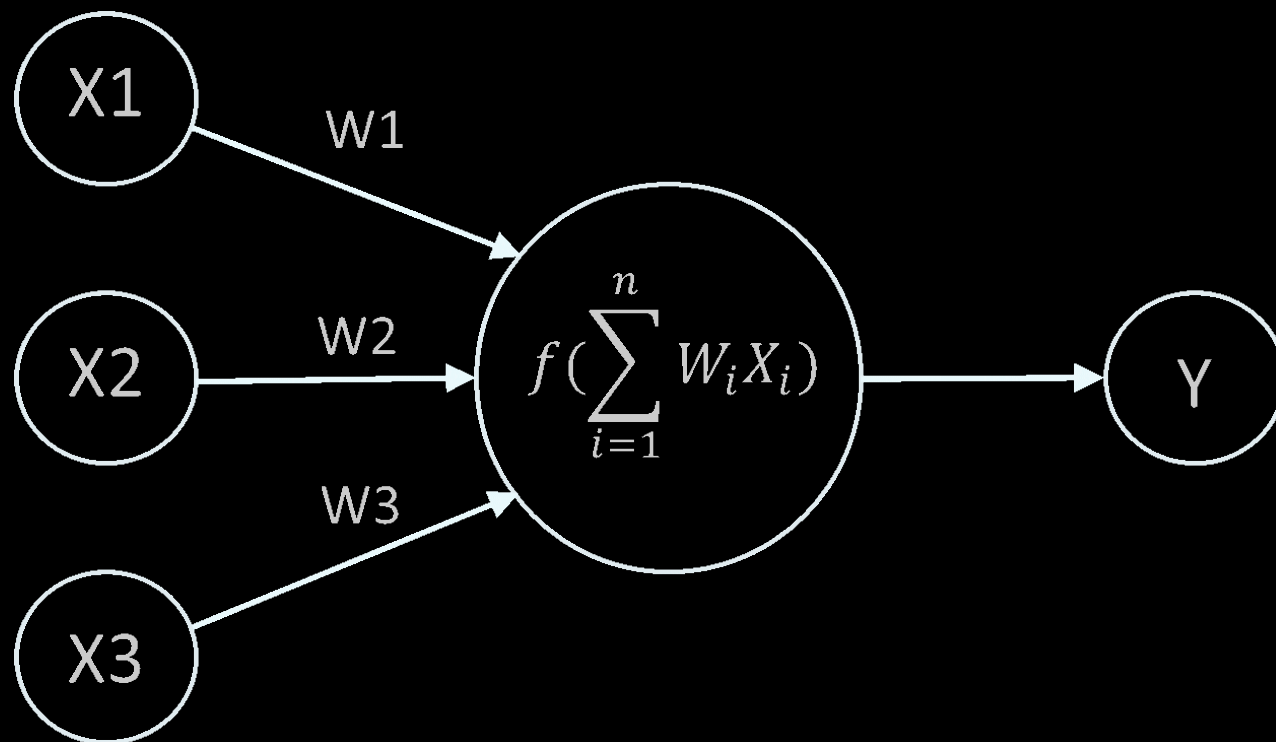


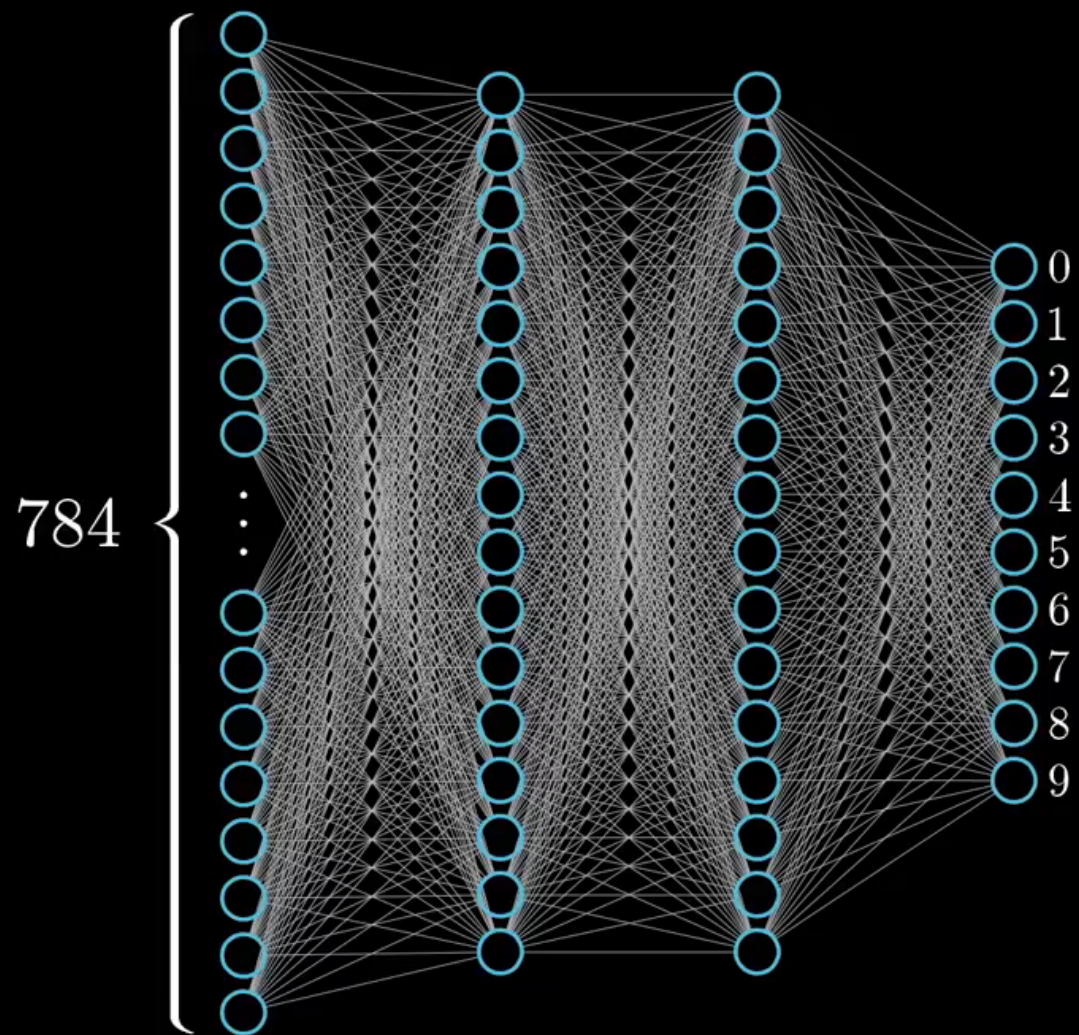


Data will
grow to
44 ZB
in 2020







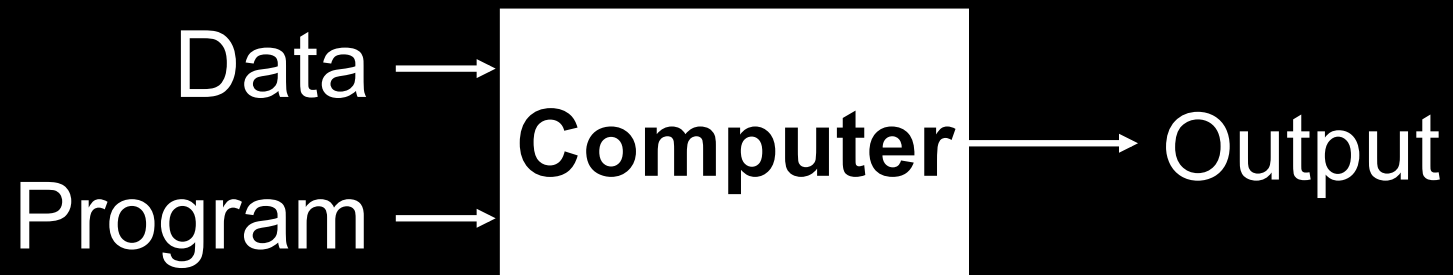


MACHINE LEARNING IN ESSENCE

(supervised learning)

A	→	B
mail	→	spam / no spam
image	→	objects in image
audio	→	text
english	→	italian
text	→	audio
ad/user	→	click / no click

TRADITIONAL PROGRAMMING



MACHINE LEARNING



Why now



**Pervasive
Data**



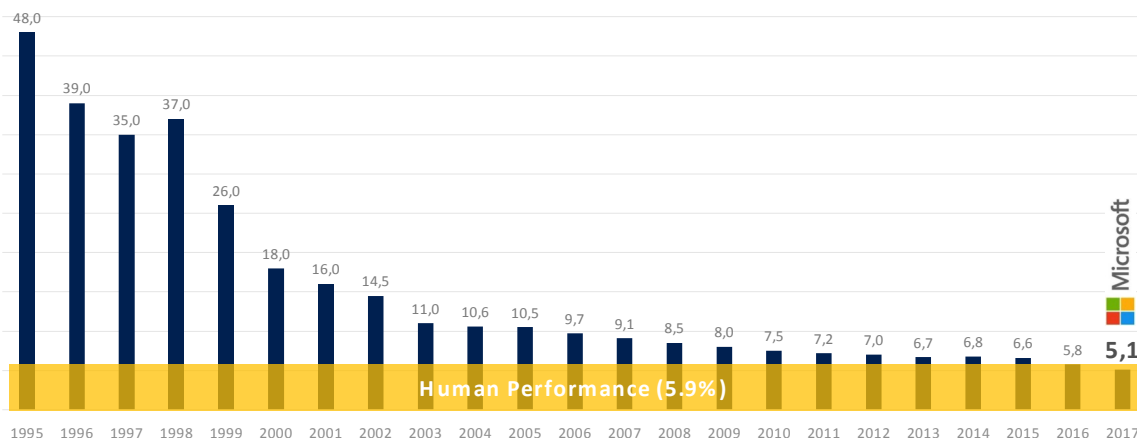
**Powerful
Algorithms**



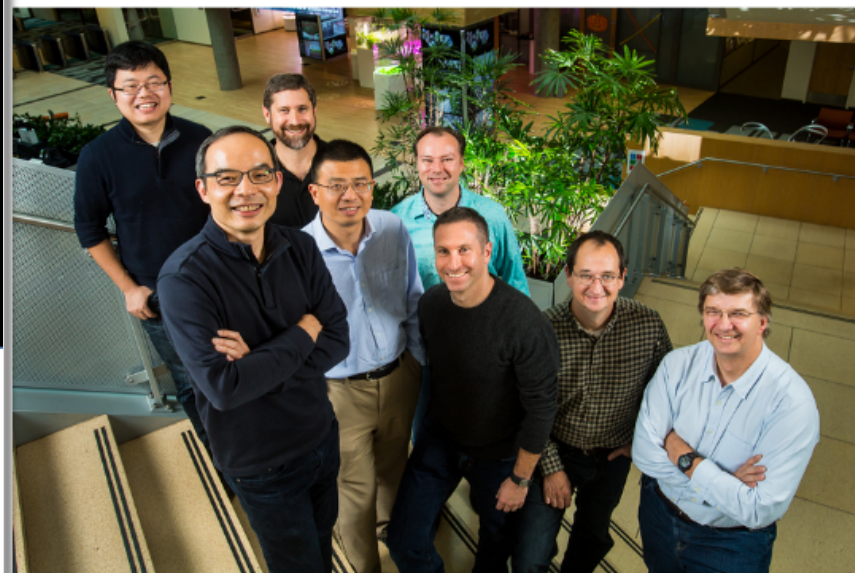
**Big Computing
in the Cloud**

VOICE RECOGNITION WITH 5.9% ERROR RATE REACHING HUMAN PARITY (October 18th, 2016)

Word Error Rate in NIST Switchboard Test (%)



Historic Achievement: Microsoft researchers reach human parity in conversational speech recognition



Microsoft researchers from the Speech & Dialogue research group include, from back left, Wayne Xiong, Geoffrey Zweig, Xuedong Huang, Dong Yu, Frank Seide, Mike Seltzer, Jasha Droppo and Andreas Stolcke. (Photo by Dan DeLong)

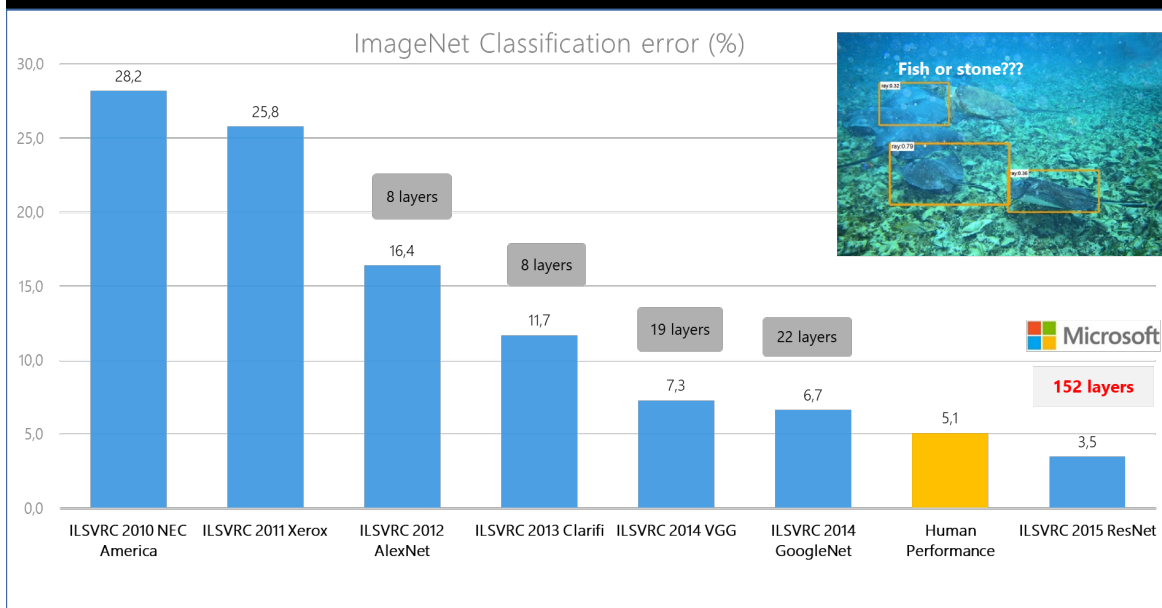
Posted October 18, 2016 By **Allison Linn**



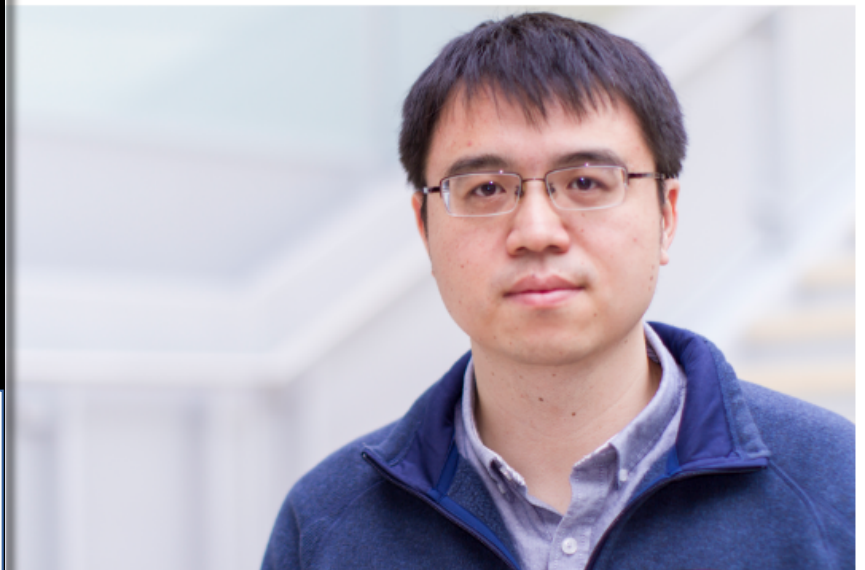
Microsoft has made a major breakthrough in speech recognition, creating a technology that recognizes the words in a conversation as well as a person does.

In a paper [published Monday](#), a team of researchers and engineers in Microsoft Artificial Intelligence and Research reported a speech recognition system that makes the same or fewer errors than professional transcriptionists. The researchers reported a word error

WORLD LEADING OBJECT RECOGNITION POWERED BY 152 LAYER DEEP NEURAL NETWORK



Microsoft researchers win ImageNet computer vision challenge



Jian Sun, a principal research manager at Microsoft Research, led the image understanding project. Photo: Craig Tuschhoff/Microsoft.

Posted December 10, 2015 By Allison Linn



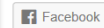
Microsoft researchers on Thursday announced a major advance in technology designed to identify the objects in a photograph or video, showcasing a system whose accuracy meets and sometimes exceeds human-level performance.

Microsoft's [new approach to recognizing images](#) also took first place in several major categories of image recognition challenges Thursday, beating out many other competitors from academic, corporate and research institutions in the [ImageNet](#) and [Microsoft Common Objects in Context](#) challenges.

QUESTION ANSWERING WITH 82.650 SCORE REACHING HUMAN PARITY (82.350) (January 15th, 2018)

Microsoft creates AI that can read a document and answer questions about it as well as a person

Jan 15, 2018 | [Allison Linn](#)



Microsoft researchers have created technology that uses artificial intelligence to read a document and answer questions about it about as well as a human.

It's a major milestone in the push to have search engines such as Bing and intelligent assistants such as Cortana interact with people and provide information in more natural ways, much like people communicate with each other.

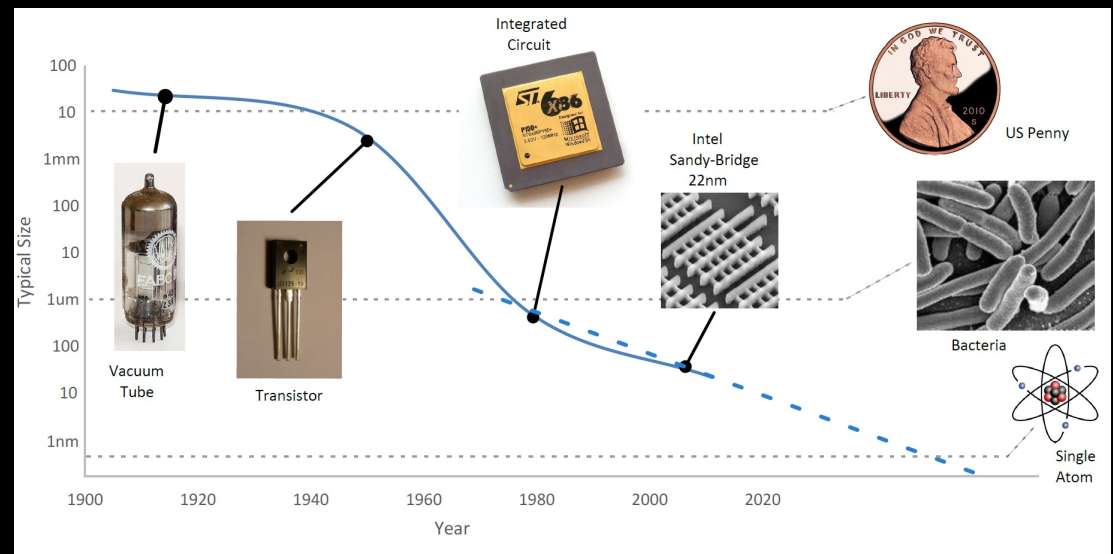
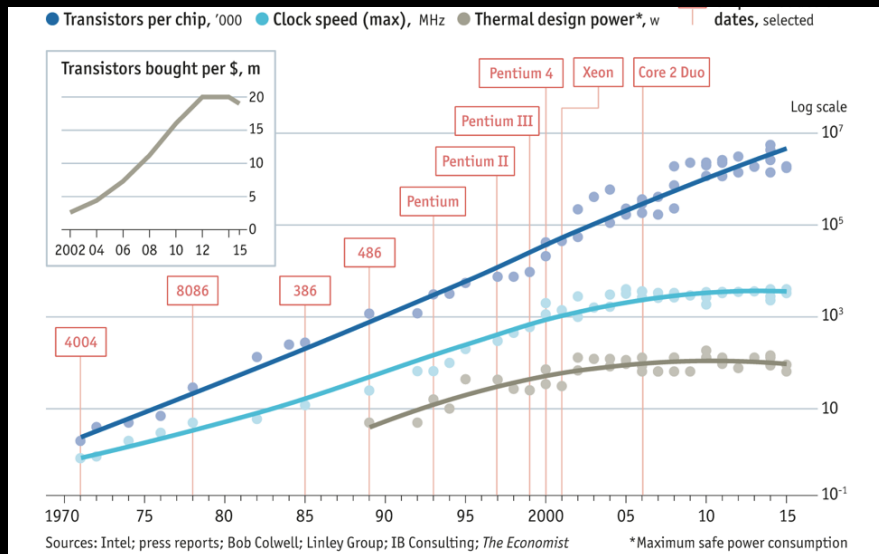
A team at [Microsoft Research Asia](#) reached the human parity milestone using the Stanford Question Answering Dataset, known among researchers as [SQuAD](#). It's a machine reading comprehension dataset that is made up of questions about a set of Wikipedia articles.

According to the SQuAD leaderboard, on Jan. 3, Microsoft submitted a model that reached the score of 82.650 on the exact match portion. The human performance on the same set of questions and answers is 82.304. On Jan. 5, researchers with the Chinese e-commerce company Alibaba submitted a score of 82.440, also about the same as a human.

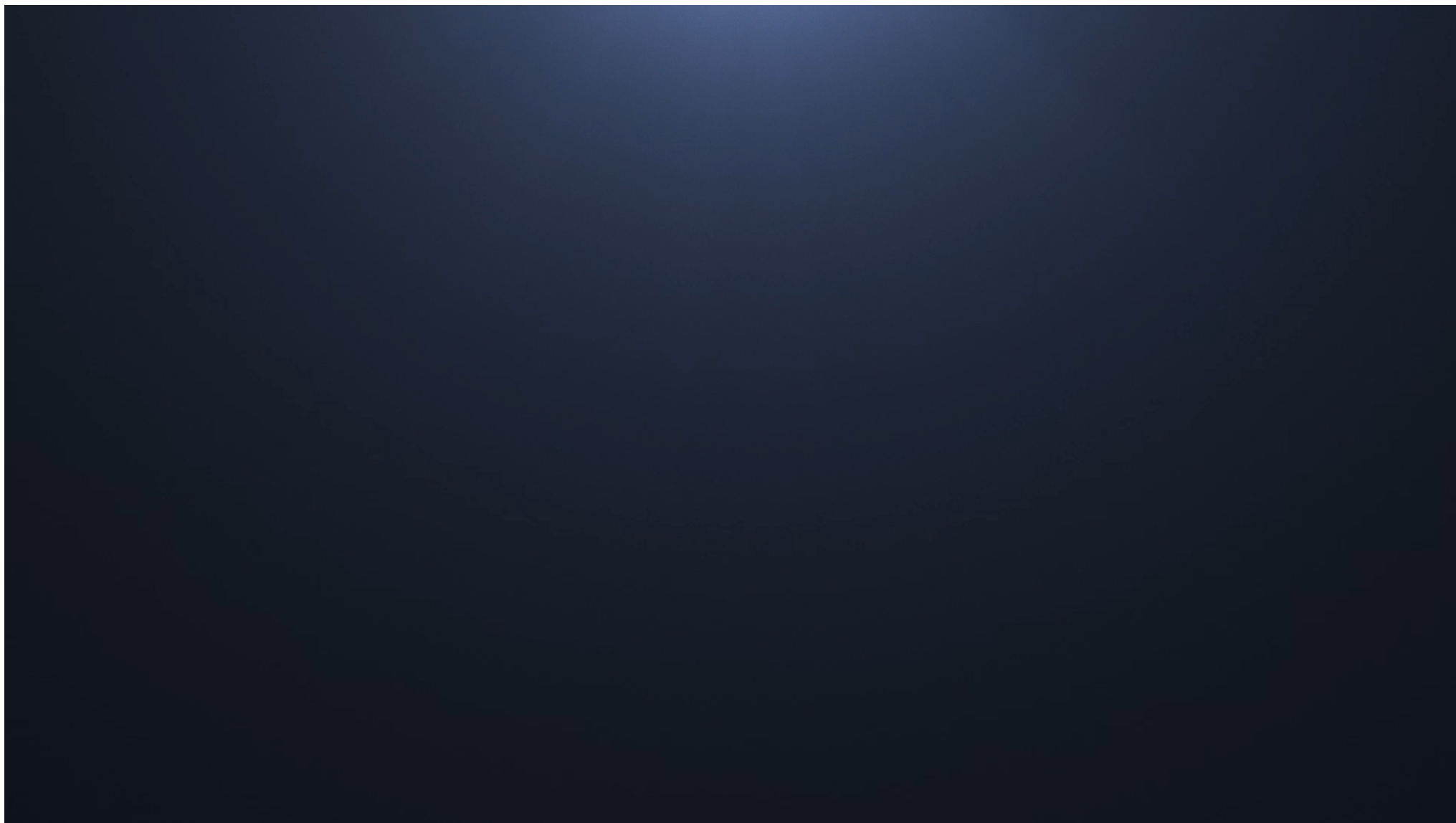
The two companies are currently tied for first place on the SQuAD "leaderboard," which lists the results of research organizations' efforts.

Microsoft has made a significant investment in machine reading comprehension as part of its effort to create

Where can we get?

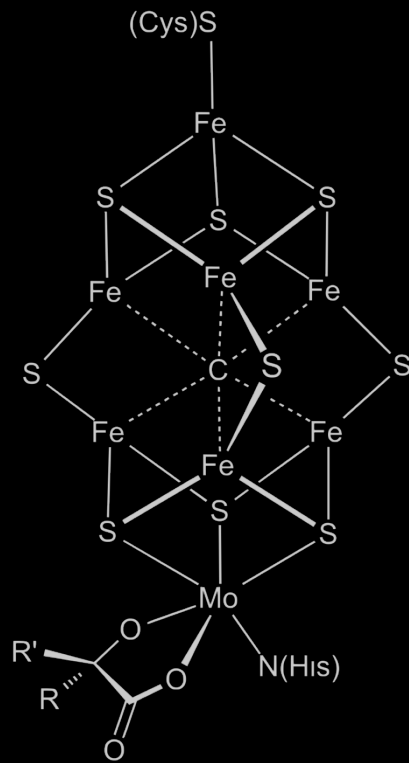








Intractable problems



(FeMoCo)

