

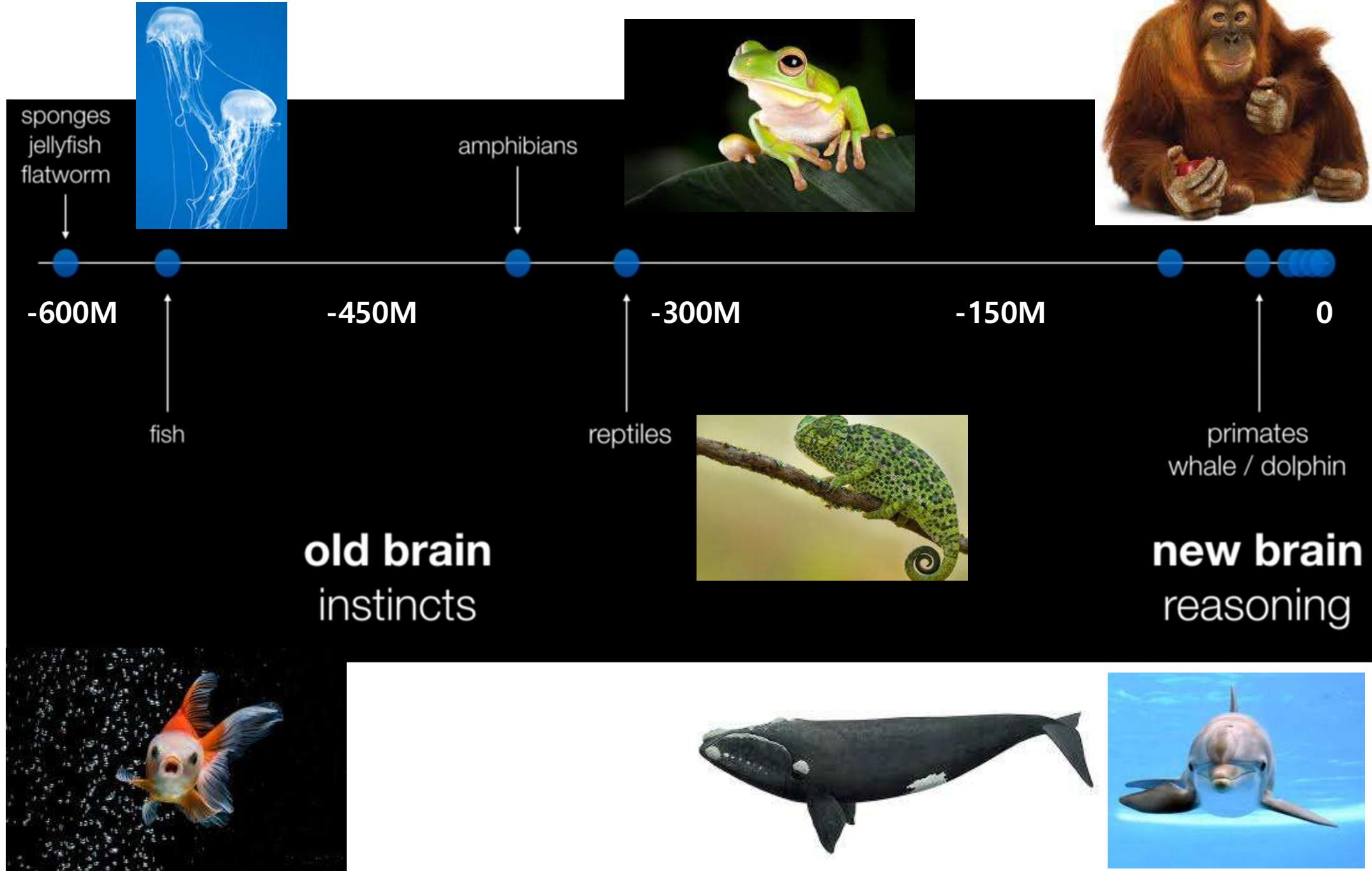
AI: Past, Present, and Future

Jae Yun JUN KIM

ECE Paris

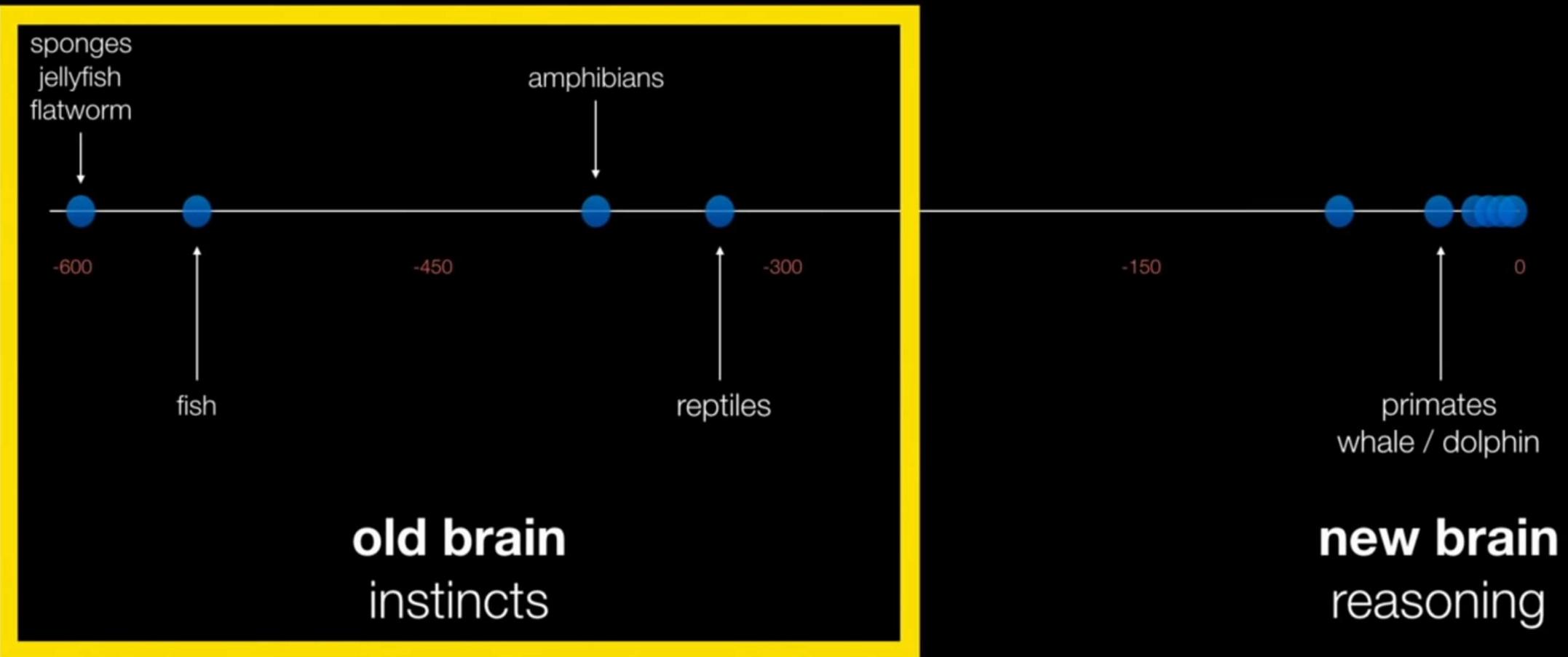
September 28, 2020

Motivation: old brains vs. new brains



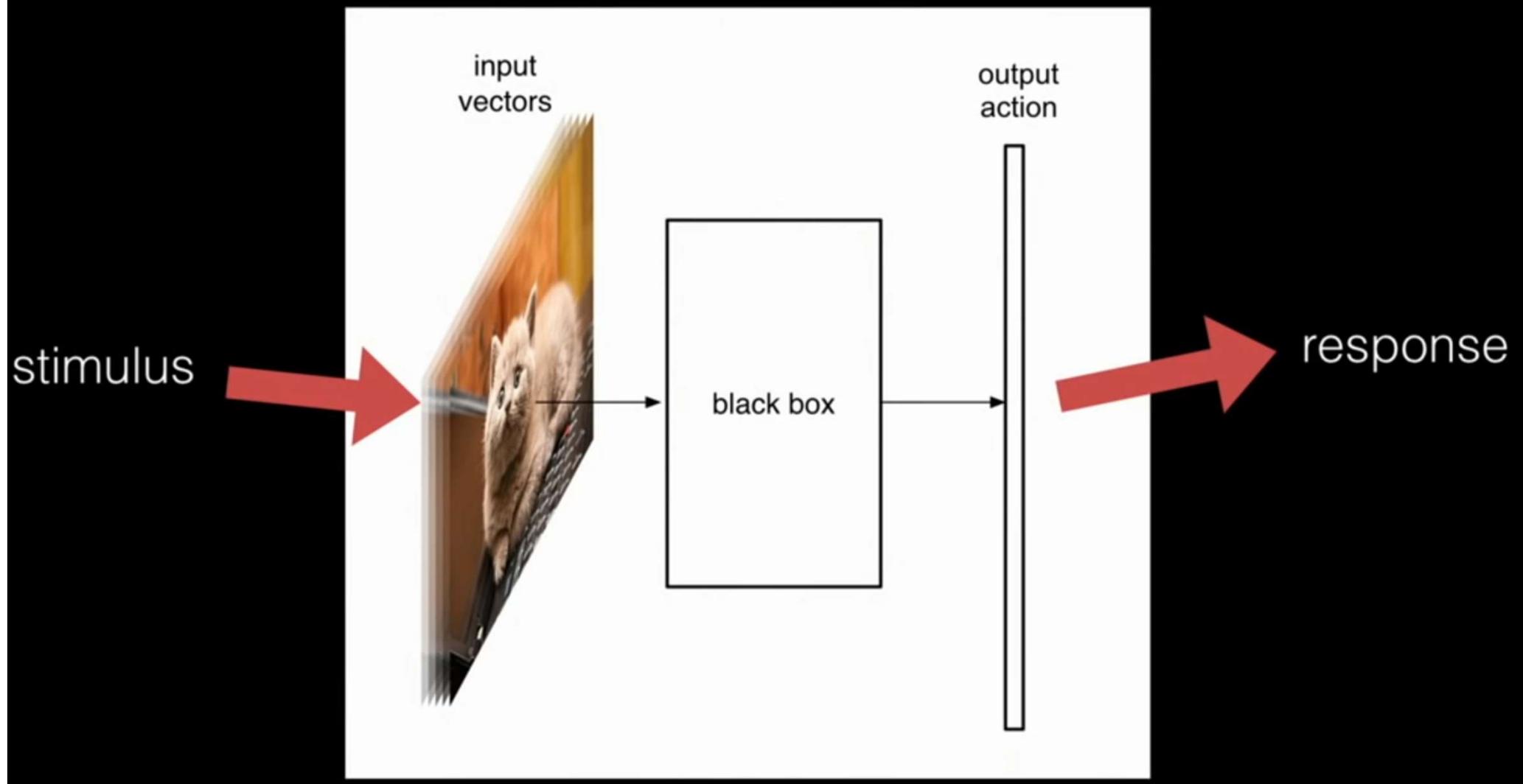
Motivation: old brains vs. new brains

Deep Learning

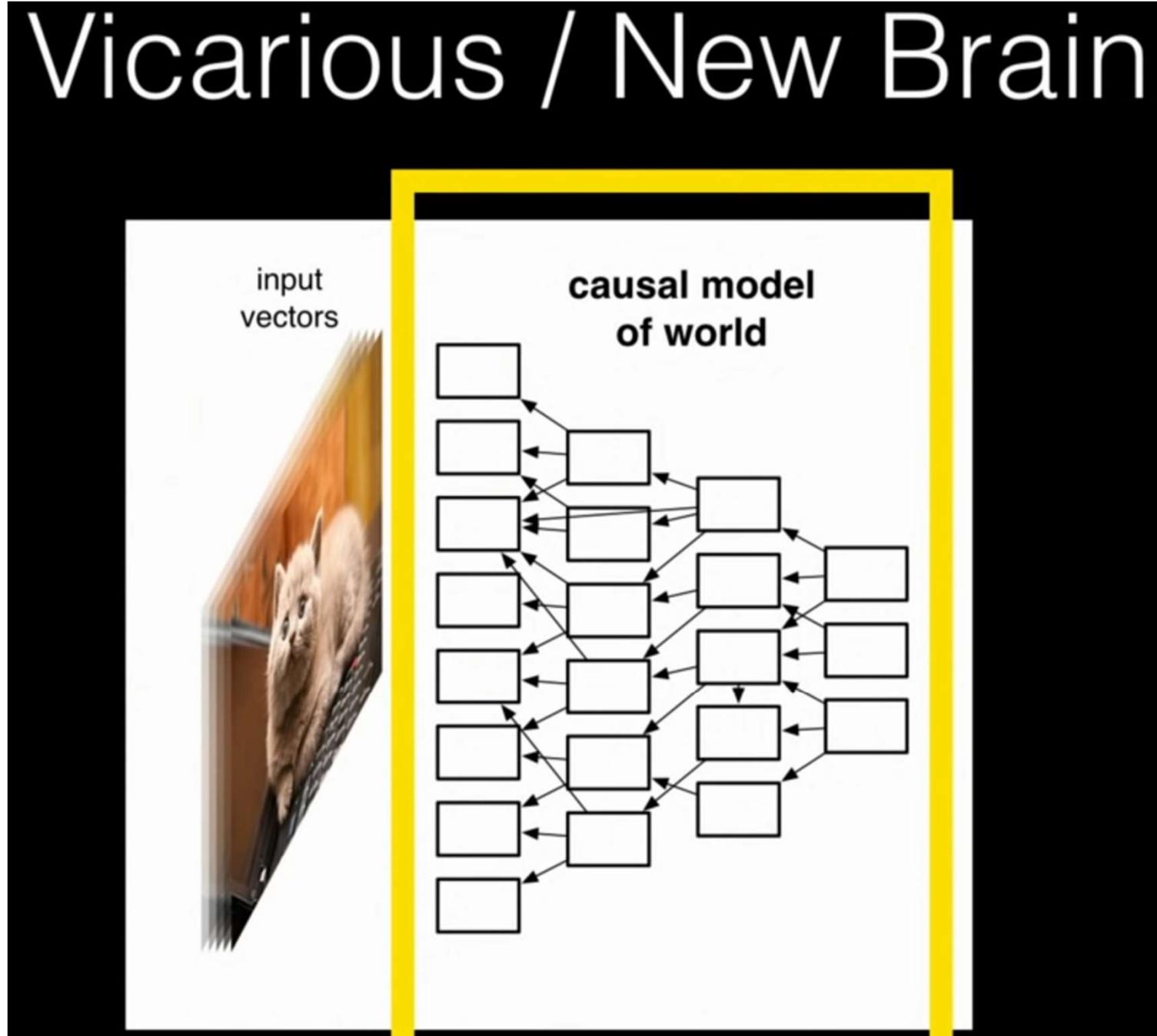


Motivation: old brains vs. new brains

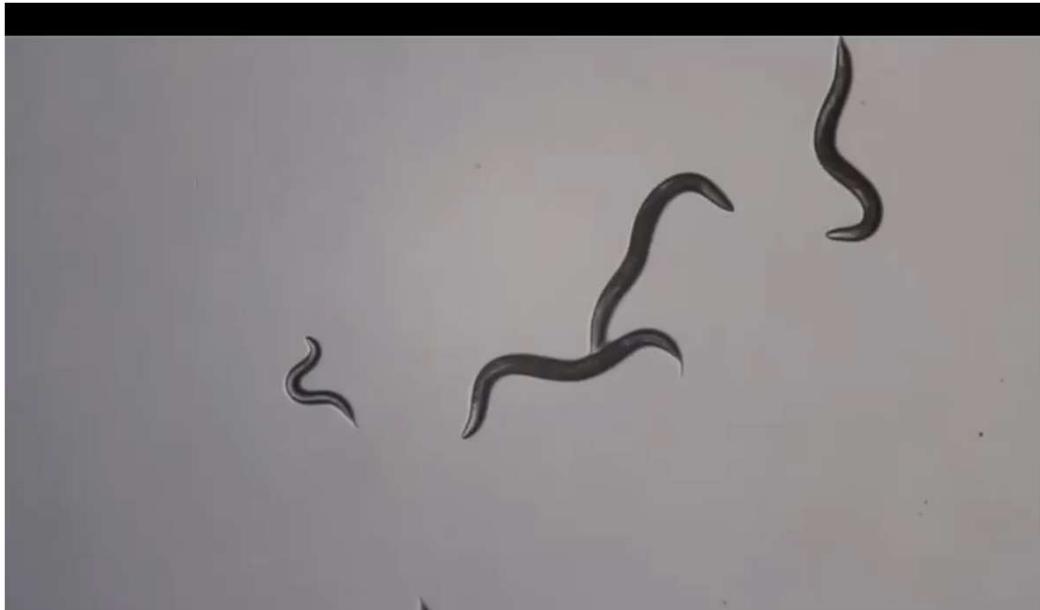
Deep Learning / Old Brain



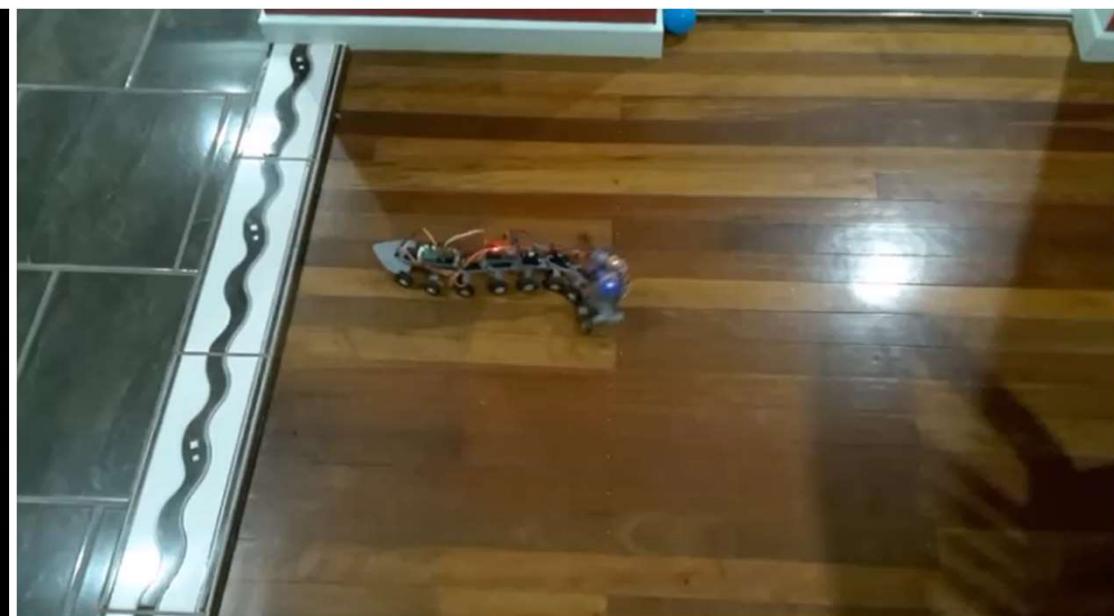
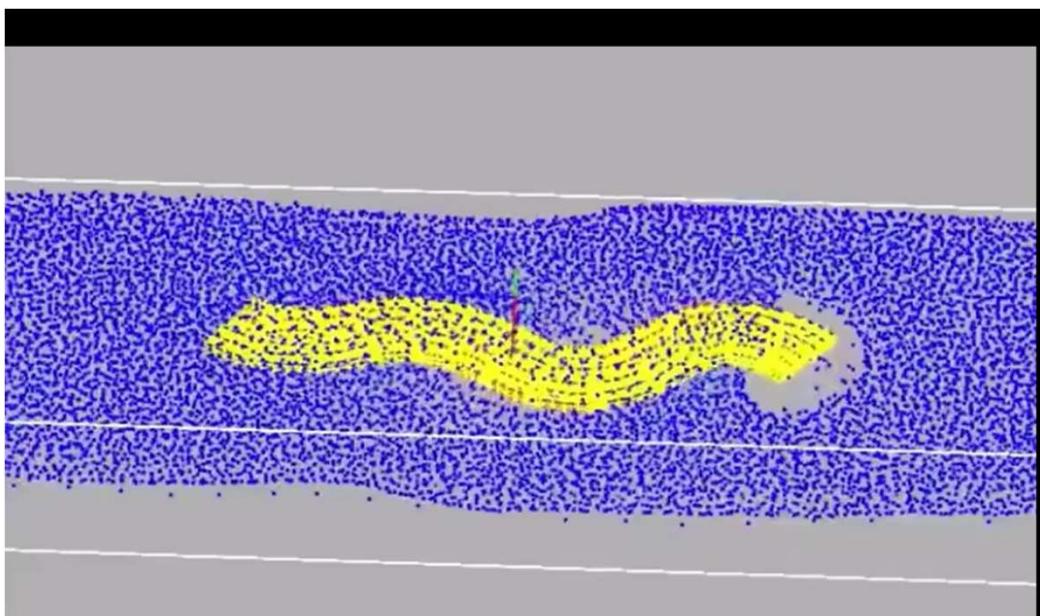
Motivation: old brains vs. new brains



Old brain: OpenWorm Project: C. Elegans



C. Elegans: 302 neurons | a few thousands synapses



Intelligence can be defined as

- the ability to learn how to address various problems.
- the ability to perceive or infer information, and to retain it as knowledge to be applied towards adaptive behaviors within an environment or context.

Artificial Intelligence (AI) can be defined as

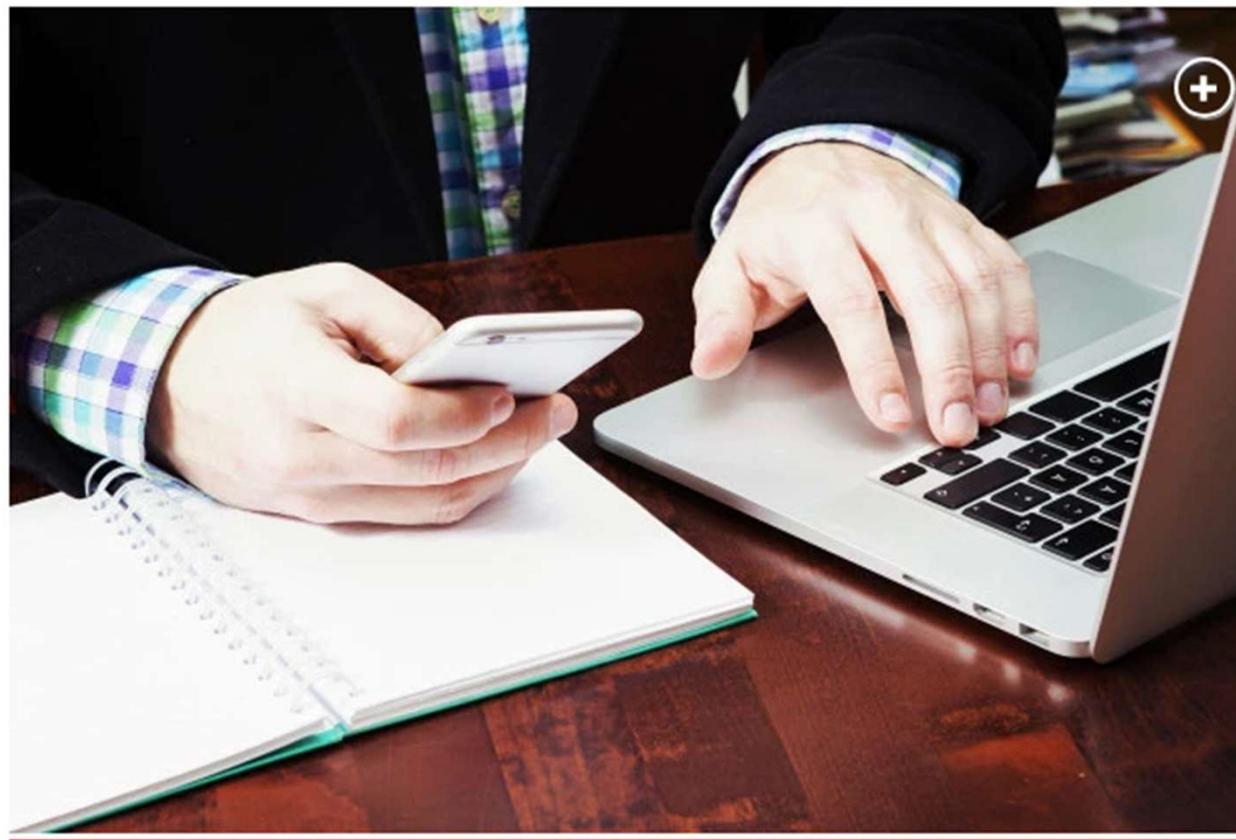
- the ability that a machine has to act adaptively in any given situation.
- the ability that a machine has to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation.

Examples of AI

AI already reads your resume – now it's going to interview you, too

By Erika Prafder

December 4, 2017 | 8:38am | Updated



Shutterstock

Examples of AI

Dating apps use artificial intelligence to help search for love

November 8, 2018 by Daniel Silva



Tinder founder Sean Rad told the Web Summit in Lisbon that AI will "create better user experiences"

Examples of AI

36,357 views | Feb 12, 2019, 04:00am

Here's What Happened When IBM's Advanced AI Machine Challenged An International Debate Champion



Carmine Gallo Senior Contributor

Leadership Strategy

I write about leadership communication to grow sales and build brands.



IBM's most advanced AI machine challenges a record-setting human debate champion.

GALLO COMMUNICATIONS

Examples of AI

GOVERNMENT

US defense department outlines its AI strategy



By [Ryan Daws](#)

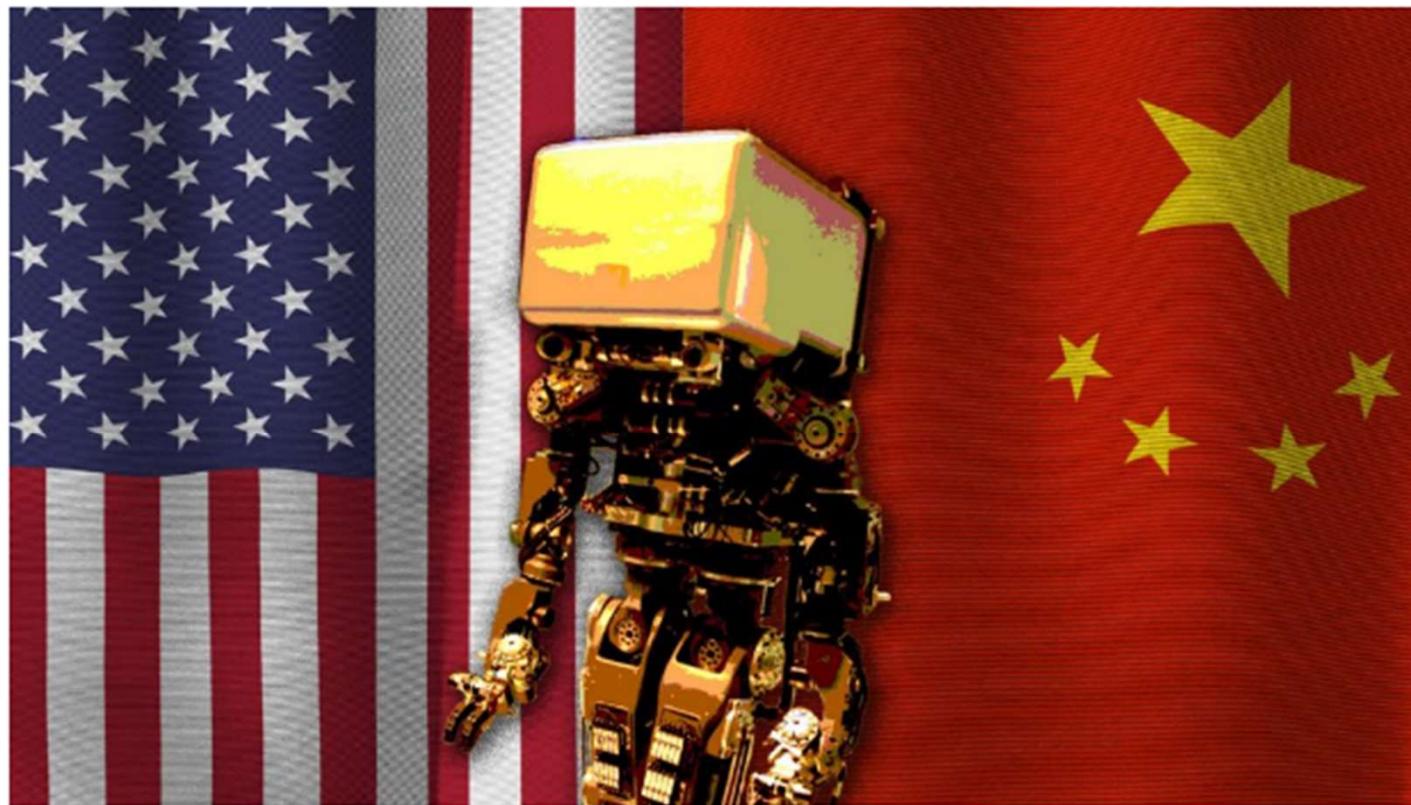
Editor of AI News. A gadget lover, music purveyor, and ex-host of a consumer technology show.

Posted on February 14, 2019



China is rapidly developing its military AI capabilities

By Matt Field, February 8, 2019



RELATED I

Credit: Matt Field. Based in part on photo by Morio CC SA 3.0 via Wikimedia Commons.

Examples of AI

13,837 views | Dec 5, 2018, 07:15am

How Artificial Intelligence Is Helping Financial Institutions



Sameer Maskey Forbes Councils
Forbes Technology Council CommunityVoice

POST WRITTEN BY

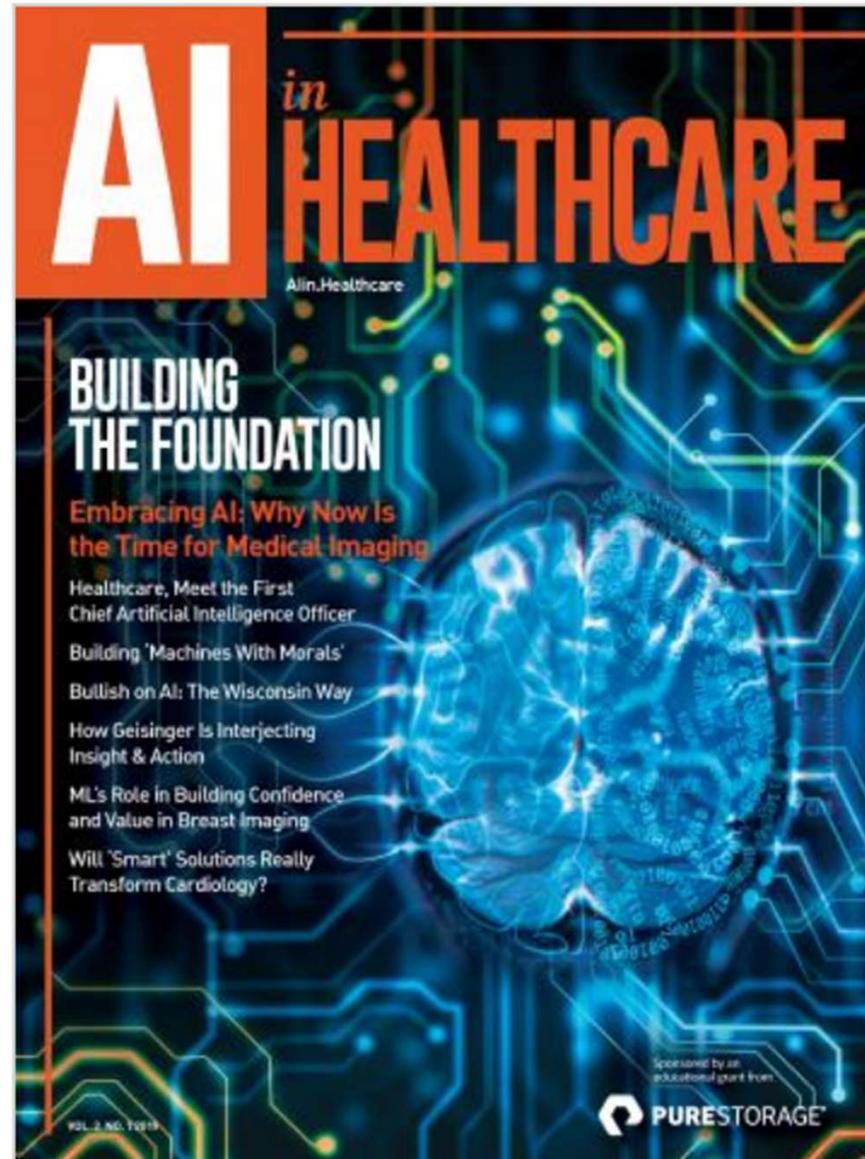
Sameer Maskey

Founder and CEO at [Fusemachines](#), an AI solutions and services provider based in NYC.



Getty

Examples of AI



Examples of AI

The Self-Driving Car Timeline – Predictions from the Top 11 Global Automakers



Last updated on February 19, 2019, published by Jon Walker

Jon Walker covers broad trends at the intersection of AI and industry. He has reported on politics and policy issues for news organizations including National Memo, Massroots, NBC, and is a published science fiction author.

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The image shows a screenshot of an article from Emerj. The title is "The Self-Driving Car Timeline". A white Tesla Model X is shown on the right side of the image. The background is blue with a network of white lines. The Emerj logo is in the top right corner. There is a black button-like shape containing the text "Comprehensive Overview".

Examples of AI

8,172 views | Oct 25, 2018, 08:29pm

What Happens Now That An AI-Generated Painting Sold For \$432,500?



William Falcon Contributor

Science

I write about AI, its business use and ethical use.

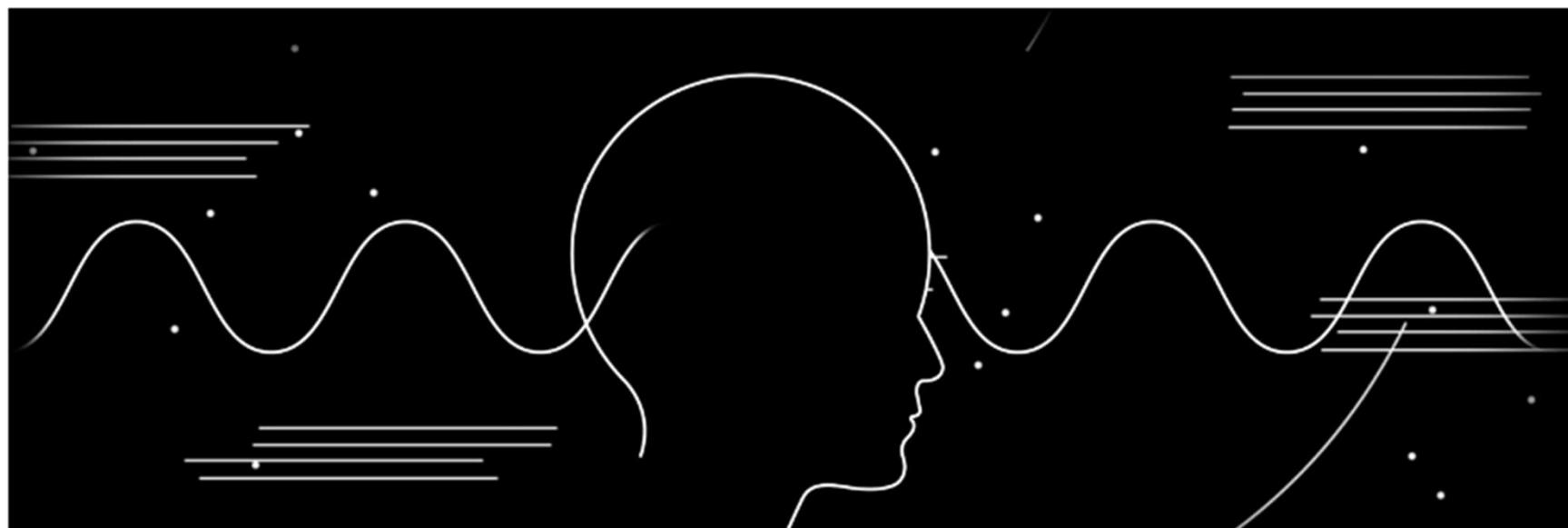


Portrait of Edmond Belamy, 2018, created by GAN (Generative Adversarial Network).

AI-music startup Endel to release albums through Warner Music

March 22, 2019

Tags: [Alexa](#) [amazon](#) [Artificial Intelligence](#) [Endel](#) [smart speakers](#) [Warner Music](#)



Examples of AI

AlphaGo: Google-developed AI beats South Korean Go grandmaster Lee Se-dol in first contest

Updated 9 Mar 2016, 9:26pm



PHOTO: South Korean professional Go player Lee Se-Dol puts the first stone against Google's artificial intelligence program, AlphaGo. (Getty Images)

Examples of AI

4,666 views | Jan 25, 2019, 03:56am

DeepMind AI Beats Professional Human StarCraft II Players



Sam Shead Contributor 

AI & Big Data

I cover artificial intelligence and Google DeepMind.



StarCraft II gameplay

DEEPMIND

Examples of AI



PITTSBURGH

HOME

CASINO4FUN

CASINO >

PROMOTIONS >

DINING >

ENTERTAINMENT >

VISIT >

EVENTS & WEDDINGS >

EMPLOYMENT



MY RUSH REWARDS
LOGIN >



777 Casino Dr.
Pittsburgh, PA 15212
412-231-7777 (Local)

The top half of the image shows a promotional graphic for a poker tournament. It features a red background with a yellow circle containing the text 'IT'S BACK!' and a hand of cards where the Aces are replaced by brain icons. The main title is 'BRAINS VS. ARTIFICIAL INTELLIGENCE RE-MATCH!' in large, bold, white and yellow letters. Below it is a banner stating 'WE ARE UPPING THE ANTE! 120,000 HANDS NO-LIMIT HOLD 'EM'. The bottom half is a photograph of five men standing together indoors. From left to right: a man in a brown sweater, a young man in a black jacket, a man in a dark suit and tie, a man in a grey t-shirt under a black leather jacket, and a man in a light blue shirt. They are all smiling. In the background, there's a screen showing the event details and some slot machine displays.

Examples of AI

The New York Times

Building A.I. That Can Build A.I.

Google and others, fighting for a small pool of researchers, are looking for automated ways to deal with a shortage of artificial intelligence experts.



Google Reveals Automatic Machine Learning: A.I. Can Create Itself

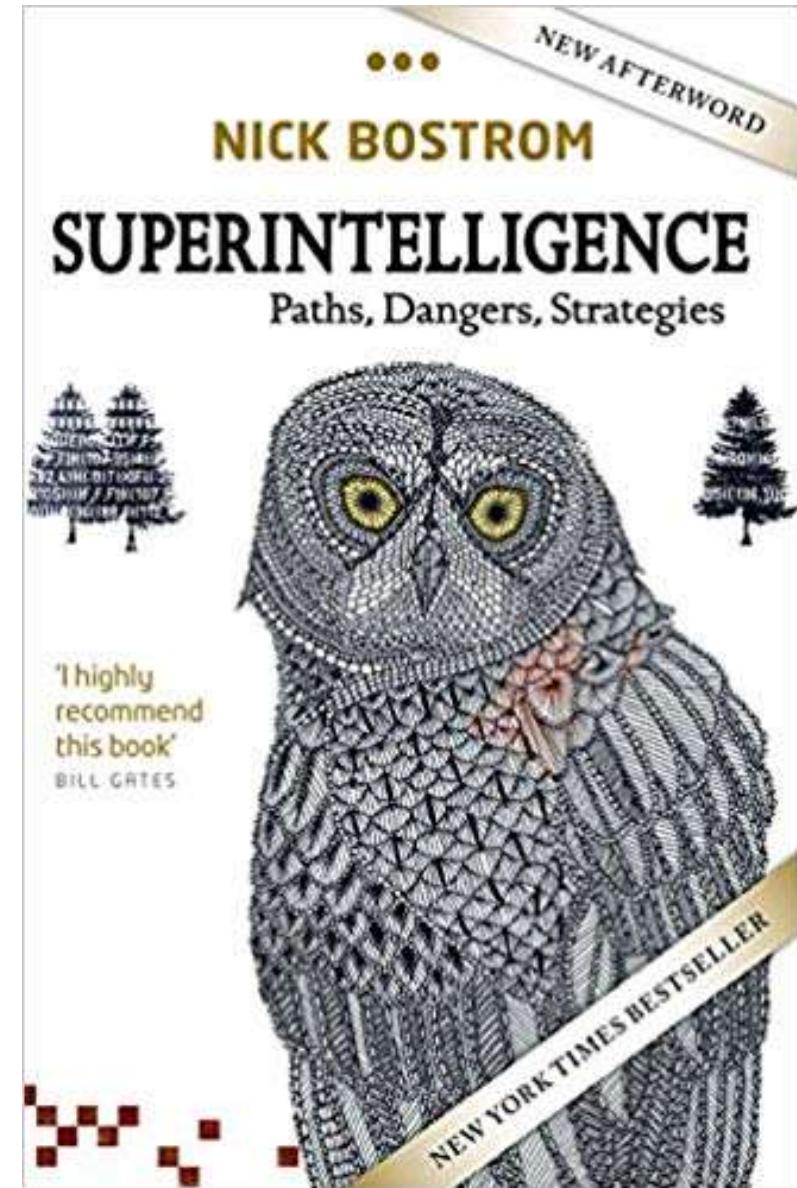


By [Graham Templeton](#) on May 23, 2017

Filed Under [Innovation](#), [Algorithms](#), [Coding](#), [Evolution](#), [Google](#), [Machine Learning](#) & [Singularity](#)

Superintelligence can be defined as

- the cognitive ability that surpasses the intelligence of the best human brain.
- any intellect that radically outperforms even the best human brains in all practically relevant fields.



Intelligence explosion can be defined as

- the theory that talks about the fact that, when machines can produce better machines, humans will no longer surpass the intelligence of machines.
- the fact that machines descendants will be more powerful than humans descendants.



Advances in Computers
Volume 6, 1966, Pages 31-88

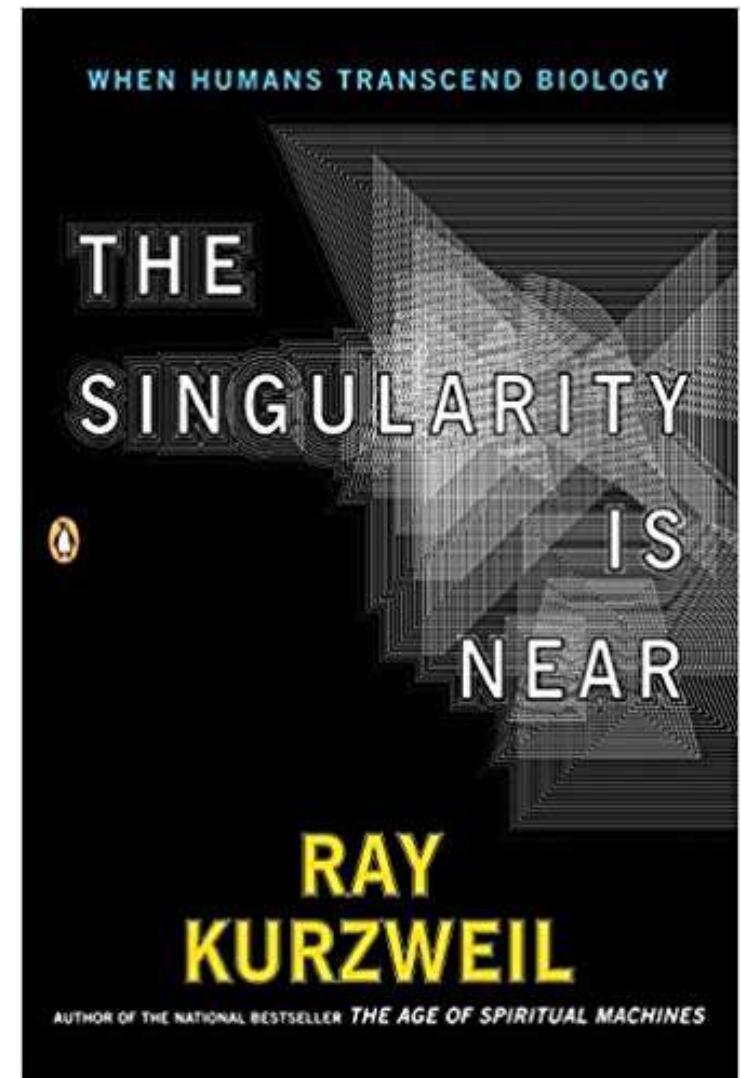


Speculations Concerning the First Ultraintelligent Machine *

Irving John Good

Technological singularity can be defined as

- the time instant at which the superintelligence takes place.
- the time instant at which the evolution of artificial intelligence accelerates and surpasses the humans' intelligence in every domain.



When the **technological singularity** would take place?

Future Progress in Artificial Intelligence: A Survey of Expert Opinion

Vincent C. Müller^{a,b} & Nick Bostrom^a

^{a)} Future of Humanity Institute, Department of Philosophy & Oxford Martin School,
University of Oxford. ^{b)}Anatolia College/ACT, Thessaloniki

When Will AI Exceed Human Performance? Evidence from AI Experts

Katja Grace^{1,2}, John Salvatier², Allan Dafoe^{1,3}, Baobao Zhang³, and Owain Evans¹

¹ *Future of Humanity Institute, Oxford University*

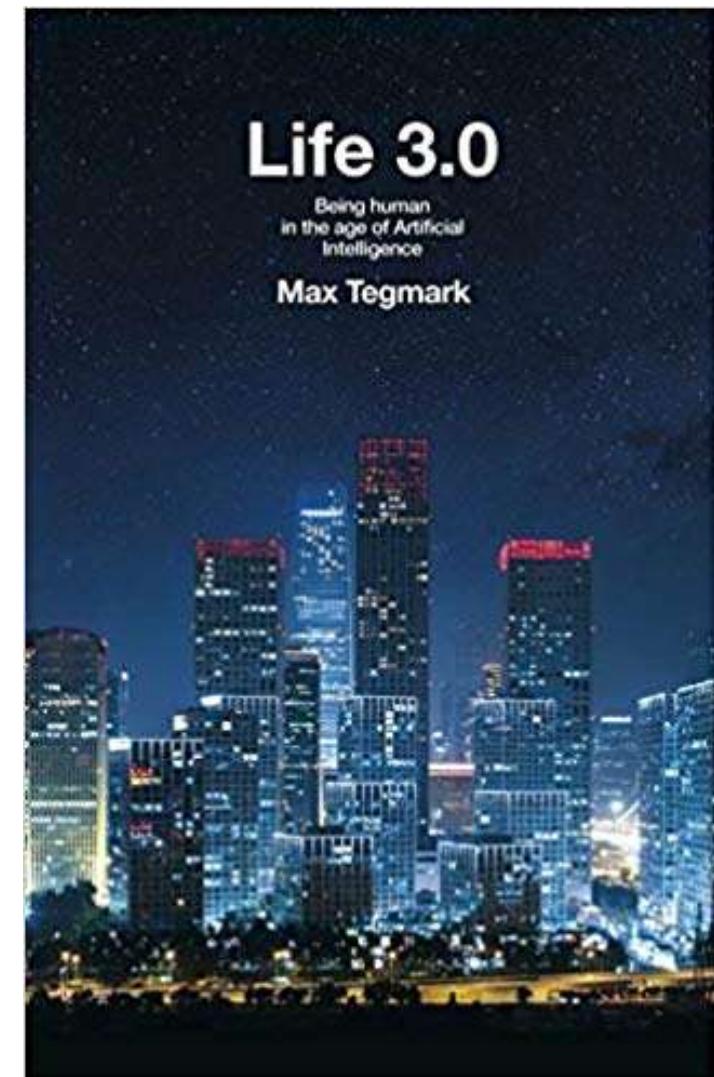
² *AI Impacts*

³ *Department of Political Science, Yale University*

Between 2040 and 2045

Life 1.0, Life 2.0, and Life 3.0

- **Life 1.0:** life of bacteria, who cannot learn anything.
- **Life 2.0:** life of humans, who can learn. This learning capability allowed us to be the most powerful organisms on the planet.
- **Life 3.0:** life of machines, who can learn not only software but also hardware, and who will surpass humans' intelligence.



Fear of superintelligence

ROBOSTOP Facebook shuts off AI experiment after two robots begin speaking in their OWN language only they can understand

Experts have called the incident exciting but also **incredibly scary**

By James Beal and Andy Jebring

1st August 2017, 12:03 am | Updated: 2nd August 2017, 4:56 am

Fear of superintelligence



SCIENCE

Stephen Hawking warns that AI could completely destroy mankind



Mike Wehner @MikeWehner

November 7th, 2017 at 2:58 PM

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Fear of superintelligence

Microsoft's Bill Gates insists AI is a threat

By Kevin Rawlinson
BBC News

⌚ 29 January 2015

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Bill Gates said he could not understand why people were not concerned by AI

Fear of superintelligence

Elon Musk on artificial intelligence: 'We're summoning the demon'

[News](#) | Updated Oct 27, 2014

By Matt Picht

Fear of superintelligence

Musk and Zuckerberg clash over future of AI

By Jane Wakefield
Technology reporter

⌚ 25 July 2017

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GETTY IMAGES

Elon Musk is worried that artificial intelligence could eventually destroy humanity

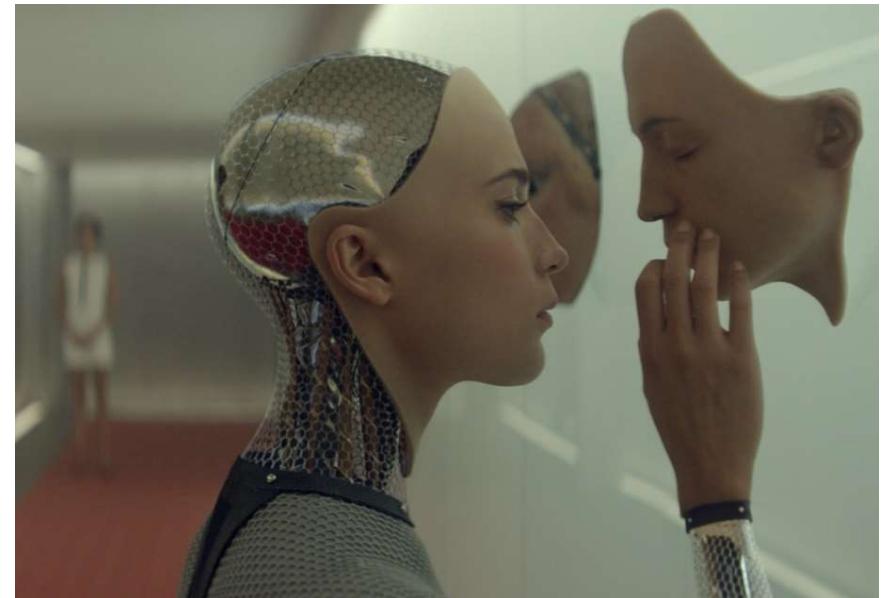
Fear of superintelligence



AI allows us ...

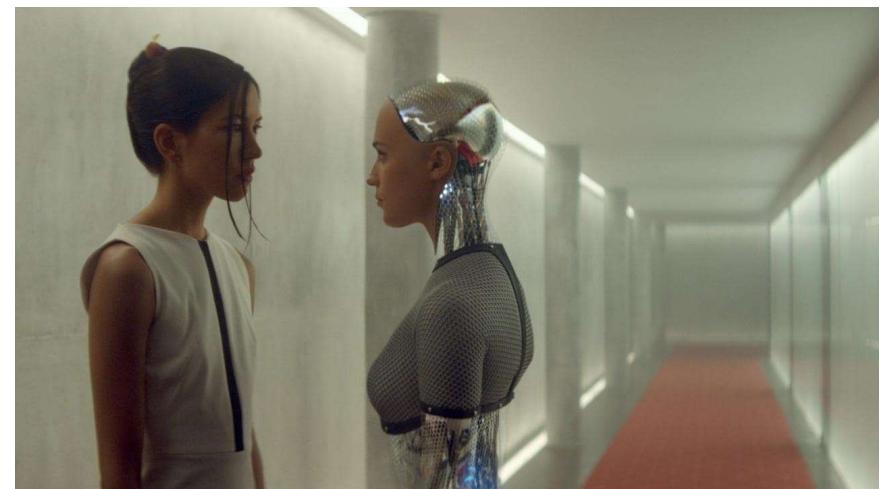
to study about **metacognition**

- Knowing about knowing
- Thinking about thinking



to **reverse-engineer**

- Who am I?
- What am I?



What is AI for you?