

THE SECOND MACHINE AGE

WORK, PROGRESS
IN A TIME OF
BRILLIANT TECHNOLOGY

ERIK BRYNJOLFSSON
ANDREW MCAFEE

HARNES
THE DIGITAL
REVOLUTION

MACHINE PLATINUM CROWD

ANDREW
ERIK BRYN

MORE

FROM LESS

THE SURPRISING STORY OF HOW WE LEARNED
TO PROSPER USING FEWER RESOURCES
—AND WHAT HAPPENS NEXT

ANDREW MCAFEE

New York Times Bestselling Coauthor of **THE SECOND MACHINE AGE**

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Minds and Machines

Minds and Machines

Playing Games



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GOODS



Kasparov has Deep Blues after losing

Chess champ: I was rooked

By **MICHELE McPHEE,**
K.C. BAKER
and **CORKY SIEMASZKO**

Daily News Staff Writers

The world's greatest human chess player threw a tantrum and cried foul yesterday after being thrashed by a supercomputer.

It took IBM's Deep Blue just 19 moves to defeat world chess champion Garry Kasparov — a stunning finale to an epic week-long battle of man versus machine.

Not mollified by his \$400,000 loser's share, Kasparov stormed off like a sore loser after resigning. He later accused IBM of unfairly programing the high-speed computer to beat him specifically

Unable to find a way out, Kasparov — playing the black pieces — tipped his king and resigned. He buried his head in his hands and didn't look at IBM's Tan when they shook hands.

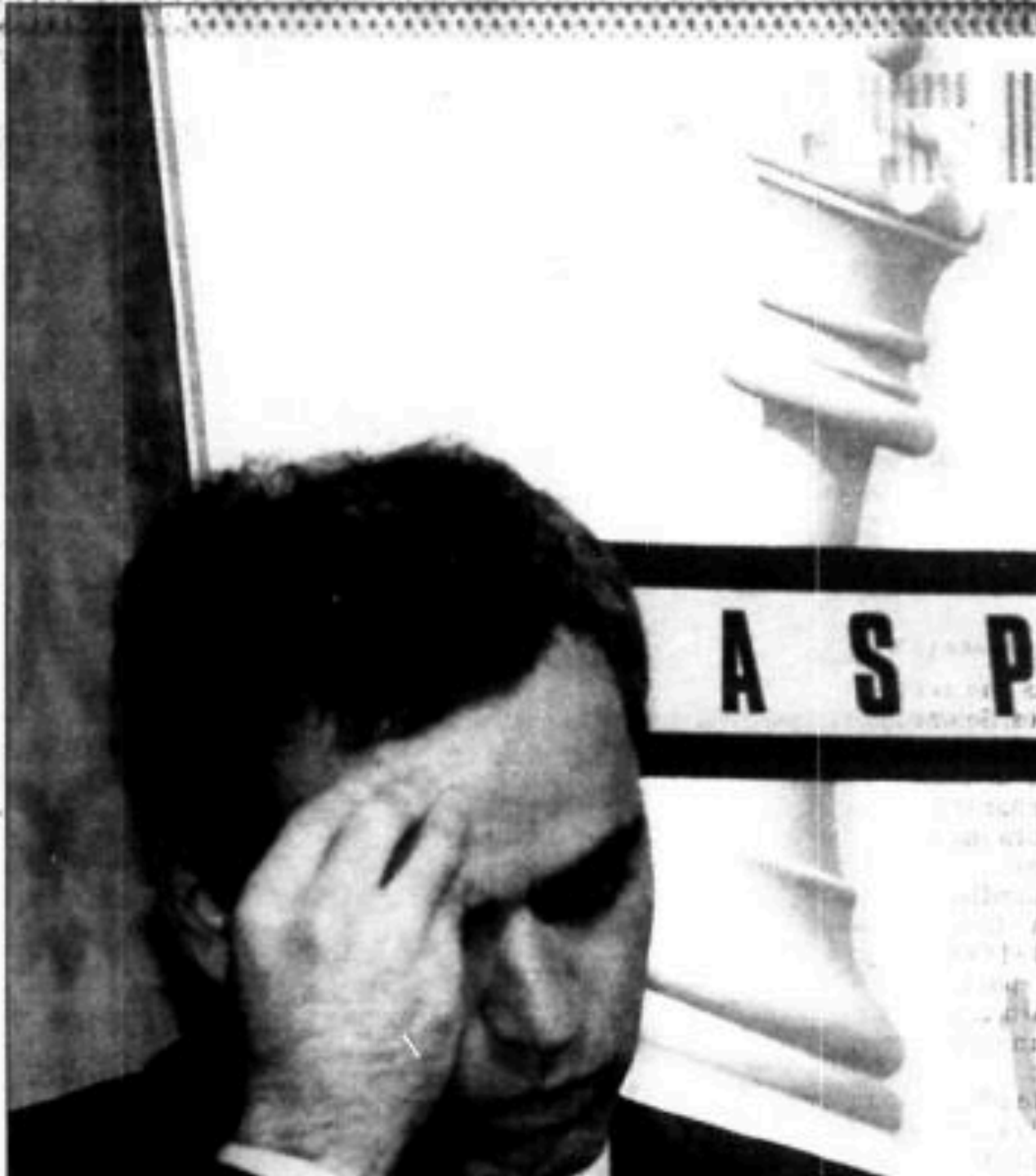
The final score was 3½ points for the computer and 2½ points for Kasparov.

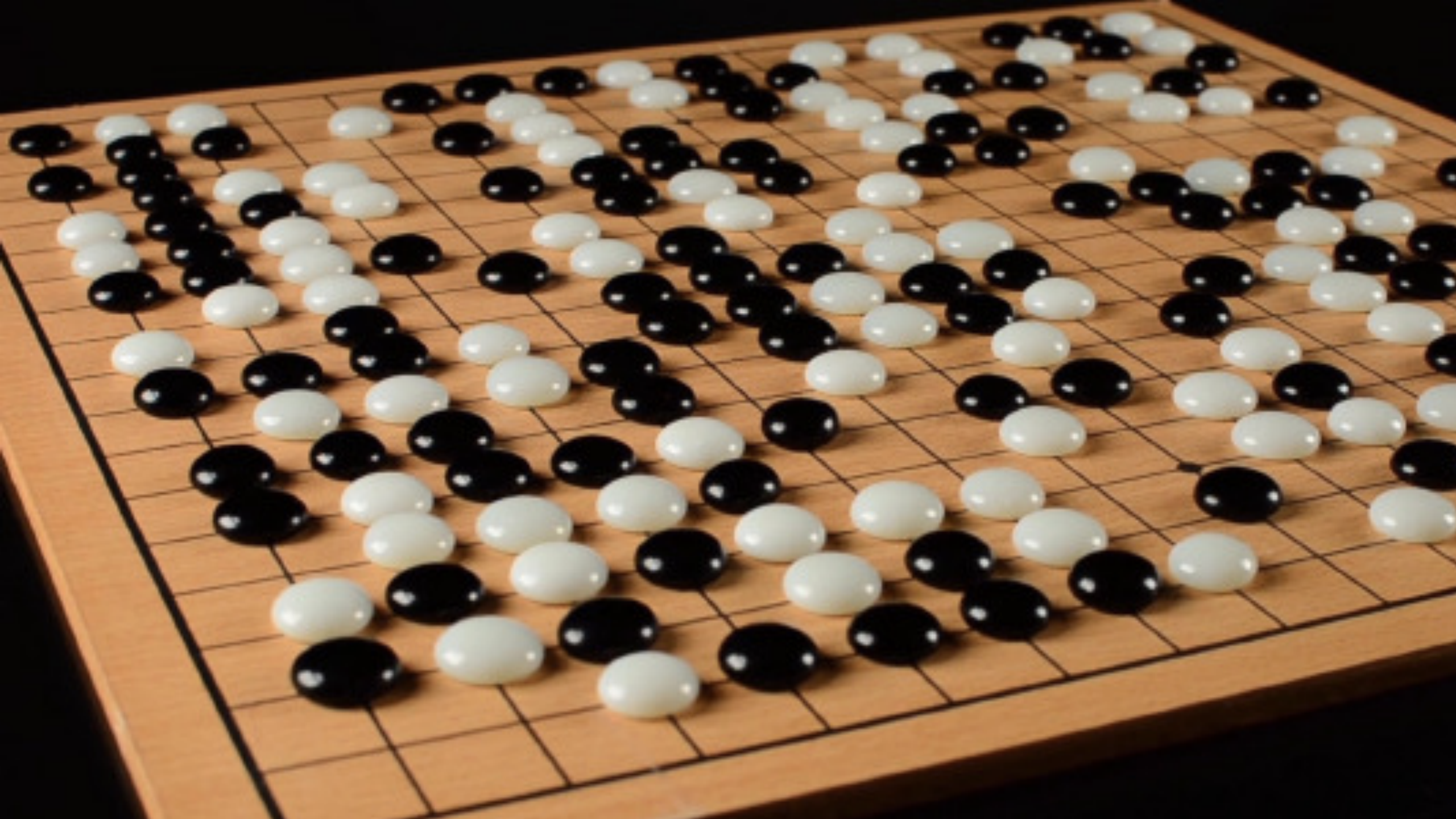
Kasparov said he "cracked under the pressure."

"I am ashamed," said Kasparov, who would have won \$700,000 if he had beaten the computer.

Patrick Wolff, author of "The Complete Idiot's Guide to Chess," said the world champ "basically cracked."

Kasparov, playing black, used a standard defense known as the "Caro-Kann," forcing white to sacrifice a piece. But for some reason he





The Mystery of Go, the Ancient Game That Computers Still Can't Win

BY ALAN LEVINOVITZ 05.12.14 | 6:30 AM | [PERMALINK](#)

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'I'LL SEE A MOVE AND BE SURE IT'S THE RIGHT ONE, BUT WON'T BE ABLE TO TELL YOU EXACTLY HOW I KNOW. I JUST SEE IT.'

The trouble is that identifying Go moves that deserve attention is often a mysterious process. "You'll be looking at the board and just know," Redmond told me, as we stood in front of the projector screen watching Crazy Stone take back Nomitan's initial lead. "It's something subconscious, that you train through years and years of playing. I'll see a move and be sure it's the right one, but won't be able to tell you exactly how I know. I just see it."

“We know more than we can tell”

- Michael Polanyi

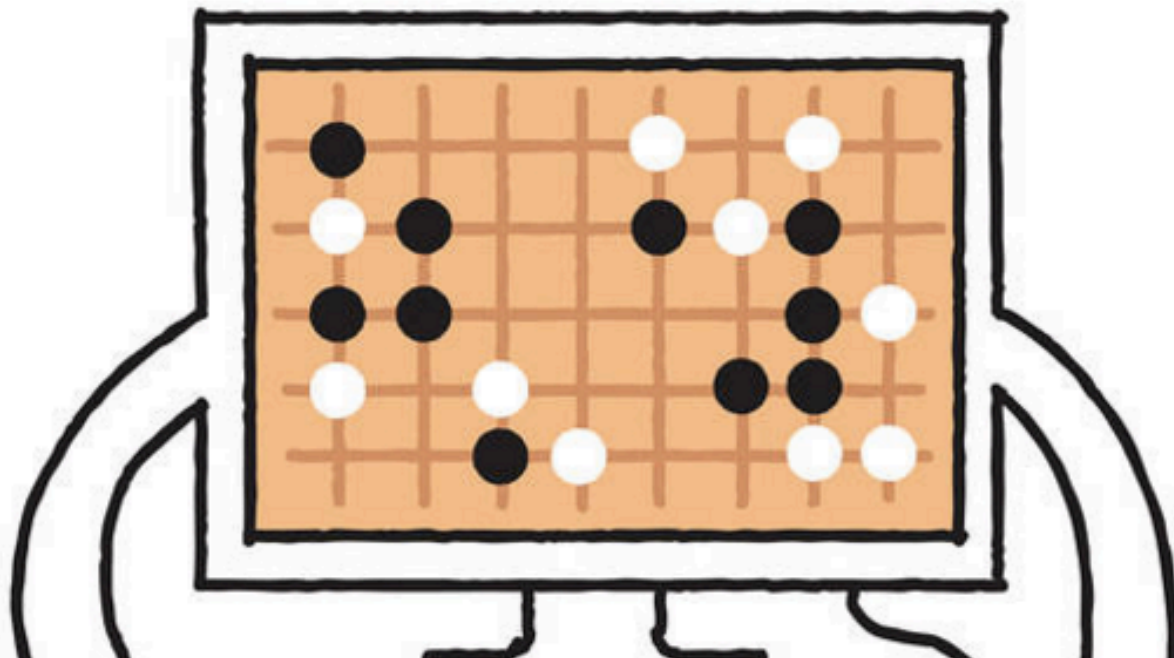
By **CHRISTOPHER CHABRIS**

Dec. 30, 2015 11:37 a.m. ET

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Why Go Still Foils the Computers

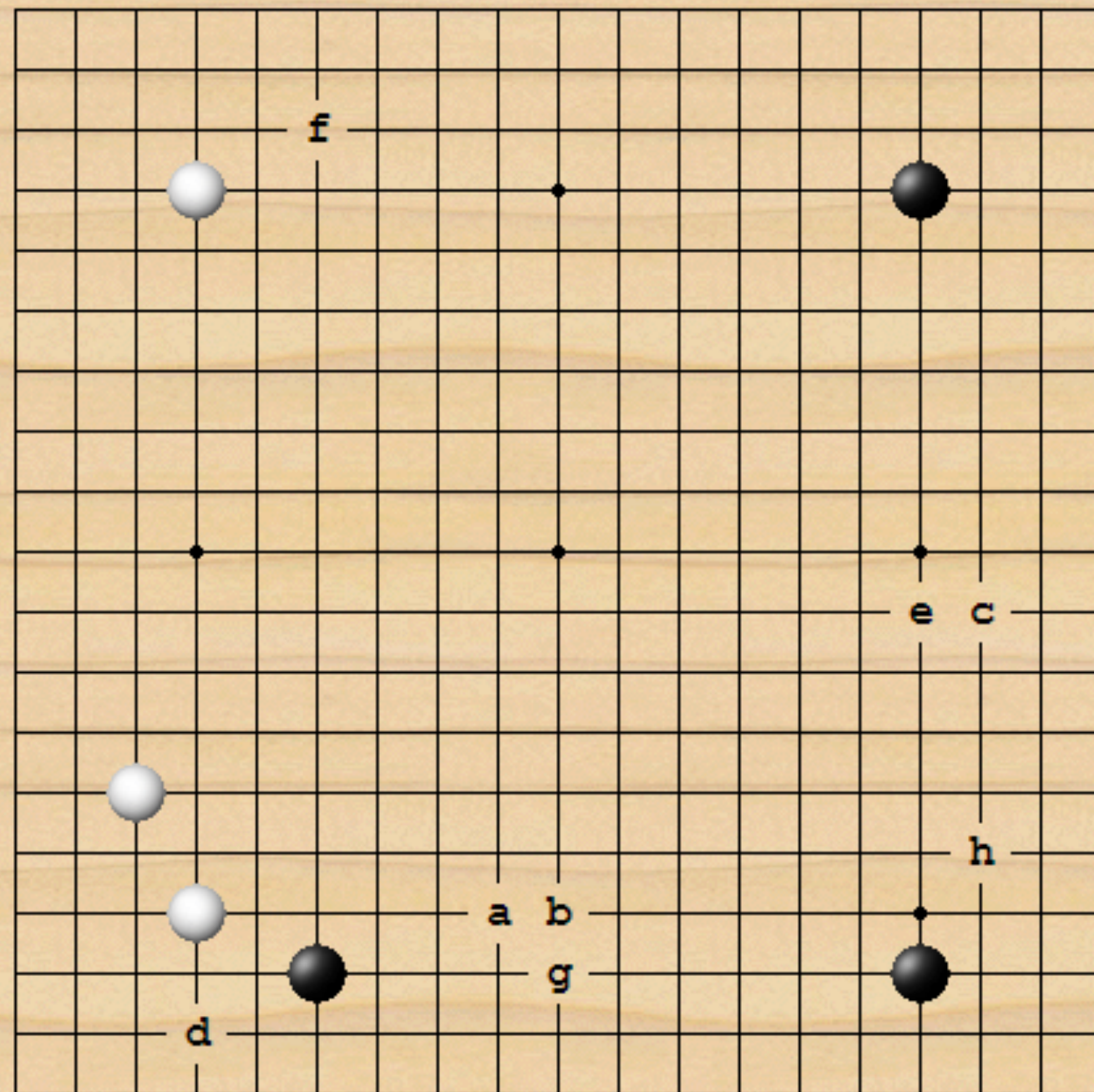
Facebook and Google are working to enable computers to play Go, an especially complex game that dates back more than 2,500 years



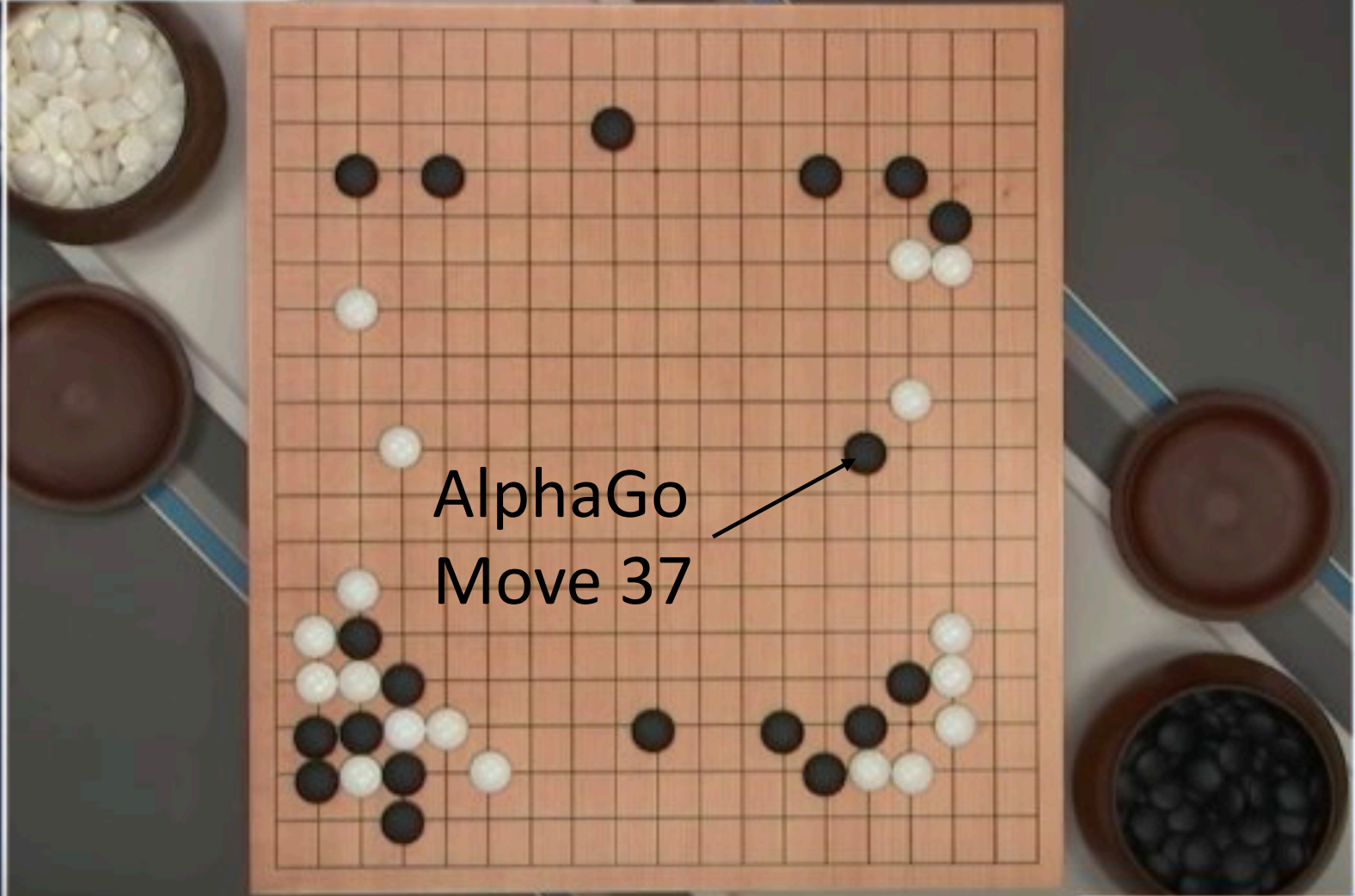
Google's AlphaGo AI beats Lee Se-dol again to win Go series 4-1

By **Sam Byford** on March 15, 2016 05:00 am [Email](#) [@345triangle](#)





LEE SEDOL
01:33:07



Google DeepMind
Challenge Match



ALPHAGO
01:38:39



23 May - 27 May, Wuzhen, China

The Future of Go Summit

Legendary players and DeepMind's AlphaGo explore the mysteries of Go together



“I would go as far as to say not a single human has touched the edge of the truth of Go.”

- Go champion Ke Jie



柯洁 KE JIE
00:46:57



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Humans Beat Computer In 'Brains vs. Artificial Intelligence' Poker Tournament

11 May 2015, 7:04 am EDT By [Sumit Passary](#) Tech Times

Humans have beat a computer in a "Brains vs. Artificial Intelligence" poker tournament.

The competition started on April 24 at the Rivers Casino in Pittsburgh. Over the course of two weeks, a computer program called Claudico, which was developed by scientists at the Carnegie Mellon University (CMU), played Heads-up, No-limit Texas Hold'em with four humans.

The human pros were Jason Les, Doug Polk, Bjorn Li and Dong Kim. All these four poker players are among the top 10 poker players of the world.

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120,000 HANDS NO-LIMIT HOLD 'EM

JANUARY 11 - 30
11AM - 7PM • POKER ROOM



DONG KIM



JASON LES



Georgia Institute of Technology
School of Computer Science

BRAINS VS.
ARTIFICIAL
INTELLIGENCE

RIVERS CASINO

GAMBLING PROBLEM? CALL 1-800-GAMBLER

How computers were finally able to best poker pros

By Devin Powell February 4, 2017

PITTSBURGH — Twelve days into the strangest poker tournament of their lives, Jason Les and his companions returned to their hotel, browbeaten and exhausted. Huddled over a pile of tacos, they strategized, as they had done every night. With about 60,000 hands

“I felt like... [Libratus] could see my cards. I’m not accusing it of cheating. It was just that good.”

- Poker pro Dong Kim

NEWS • 11 JULY 2019

No limit: AI poker bot is first to beat professionals at multiplayer game

Triumph over five human opponents at Texas hold'em brings bots closer to solving complicated real-world problems.

Thu 7 Dec 2017 07.41 EST

AlphaZero AI beats champion chess program after teaching itself in four hours

Google's artificial intelligence sibling DeepMind repurposes Go-playing AI to conquer chess and shogi without aid of human knowledge

**“I’m absolutely convinced
[AlphaZero won] because it hasn’t
learned from humans”**

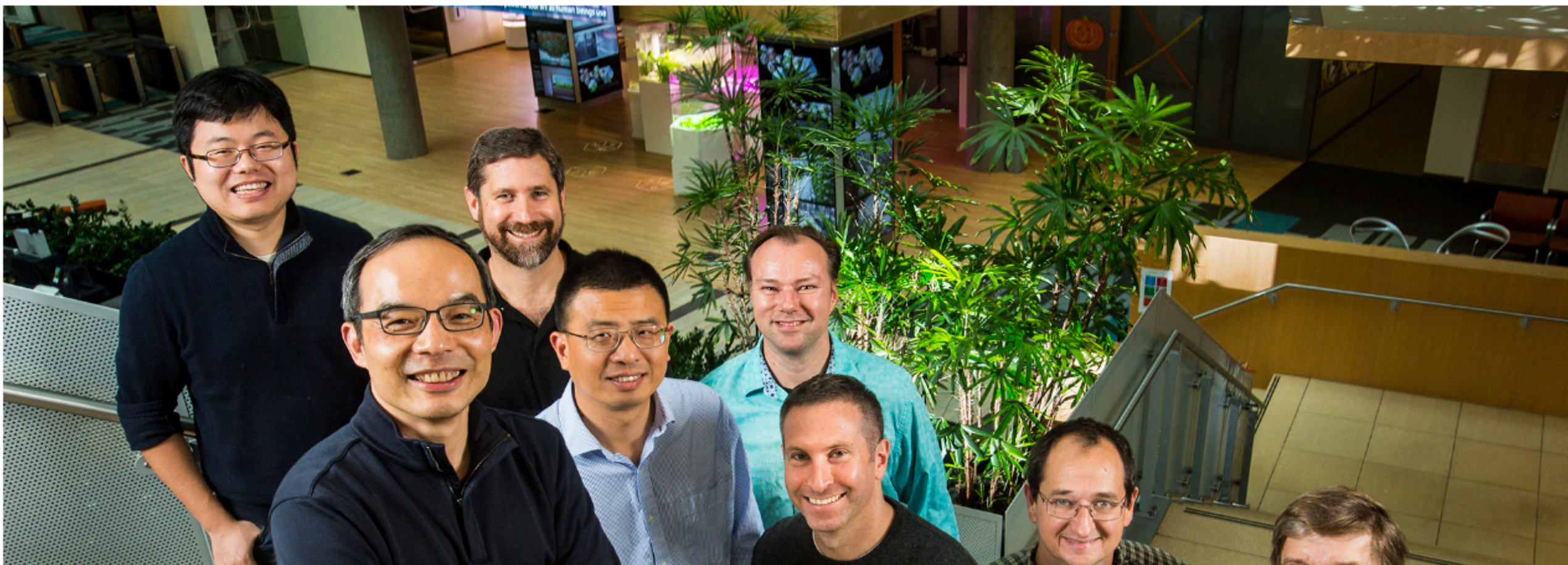
**- Computer Scientist Jonathan
Schaeffer**

“It doesn’t play like a human, and it doesn’t play like a program. It plays in a third, almost alien, way... it’s like chess from another dimension”-

Computer Scientist Demis Hassabis

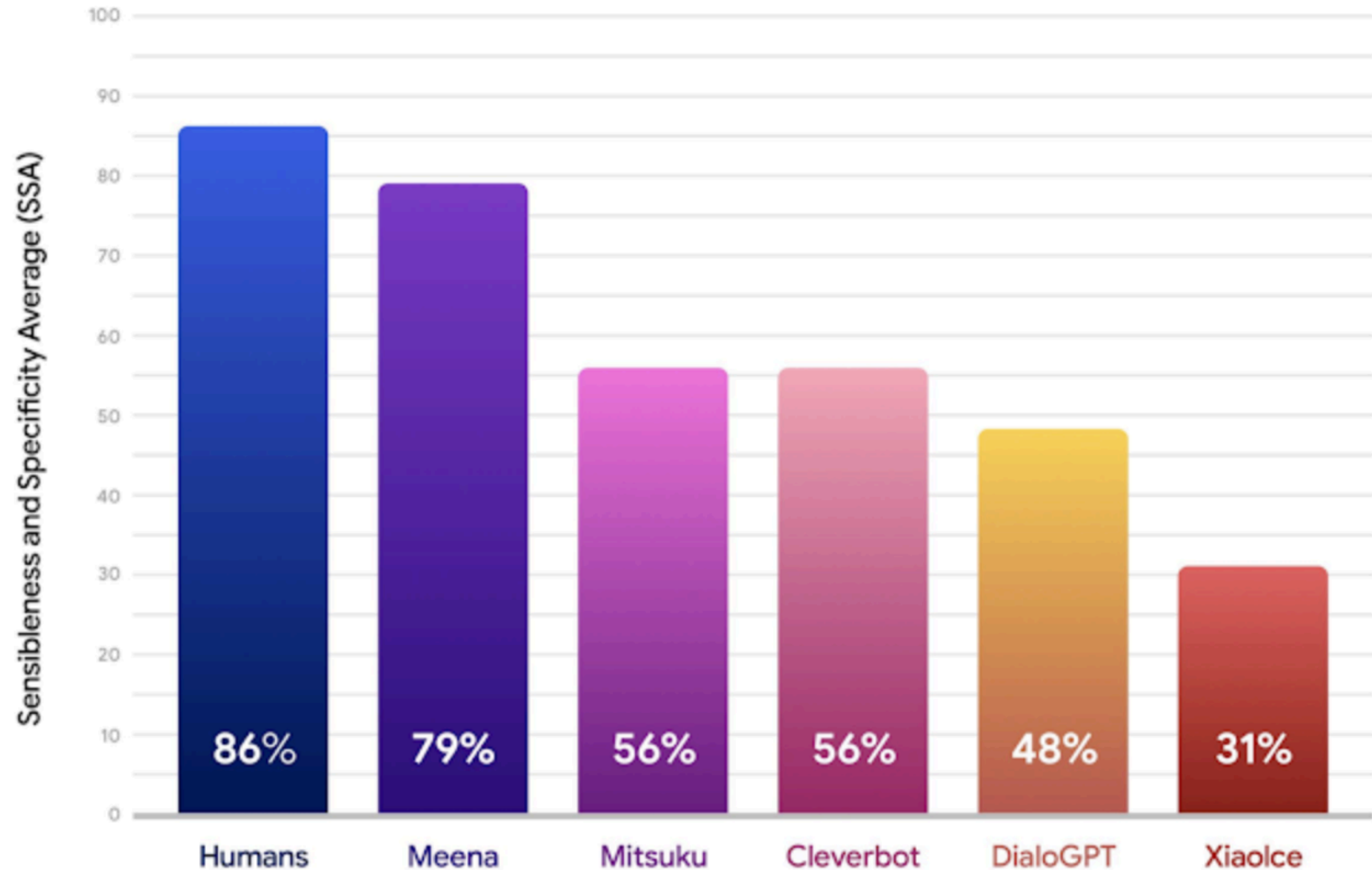
Minds and Machines
Doing Useful Work

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



Towards a Conversational Agent that Can Chat About... Anything

Tuesday, January 28, 2020



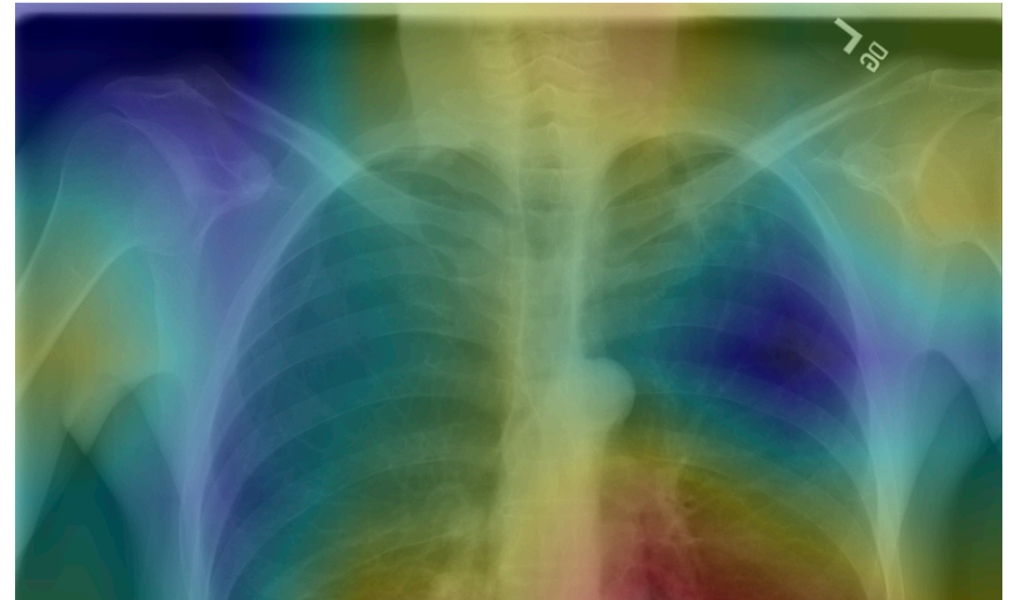
CheXNet: Radiologist-Level Pneumonia Detection on Chest X-Rays with Deep Learning

Pranav Rajpurkar*, Jeremy Irvin*, Kaylie Zhu, Brandon Yang, Hershel Mehta, Tony Duan, Daisy Ding, Aarti Bagul, Curtis Langlotz, Katie Shpanskaya, Matthew P. Lungren, Andrew Y. Ng

We develop an algorithm that can detect pneumonia from chest X-rays at a level exceeding practicing radiologists.

Chest X-rays are currently the best available method for diagnosing pneumonia, playing a crucial role in clinical care and epidemiological studies. Pneumonia is responsible for more than 1 million hospitalizations and 50,000 deaths per year in the US alone.

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“Sixty years on... we do not know what most of our DNA does... we do not fully understand how evolution works at the molecular level.”

- Science journalist Philip Ball

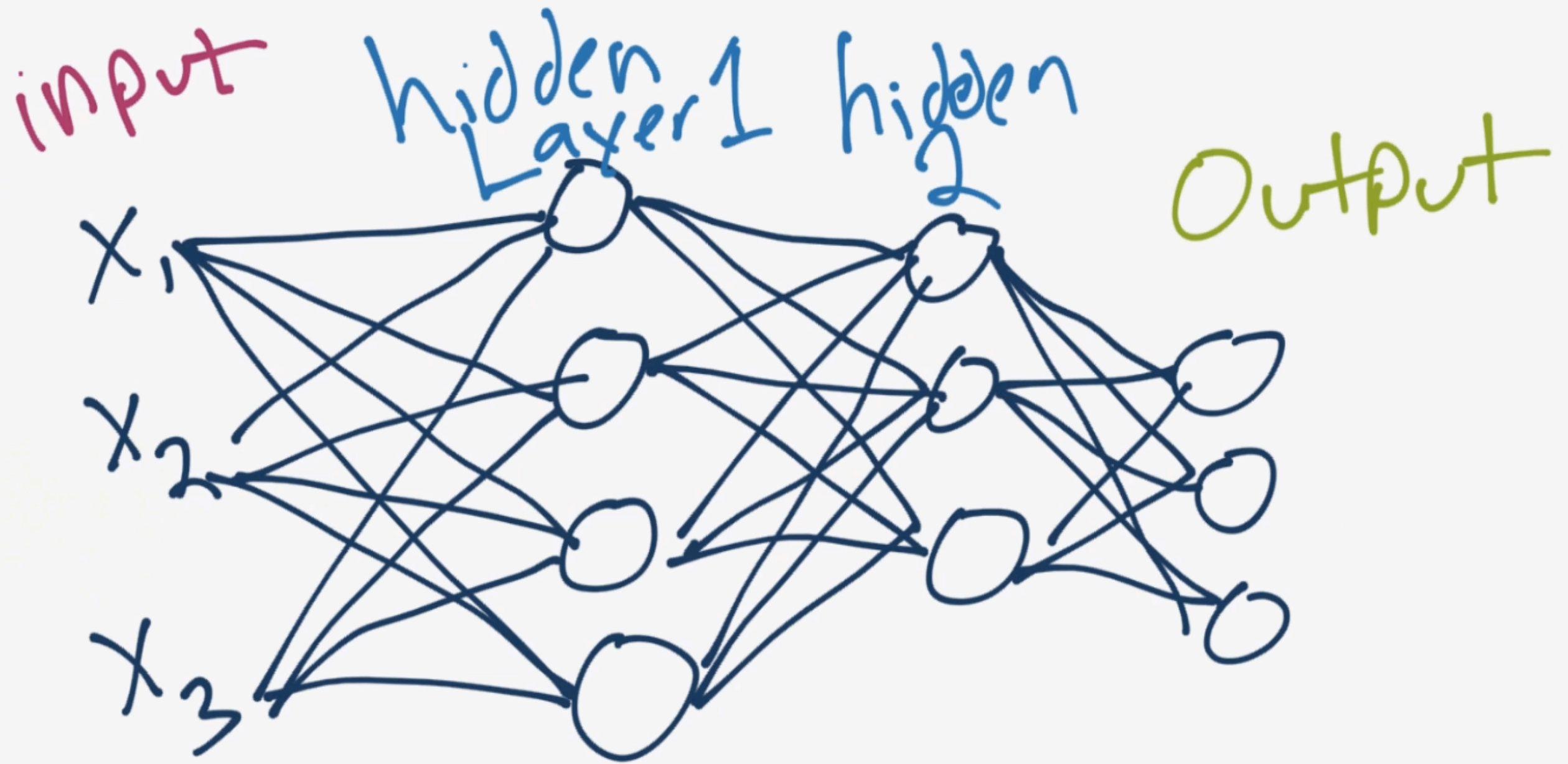
**“the Universe is not only queerer
than we suppose, but queerer than
we can suppose.”**

- Biologist J.B.S. Haldane



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Results

| | |
|-------------|-----------------------------|
| Old method: | 7% improvement in 10 years |
| New method: | 15% improvement in 1 year |
| | 2.4x net margin improvement |
| | 15 suggested genome edits: |
| | - 3 on pathway |
| | - 3 explainable |
| | - 6 not explainable |
| | - 3 “no known function” |

Will We Still Need Minds?

List of cognitive biases

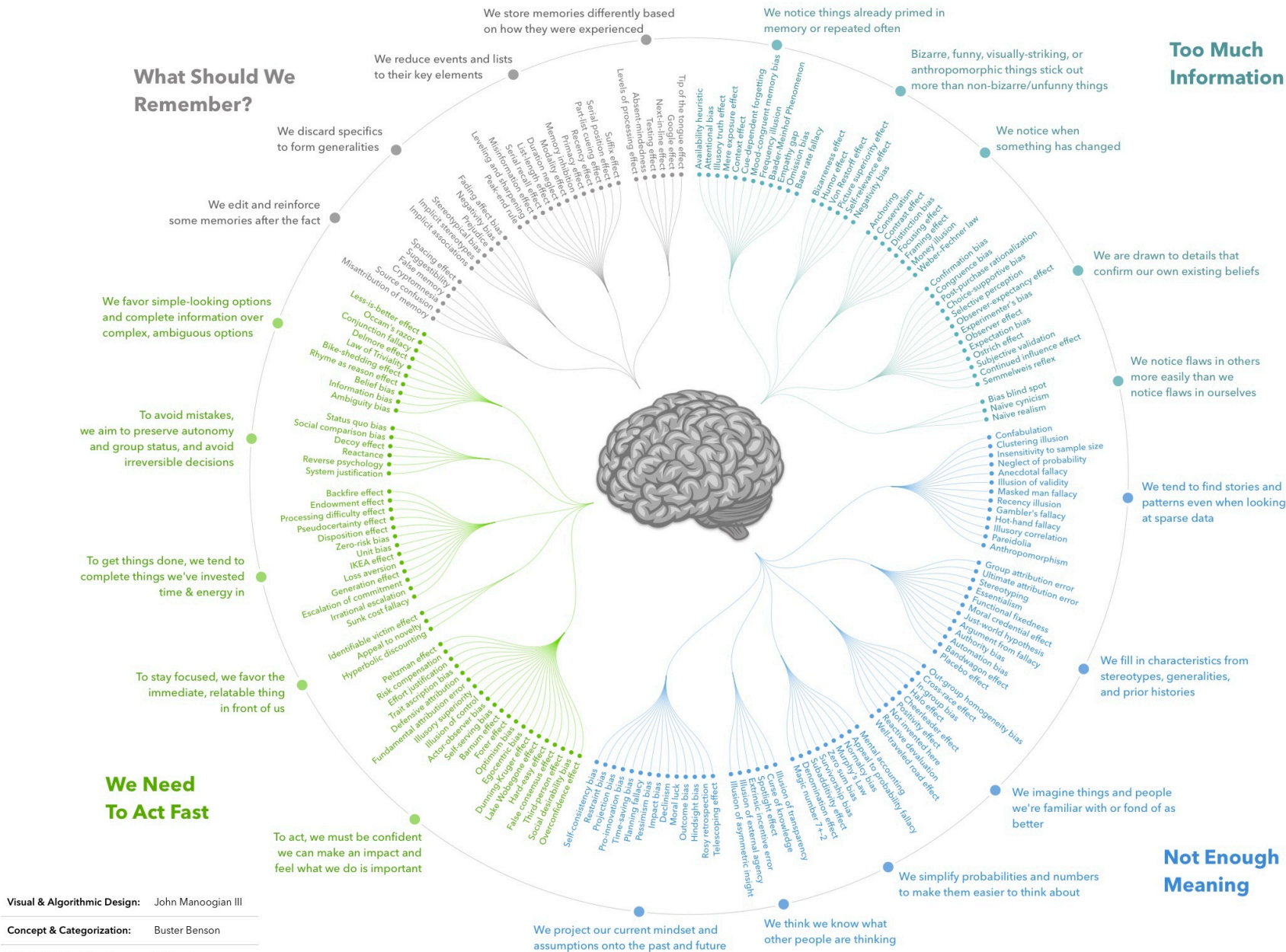
From Wikipedia, the free encyclopedia

Cognitive biases are systematic patterns of deviation from norm or rationality in judgment, and are often studied in **psychology** and **behavioral economics**.^[2]

Although the reality of these biases is confirmed by **replicable** research, there are often controversies about how to classify these biases or how to explain them.^[3] Some are effects of information-processing rules (i.e., mental shortcuts), called **heuristics**, that the brain uses to produce **decisions** or judgments. Such effects are called *cognitive biases*.^{[4][5]} Biases have a variety of forms and appear as cognitive ("cold") bias, such as mental noise,^[6] or motivational ("hot") bias, such as when beliefs are distorted by **wishful thinking**. Both effects can be present at the same time.^{[7][8]}

There are also controversies over some of these biases as to whether they count as useless or **irrational**, or whether they result in useful attitudes or behavior. For example, when getting to know others, people tend to ask **leading questions** which seem biased towards confirming their assumptions about the person. However, this kind of **confirmation bias** has also been argued to be an example of **social skill**: a way to establish a connection with the other person.^[9]

COGNITIVE BIAS CODEX



designhacks.co

Will We Still Need Minds?

Will We Still Need Minds?

Yes.

Human Value in the Second Machine Age

Common Sense

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Technology

Uber 'truly sorry' for price rise during Sydney siege

🕒 24 December 2014

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Human Value in the Second Machine Age

Common Sense
Asking Questions

**“Put [computers] are
useless. They can only
give you answers!”**

- Pablo Picasso

Human Value in the Second Machine Age

Common Sense

Asking Questions

**“Judge a man by his
questions, not his
answers.”**

- Voltaire

Human Value in the Second Machine Age

Common Sense
Asking Questions
Social Skills

CESifo Area Conference on the
Economics of Education

11–12 September

The Growing Importance of Social Skills in
the Labor Market

David J. Deming

Human Value in the Second Machine Age

Common Sense

Asking Questions

Social Skills

**Partnering with
Machines**

Case study: Shanghai Tower



In the Future...

Machines Open Up New Territory;

**Minds and Machines Explore It
Together.**

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