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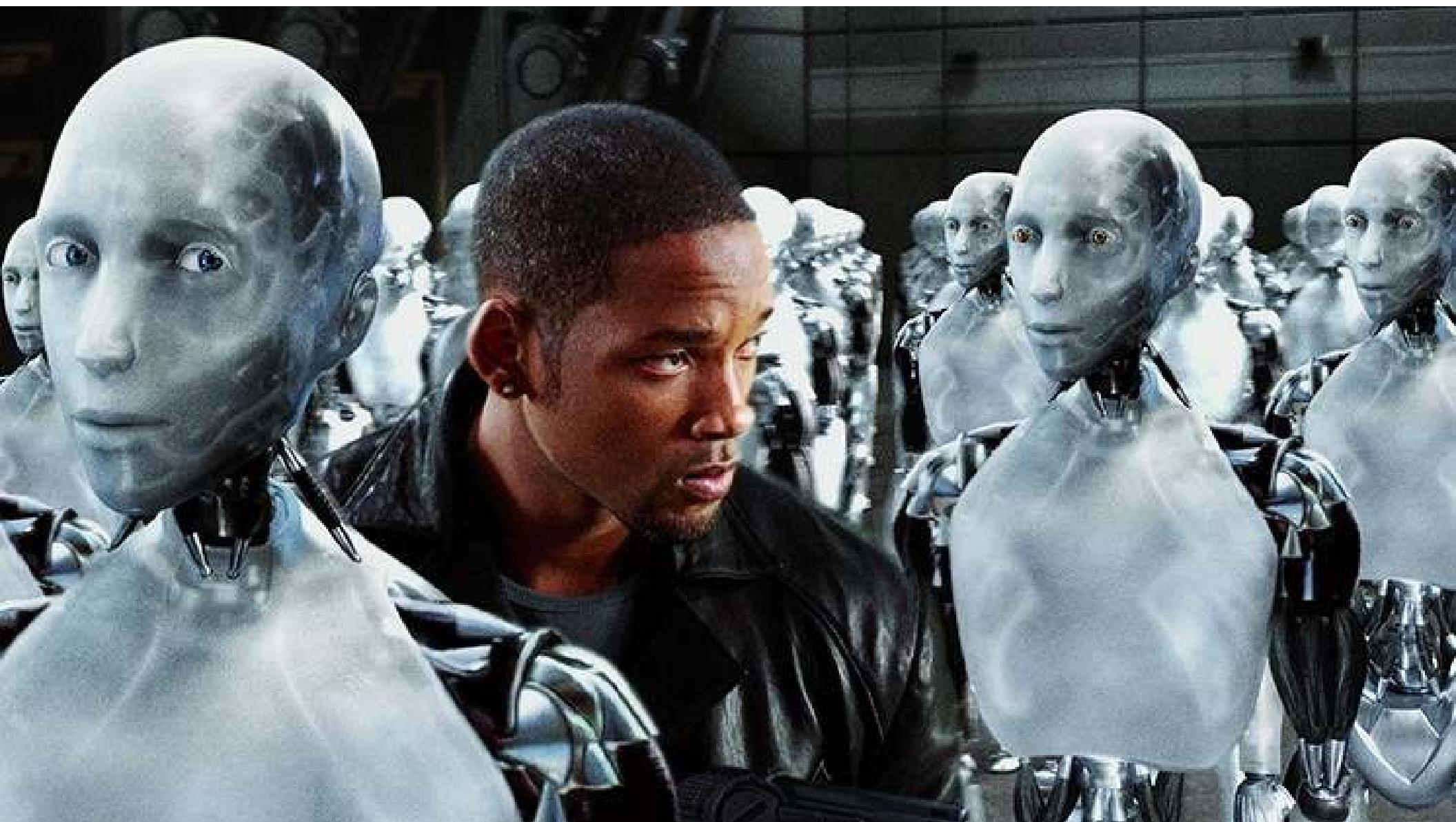
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Research

## ARTIFICIAL INTELLIGENCE AND THE BUSINESS ANALYST









Ethics



The development of full artificial intelligence could spell the end of the human race.

— *Stephen Hawking* —



AI is Highly Likely to  
Destroy Humans -  
Elon Musk

A photograph of Mark Zuckerberg, founder of Facebook, smiling and waving his right hand towards the camera. He is wearing a grey t-shirt and is standing outdoors in front of a house with a green lawn and bushes in the background.

ELON MUSK'S  
DOOMSDAY AI  
PREDICTIONS  
ARE 'PRETTY  
IRRESPONSIBLE'  
- MARK  
ZUCKERBERG

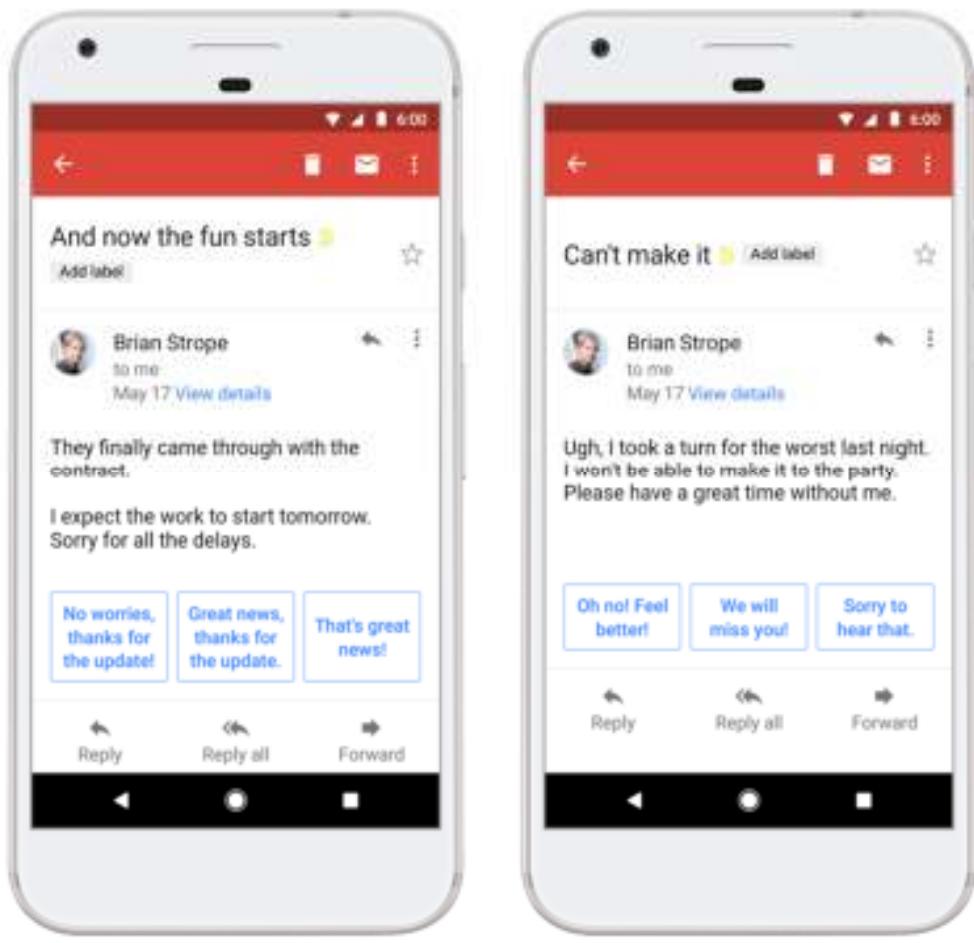


A man in a dark suit and striped tie is covering his ears with his hands, looking weary or annoyed. He is standing against a plain, light-colored wall.

Can't Ignore it?









**NETFLIX**





# Artificial intelligence spots more skin cancers than experts

Chris Smyth, Health Editor

May 29 2018, 12:01am,  
The Times

Fitness

Health

Technology

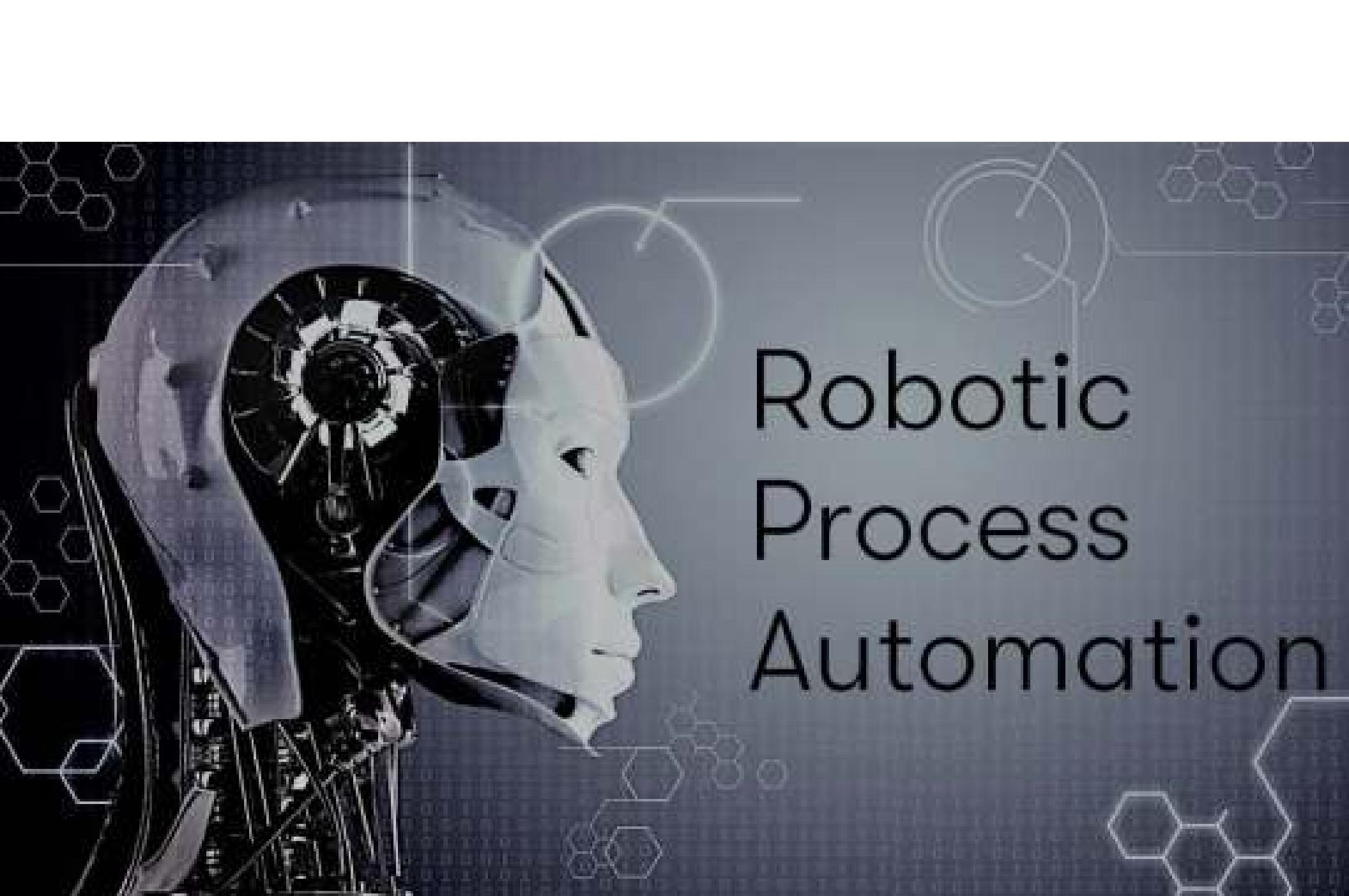
Conservative Party

Theresa May



There are about 16,000 cases of melanoma a year in Britain  
GETTY IMAGES

Artificial intelligence is better than doctors at spotting skin cancer, a study has shown. A Google algorithm devised to recognise unusual moles not only picked up more cancers but also ruled out more benign lesions.



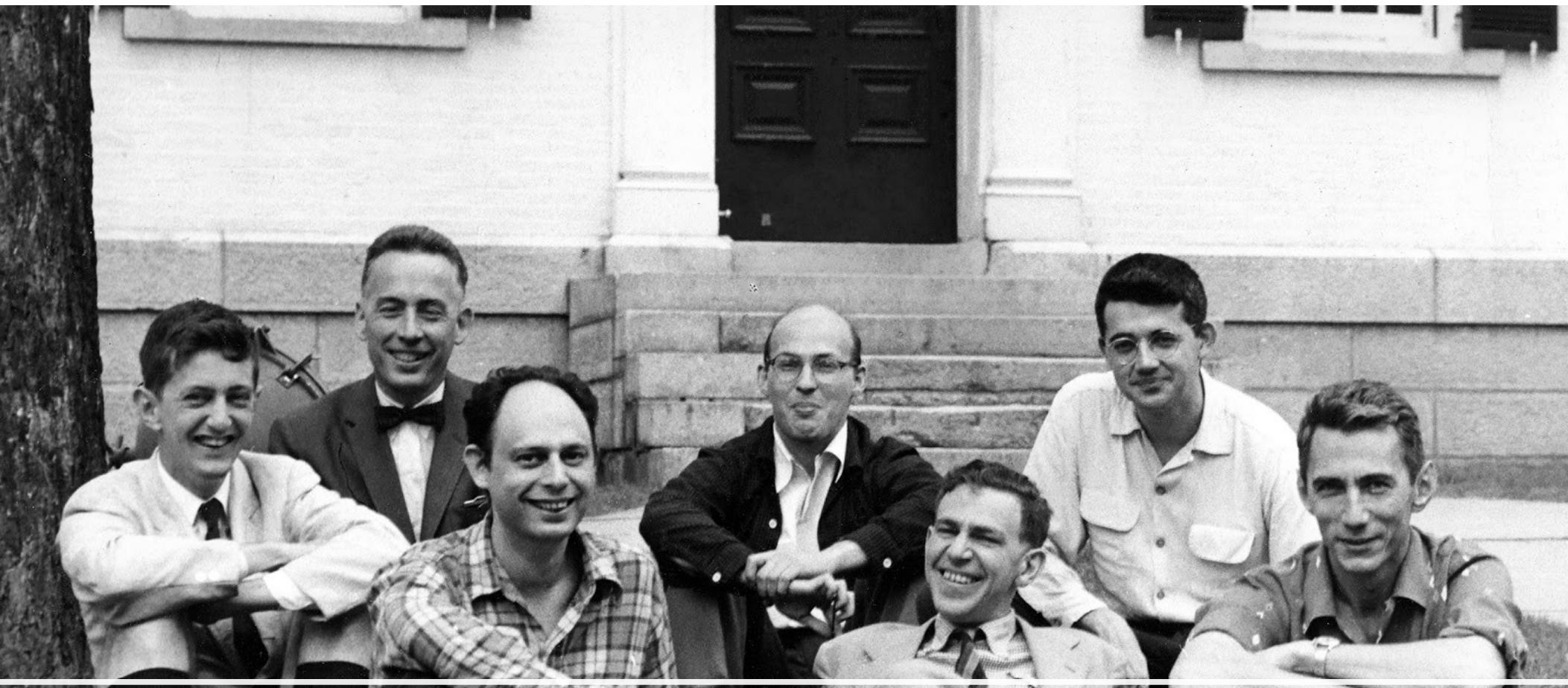
# Robotic Process Automation

# ROBOTIC PROCESS AUTOMATION (RPA)

“Robotic process automation (RPA) refers to software that can be easily programmed to do basic tasks **across applications** just as human workers do.

The software robot can be taught a workflow with multiple steps and applications, such as taking received forms, sending a receipt message, checking the form for completeness, filing the form in a folder and updating a spreadsheet with the name of the form, the date filed, and so on.”

Investopedia

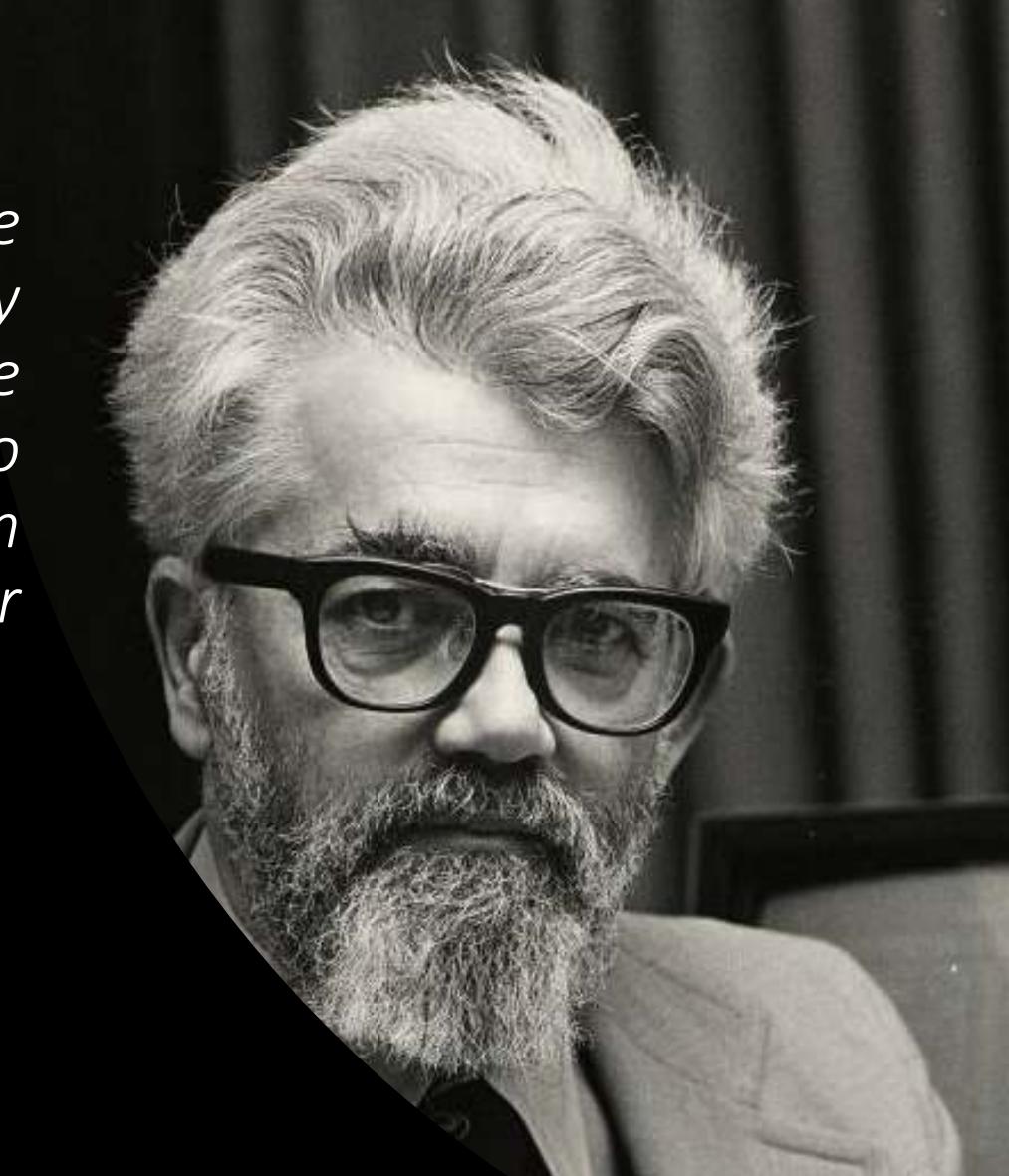


In the beginning – Dartmouth College (1956)



*This conference is "to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it." - Professor John McCarthy in 1956*

(Convenor of the Artificial Intelligence Meeting)





# ARTIFICIAL INTELLIGENCE

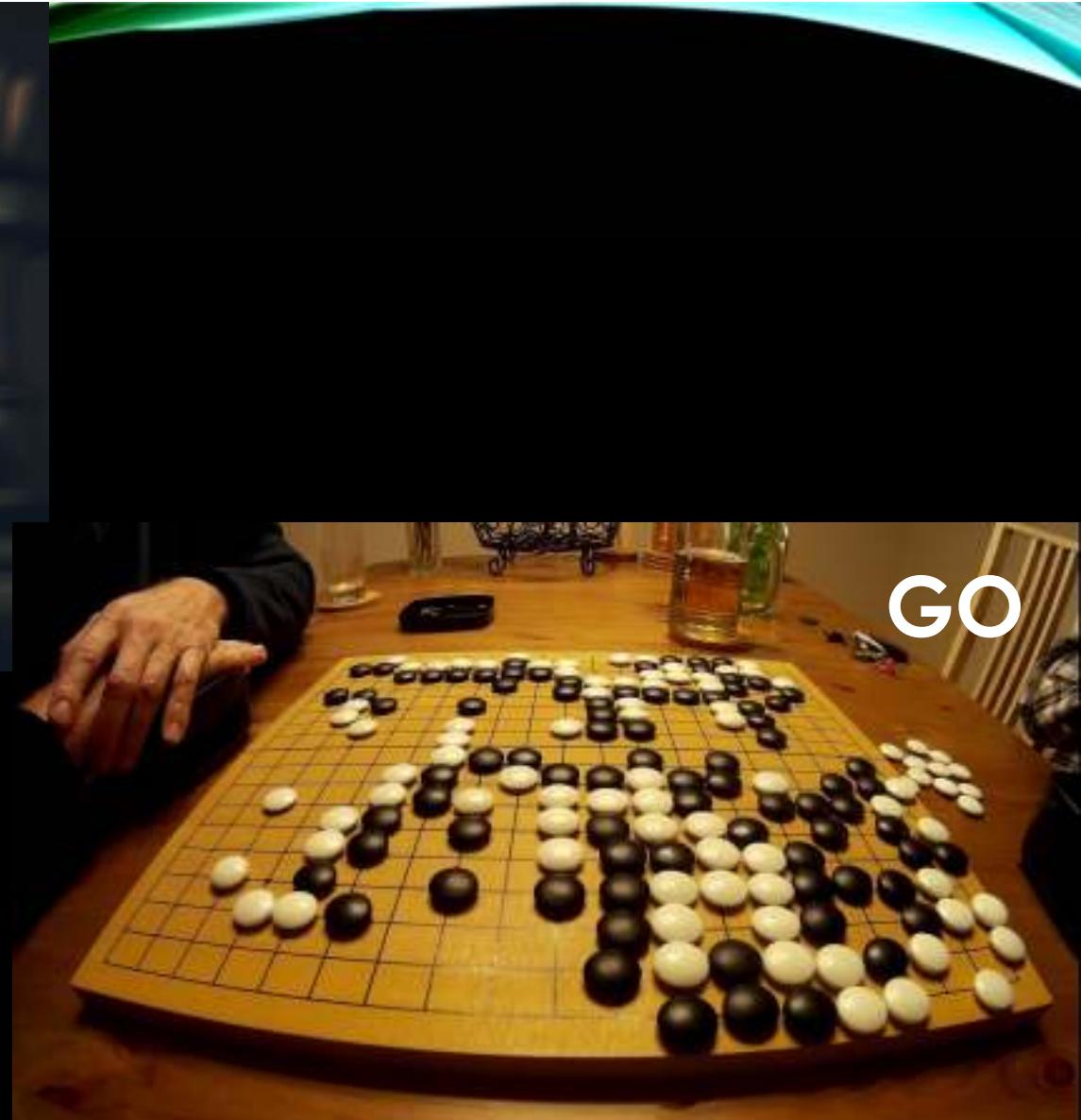
Artificial Intelligence, in the broadest term, applies to any technique that enables computers to mimic human intelligence, using logic, if then rules, decision trees and machine learning.

Time Magazine (2017)

CHESS



A TALE OF  
TWO GAMES



CHESS

IBM Deep Blue

Vs

Garry Kasparov

(May 11, 1997)



GO  
DeepMind AlphaGo  
vs  
Fan Hui (Go)  
2015



IBM's Deep Blue was programmed with decision trees or equations on how to evaluate board positions or with if-then- rules



AlphaGo learned how to play Go essentially from self-play and from observing big professional games

# MACHINE LEARNING

Machine learning is a method of data analysis that automates analytical model building. It is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention.

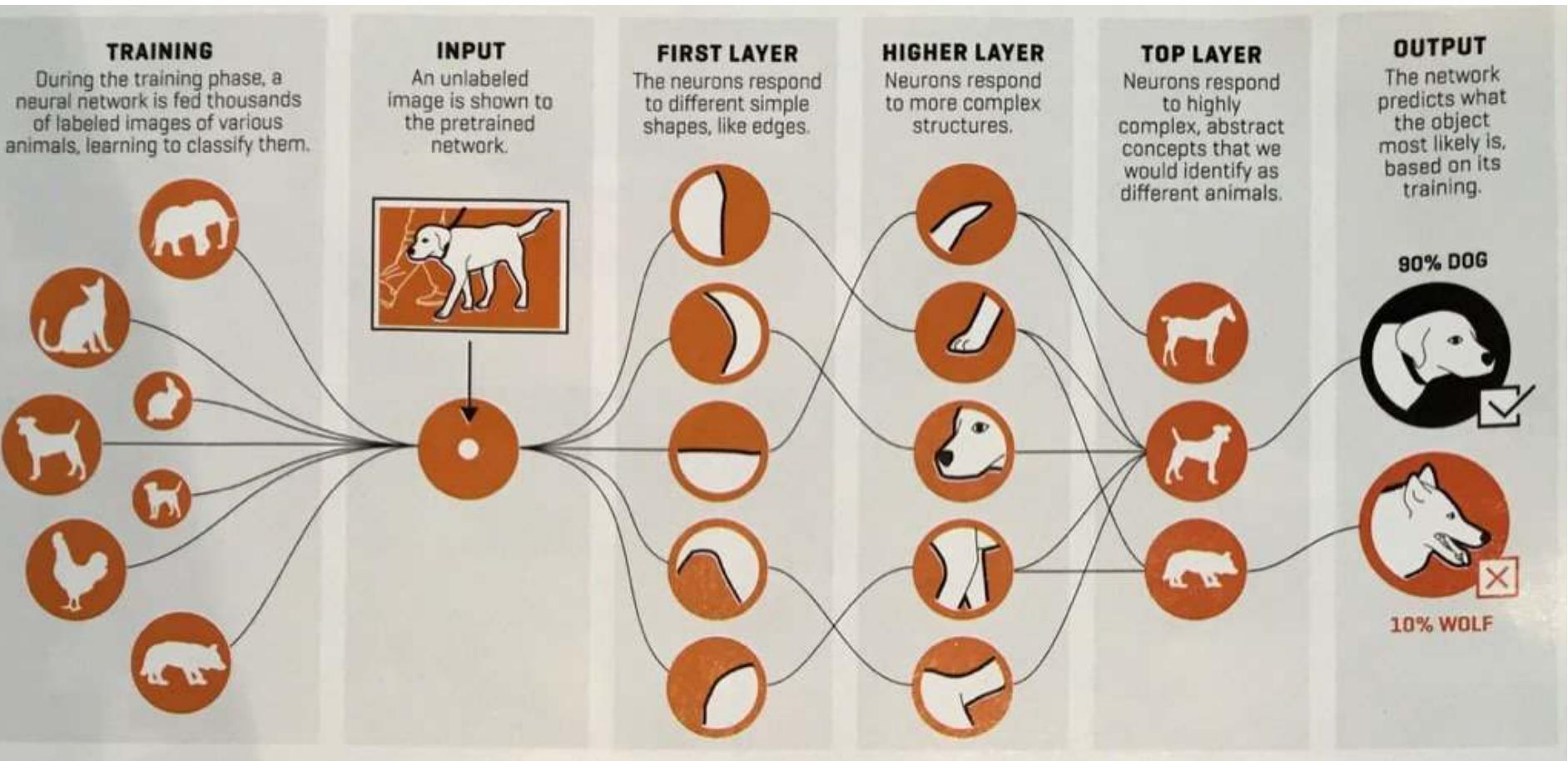
...SAS



# NEURAL NETWORKS

Software constructions modeled after the way adaptable networks of neurons in the brain are understood to work, rather than through rigid instructions predetermined by humans

Time Magazine (2017)





# WHY NOW?

- Increased availability- in volume, velocity and variety - of data
- Significant improvements in computing power and storage (*at affordable cost*).

A black and white photograph showing a close-up of a person's hands resting on a laptop keyboard. The hands are positioned as if the person is taking a break or is about to start work. The laptop is open and placed on a light-colored wooden desk. To the left of the laptop, there is a clear glass containing a dark liquid, possibly water or coffee. The overall atmosphere is focused and professional.

# THE DARK SIDE OF ARTIFICIAL INTELLIGENCE



Recruitment





**Privacy?**

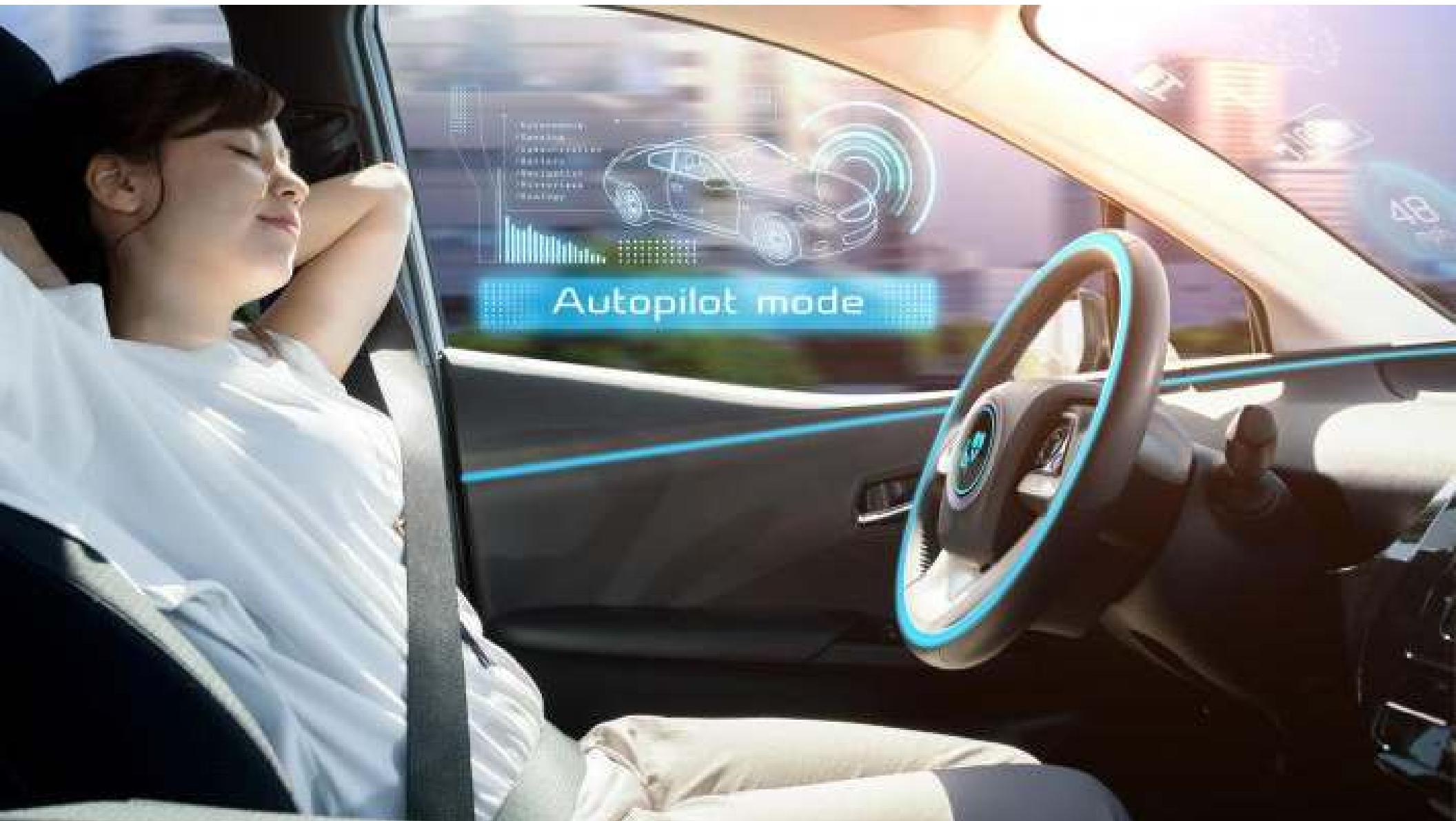






# Weaponize AI





AI-generated "real fake" video of Barack Obama



**AI** could now generate highly realistic videos of  
**BARACK OBAMA** using existing audio and video clips of him



**WHAT DOES THIS  
MEAN**

**FOR YOU?**



In 2017, 61 percent of businesses said they implemented AI, compared to 38 percent in 2016, according to the “[Outlook on Artificial Intelligence in the Enterprise 2018](#)” report from Narrative Science, an artificial intelligence company, in collaboration with the National Business Research Institute.

In the communication arena, 43 percent of these businesses said they send AI-powered communications to employees.

BI I tried HireVue's AI-pow X +

www.businessinsider.com/hirevue-ai-powered-job-interview-platform-2017-8

BUSINESS INSIDER TECH FINANCE POLITICS STRATEGY LIFE INTELLIGENCE ALL

**I tried the software that uses AI to scan job applicants for companies like Goldman Sachs and Unilever before meeting them — and it's not as creepy as it sounds**

Richard Feloni Aug. 23, 2017, 12:00 PM 161,527

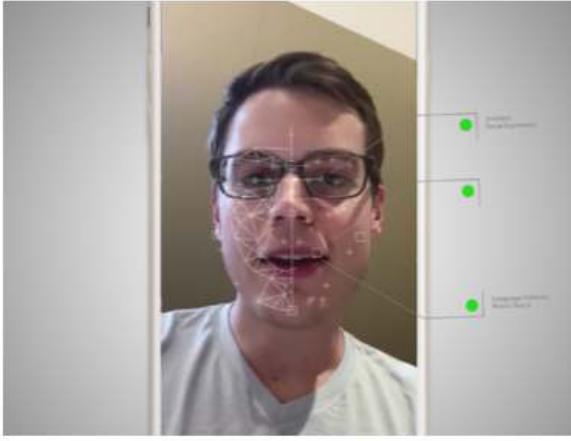
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**RECOMMENDED FOR YOU**

• **HireVue uses AI to analyze word choice, tone, and facial movement of job applicants who do video interviews.**

• **The company has raised \$95 million and works with companies like Unilever and Goldman Sachs.**

• **I tried the software by applying to a HireVue job and discussed the results with HireVue's CTO.**



I had my body language, tonality, and speech analyzed by AI. This is a simulated image of the analysis. [HireVue](#)

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# Football transfers: How clubs research social media & body language to buy players

By Patrick Jennings  
BBC Sport

1 August 2017 | Football

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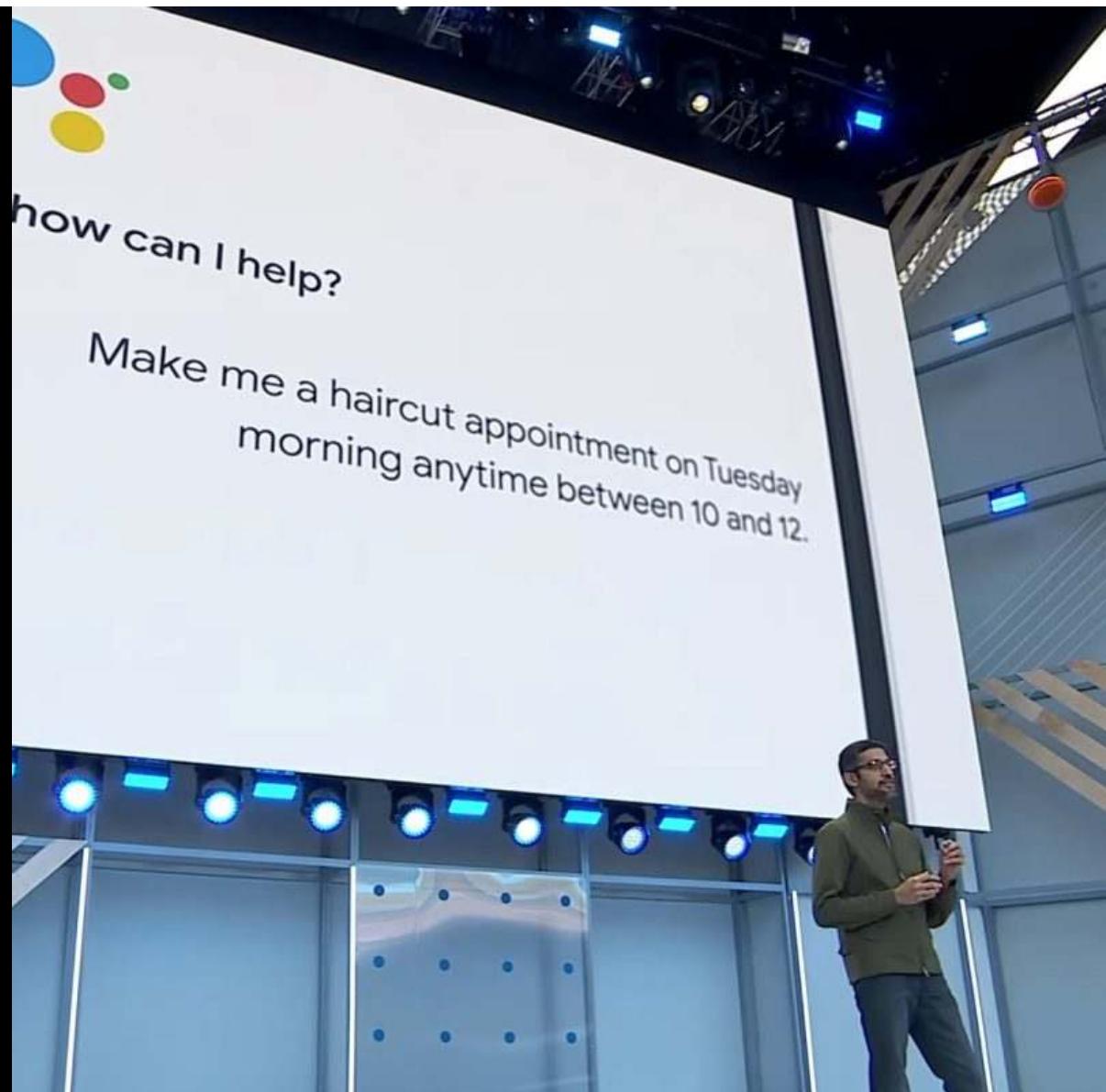
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- Everton could appoint ex-Watford boss Silva this week (1h | Football)
- Man City's Sterling backed by England after gun tattoo row (2h | Football)

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# GOOGLE DUPLEX

- A new technology for conducting natural conversations to carry out "real world" tasks over the phone.
- The technology is directed towards completing specific tasks, such as scheduling certain types of appointments.
- For such tasks, the system makes the conversational experience as natural as possible, allowing people to speak normally, like they would to another person, without having to adapt to a machine.

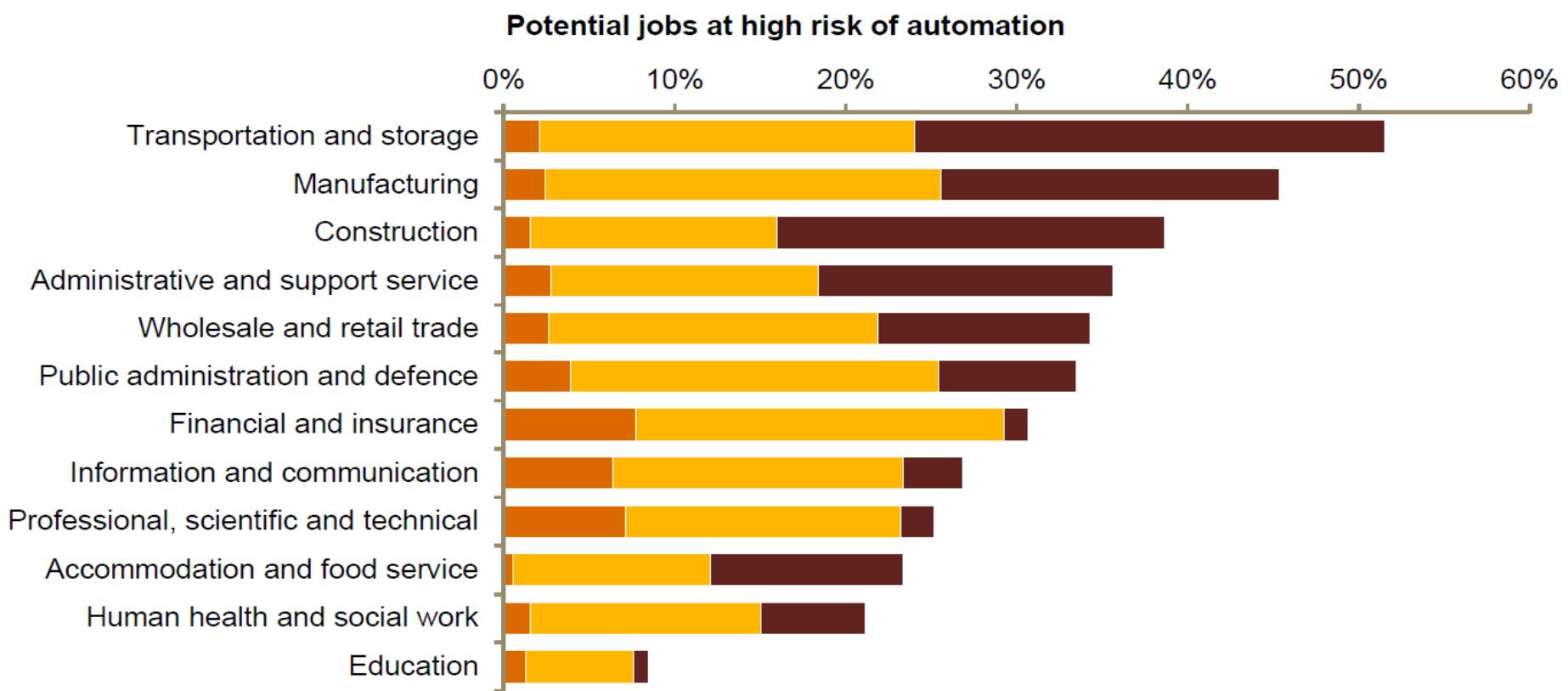






# Robotic Process Automation

# POTENTIAL JOBS AT RISK OF AUTOMATION BY 2030 (PRICEWATERHOUSECOOPERS)





RECOMMENDER  
SYSTEMS



41 percent of British companies surveyed said their business models will cease to exist in the next five years thanks to artificial intelligence (AI), according to research conducted by Microsoft (which surveyed more than 5,000 business leaders and employees of large enterprises across the United Kingdom).



“According to the World Economic Forum's *The Future Of Jobs Report*, within the next five years alone, a majority of companies expect to scale back their full-time workforce to make room for automation.



The chief economist for the Bank of England predicted that there might be as many as **80 million jobs** automated in the US alone. With fully half of all workplace tasks being performed via automation within the next decade, some jobs are more susceptible to this shift than others.



Over the next decade, advances in technology and automation will transform more than 40 per cent of Canadian jobs, researchers at the Brookfield Institute for Innovation and Entrepreneurship predict. Most jobs will require a completely new set of skills from employees.



*Explore*  
the possibilities





## SOME GOOD NEWS

- “By 2020 Artificial Intelligence Will Create More Jobs Than It Eliminates” – Gartner Research
- “Machines and algorithms in the workplace are expected to create 133 million new roles, but cause 75 million jobs to be displaced by 2022” - World Economic Forum (WEF) called “[The Future of Jobs 2018](#).”
- “Artificial intelligence (AI) and related technologies will generate as many jobs in the U.K. as they displace over the next 20 years. While AI could displace roughly 7 million jobs in the country, it could also create 7.2 million jobs, resulting in a modest net boost of around 200,000 jobs. In the health and social work sector, the number of people employed could rise by almost 1 million, while jobs in manufacturing could fall by roughly 25 percent, a net loss of almost 700,000 roles.” – PwC (2018)



“The ability to think outside the box, to adapt, and to think about things from unconventional perspectives are exactly what future employers are looking for.” – Globe and Mail, 2018



“Core skills like maths, writing and science will remain key but modern employers demand new ones like collaboration, coding, digital literacy, fluency in languages, critical thinking, creativity and entrepreneurial skills. .” – The Telegraph, 2018



# THE BUSINESS ANALYST

- Critical thinking and rethinking decisions based on dynamically changing situations.
- Going by the current stream of AI research and spiking growth of automated systems in business analysis, one can safely conjecture that in the next 10 years, the human Business Analyst will collaborate and partner with Artificial Intelligence and Machine Learning solutions to analyze, measure, and refine business processes. - DataVersity



# THE BUSINESS ANALYST AND RPA (DATAVERSITY)

- Identify which business processes are sufficiently data-driven to be, or which otherwise lend themselves as, prime RPA candidates.
- Help shape RPA by analyzing business processes and creating the business rules that the RPA software will process.
- Create the requirements necessary to implement RPA and adapt interfacing systems to accommodate it.
- Find ways to measure the value that RPA brings to the organization (whether that is money it saves, additional business it enables, etc.)



# THE BUSINESS ANALYST AND ARTIFICIAL INTELLIGENCE (DATAVERSITY)

- Support AI the same way it will support RPA.
- In addition, the Business Analyst will create the business processes and requirements necessary to enable AI to self-learn and understand context. That might be shoring up the business's knowledge base, or helping to implement sound Knowledge Management processes in the organization.
- If data is scattered throughout the organization, the BA may identify the right data repositories and interfaces the AI will need. Or the BA might "train" the AI directly.



# THE BUSINESS ANALYST IN INDUSTRY 4.0

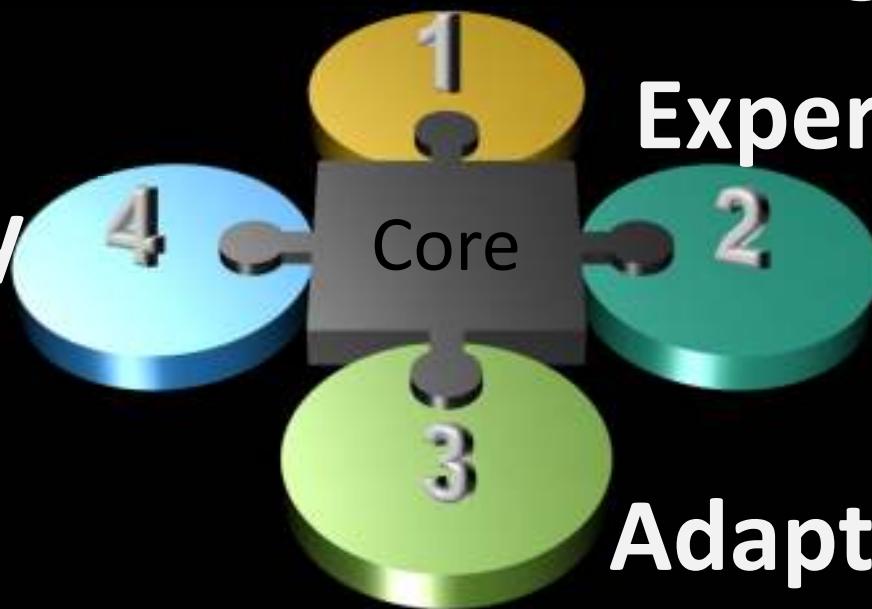
- Data Analysis
  - Requirements Gathering
  - Determine metrics to be reported on
  - Helping generate Insights
- Business Intelligence
  - Use of dashboards and visualizations for communicating insights (Tableau, Power BI, Spotfire, etc)
  - Help define relevant metrics to use for measuring business performance
  - May be involved in descriptive, diagnostic, predictive and prescriptive analysis.

# HOW DO I GET READY FOR THE FUTURE?

Continuous Learning

Experimentation

Cross Industry  
Engagement



Adaptability

# LEARNING RESOURCES

- Online Courses
  - Coursera, UDEMY, DataVersity, Fast.ai, DataCamp, etc
- Conferences (Check out Event-Brite)
  - Re-Work
  - Big Data and AI Toronto
  - Q & AI : Get Down to Business with Expert Advice on AI (Nov, 30 in Ottawa)
- Formal Education: Sprout School of Business, St Lawrence College ; University of Ottawa, etc
  - Analytics and AI program (Sprout has an MBA in Analytics program)
  - Big Data and AI Conference
  - Masters Program in Artificial Intelligence (Queen's University)
- Data and AI Literacy Courses
  - Beyond The Data
  - EBCHIM and 1 Million Teachers (To be launched in Spring of 2019)
- Individuals and Corporations to follow online
  - Bernard Marr
  - Microsoft
  - etc



“In a world of change, the learners shall inherit the earth, while the learned shall find themselves perfectly suited for a world that no longer exists.” — Eric Hoffer

# ETHICAL AI

- PAI (Partnership on AI) is a body that develops ethical guidelines for AI research, including ensuring research does not violate international conventions or human rights.
  - 80+ partners and 13 countries
  - Includes companies like Google, Facebook, Accenture, Apple, Baidu, BBC, Microsoft, Samsung, etc
- Europe is ahead
  - General Data Protection Regulation (GDPR)
  - California closely following suite
    - GDPR version
    - IOT bill
- Governments and policy makers need to be involved.

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## RBC Foundation supports advancing ethical AI with \$1 million commitment to CIFAR



**MONTREAL, October 9, 2018** - At the official opening of the Borealis AI Montréal lab today, Dave McKay, President & CEO of RBC, announced the RBC Foundation will donate \$1 million over the next three years to the Canadian Institute for Advanced Research (CIFAR). The commitment will support research and initiatives aimed at furthering the study of ethical artificial intelligence (AI) practices.

CIFAR is leading the [Pan-Canadian Artificial Intelligence Strategy](#), working in partnership with three world renowned AI institutes – the Alberta Machine Intelligence Institute (Amii) in Edmonton, Mila in Montreal and the Vector Institute in Toronto. CIFAR will work closely with [Borealis AI](#), an RBC institute for research, to deliver on key aspects of the strategy.

"The wide-spread adoption of AI means research on responsible and ethical AI practices is extremely important," said Dr. Foteini Agrafioti, Chief Science Officer, RBC and Head, Borealis AI. "These aspects of the technology cannot be an after-thought. That's why we are taking steps to invest in advancing the ethical principles surrounding AI with this commitment to CIFAR."

The Foundation's donation will be critical in delivering three CIFAR initiatives:

- **Catalyst Grants** – Supporting new research collaborations and exchange between researchers at any Canadian institution in novel areas of AI

[www.rbc.com/newsroom/news/2018/20181108-wm-chilton-partnership.html](http://www.rbc.com/newsroom/news/2018/20181108-wm-chilton-partnership.html) Two of the awards will be in support of research in the areas of

**In The News**

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- ▶ [Many Canadians are More Prepared for a Stormy Day than a Financial Emergency: RBC](#)
- ▶ [RBC honoured with four wealth management awards at industry galas](#)
- ▶ [RBC Wealth Management partners with 'The Wealthy Barber' David Chilton](#)

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# SAGE GROUP'S FRAMEWORK FOR ETHICAL AI IN BUSINESS AND GOVERNMENT

