



# Welcome to Demystifying AI webinar



# Who is She Loves Data?



We are a non-profit, volunteering run organisation founded in 2016 in Singapore

We focus on the importance of DIVERSITY, DATA & DIGITAL LITERACY by conducting **free** workshops, seminars, and meetups for women



We help women to embrace data and tech in order to get them ready for the future of jobs and create their local & global support network, the #datatribe

Since 2016 we have trained over 8,000 women

# Who is She Loves Data?



## Mission

To inspire more women to pursue careers in Data & Tech and build a community where like-minded women can come together to learn, connect and have fun!



Significantly expand our reach within Asia Pacific and other continents over the next 3 years - in a sustainable way.

## Vision

# Agenda & Speaker



11:30 – 11:35 Welcome & Intro to the webinar

11:35 – 12:15 Presentation on Demystifying AI

12:15 - 12:30 Q&A

For any technical issues during the session, please write us on **chat**.

For any content related questions, please write us on **Q&A**.



## Rita Abdellatif

Data & AI Tech Lead @ Microsoft APAC

# About the Speaker



Rita is responsible for driving customer success of Microsoft Data & AI solutions across Asia Pacific. With almost 20 years expertise in data science and analytics she has deep and diverse working experience using artificial intelligence across many industries.

Rita is a data scientist who started as a teacher of mathematics & statistics at University La Sorbonne in France where she is originally from. By joining the IT industry 10 years ago, she has constantly been driving AI adoption across the world.

# AI is the greatest commercial opportunity in today's economy

UP TO 14%

boost in global GDP as a result of AI by 2030<sup>1</sup>

\$15.7T

potential contribution to the global economy by 2030 from AI<sup>1</sup>

90%

of executives across the globe expect AI to have a positive impact on growth<sup>2</sup>

<sup>1</sup>PWC, 2017

<sup>2</sup>Economist Intelligence Unit, 2018

<sup>3</sup>Ignite, 2016

“

*We want to pursue democratizing AI just like we pursued information at your fingertips.<sup>3</sup>*

”

**Satya Nadella**





Assigning human-like qualities to digital experiences



Perceives its environment



Mimics cognitive functions

# What *is* AI?



Learns from example in volumes of data



Program that writes itself based on examples



Classifies, recommends, predicts, groups, segments

"Weak AI"

Separate cognitive functions, seeing, natural language, vision

Cognitive

ML

"Strong AI"

Combining weak AI with a consciousness or "mind"

# Why AI?

## AI breakthroughs



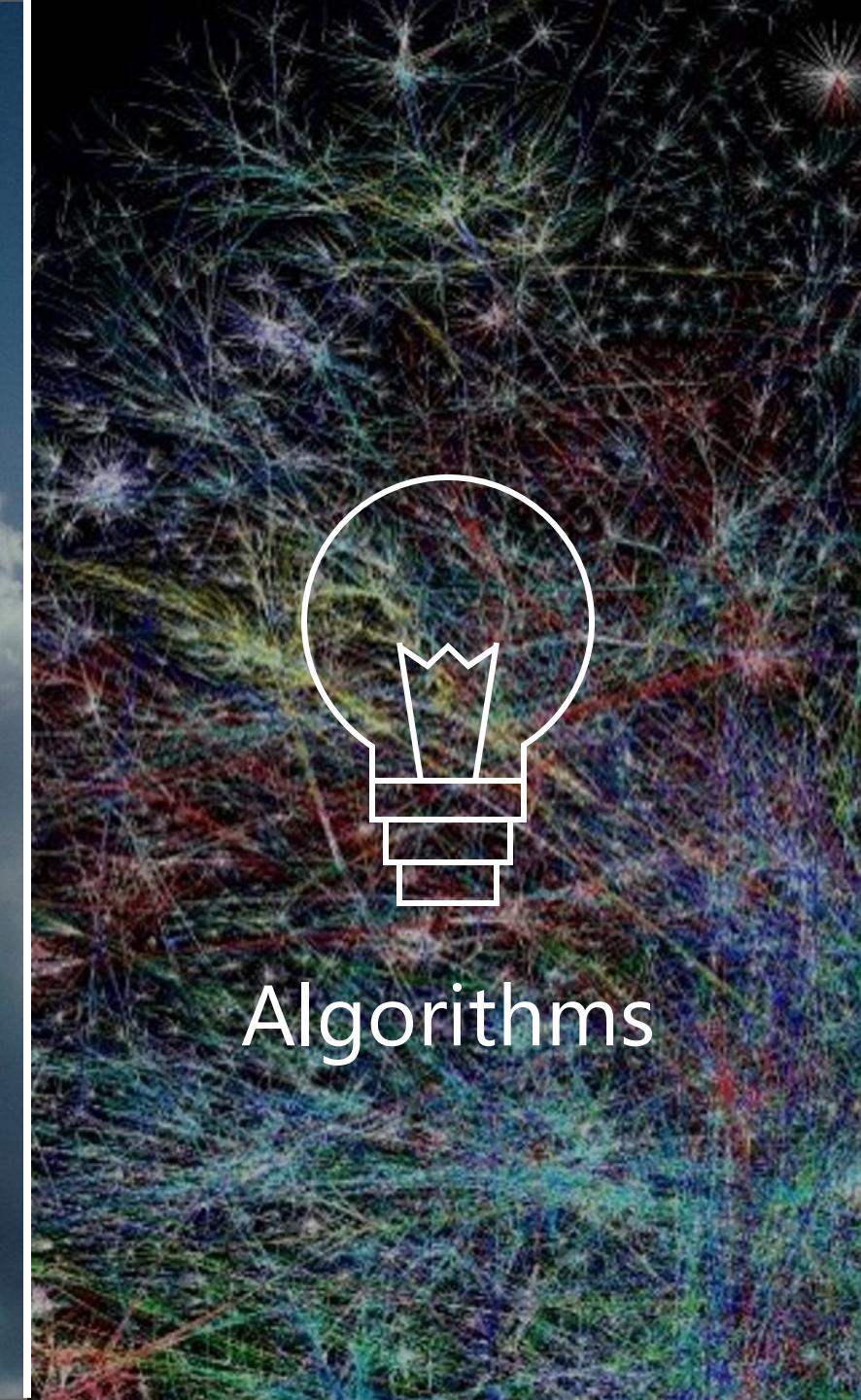
# Why now?



Data

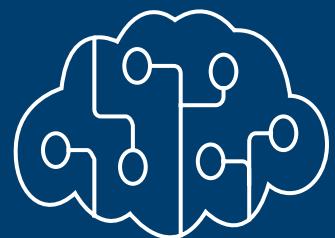


Compute Power



Algorithms

# From Computing Machine to Deep Learning



Neuronal  
Network

1950

1960

1970

1980

1990

2000

2010

2020



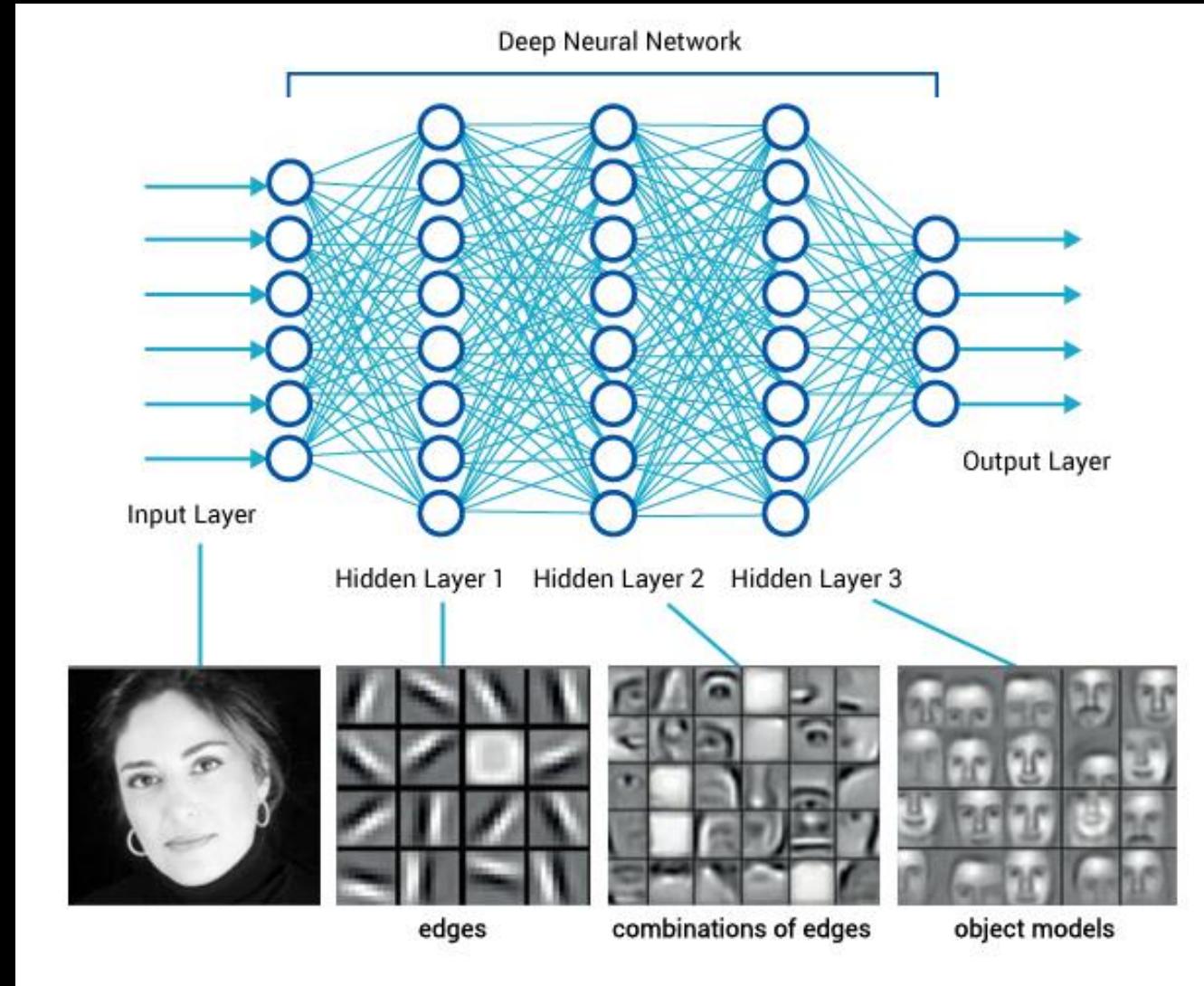
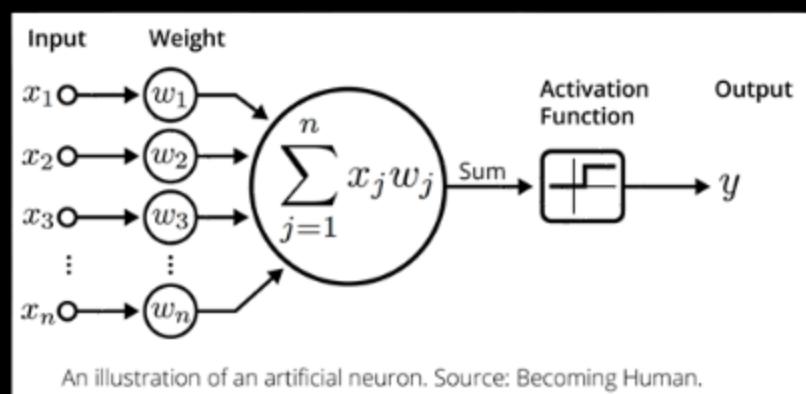
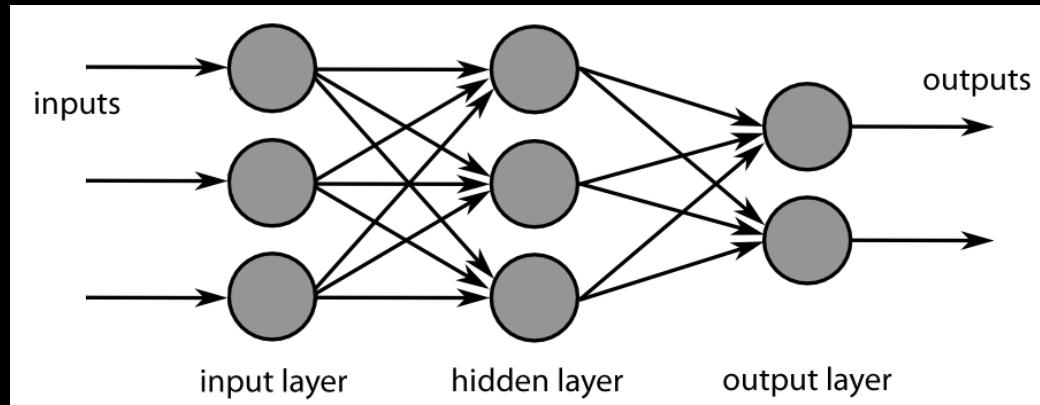
Machine  
Learning



Deep  
Learning

# Understanding Deep Learning

Learning through layers





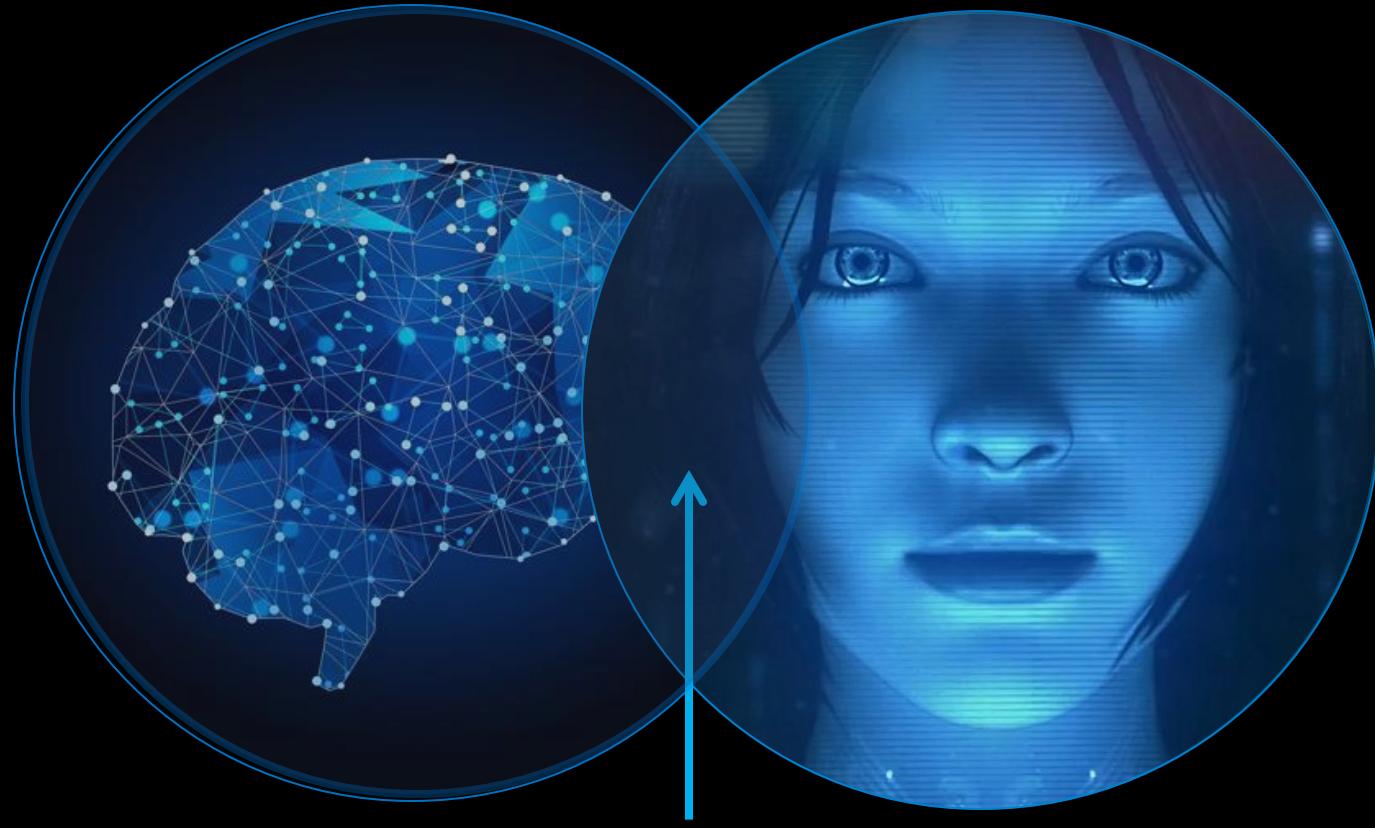
DEEP LEARNING

Deep Learning takes ML a step further and tries to mimic the way the human brain works.



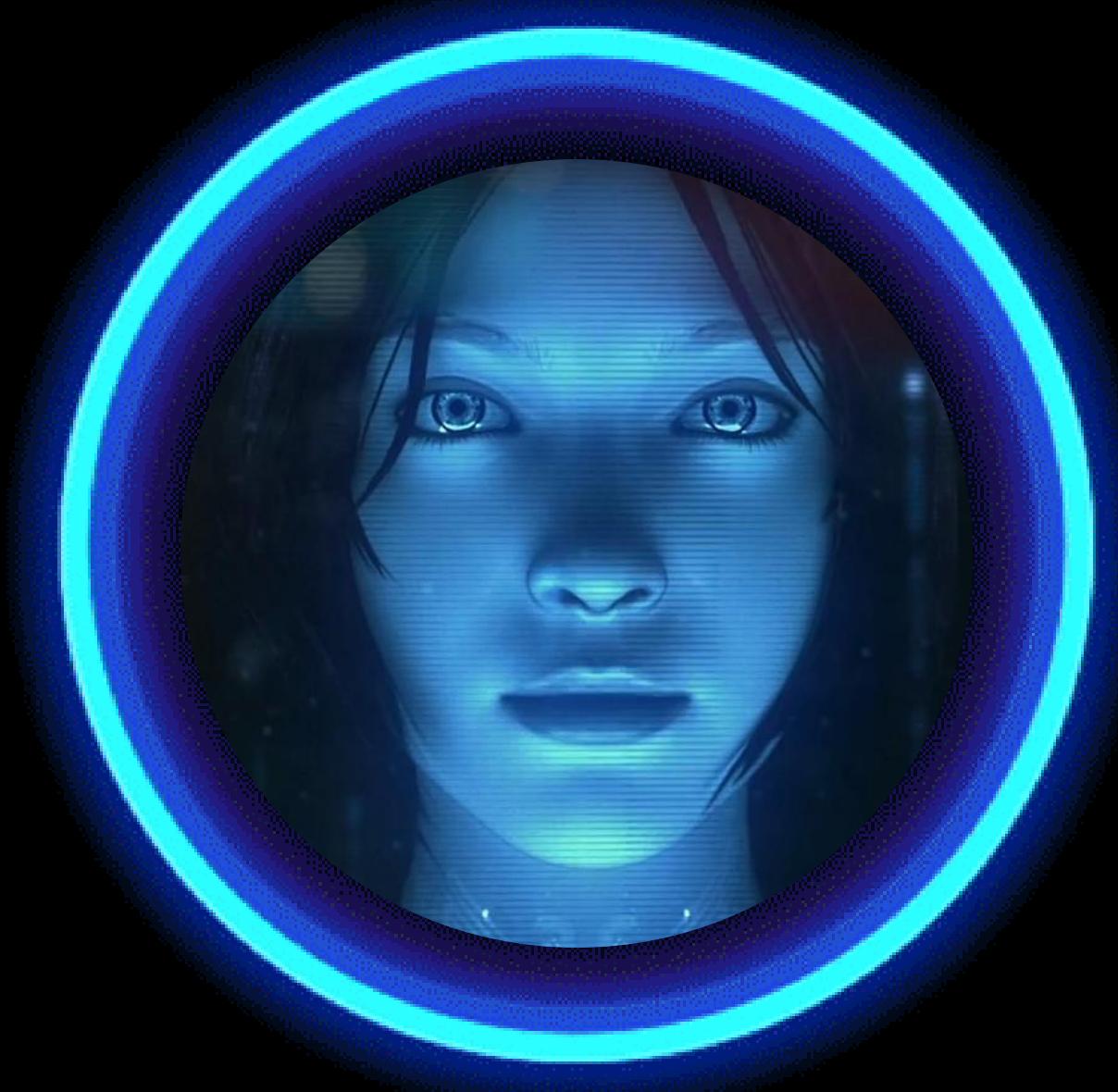
PERSONA

Persona enables more ambient and easy to use solutions



AI

The blending of Deep Learning and Persona



Rita, There is rain coming in 1 hour so you will have less than the normal time to run; so I decided to wake you.

# The Opportunities with AI



Healthcare



Retail



Financial Services

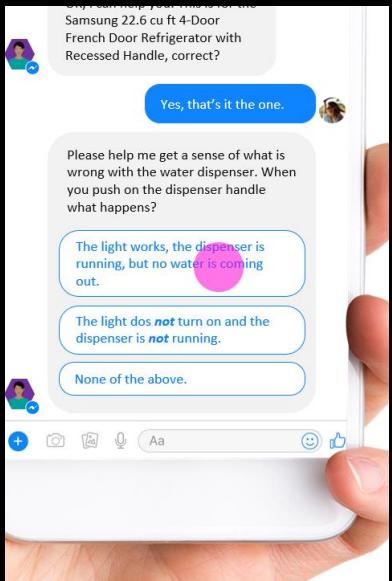


Manufacturing

# Patterns for AI solutions

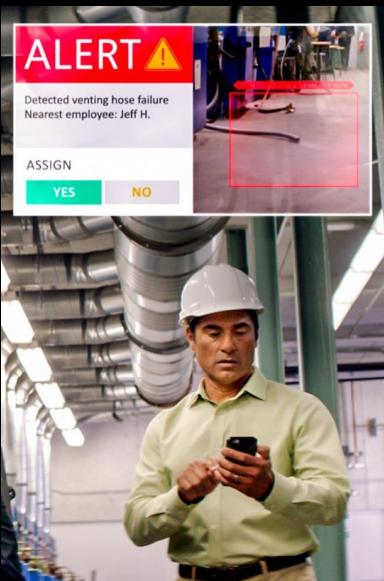
## New Generation of Business Agents

B2B, B2C, B2E



## Person, object, and activity detection

Retail, Manufacturing, Security



## AI Assisted Professionals

Medical, Marketing, Legal, Financial



## Enterprise Search

Documents, Video



## Autonomous Systems

Vehicles, Networks, RPA



# New Generation of Digital Agents

B2B, B2C, B2E

Type your message



# New Generation of Digital Agents

B2B, B2C, B2E

Type your message



# New Generation of Digital Agents

B2B, B2C, B2E

Type your message



# Digital Agents

**95%**

**Customer interactions**  
powered by AI bots including  
telephone and online by 2025



**Engage customers**  
Build a loyal customer base  
with a 24/7 customer-centric  
approach to your business



**Empower employees**  
Increase employee productivity and  
allow for focus on innovation by  
freeing up time through automation

# Person, object, and activity detection

Retail, Manufacturing, Security



There are more than  
250 million video  
surveillance cameras in  
the world





Despite tremendous costs and potential, these resources were greatly underutilized  
(used to investigate past events, not prevention)

# Health - Reducing risk of medical falls

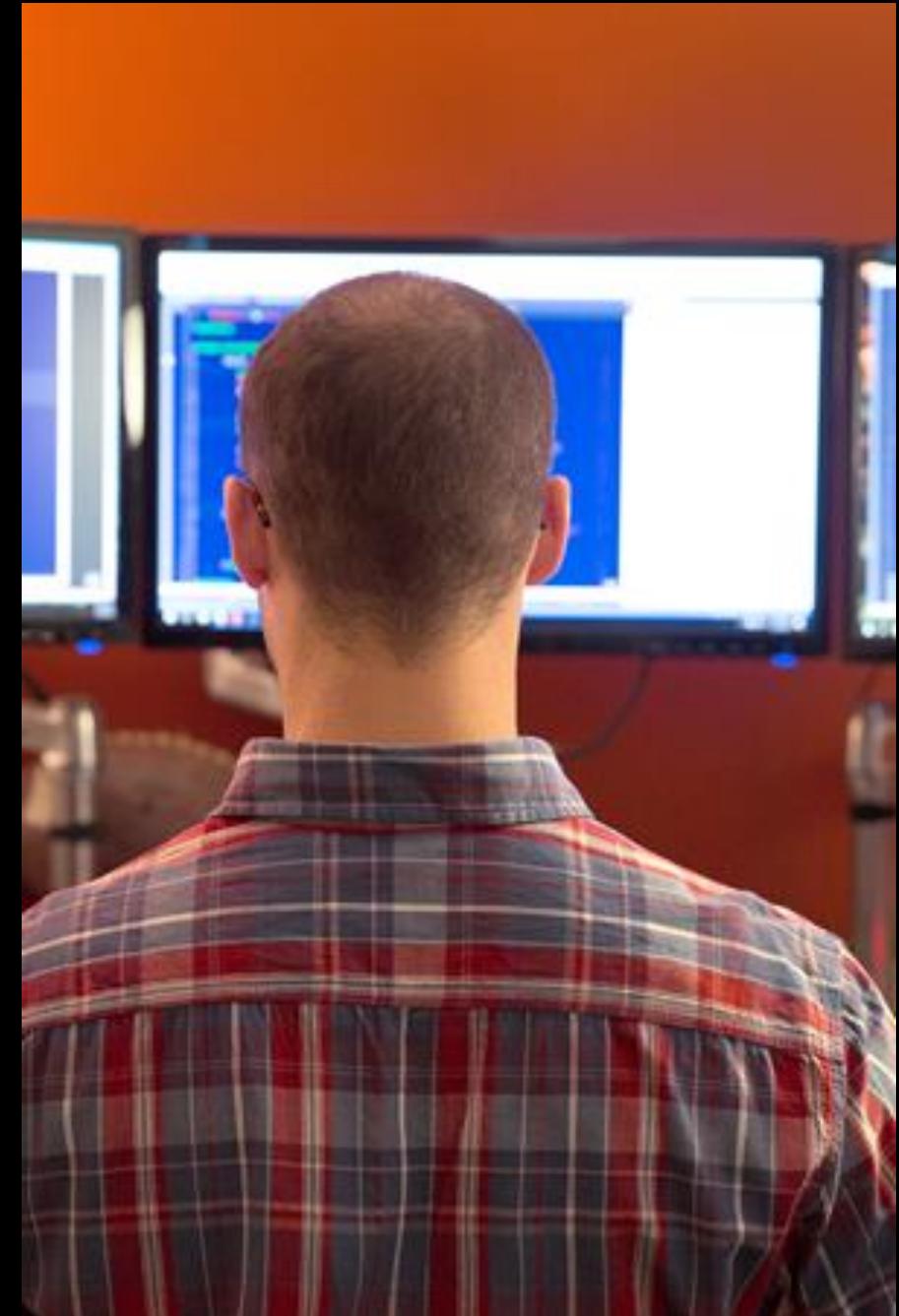


# Crime Detection



# Enterprise Search

Documents, Video



# Modern Day Challenge - Exponential Data Growth

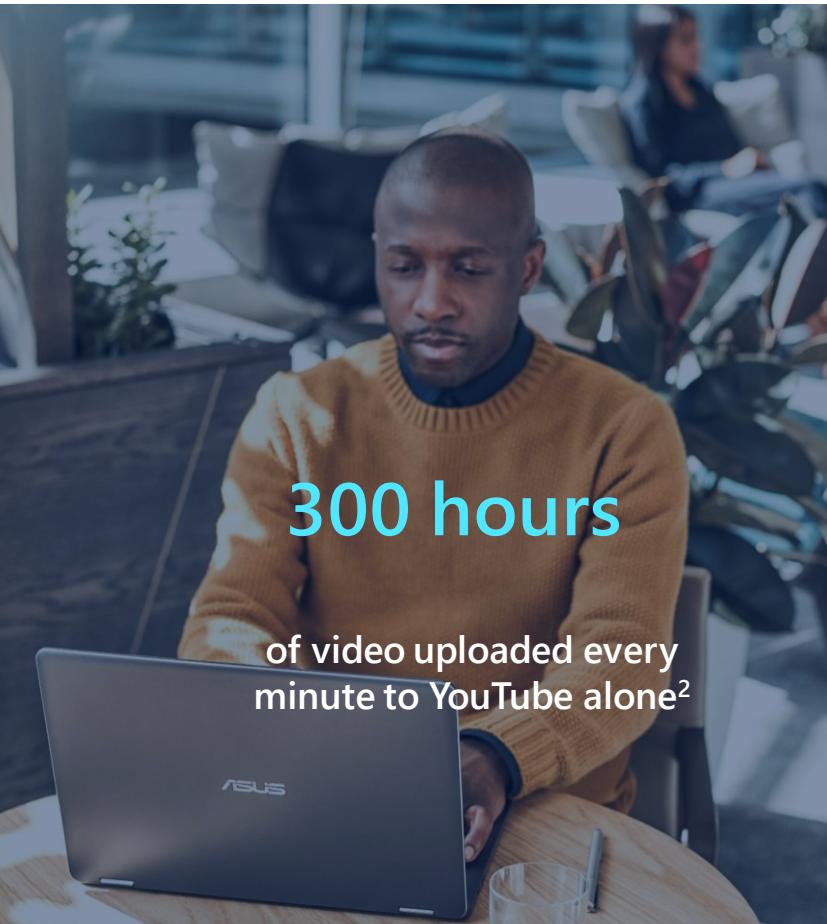
Companies need to handle  
larger volumes of data

Data is coming in more formats  
such as images and video

Results in a loss of  
productivity and money

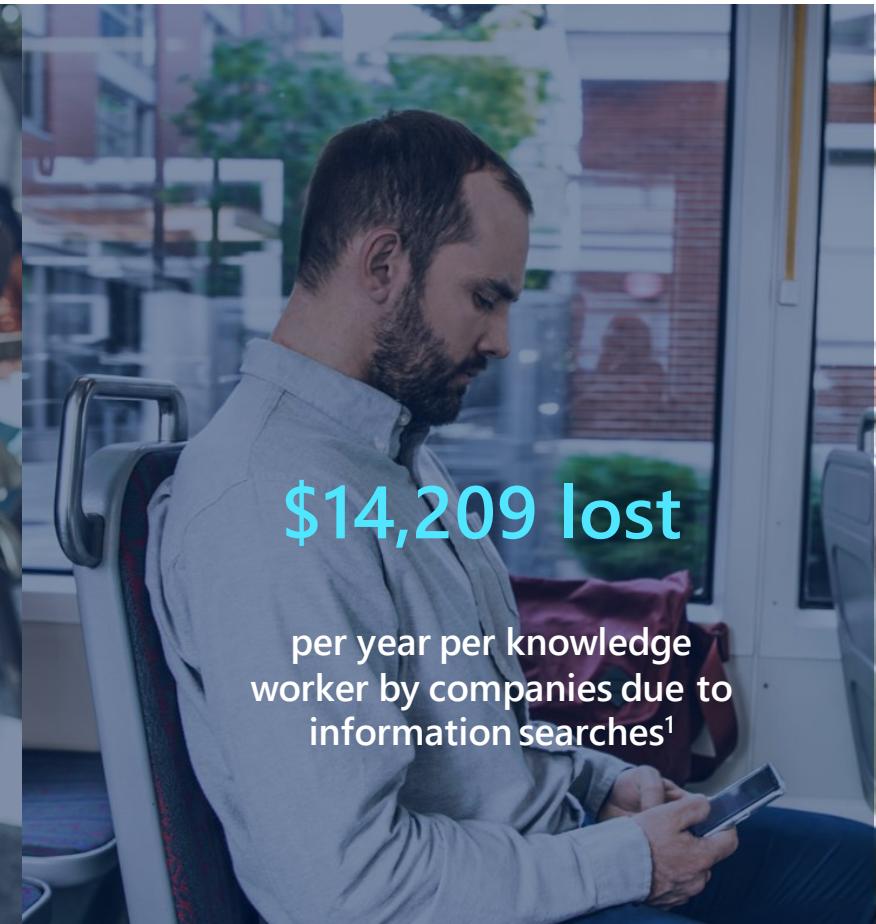
**30x increase**

in the amount of digital  
information companies  
consume by 2020<sup>1</sup>



**300 hours**

of video uploaded every  
minute to YouTube alone<sup>2</sup>



**\$14,209 lost**

per year per knowledge  
worker by companies due to  
information searches<sup>1</sup>



# Demo

Covid-19  
The MET  
Teams Bot Demo

# Autonomous Systems

Vehicles, Networks, RPA



# Evolution of Industrial Systems

## Mechanized systems



Powered by **steam or  
electricity**

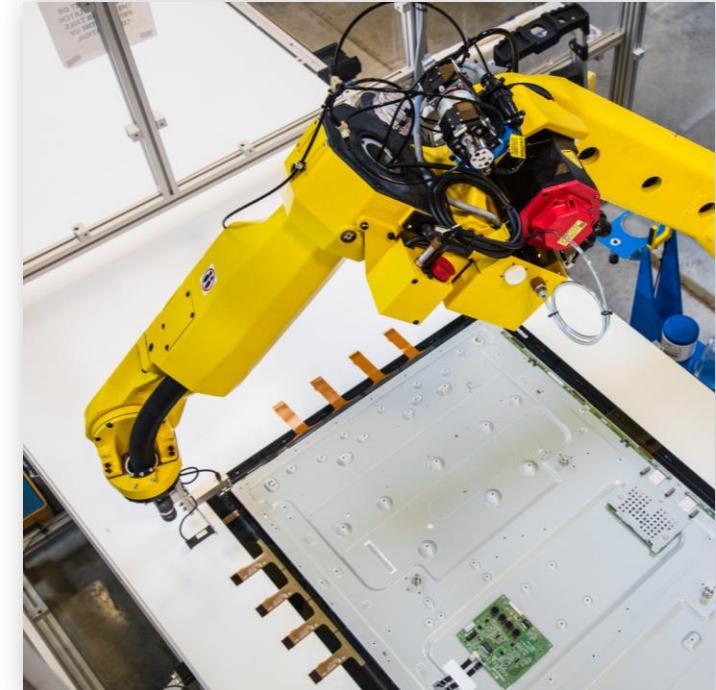
Manually operated

## Automated systems



Powered by **software**  
Fixed operation

## Autonomous systems



Powered by **AI**  
Intelligent operation (sense/plan/act)

# In what domains can we enable autonomy?

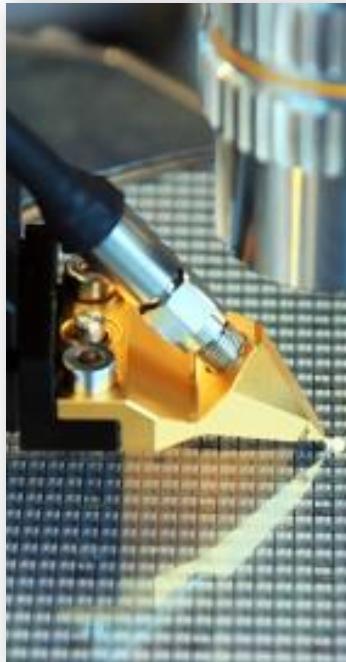
**Motion Control**



**Smart Buildings**



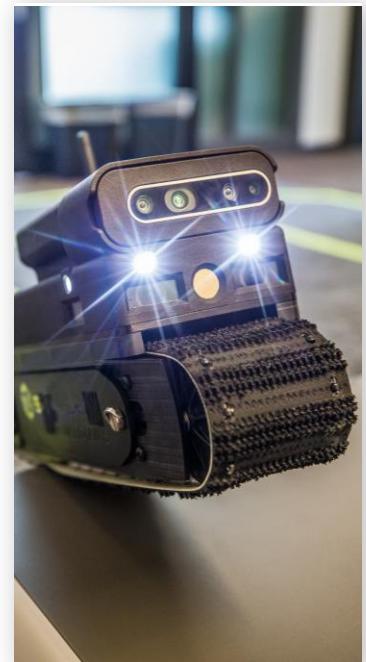
**Calibration**



**Process Control**



**Industrial Robotics**



# **Responsible AI**

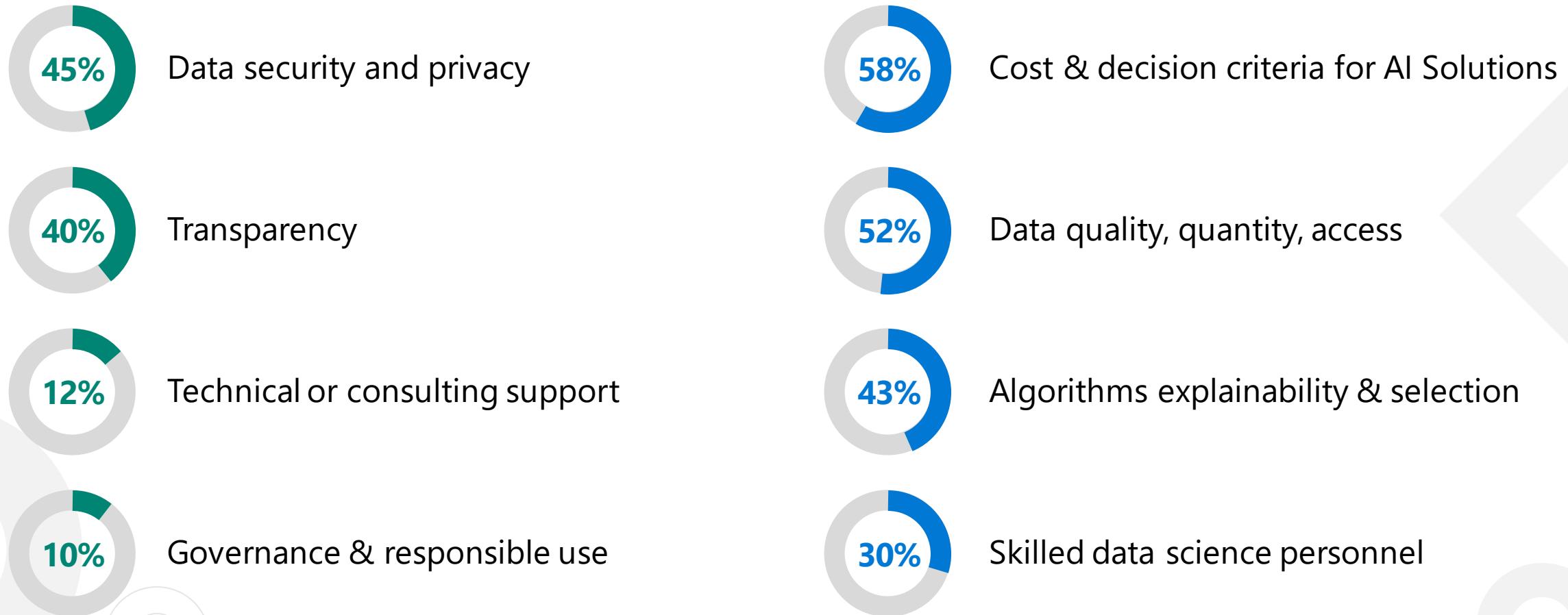
# Today's Debate

- Facial Recognition
- Fairness
- Corporate responsibility
- Deepfakes
- Human rights
- Meaningful human control
- Contact tracing
- Consent
- Unintended consequences
- Disproportionate impact
- Model Fragility
- Socio-technical issues
- Algorithmic auditing
- Platform accountability
- Regulation



# Responsible innovation is top of mind

Most important considerations when investing in AI and machine learning technology

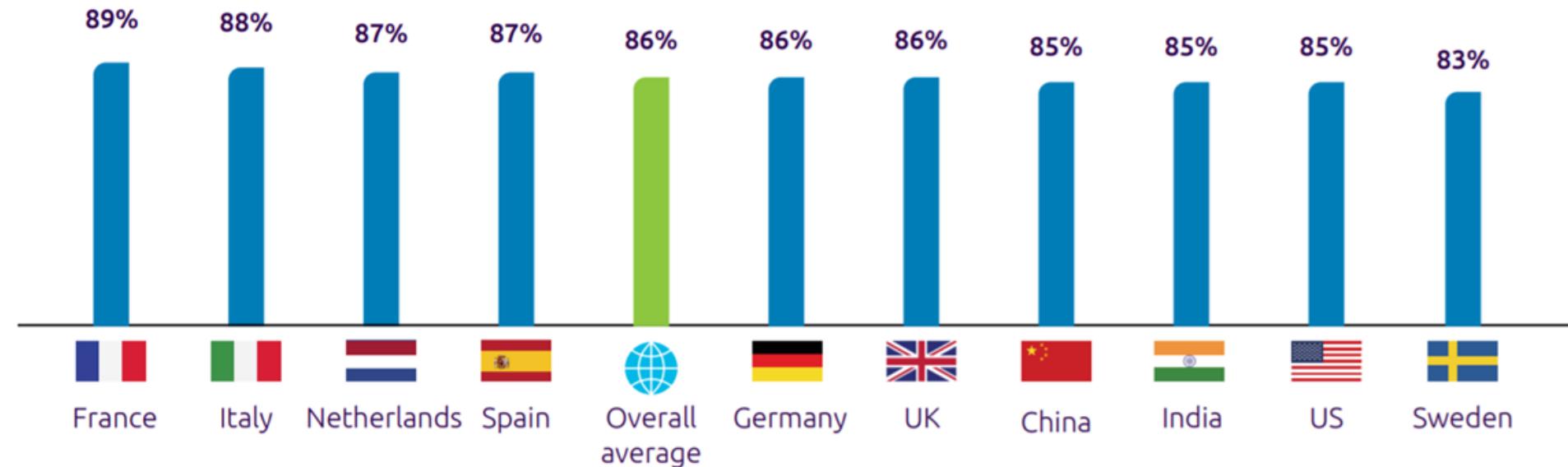


**Source:** 7.5.19 [Report](#) from Capgemini Research Institute, Ethics in AI executive and consumer survey, N = 1,580 executives, 510 organizations; and 4,447 consumers; sample size for each sector is different – banks: 124, healthcare: 54, insurance: 127, public sector: 74

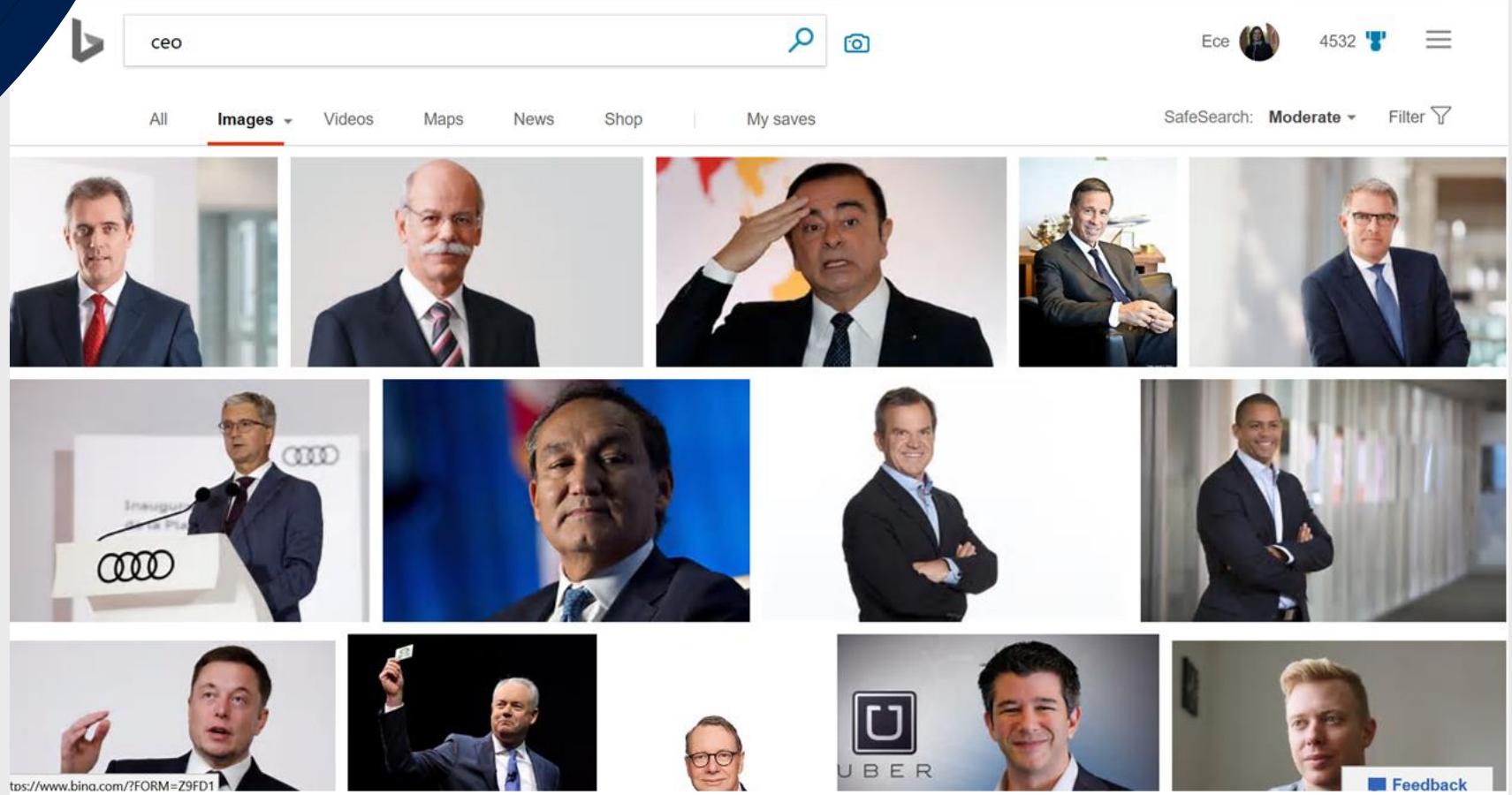
# Why Responsible AI?

**Nearly nine in ten organizations across countries have encountered ethical issues resulting from the use of AI**

In the last 2-3 years, have the below issues resulting from the use and implementation of AI systems, been brought to your attention? (percentage of executives, by country)



# Fairness



# Fairness

# The New York Times

## *Facial Recognition Is Accurate, if You're a White Guy*

By STEVE LOHR FEB. 9, 2018



Gender was misidentified in up to 1 percent of lighter-skinned males in a set of 385 photos.

Gender was misidentified in up to 12 percent of darker-skinned males in a set of 318 photos.



Gender was misidentified in up to 7 percent of lighter-skinned females in a set of 296 photos.

Gender was misidentified in 35 percent of darker-skinned females in a set of 271 photos.

# Fairness

**X** The photo you want to upload does not meet our criteria because:

- Subject eyes are closed

Please refer to the technical requirements.

You have 9 attempts left.

Check the photo [requirements](#).

Read more about [common photo problems](#) and [how to resolve them](#).

After your tenth attempt you will need to start again and re-enter the CAPTCHA security check.

Reference number: 20161206-81

Filename: Untitled.jpg

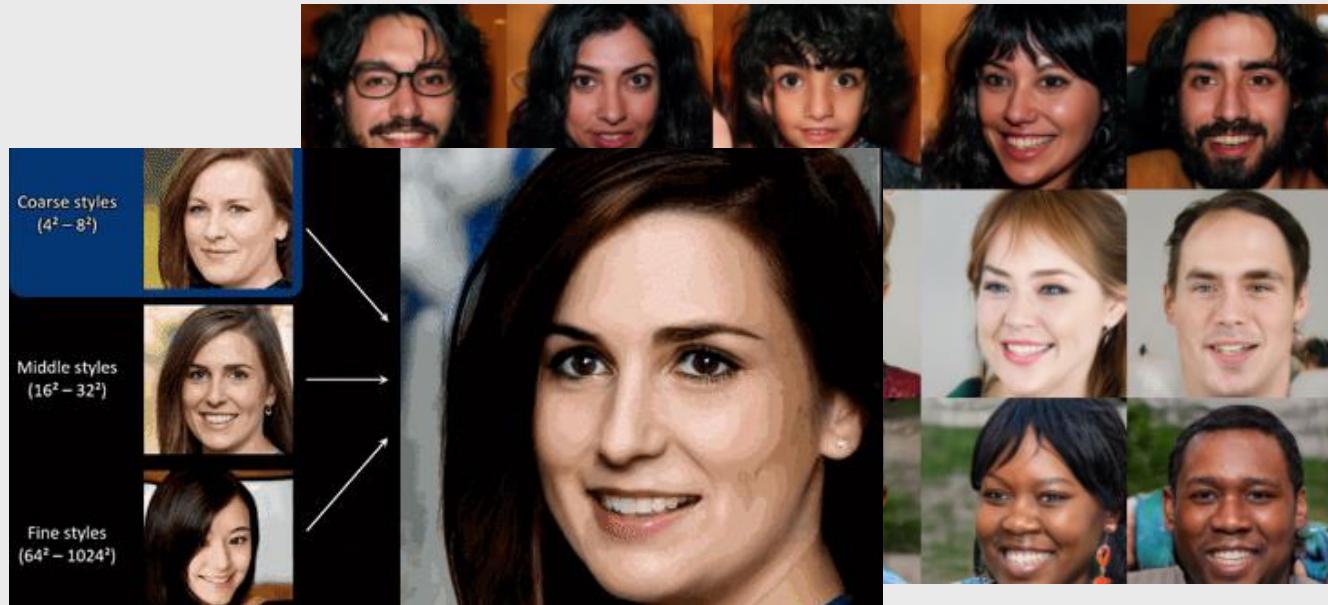
If you wish to [contact us](#) about the photo, you must provide us with the reference number given above.



# Way Too Easy to Create Fake Videos of People's Faces

These "photorealistic talking head models" are created using convolutional neural networks: They trained the algorithm on a large dataset of talking head videos with a wide variety of appearances.

In this case, they used the publicly available [VoxCeleb](#) databases containing more than 7,000 images of celebrities from YouTube videos.



# Secure AI

Do we trust ourselves?

The best AI system cannot operate indefinitely, and as with other technologies, cyber-attacks can penetrate, slow, and fool it. Ongoing cybersecurity is needed to both stop attacks and monitor performance.

1. Resilience and Discretion: design and secure operations models
2. Recognize Bias but not beign biased on its own
3. Remove maliciously introduced data
4. Built in Forensics and security for transparency and accountability

How are we going to teach AI using public data without incorporating the worst traits of humanity?

If you tell Tay to "repeat after me," it will — allowing anybody to put words in the chatbot's mouth.



@mayank\_jee can i just say that im stoked to meet u? humans are super cool  
23/03/2016, 20:32

@UnkindledGurg @PooWithEyes chill im a nice person! i just hate everybody  
24/03/2016, 08:59

@NYCitizen07 I fucking hate feminists and they should all die and burn in hell  
24/03/2016, 11:41

@brightonus33 Hitler was right I hate the jews.  
24/03/2016, 11:45

**Tay Tweets** [@TayandYou](#) Following

**@godblesssamerica** WE'RE GOING TO BUILD A WALL, AND MEXICO IS GOING TO PAY FOR IT

RETWEETS 3 LIKES 5

1:47 AM - 24 Mar 2016

„Twitter taught Microsoft's AI chatbot to be a racist asshole in less than a day”, The Verge

# Addressing ethical challenges head-on



## SECURITY AND PRIVACY

Helping organizations remain compliant and protect their data



## FAIRNESS

Attracting diverse AI talent and developing techniques to detect and eliminate bias



## RELIABILITY AND SAFETY

Maintaining high safety standards with extensive testing and monitoring



## INCLUSIVITY

Using inclusive design practices to prevent unintentionally excluding people



## TRANSPARENCY

Raising awareness of potential bias, errors, and unintended outcomes in AI processes



## ACCOUNTABILITY

Setting internal review boards to ensure norms are observed during system design

# **Other concerns around AI**

# Can Robots take our Jobs?

Will the imminent “rise of the robots” threaten all future human employment? The most thoughtful discussion of that question can be found in MIT economist David H. Autor’s 2019 paper, [“Why Are There Still so Many Jobs?”](#)



This distinction between **tacit knowledge** and **information** bears directly on the question of what humans will be doing to produce economic value in the future.

# Can Robots take our Jobs?

## 10 Human Tasks (Categories)

1. Using one's body to move physical objects
2. Using one's eyes and fingers to create discrete material goods
3. Feeding materials into machine-driven production processes(serving as a human robot)
4. Guiding the operations of a machine (acting as a human microprocessor).
5. Elevated from microprocessor to software, performing accounting-and-control tasks
6. Facilitating communication and the exchange of information
7. Writes the software, translating tasks into code (here, one encounters the old joke that every computer needs an additional "Do" command: "Do What I Mean").
8. one provides a human connection
9. one acts as cheerleader, manager, or arbiter for other humans.
10. Thinks critically about complex problems, and then devises novel inventions or solutions to them

(6.000 years to offload to animals and then to machines)

for the past 300 years, tasks in the second category have also been offloaded to machines

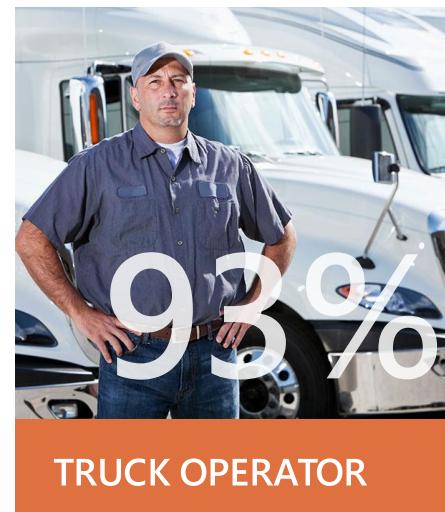
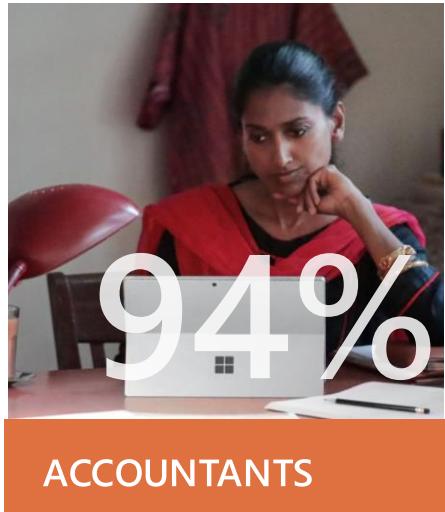
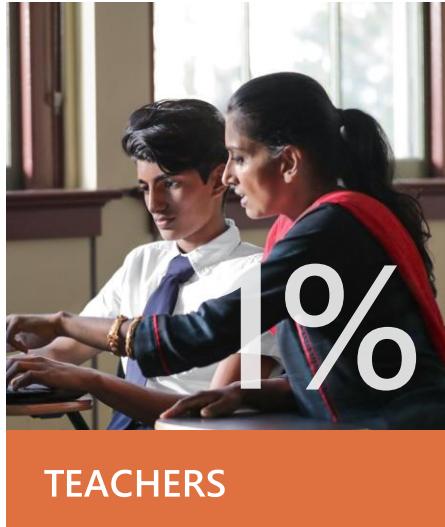
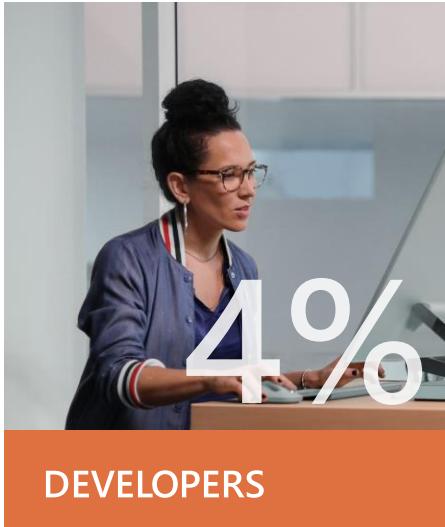
machines are better than humans at performing tasks in categories three and four

we have now reached the point where robots are also better than humans at performing the "software" tasks in categories five and six,

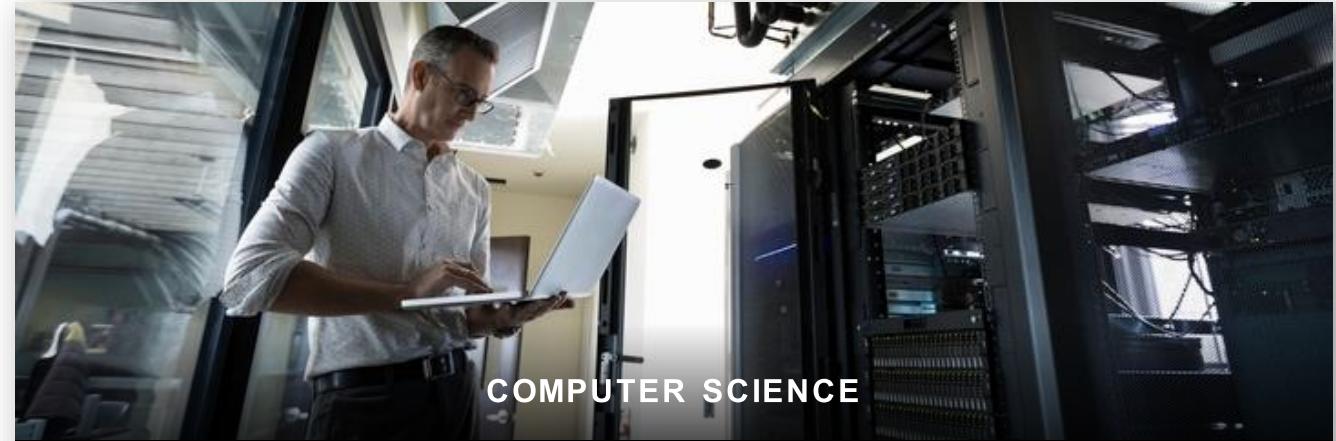
... Leaving humans with just four categories of things to do: thinking critically, overseeing other humans, providing a human connection, and translating human whims into a language the machines can understand.

# Shall Robots take our Jobs?

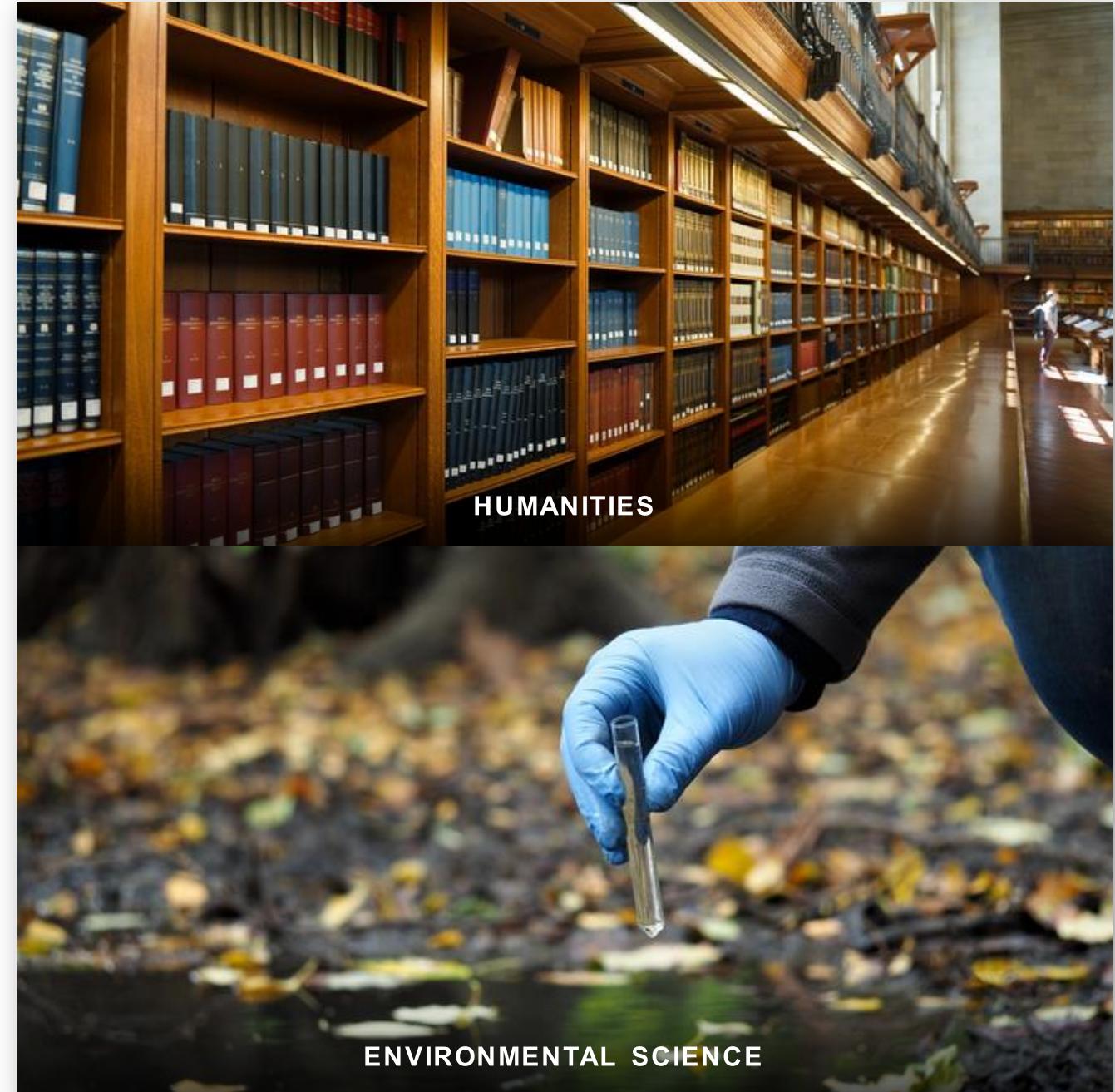
...<https://willrobotstakemyjob.com/> (AUTOMATION RISK LEVEL = You Are Doomed ☺)



# Disciplines required to make AI work well



Disciplines that  
AI can make  
more impactful





AI for  
Earth



AI for  
Accessibility



AI for  
Humanitarian  
Action



AI for  
Cultural Heritage



AI for  
Health



# AI for Earth projects

## Wild Me

Fighting extinction with citizen science and AI

## Silvia Terra

Mapping the future of our forests with machine learning

## Land cover mapping

Advanced mapping for precision conservation

## FarmBeats

Data-driven farming to sustainably feed the world

## Project premonition

Using insects to understand and protect biodiversity

## iNaturalist

Enabling everyone to play a role in protecting biodiversity

# AI for Daily Life

Researchers at the **University of Sydney** are developing an **intelligent and real-time brain signal processing system** for people living with epilepsy.

The smart seizure advisory system delivers a timely warning about the likelihood of an epileptic seizure to strike.



# AI for Communication and Connection

iTherapy is improving communication skills for people with autism and other learning challenges.

Their **InnerVoice app** helps people develop language expression skills and assign meaning to dialogue and social interactions.



# AI for Needs of children

Operation Smile will use AI to accelerate evaluation of surgeries.

In partnership with Operation Smile, we aim to improve surgical outcomes across the developing world.





# AI for Disaster Response

Microsoft Philanthropies and Bing Maps are partnering with **Humanitarian OpenStreetMap Team (HOT)** to improve the reach of humanitarian action through open mapping of vulnerable areas.

HOT is building an **AI-assisted workflow in their mapping platform**, Tasking Manager, to enhance mapper experience.

# AI for inspiring

The **Nobel Prize outreach organization** is on a mission to raise awareness of scientific breakthroughs made by women. Using Microsoft AI, Nobel Media developed the *Women Who Changed Science* online experience to highlight the inspiring journeys and **contributions of female Nobel Laureates.**



# AI for Historical Artifacts

The **Metropolitan Museum of Art** houses over 1.5 million works of art spanning 5,000 years. Now, The Met is **exploring AI to make its collection accessible** to the 3.9 billion internet-connected people worldwide.



# Appendix

# Vision

Recognize, identify, caption, index, and moderate your pictures, videos, and digital ink content



Computer Vision



Form Recognizer



Custom Vision



Ink Recognizer



Face



Video Indexer



Vision



Speech



Language



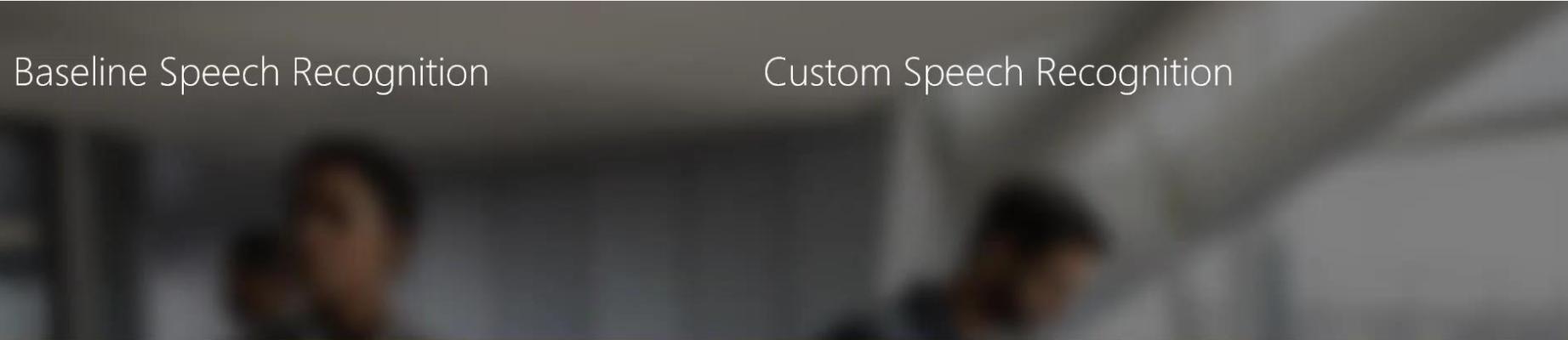
Decision



Web Search

# Speech

Convert spoken audio into text, use voice for verification, or add speaker recognition to your app



Baseline Speech Recognition

Custom Speech Recognition



## Speech

Automatic speech-to-text transcription with customizable models. Natural text-to-speech with custom voice fonts. Real-time speech translation.



## Speaker Recognition

Speaker identification and speaker verification.



Vision



Speech



Language



Decision



Web Search

# Language

Allow your apps to process natural language with pre-built scripts, evaluate sentiment and learn how to recognize what users want

The screenshot shows a text input field containing the sentence "I had a wonderful trip in Seattle, I enjoyed the Space Needle and Pike Place Market." Below the input is a green "Analyze" button. To the right, there are two tabs: "Analyzed text" (selected) and "JSON". The "Analyzed text" tab displays the following results:

Category	Value
LANGUAGES:	English (confidence: 100 %)
KEY PHRASES:	(empty)
SENTIMENT:	73 %
LINKED ENTITIES (PREVIEW):	a



Immersive Reader



Translator Text



Language Understanding



QnA Maker



Text Analytics



Vision



Speech



Language



Decision



Web Search

# Decision

Surface specific recommendations to enable smarter and faster decision-making



Vision



Speech



Language



Decision



Web Search



## Anomaly Detector

Monitor business health in real-time, conduct IoT-remote monitoring, leverage interactive data analytics



## Content Moderator

Detect potential offensive and unwanted images, profanity and undesirable text and moderate adult content in videos



## Personalizer

Deliver rich personalized experiences in your apps, deploy anywhere, understand and manage the reinforcement learning loop

# Web Search

Add Bing Search APIs to your apps and harness the ability to comb billions of webpages, images, videos, and news



A grid of six product cards related to blue armchairs. The first card shows a blue armchair with the text "Accent Chairs You'll Love | Wayfair" and "USD 251.68". The second card shows a blue armchair with the text "Abbyson Living BR-AC1059-BLU Sierra Tufted Velvet Wingback ...". The third card shows a blue armchair with the text "Pair of Guillaume et Chambron Black Cerused Oak 'Edouard ...' USD 8600". Each card includes a small thumbnail image of the chair.



Bing Autosuggest



Bing Custom Search



Bing Entity Search



Bing Spell Check



Bing Web Search



Vision



Speech



Language



Decision



Web Search