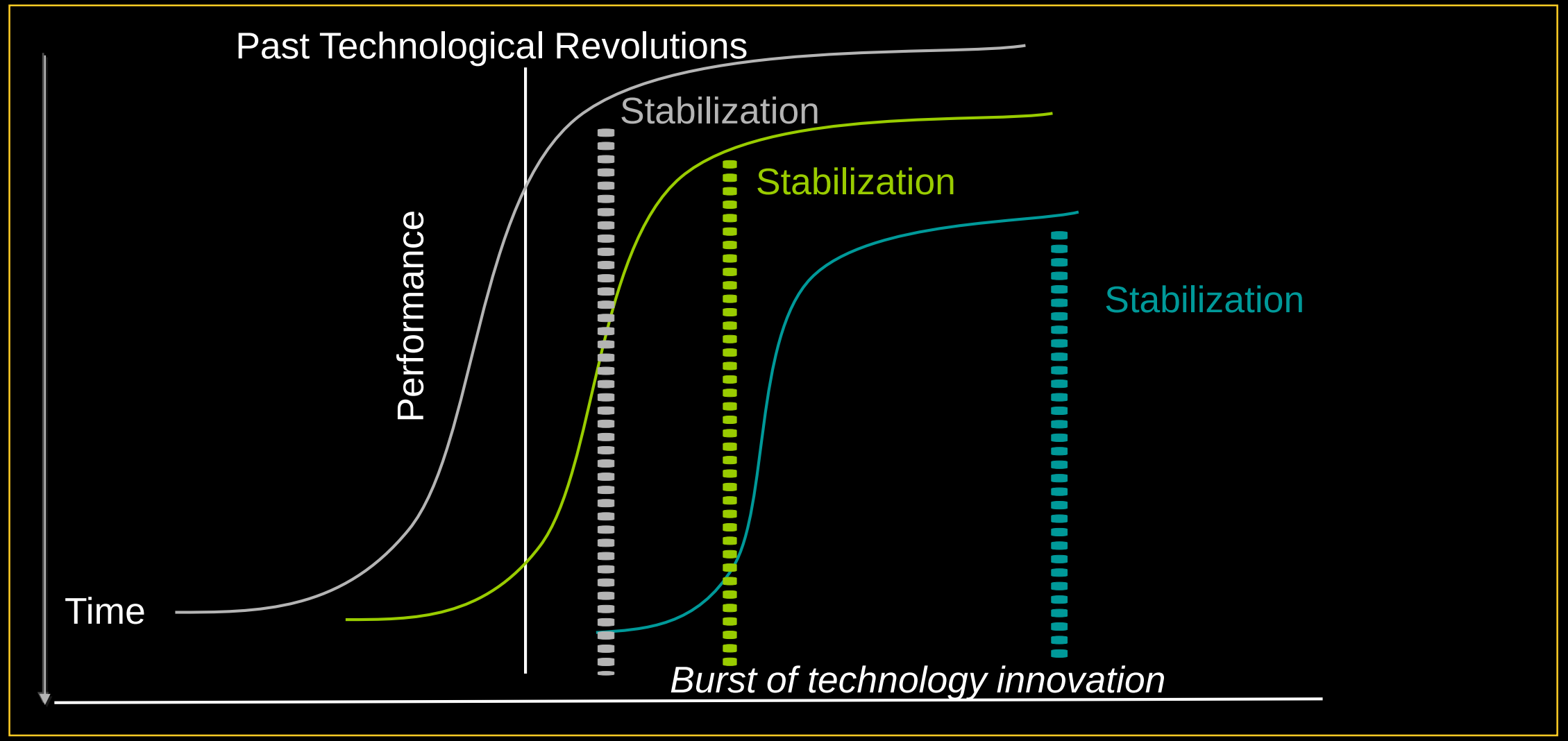
Deloitte.

Emerging trends and exponential forces

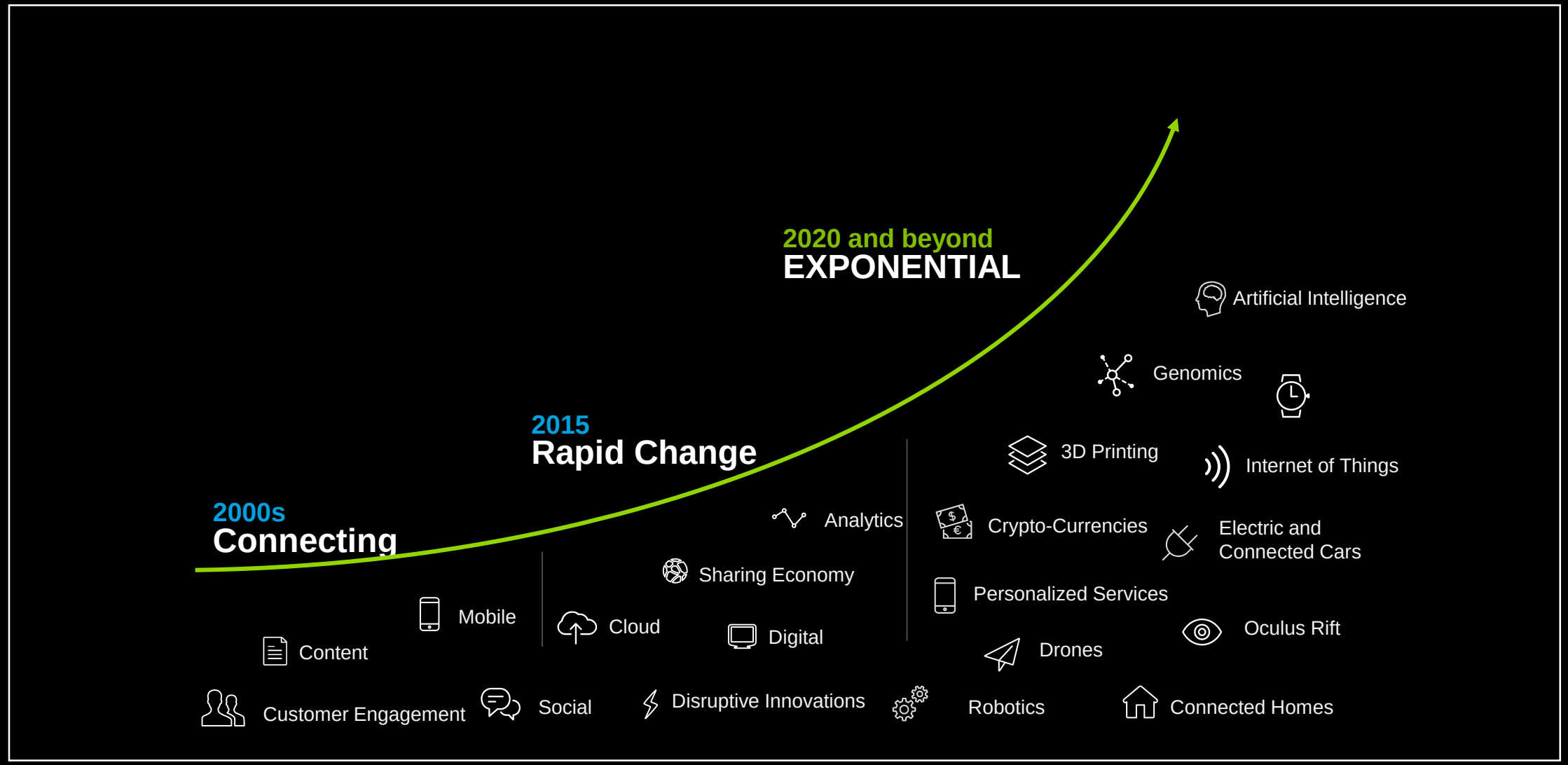
Bill Eggers, Executive Director, Deloitte Center for Government Insights

The S-Curve



Sources: The Big Shift by John Hagel, John Seely Brown and Lang Davison, Deloitte Center for the Edge, Carlota Perez, "Technological Revolutions and Financial Capital", Intel, U.S. Bureau of Labor Statistics, FCC, CNet, Skype, Hartford Courier, Brad M. Barber & Terrance Odean, Clayton Christensen

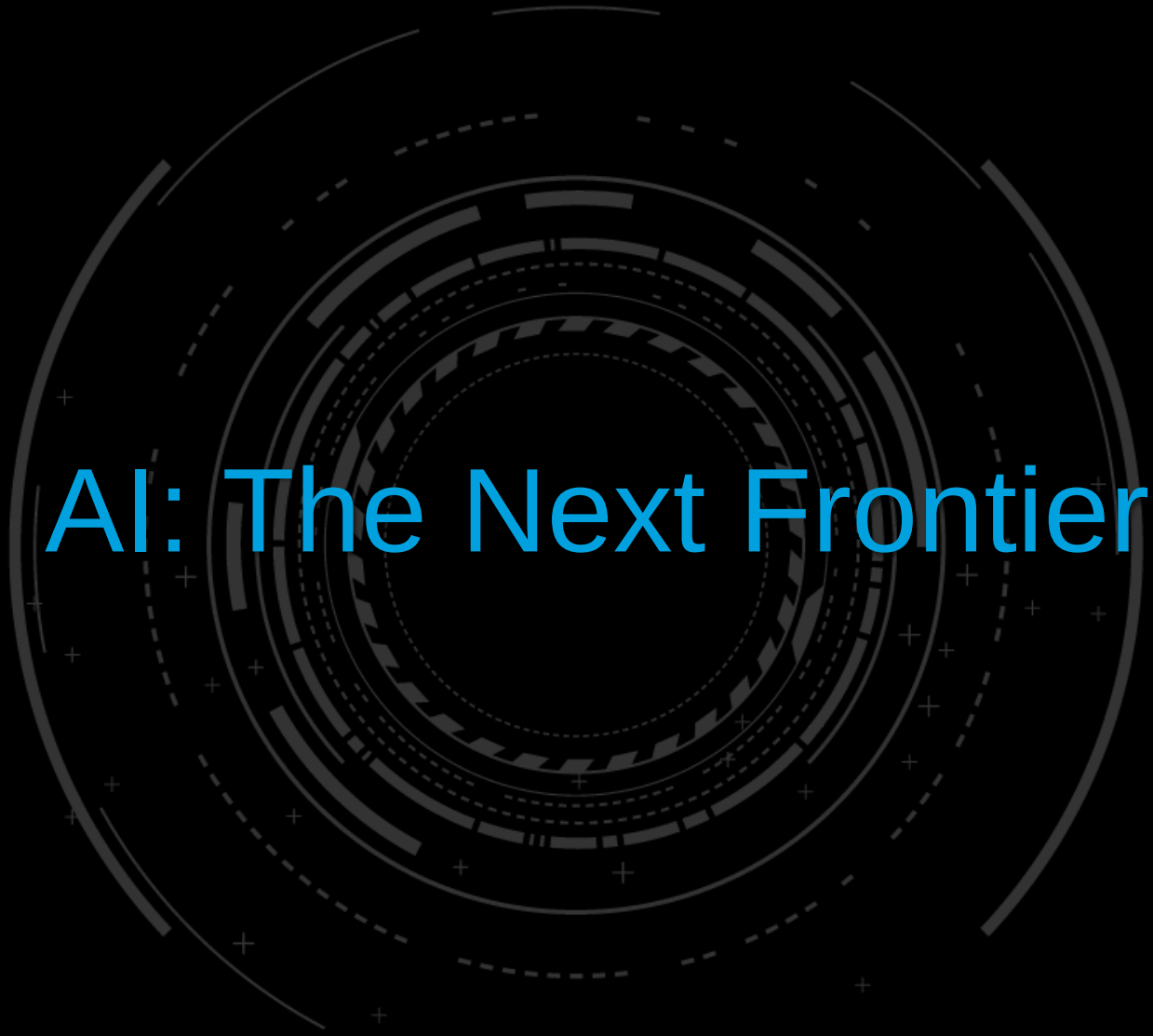
Digital technologies: Progressing at an exponential rate



Dropping costs fuel the digitization cycle

DECEPTIVE → DISRUPTIVE → DEMATERIALIZE → DEMONETIZE → DEMOCRATIZE

Source: Peter Diamandis, "6 D's of Exponentials"



AI: The Next Frontier

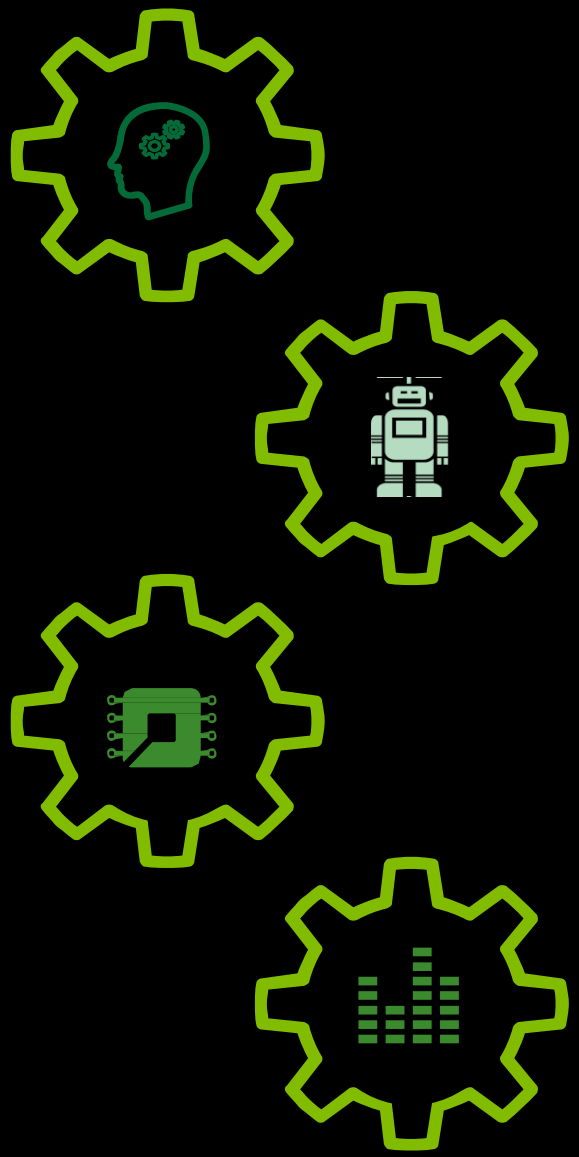
The AI Spring

Computer algorithms that ‘learn’ based on trial and error, resulting in an ever-improving ability to assess inputs and derive more accurate outputs

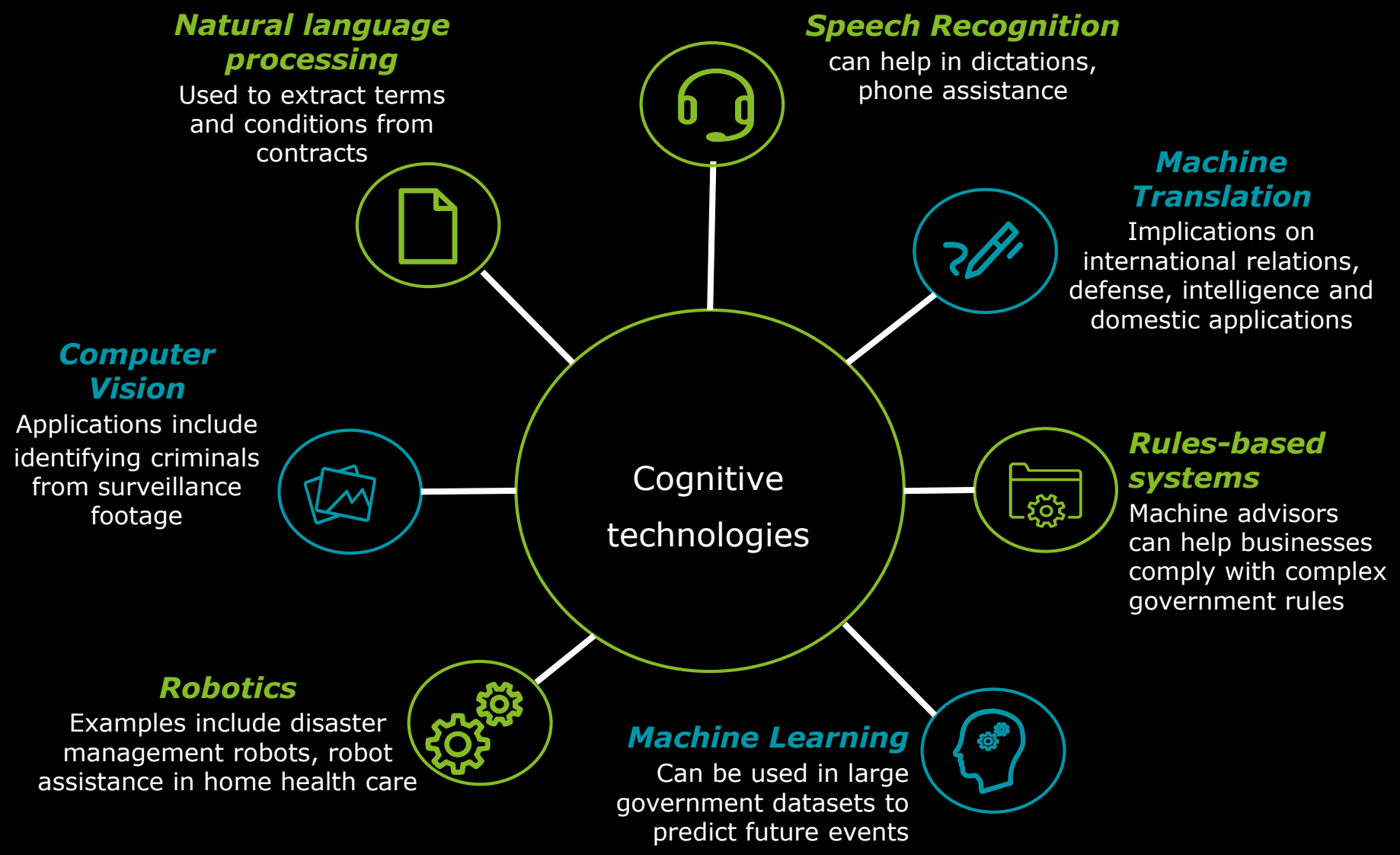
Cognitive systems mimic – and ideally amplify – human judgement and (with robotics) human actions

AI: The new electricity

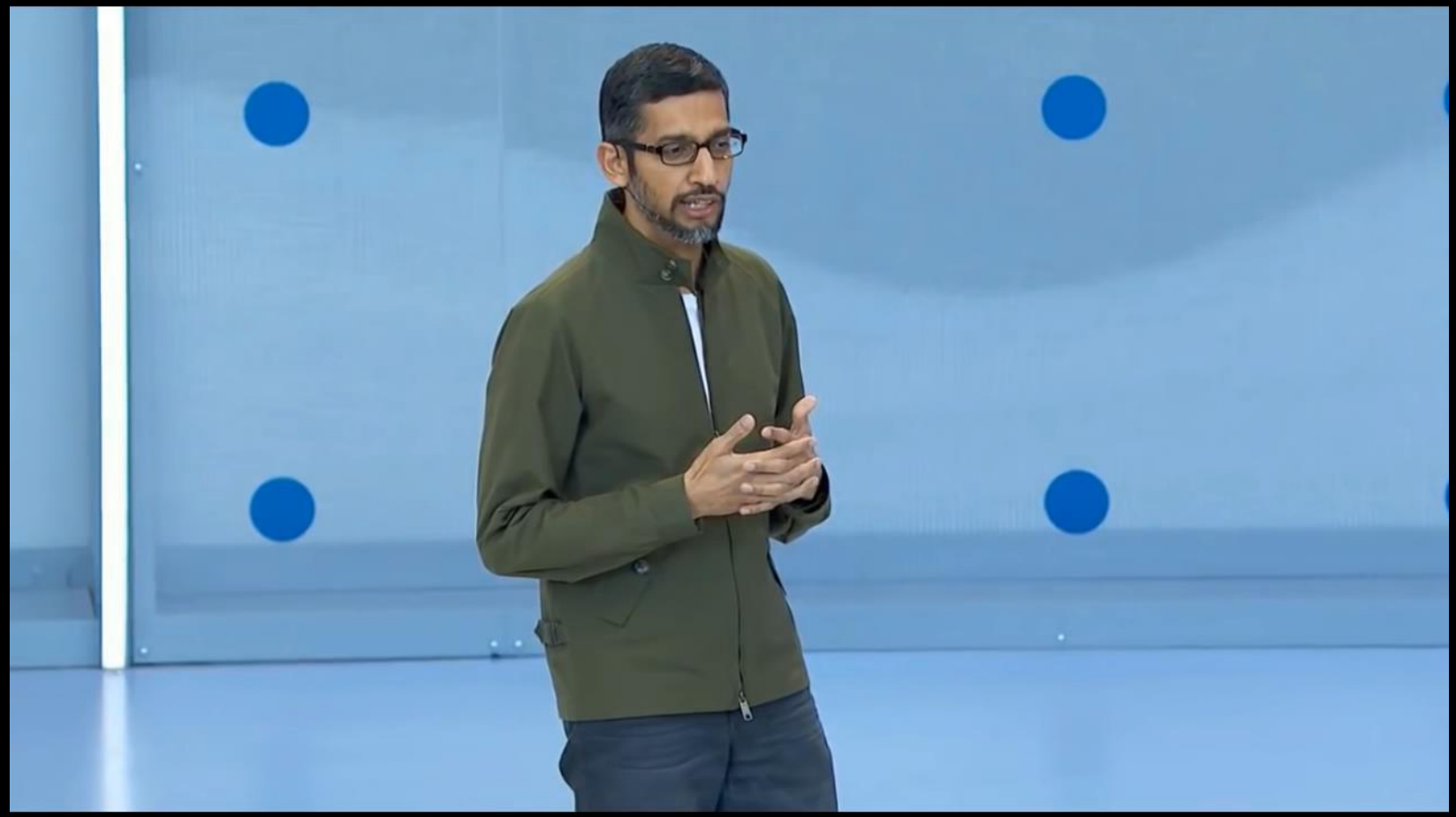
Future of work (and play…) will be powered by AI…



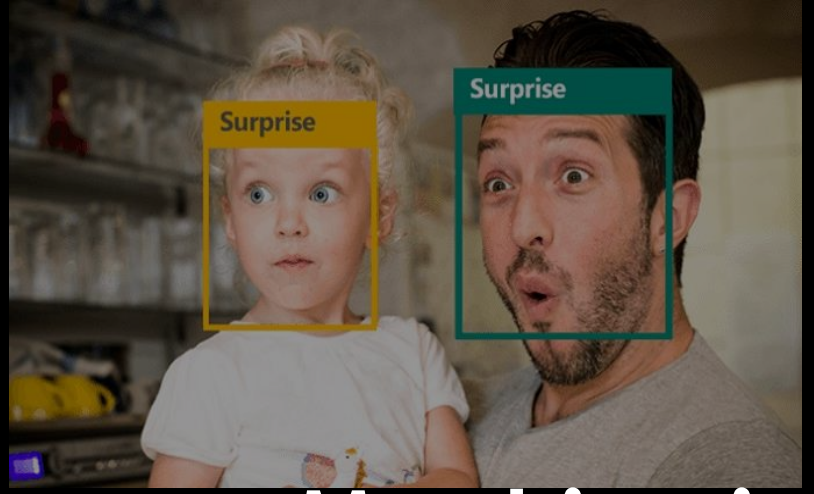
Types of cognitive technologies

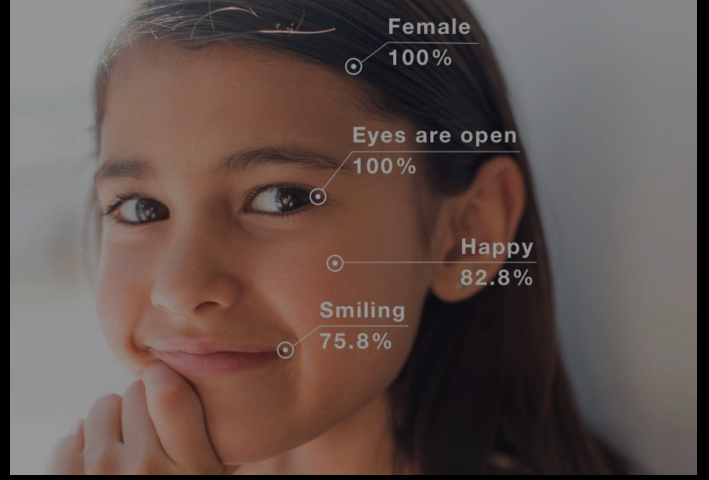


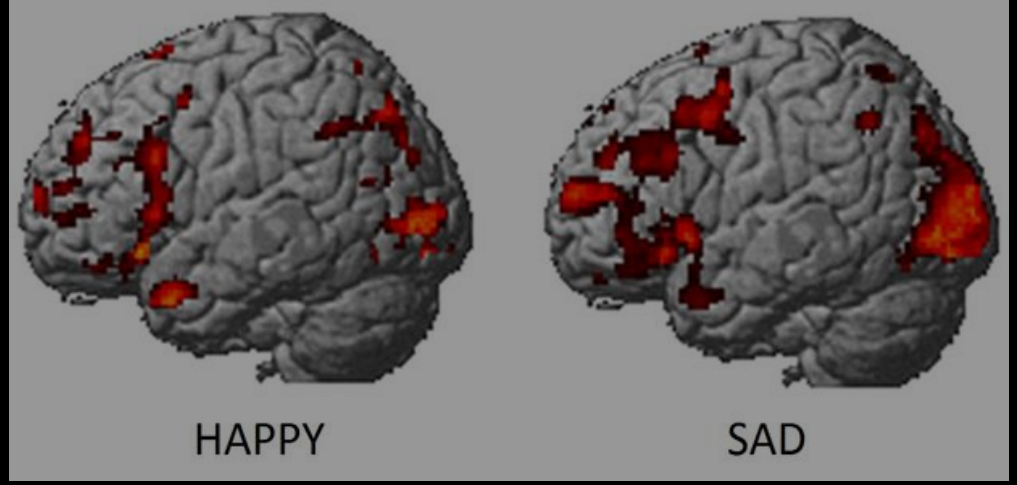
Google Assistant can assist you in every task



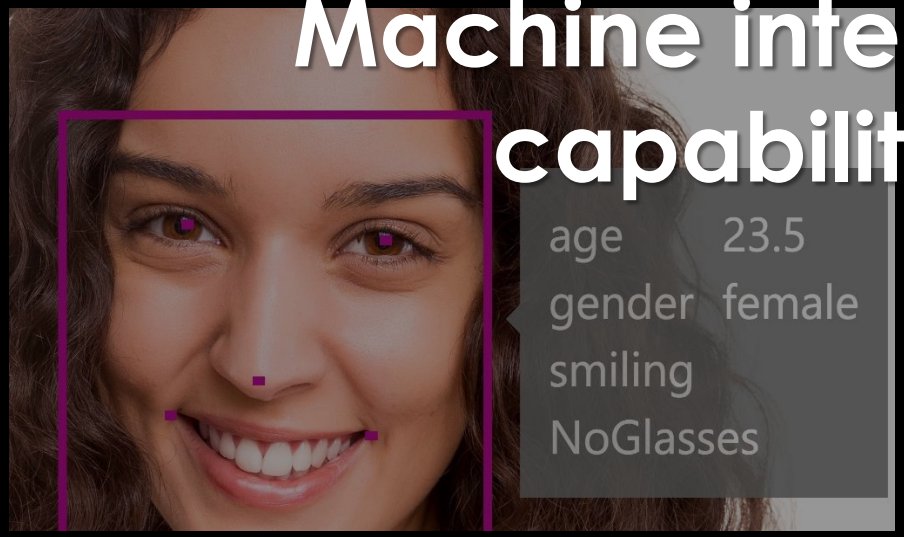

All Seeing AI

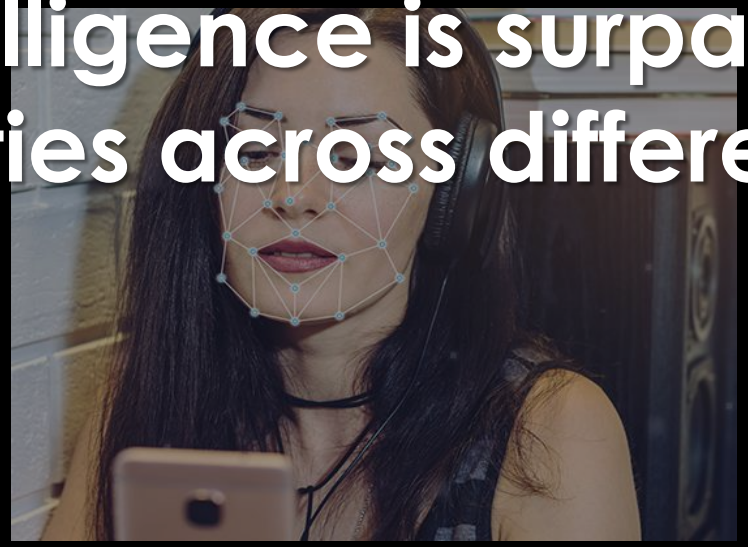


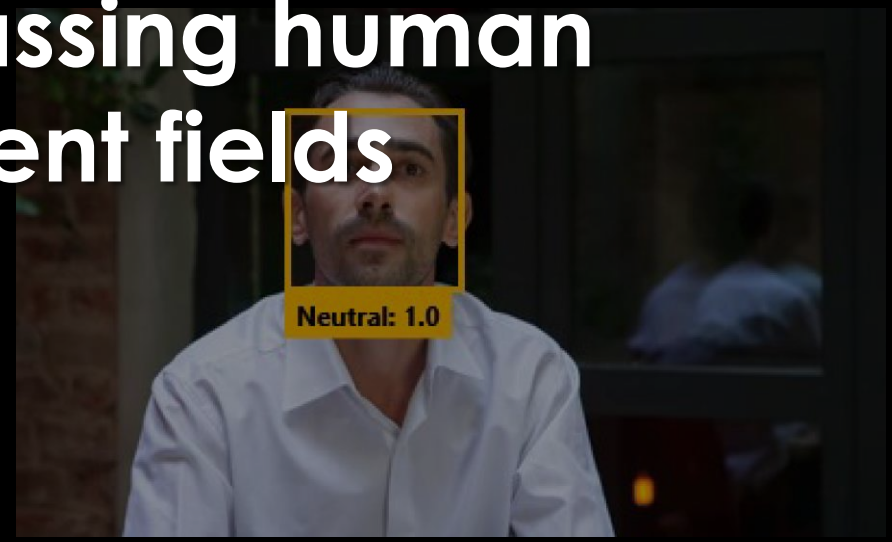


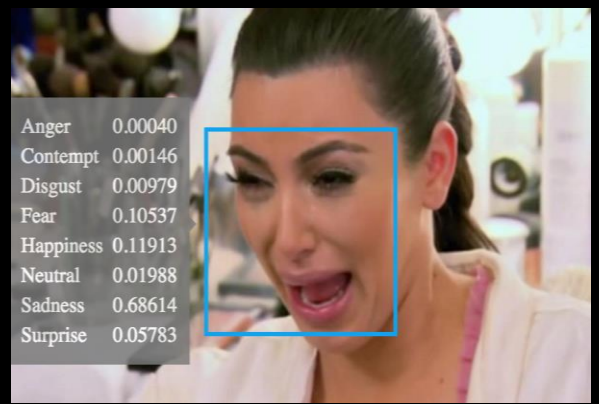


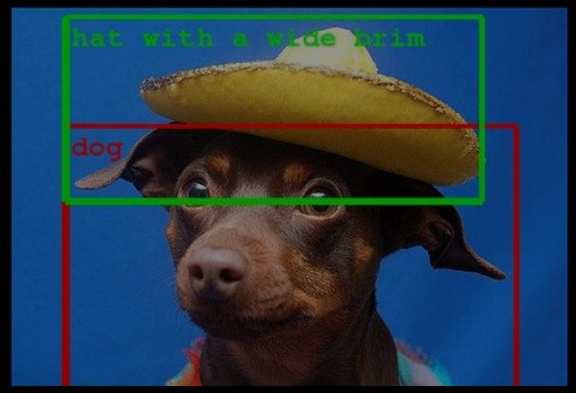
Machine intelligence is surpassing human capabilities across different fields

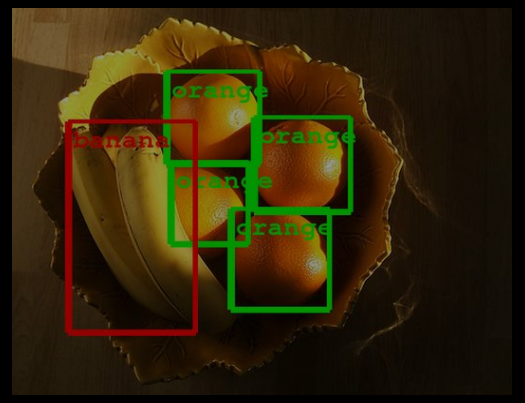




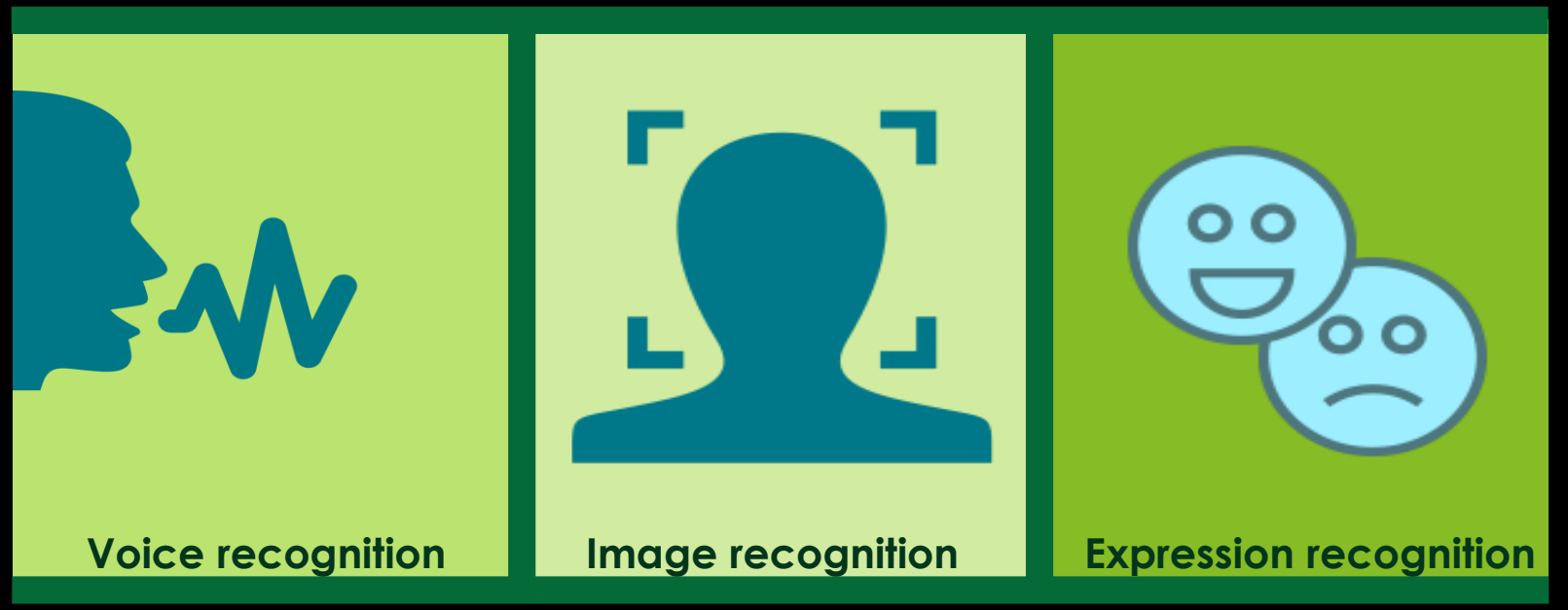




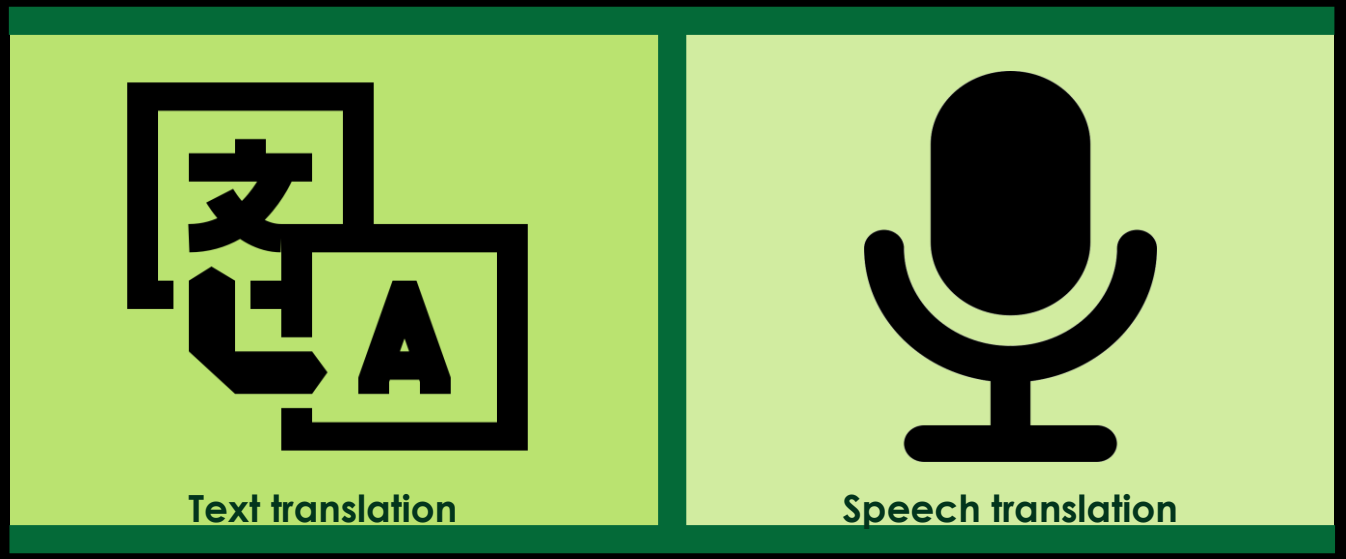




Now…


Voice recognition
Image recognition
Expression recognition

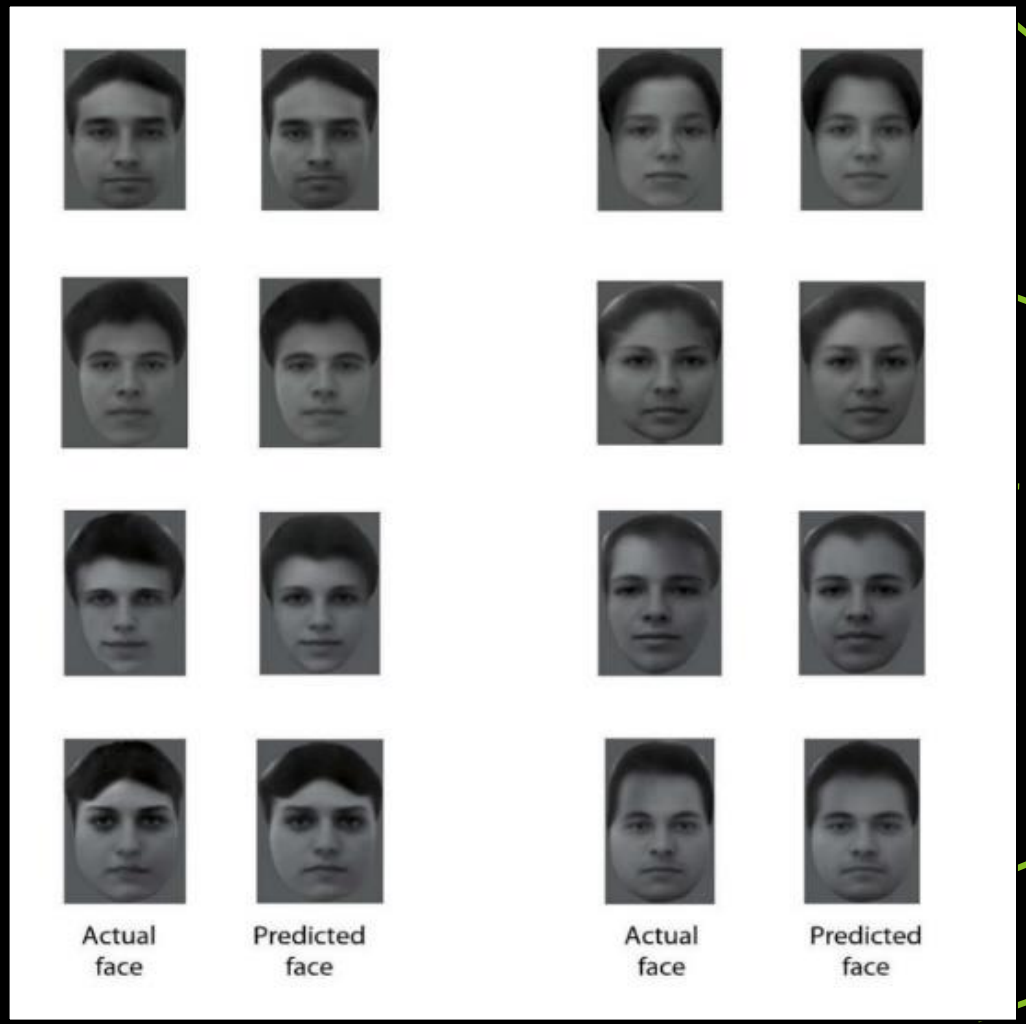
And soon…


文
A
Text translation
Speech translation

Combined with cutting edge analytics, it is increasingly possible to understand and predict future behavior

An online shopping study demonstrated that the face can predict buyer intent with an average accuracy of **73%** accuracy ot **76%**

Neuro imaging with AI



The Gallant Lab at Berkeley has pioneered the mapping of key words or images to parts of the brain.

Like a carbon copy, researchers today can replicate the images people are viewing based on brain activity alone.

AI can detect deception in the courtroom

Results showed that DARE managed to spot 92 per cent of the micro-expressions, which the researchers describe as a 'good performance'

These technologies can help us understand team & individual performance

How can I understand more about my counterpart?

Speech analysis

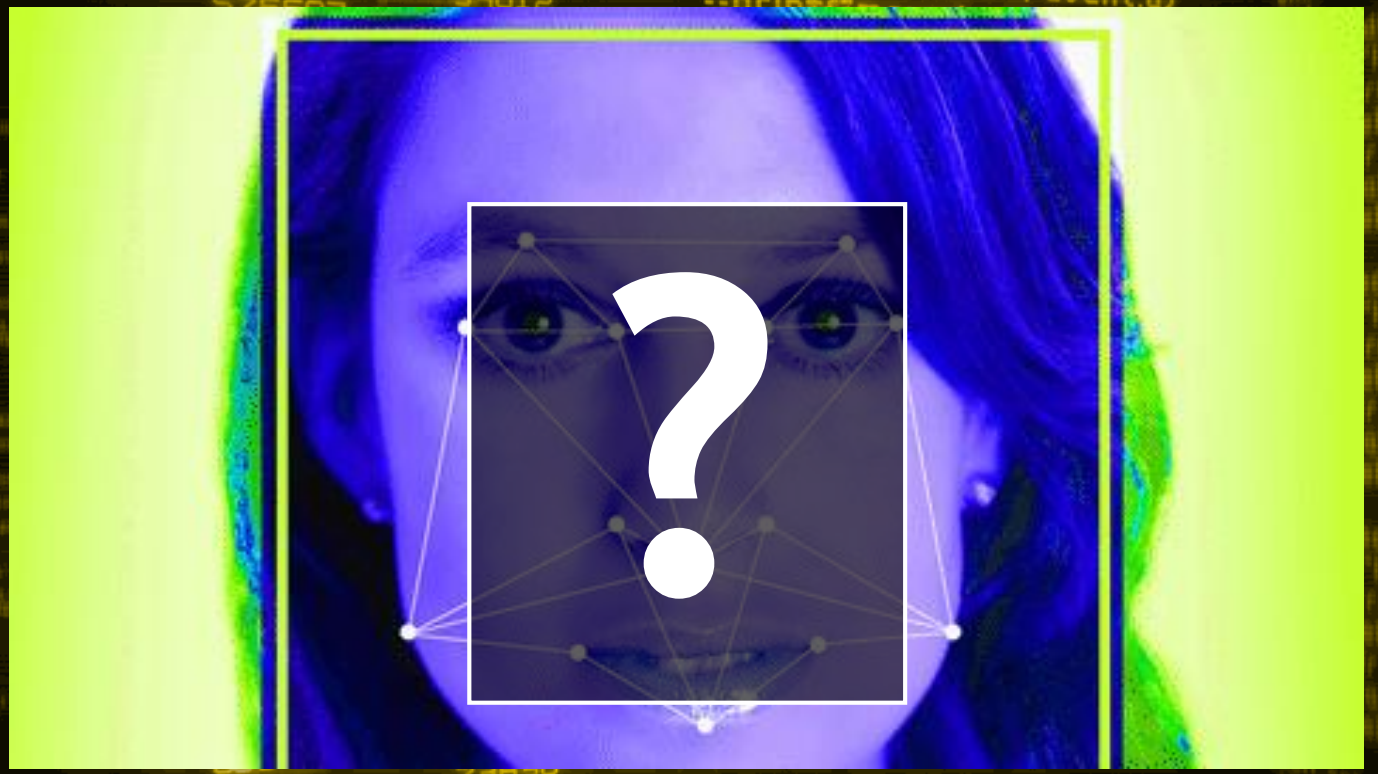
AI augmented face analysis

Text analytics

Social media profiling

Sentiment analysis

Public database mining



Employment history

Demographics

Religious views

Political views

Likes/dislikes

Education

Health

Sexual Orientation

Social influence

Family

Household income

Travel history

Shopping habits

With AI you can know someone without ever meeting them

The Future of Work

How can we get 5X, 10X the output with the same resources?

What big shifts are required?

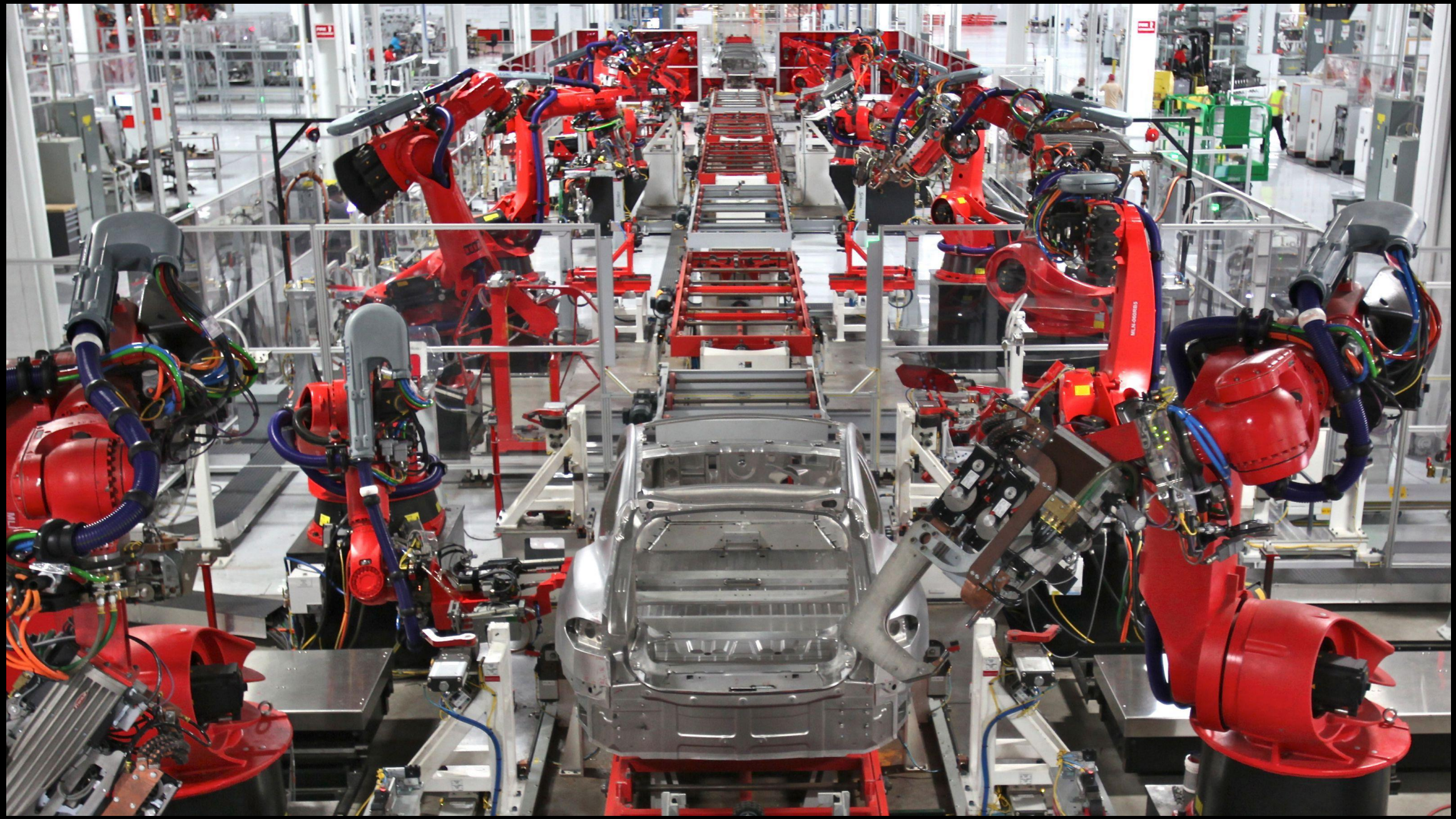
Every aspect of work will be redesigned

WORK **WORKER** **WORKPLACE**

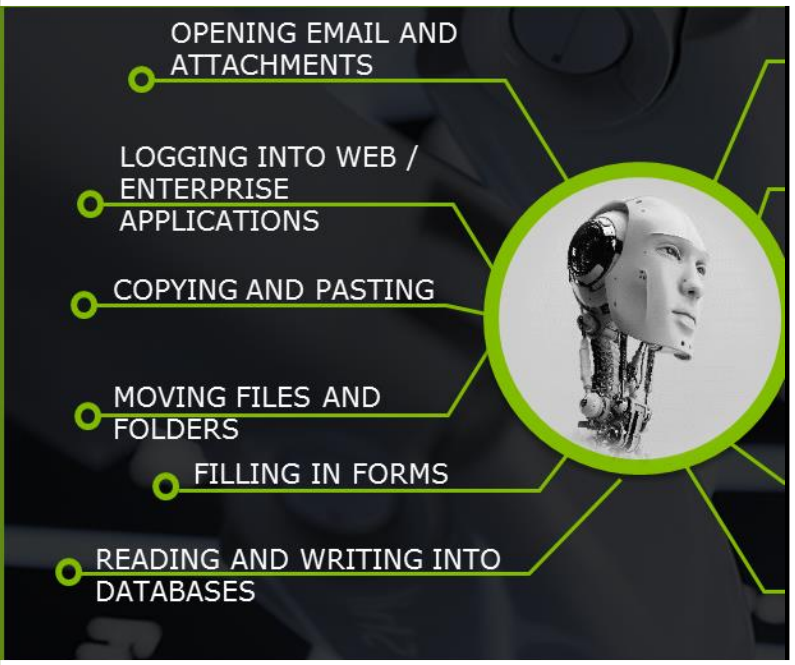
What
work gets done?

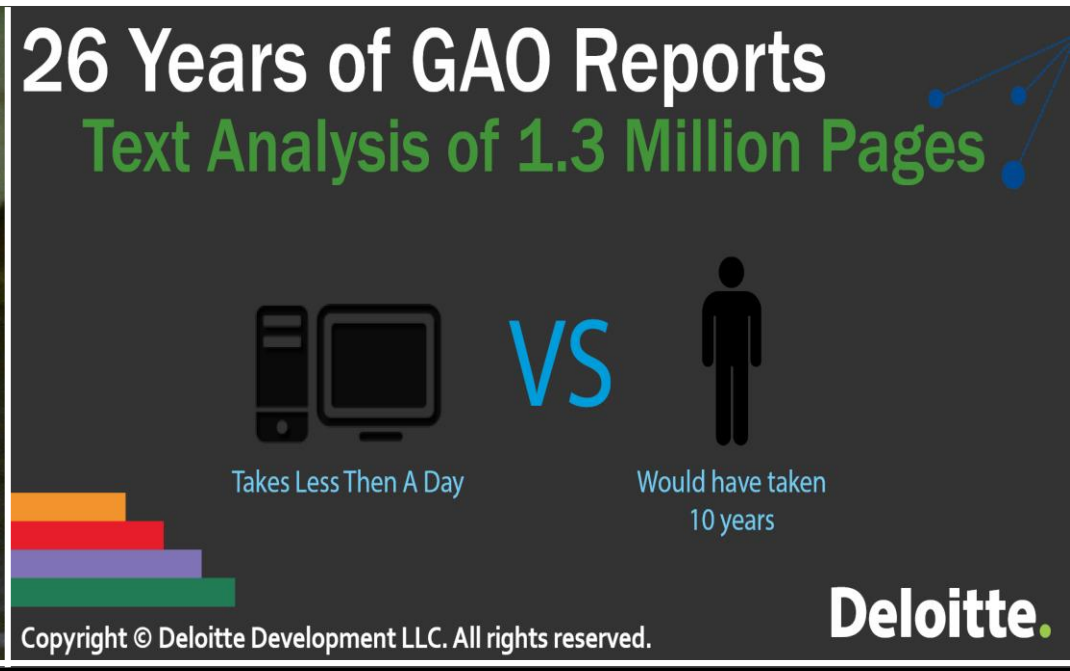
Who
can do the work?

Where
is the work done?



Autonomous: Mind to Machine



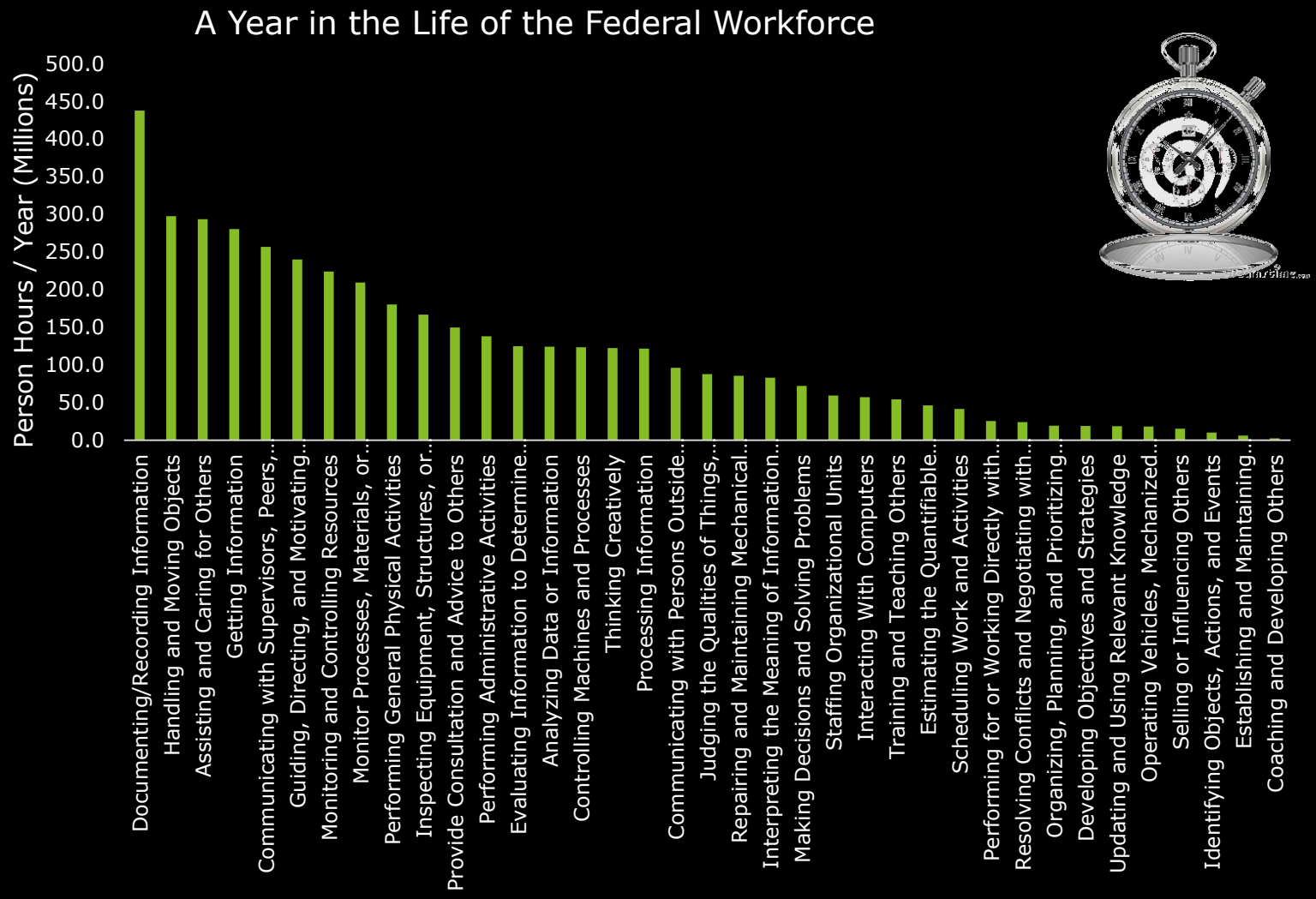


Dull

Dangerous

"Dear"
(high-value)

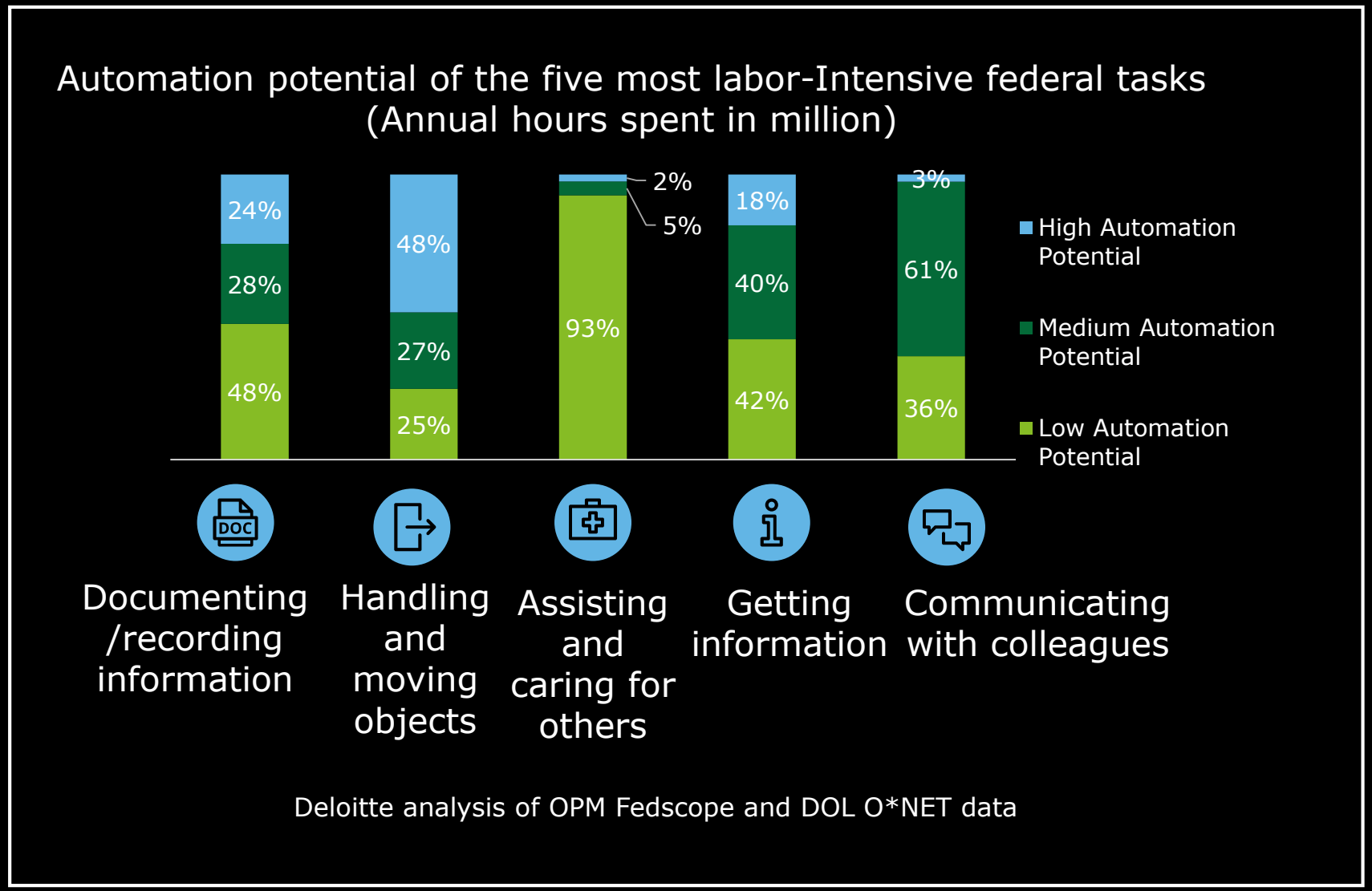
How does the federal govt. workforce spend its time?



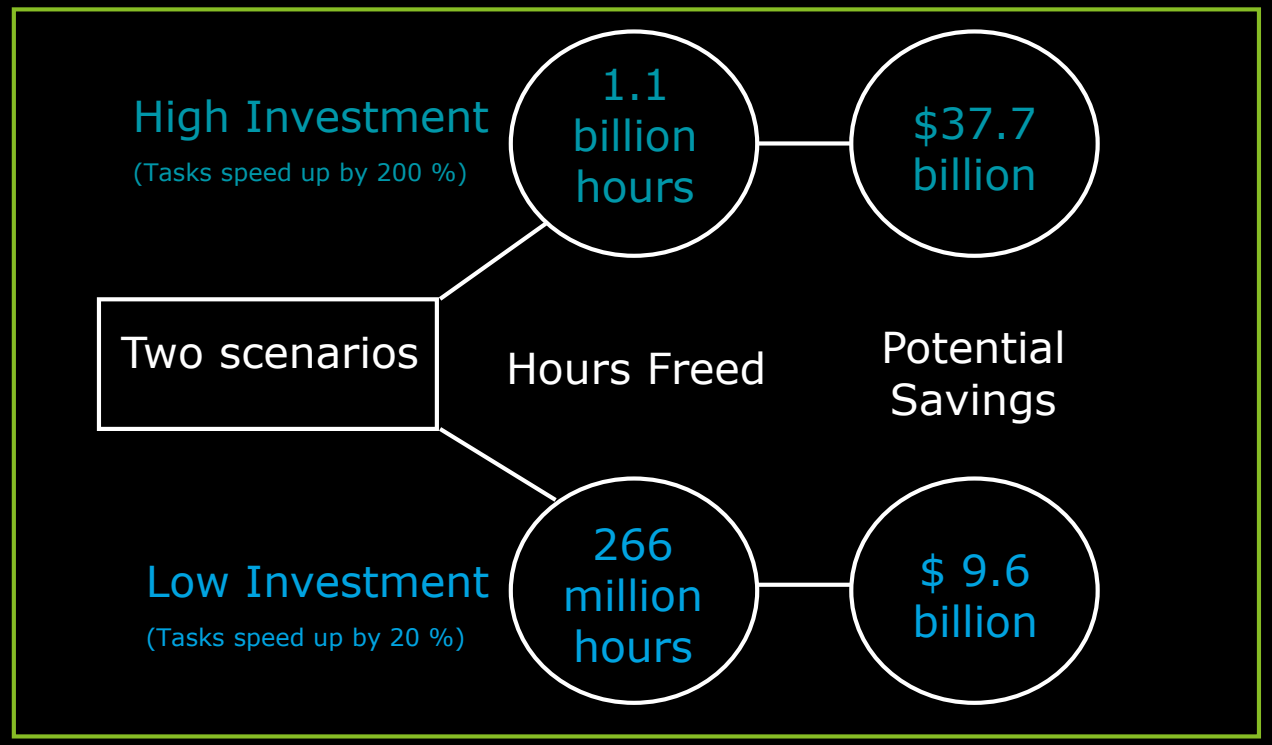
*Sources: Deloitte analysis of OPM Fedscope data and Department of Labor O*Net Generalized Work Activities.*
**2011 figure, latest available: Justin Falk et al, 'Comparing the Compensation of Federal and Private Sector Employees.'*

Four out of five most labor-intensive tasks are highly amenable to automation…

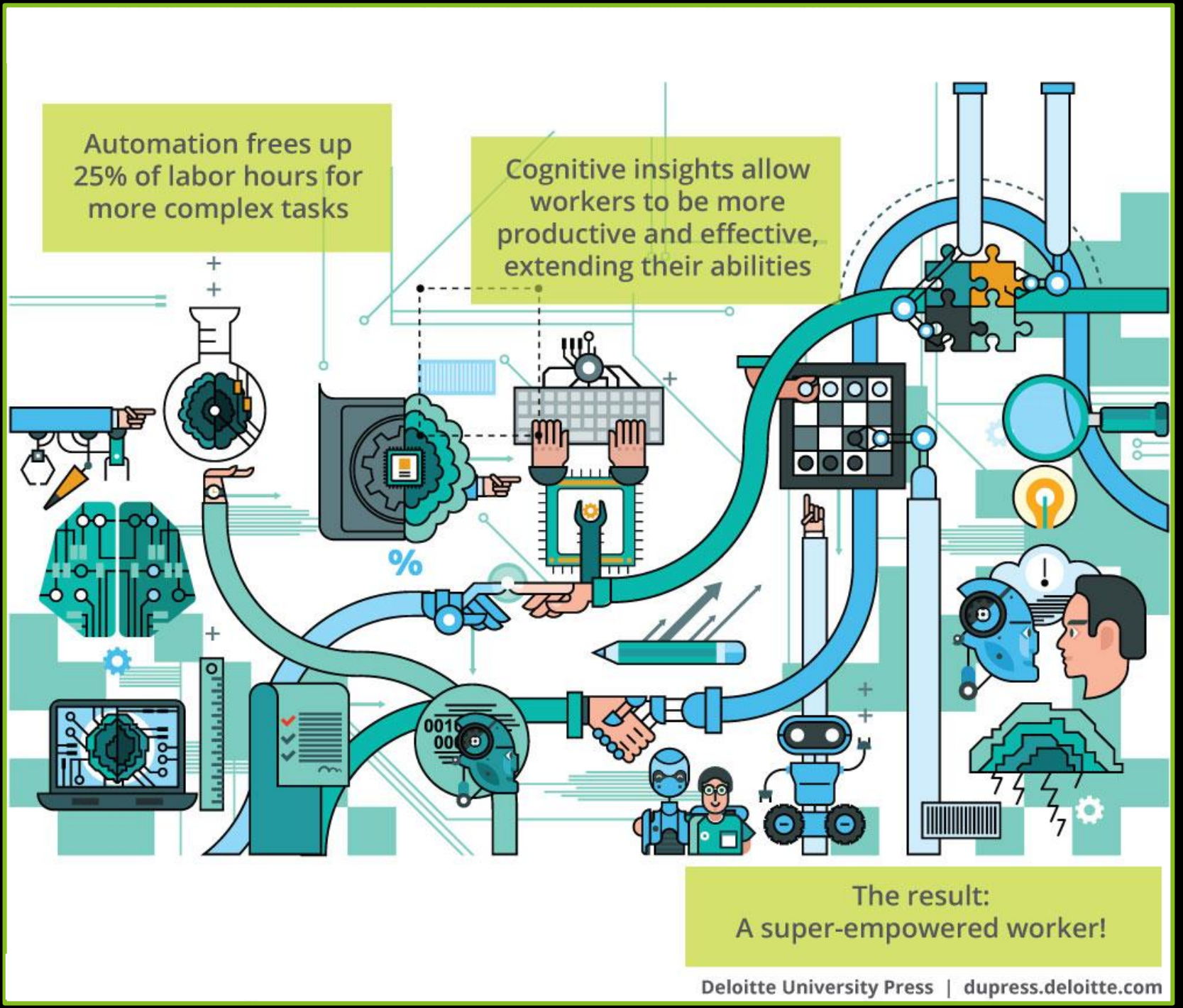
Four out of five most labor-intensive activities have 50% or more medium / high automation potential



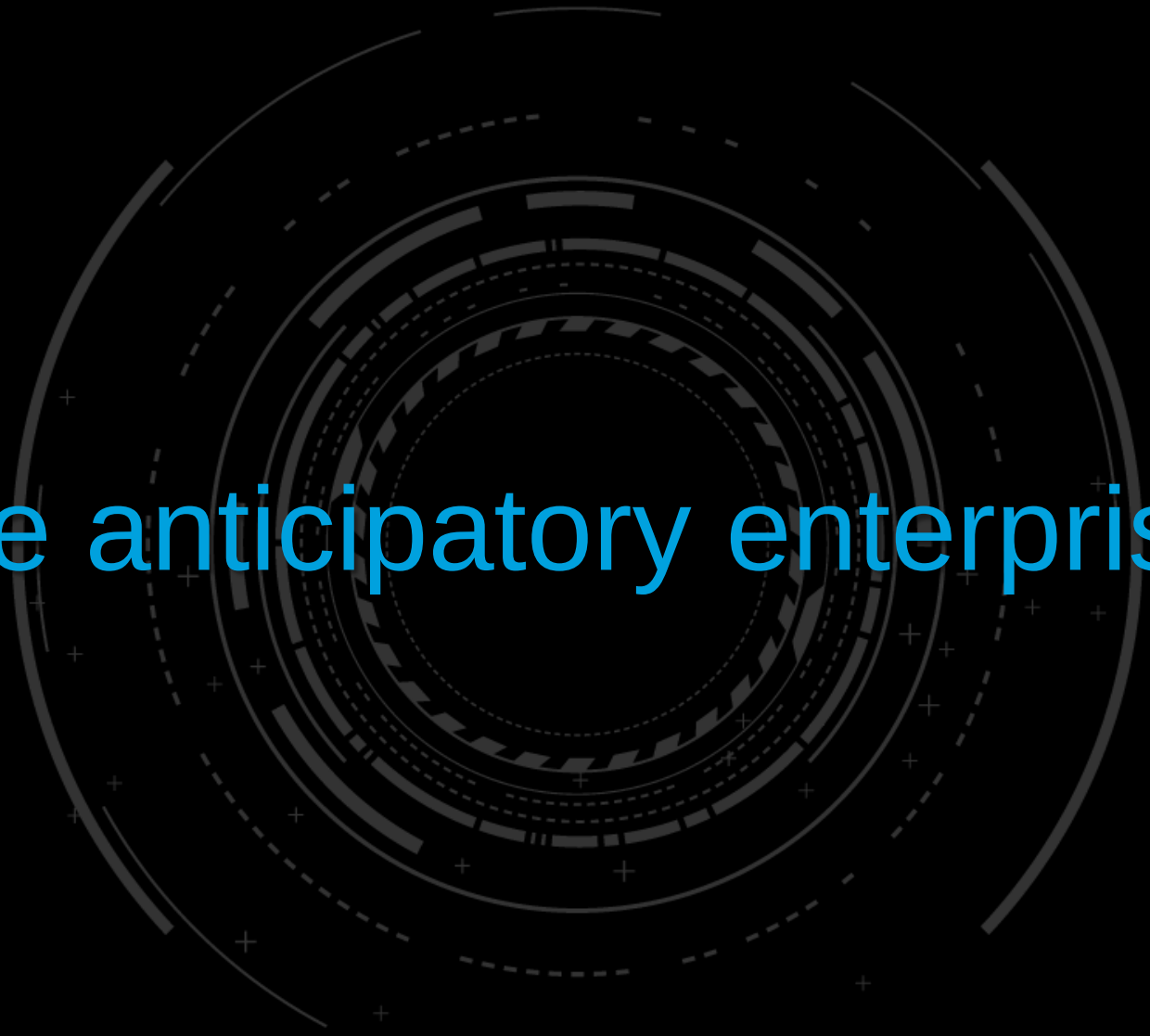
Potential savings for the federal government from AI



Source: Deloitte Research



Benefits of adding cognitive technologies to the work flow…



The anticipatory enterprise

Human vs machine prediction and the HIPPO problem

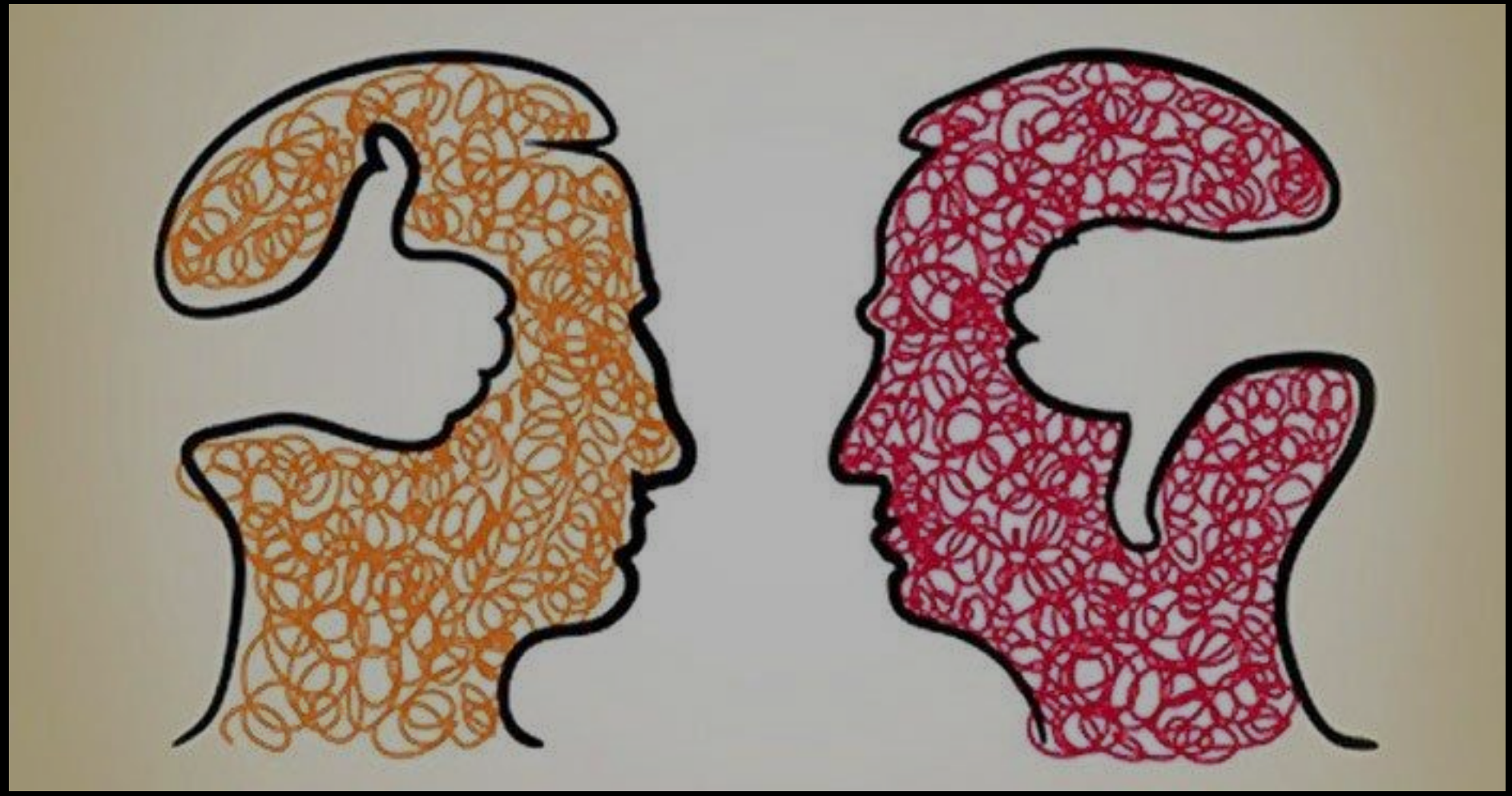
William Grove, a professor of psychology at the University of Minnesota, went through 50 years of data comparing “head-to-head” test approaches completed by humans and machines, and found people were only superior 6% of the time

Between 1987 and 2003, Tetlock asked 284 people who "commented or offered advice on political and economic trends" professionally to make a series of predictive judgments about the world: 82,361, in total.

The result: “Humanity barely bests [a] chimp throwing darts at the possible outcomes.”

-Philip Tetlock

Removing cognitive bias



Broward County, Florida school district found that moving from teacher nomination to nonverbal testing identified **80%** more black and **130%** more Hispanic students as gifted.

Augmented: Shifting from Human to Centaur

"Weak human + machine + superior process was greater than a strong computer and, remarkably, greater than a strong human + machine with an inferior process."

Garry Kasparov

IBM Watson for Oncology synthesizes data from over 200 textbooks, over 290 medical journals, and 12 million pages of text to shed light on treatment methods that no single human could find on their own

Fulfilment Center 110

Common Carrier

Hub 120a

Expedited Service Path

Private Carrier

Tender to common carrier at hub

Nonexpedited Service Path

Hub 120a

Hub 120a

Delivery Location

Anticipatory shipping model by amazon

The AI advisor can play out security outcomes under various scenarios

Algorithmic black box: The problem

Governments increasingly rely on data-driven insights powered by algorithms. However, *bias* can arise as a result of vulnerabilities in the-

Input data

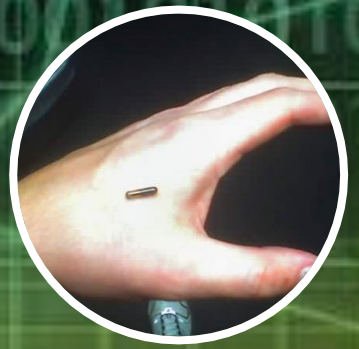
Algorithm design

Output data

Bioenhancement

Forms of enhancement

Put in

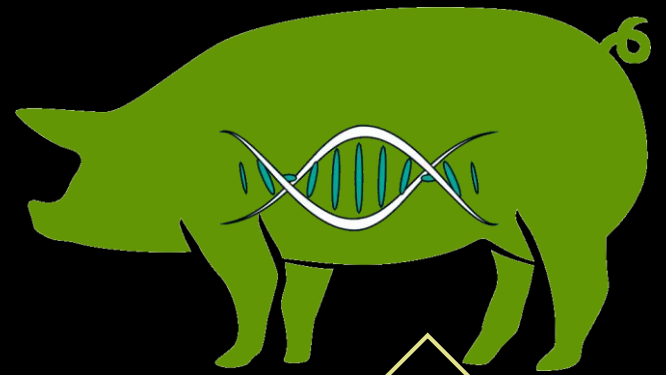


Put on

Bake in

Neuroproductivity

CRISPR Super Plants, Super Animals



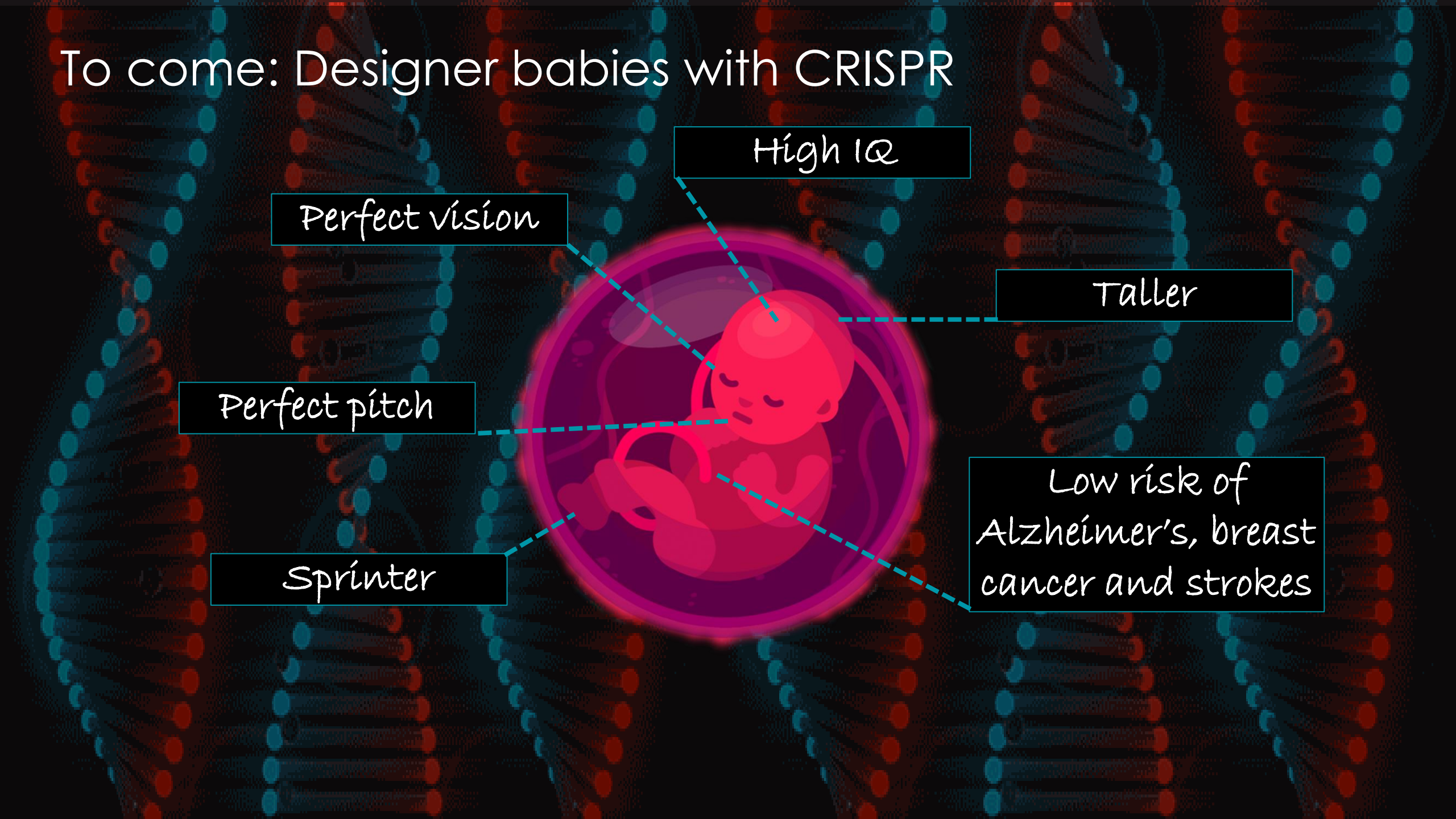
Genetic modification to produce more muscular pigs

Gene editing of mosquito parasites to eliminate Malaria

Plants resistant to pests and herbicides- better nutritional value

Costs of producing plants and animals will fall

To come: Designer babies with CRISPR



Just remember…

**“People are very open minded about new things.
As long as they are exactly like the old ones.”**

- Charles Kettering

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