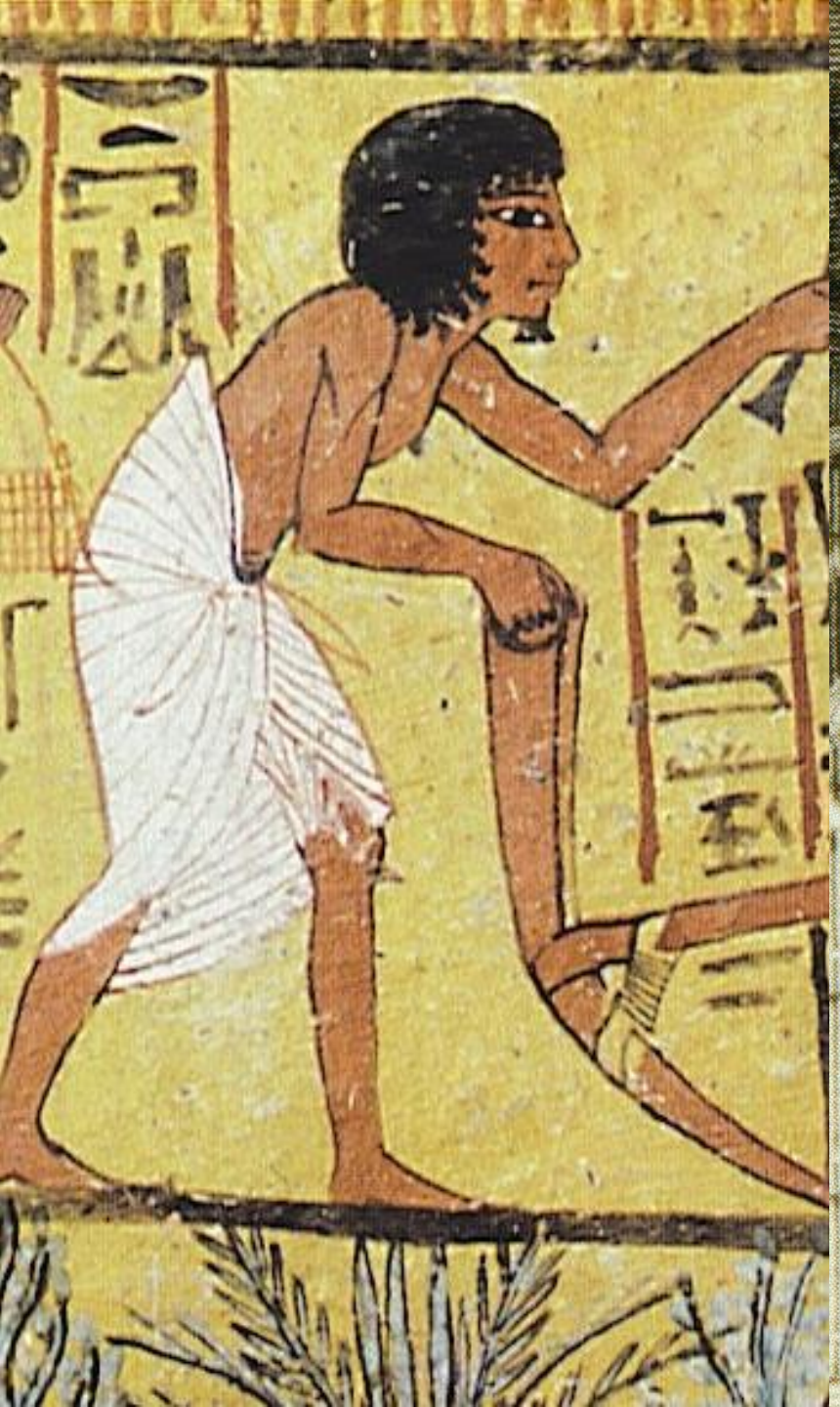
Artificial Intelligence:
Preparing Your Career for AI

Matthew Renze
Data Science Consultant
Renze Consulting

Source: Wikipedia

Source: Wikipedia

IBM
IBM
IBM
IBM
IBM
TAPE RACK 1
US



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What should I do *today* to prepare for AI-enabled automation?

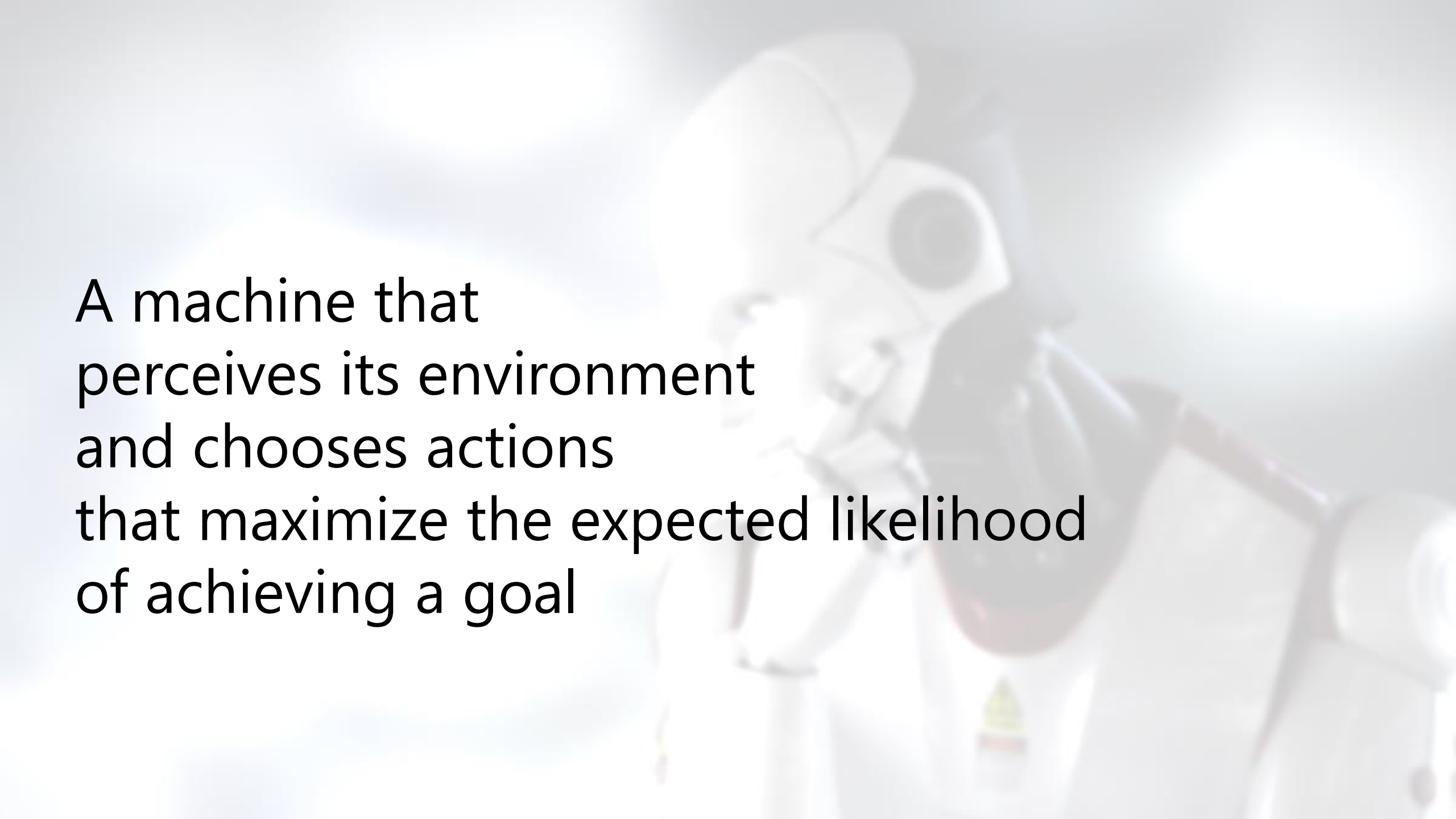
What should I do *today* to prepare for AI-enabled automation?

Overview

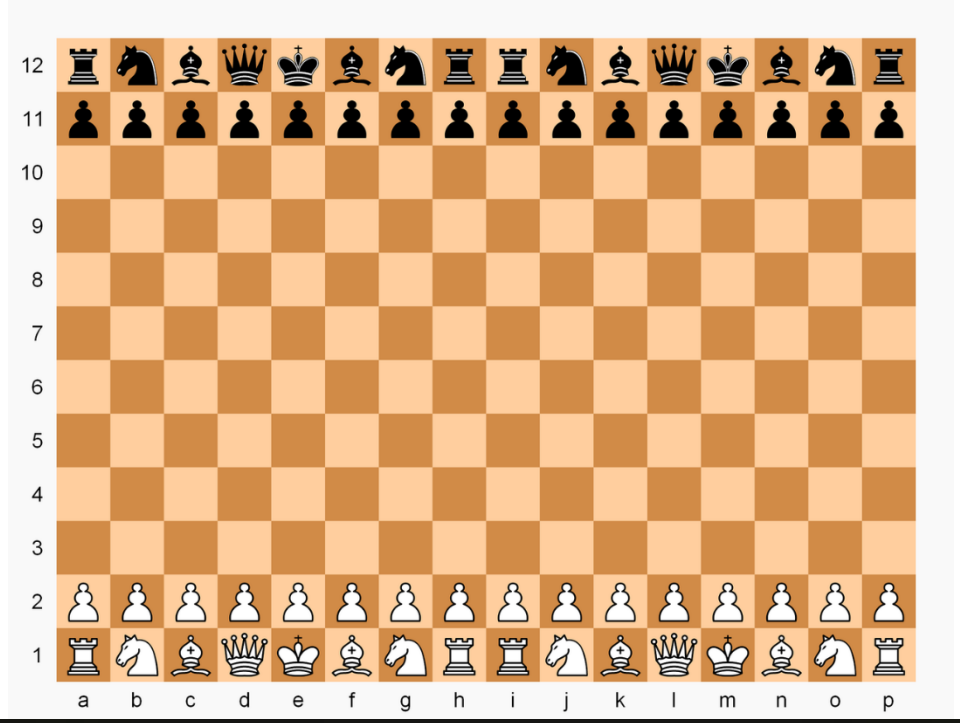
1. Educate yourself about AI
2. Upgrade your career for AI
3. Invest in an AI-first economy
4. Use AI responsibly and ethically
5. Adapt or become obsolete

What is AI?

Caution
WARNING
ELECTRICITY



A machine that
perceives its environment
and chooses actions
that maximize the expected likelihood
of achieving a goal

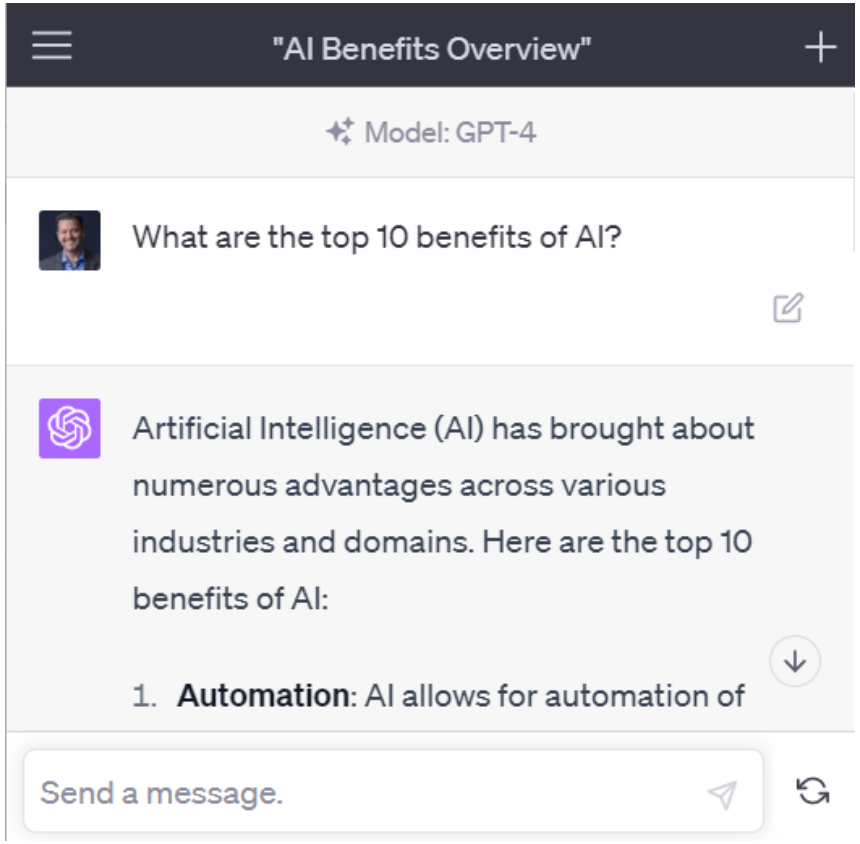

12
11
10
9
8
7
6
5
4
3
2
1
a b c d e f g h i j k l m n o p

Your location
Arrivals
1 hr 44
1 hr 46
14 min
SOUTH HOMES
16 min
14 min
14 min (7.5 km)

What about sentient robots?

Source: Disney, VIACOM-CBS, MGM

General AI

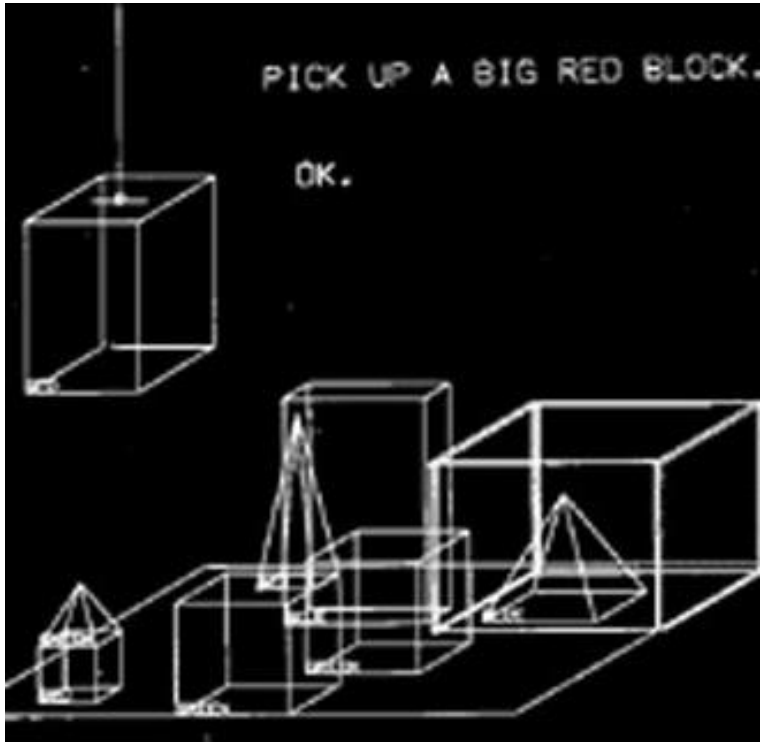


Source: OpenAI, Amazon, Tesla

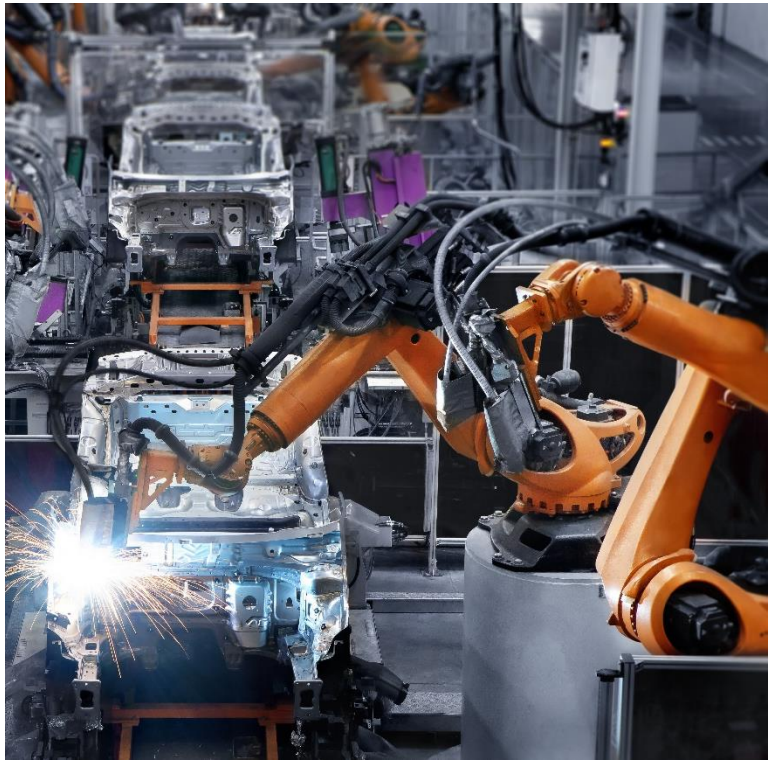
Narrow AI

Source: IBM, Amazon, Google

Source: LIFE Magazine



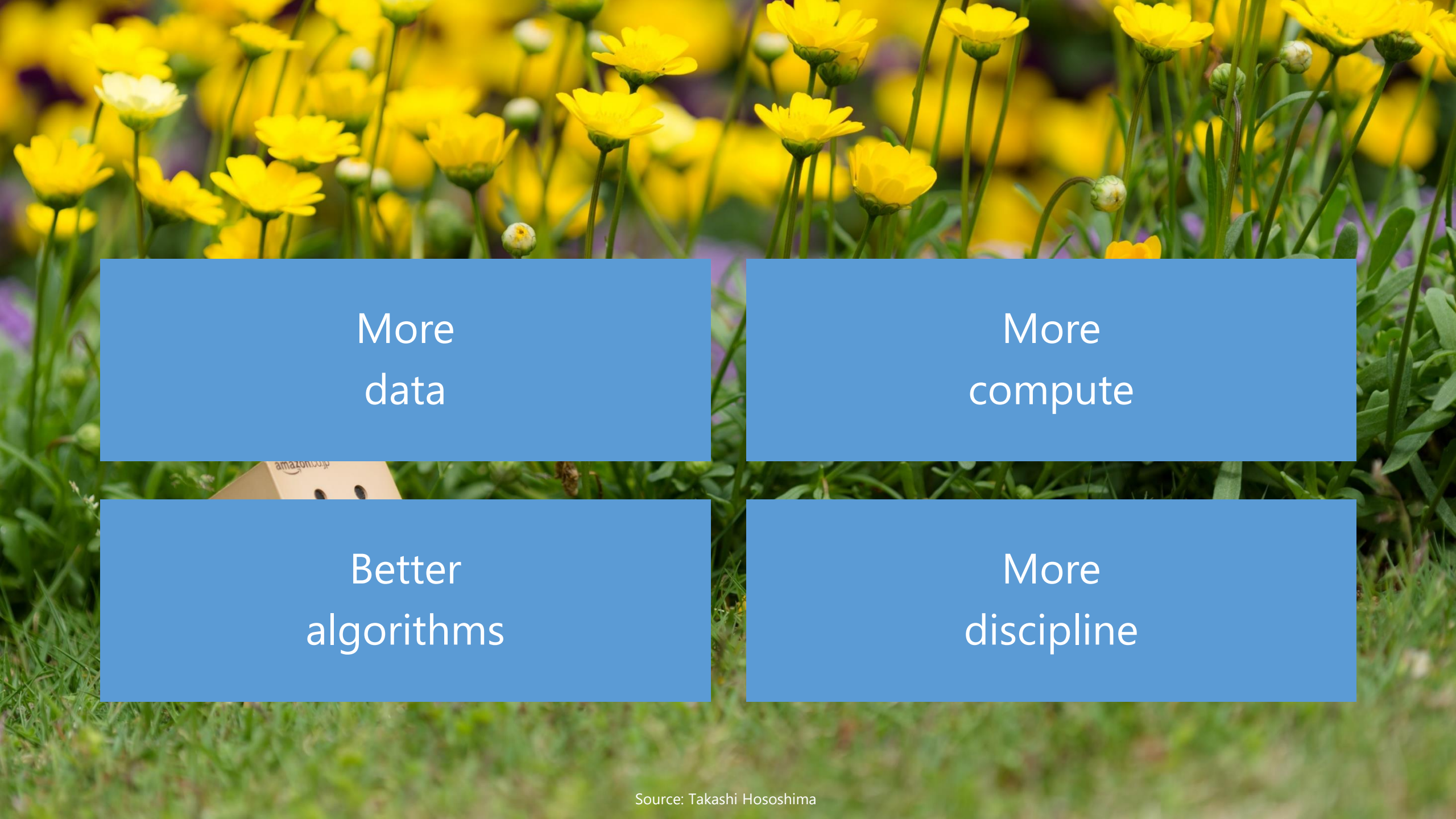
Source: Evan Amos



AI Winters
1970s – 2000s

Source: Takashi Hososhima

Source: Takashi Hososhima



Source: Takashi Hososhima

Summary

Machine that acts rationally

Summary

Machine that acts rationally

Narrow vs. general AI

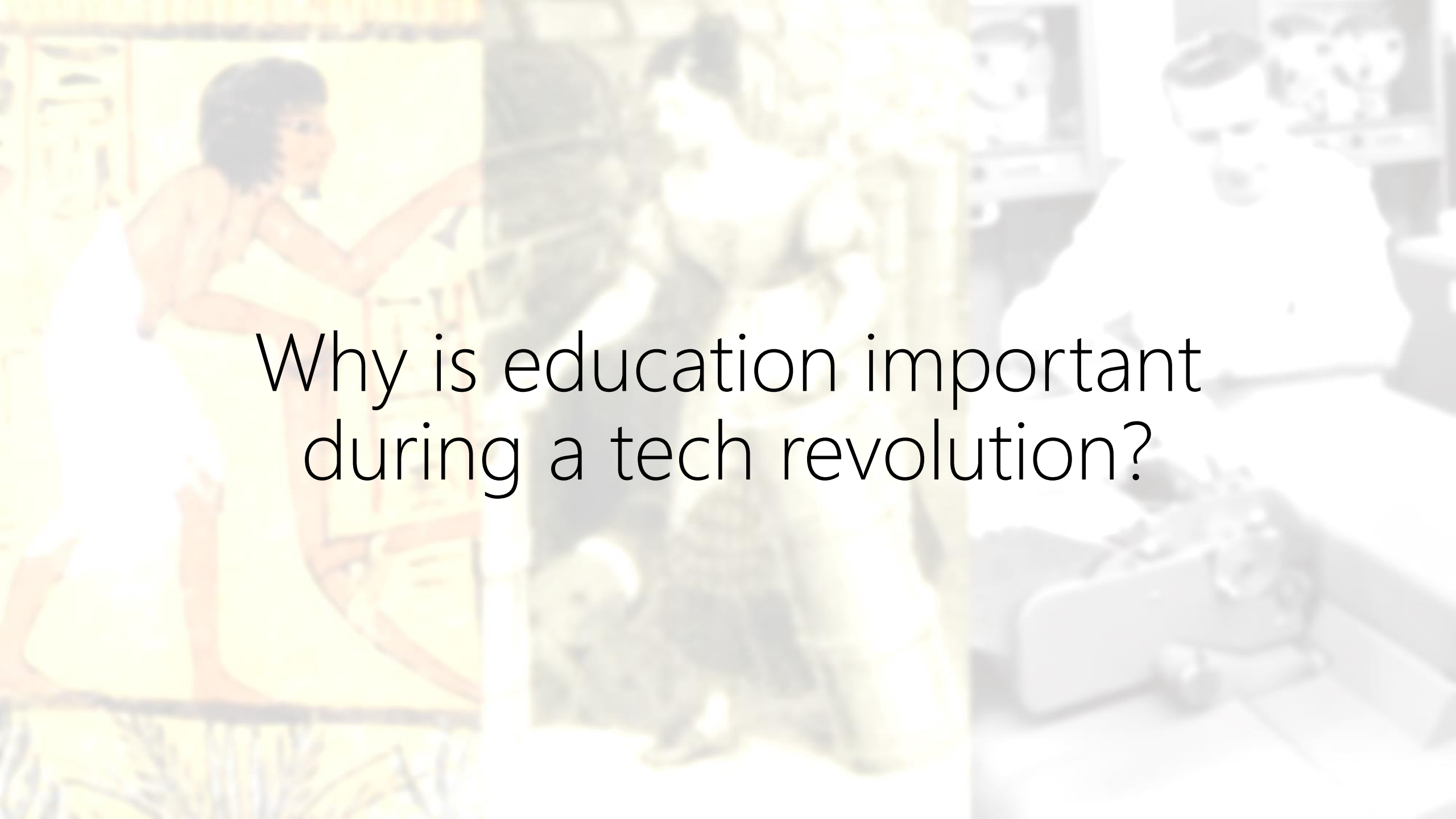
Summary

Machine that acts rationally

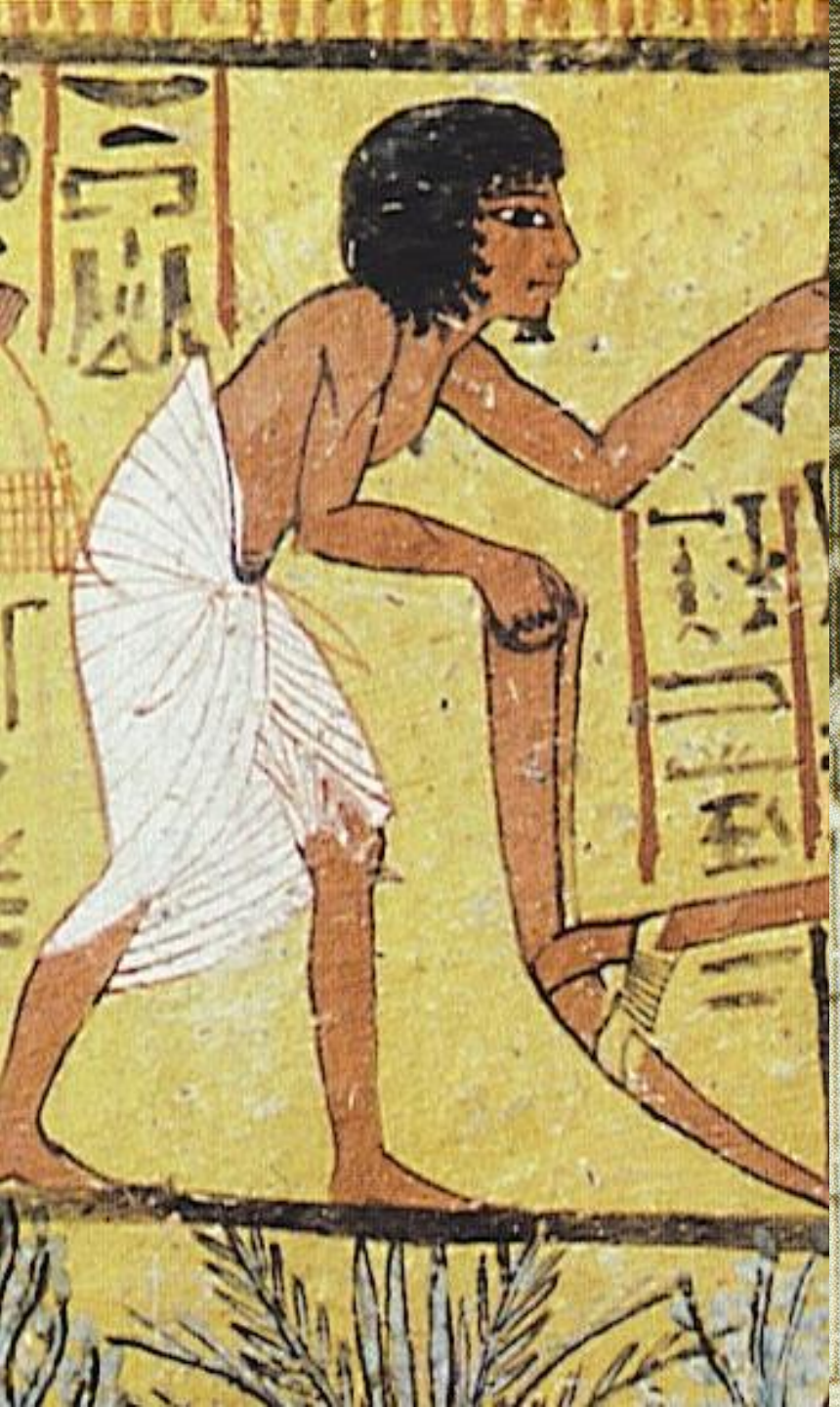
Narrow vs. general AI

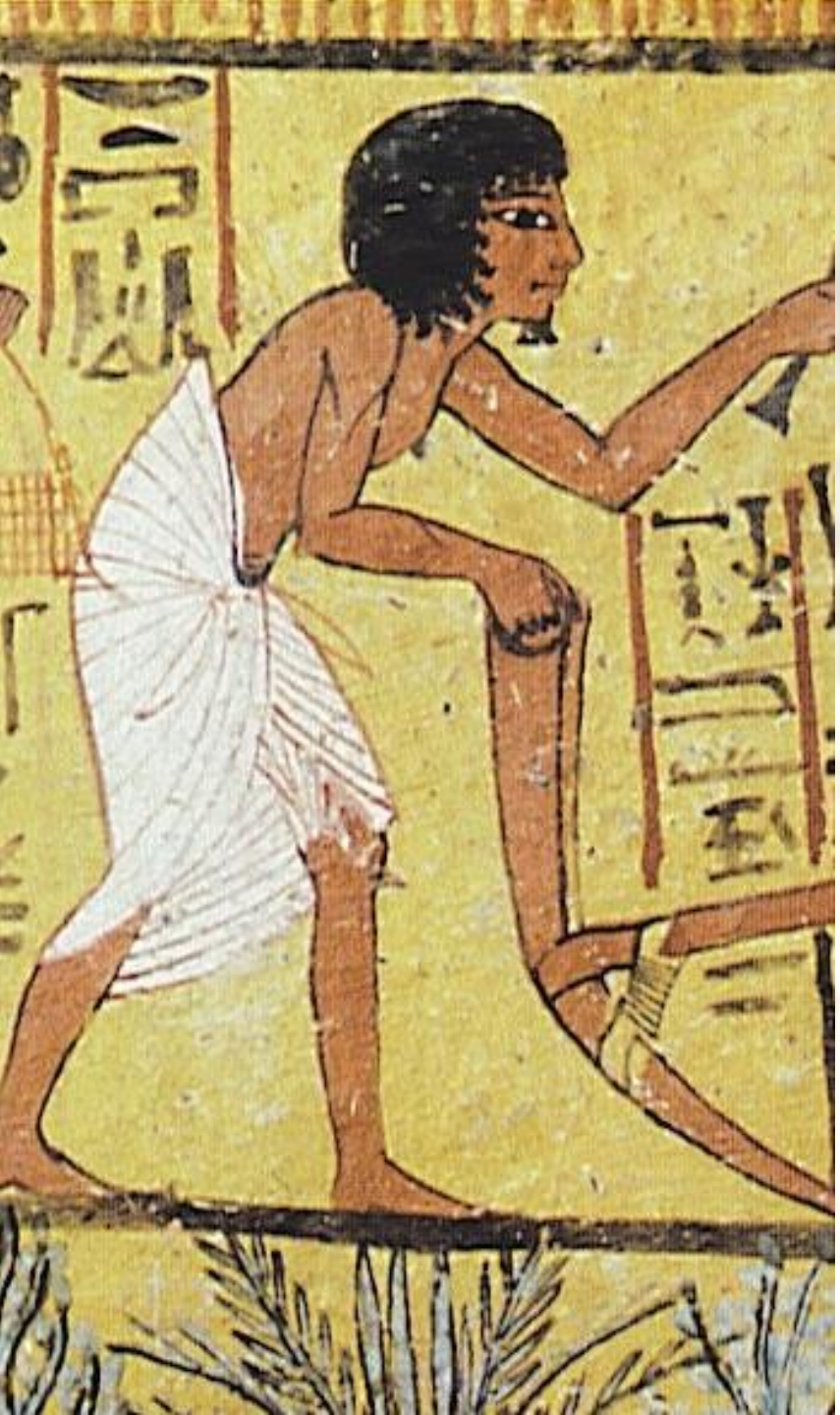
Hype vs. reality

1. Educate Yourself About AI



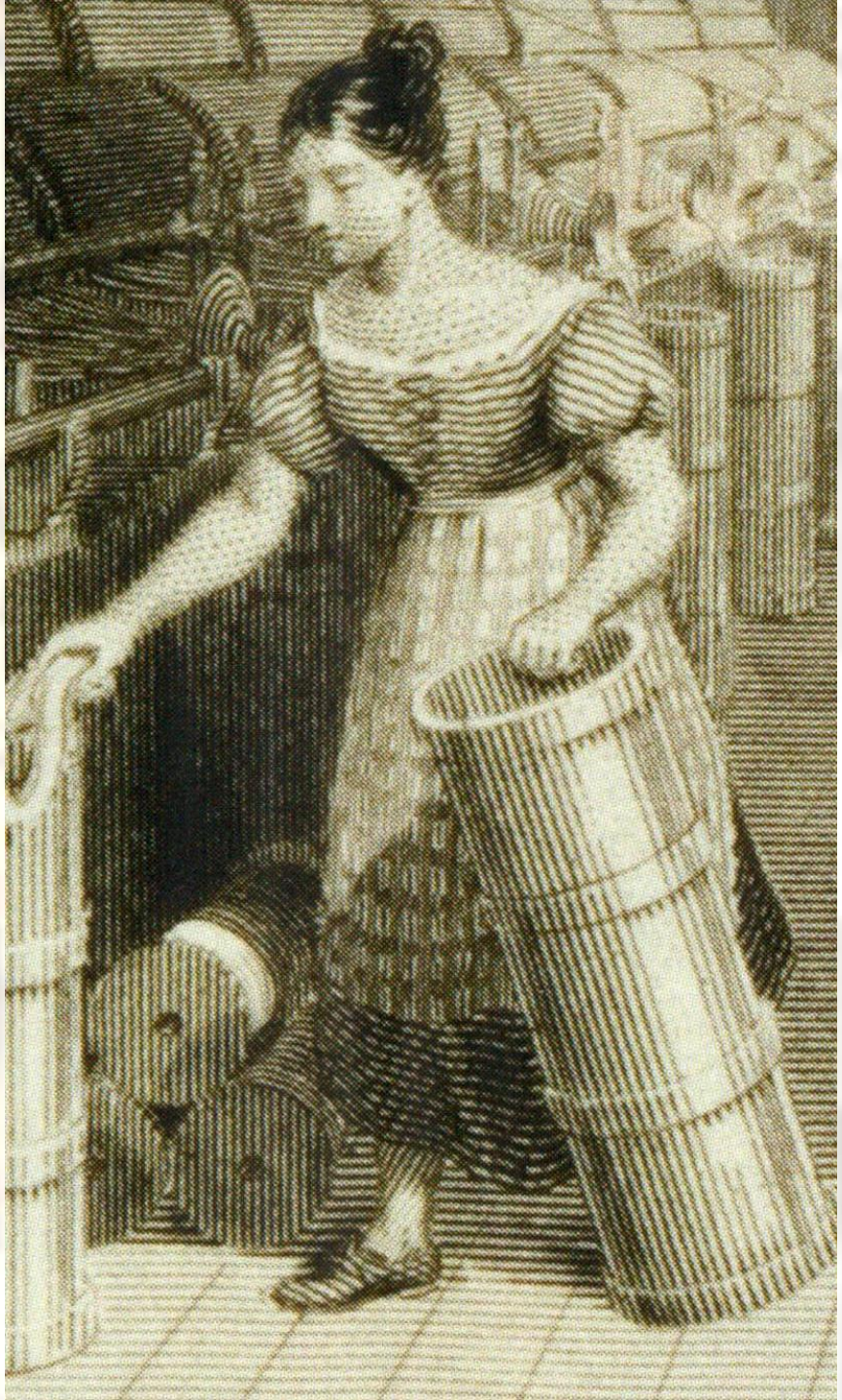
Why is education important during a tech revolution?





Agricultural Technologies

Farming
Domestication
Plow

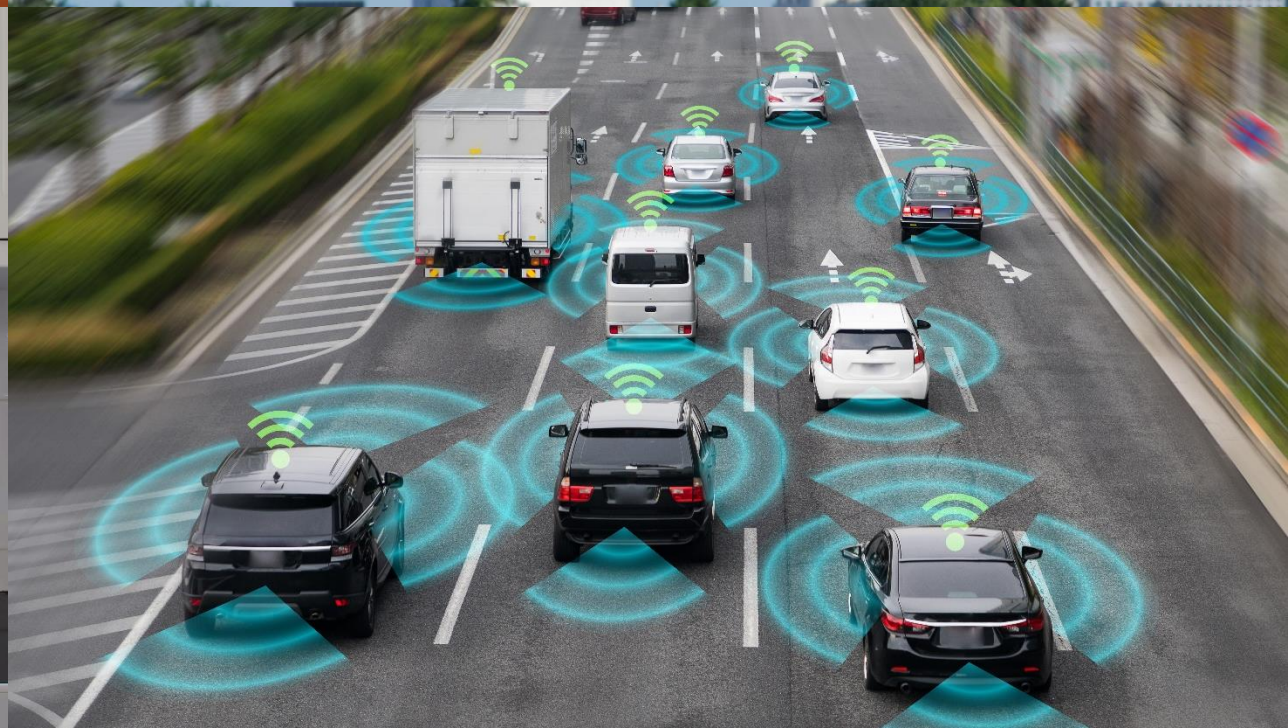


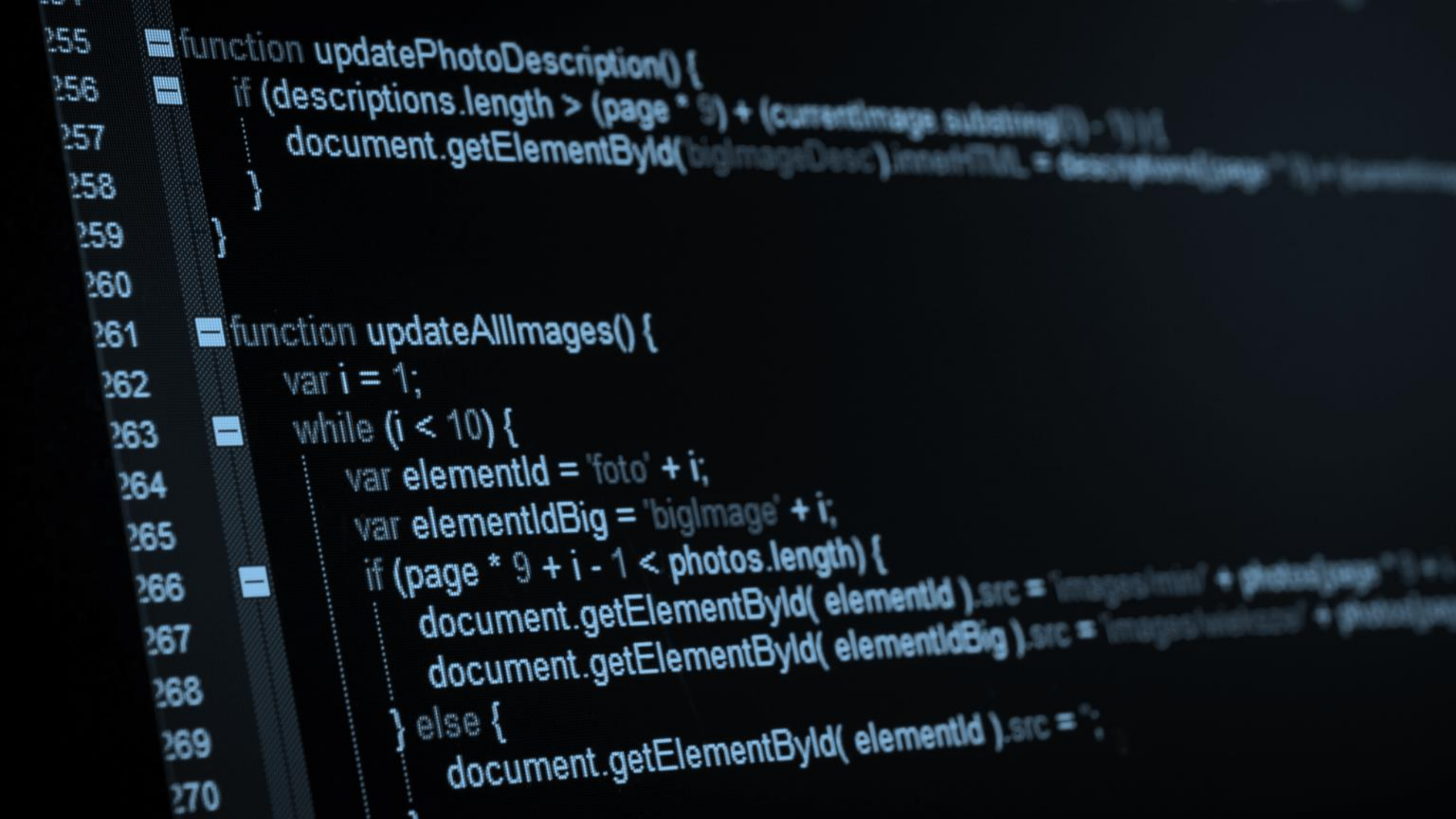
Industrial Technologies

Steam engines
Machinery
Electricity

Information Technologies

Telephones
Computers
Software

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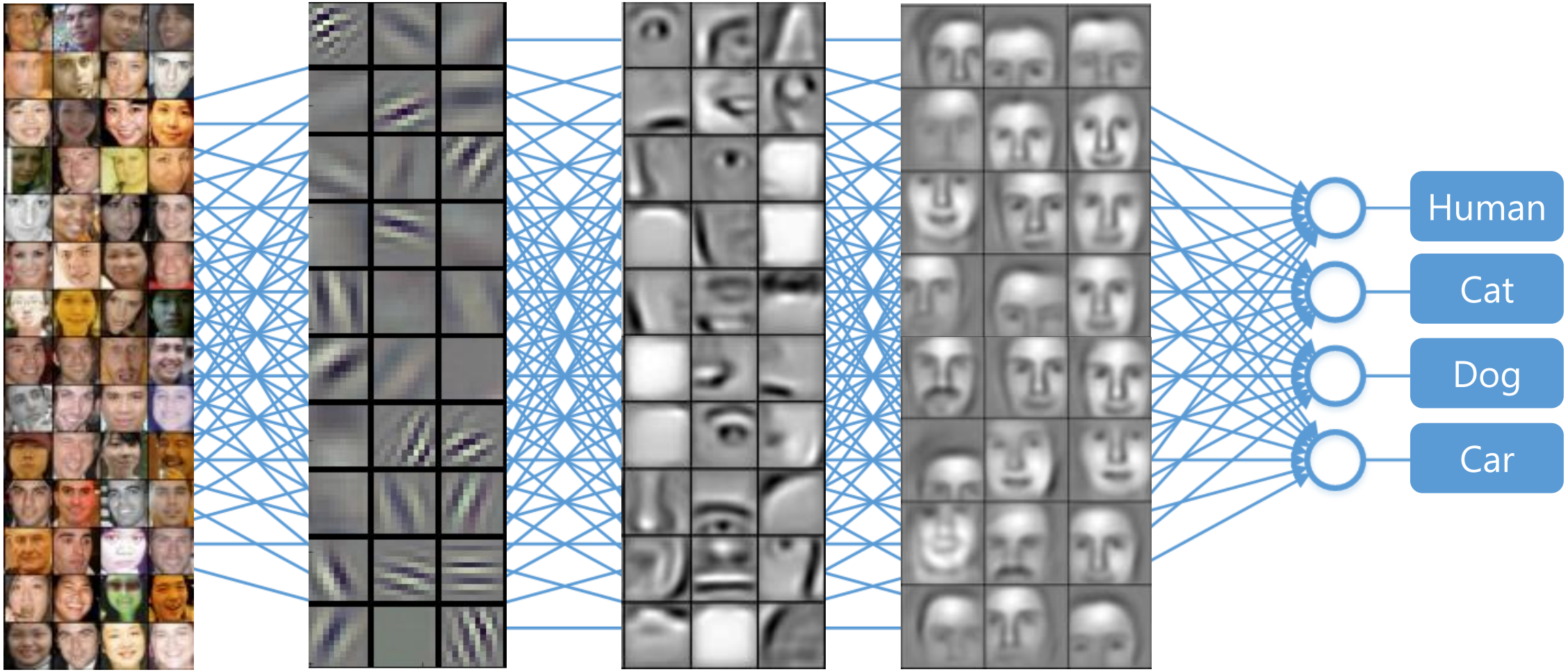
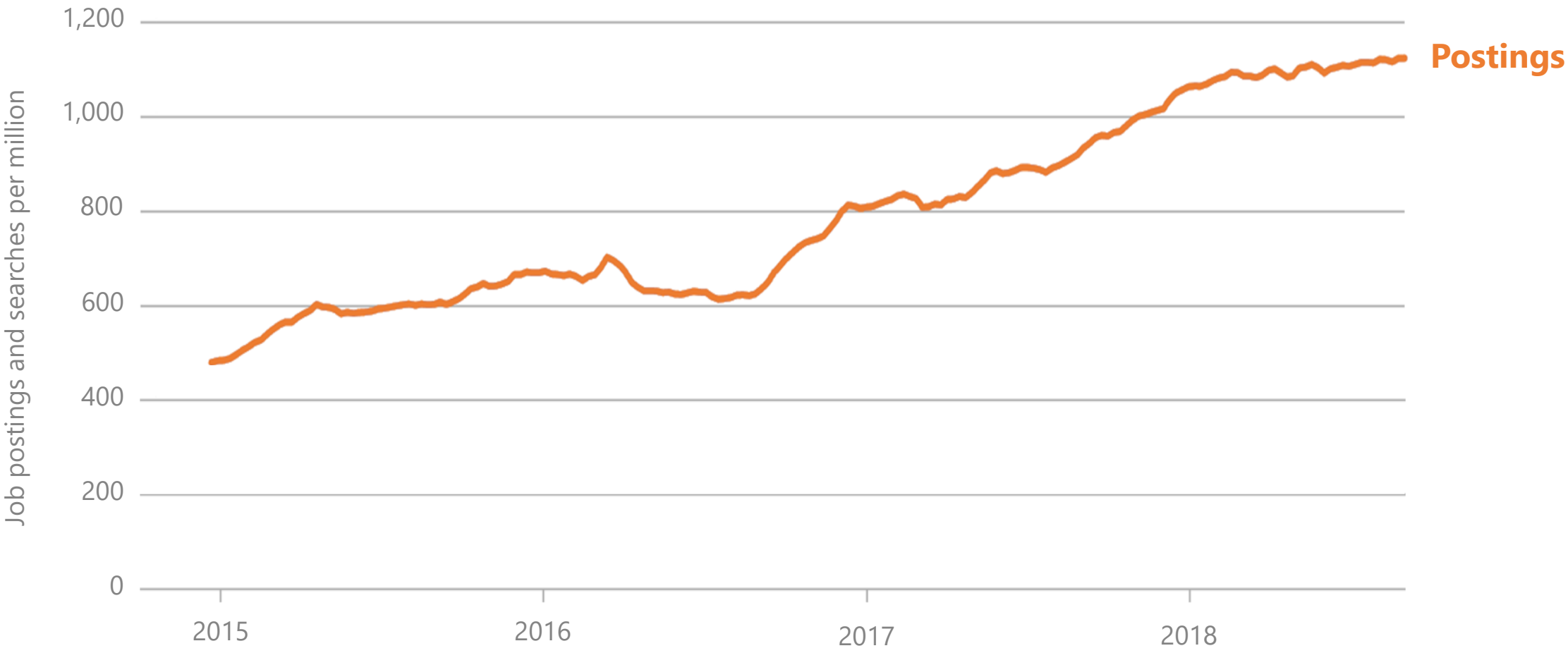
if (descriptions.length > (page * 9)
document.getElementById(
}
}
function updateAllImages() {
var i = 1;
while (i < 10) {
var elementId = 'foto' + i;
var elementIdBig = 'bigImage' + i;
if (page * 9 + i - 1 < photos.length) {
document.getElementById(elementId)
document.getElementById(elementIdBig)
} else {
document.getElementById(elementId).src = '';

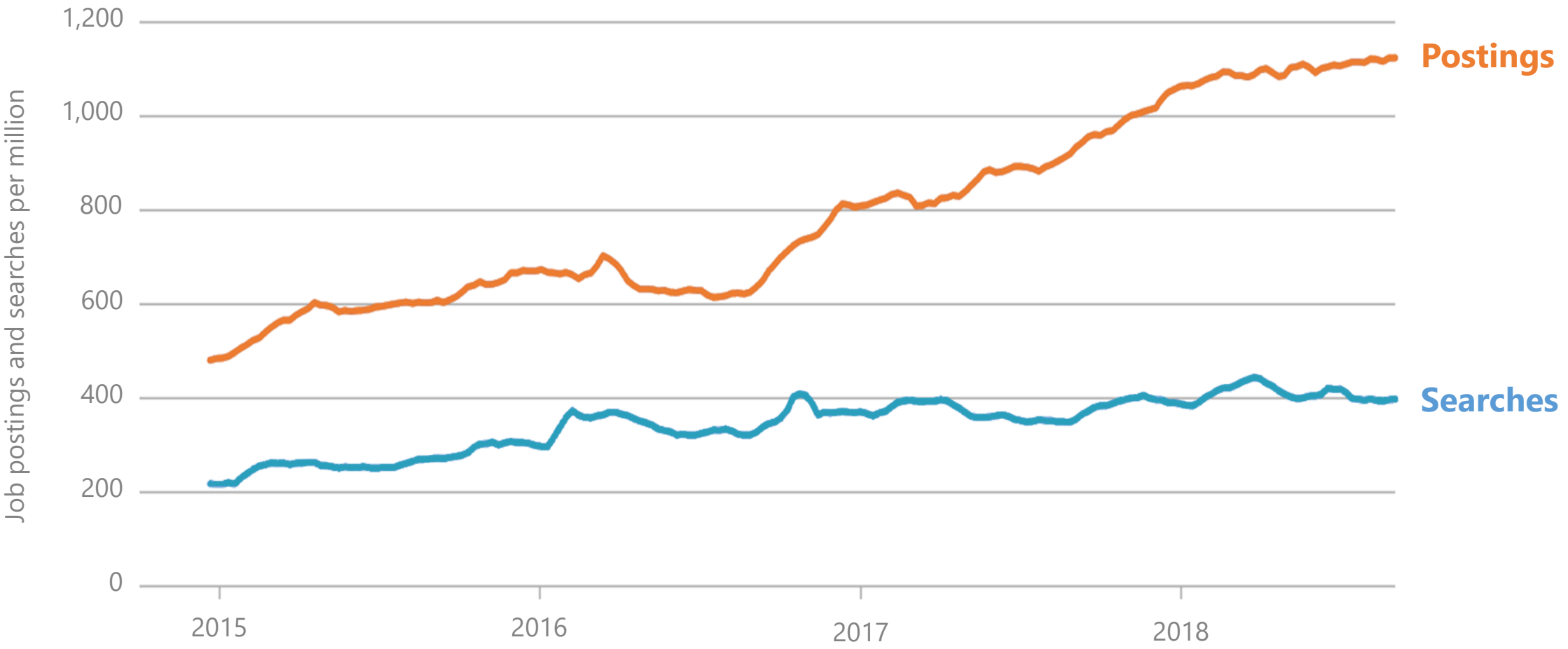

Human
Cat
Dog
Car

AI Job Postings vs. Searches



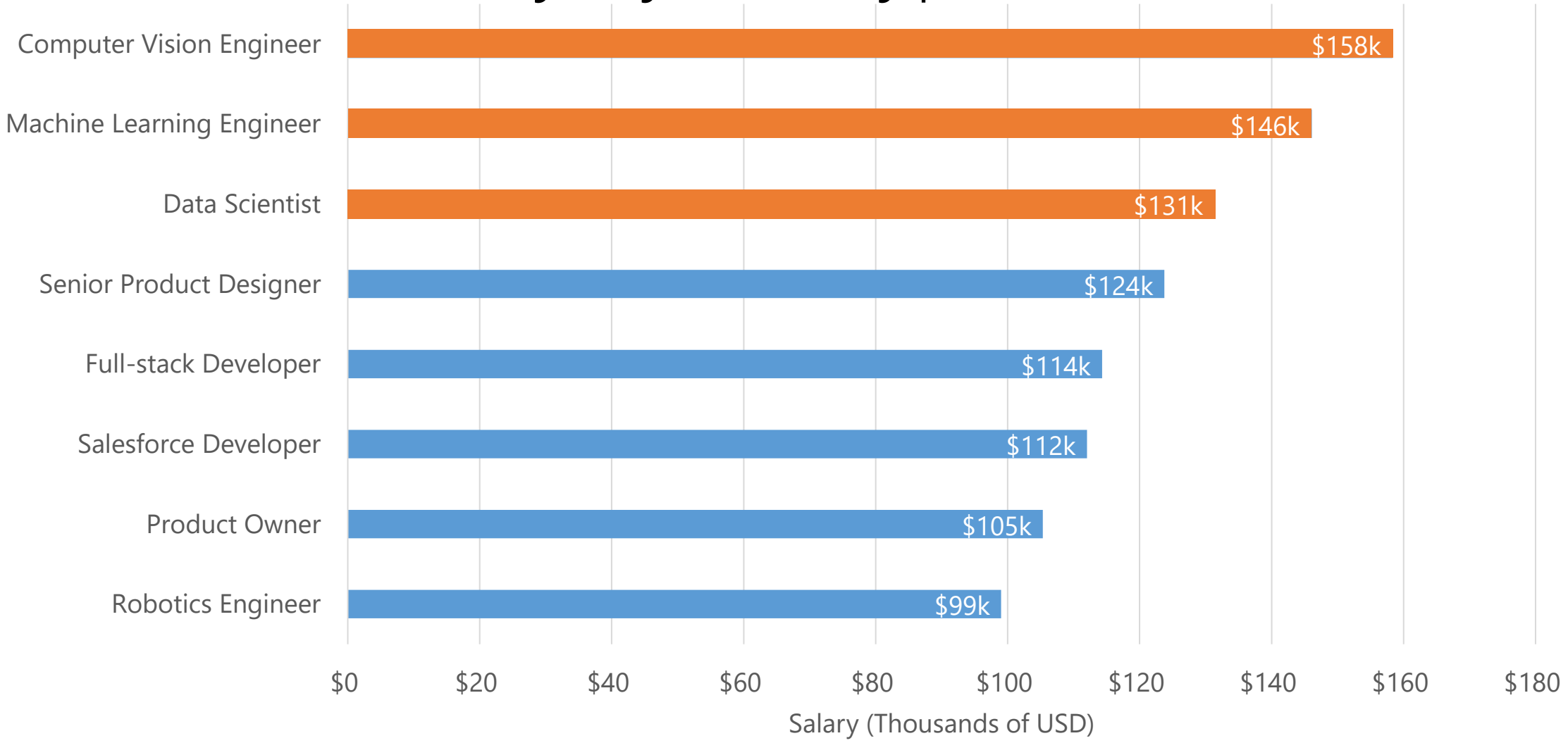
Source: Indeed.com, Reuters, Ann Saphir

AI Job Postings vs. Searches

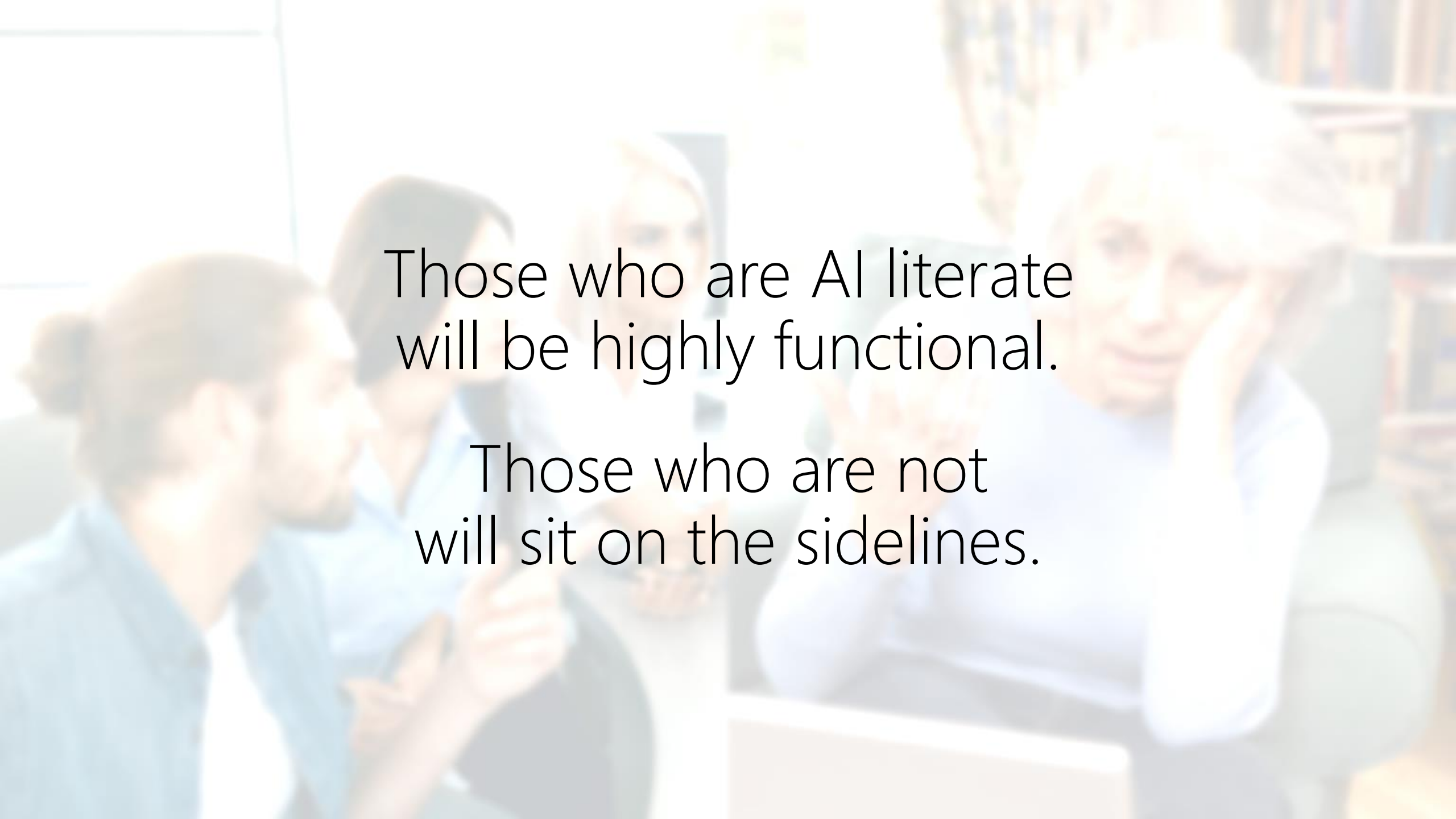


Source: Indeed.com, Reuters, Ann Saphir

Salary by Job Type (USA)



Source: Indeed's Best Jobs of 2019



Those who are AI literate
will be highly functional.

Those who are not
will sit on the sidelines.

How should I educate myself about AI?

1. Learn the Basics of AI

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Real
vs
Hype

1. Learn the Basics of AI

Real
vs
Hype

Data science
Machine learning
Deep learning

1. Learn the Basics of AI

Real
vs
Hype

Data science
Machine learning
Deep learning

Types of AI

2. Choose Your Objective

2. Choose Your Objective

Automate new tasks with AI

2. Choose Your Objective

Automate new tasks with AI

Add a bit of AI to existing apps

2. Choose Your Objective

Automate new tasks with AI

Add a bit of AI to existing apps

Be more productive with AI tools

3. Get the Right Training

3. Get the Right Training

AI Trainer =
data science +
machine Learning

3. Get the Right Training

AI Trainer =
data science +
machine Learning

AI Dev =
programming +
pre-trained models

3. Get the Right Training

AI Trainer =
data science +
machine Learning

AI Dev =
programming +
pre-trained models

AI User =
AI literacy +
AI tools

4. Practice Your Skills

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Kaggle competitions

4. Practice Your Skills

Kaggle competitions

Open-source projects

4. Practice Your Skills

Kaggle competitions

Open-source projects

Low-risk projects

5. Choose Reliable Sources

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Avoid

Hucksters
Charlatans
Snake oil

5. Choose Reliable Sources

Avoid

Hucksters
Charlatans
Snake oil

Trust

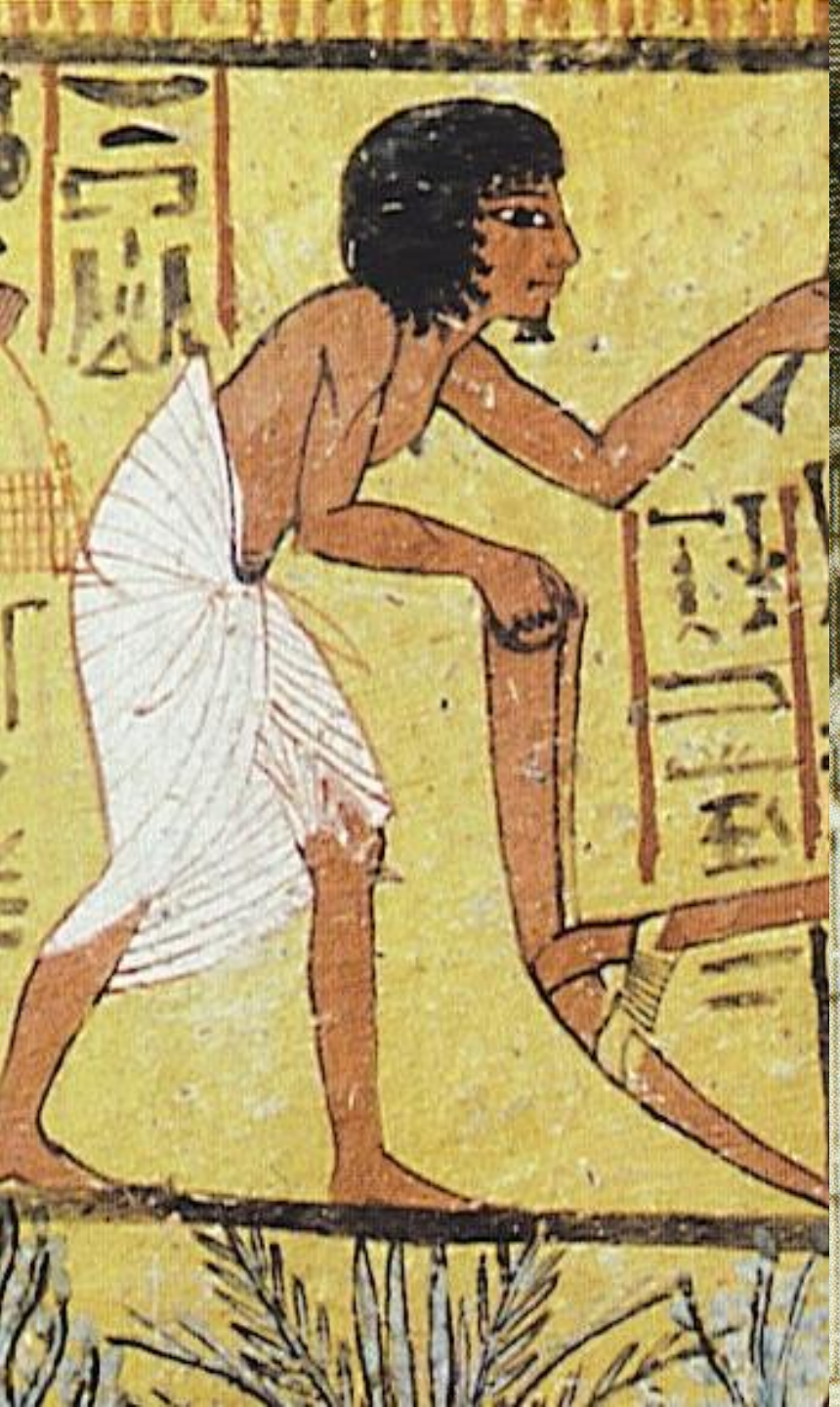
Credentials
Qualifications
Experience

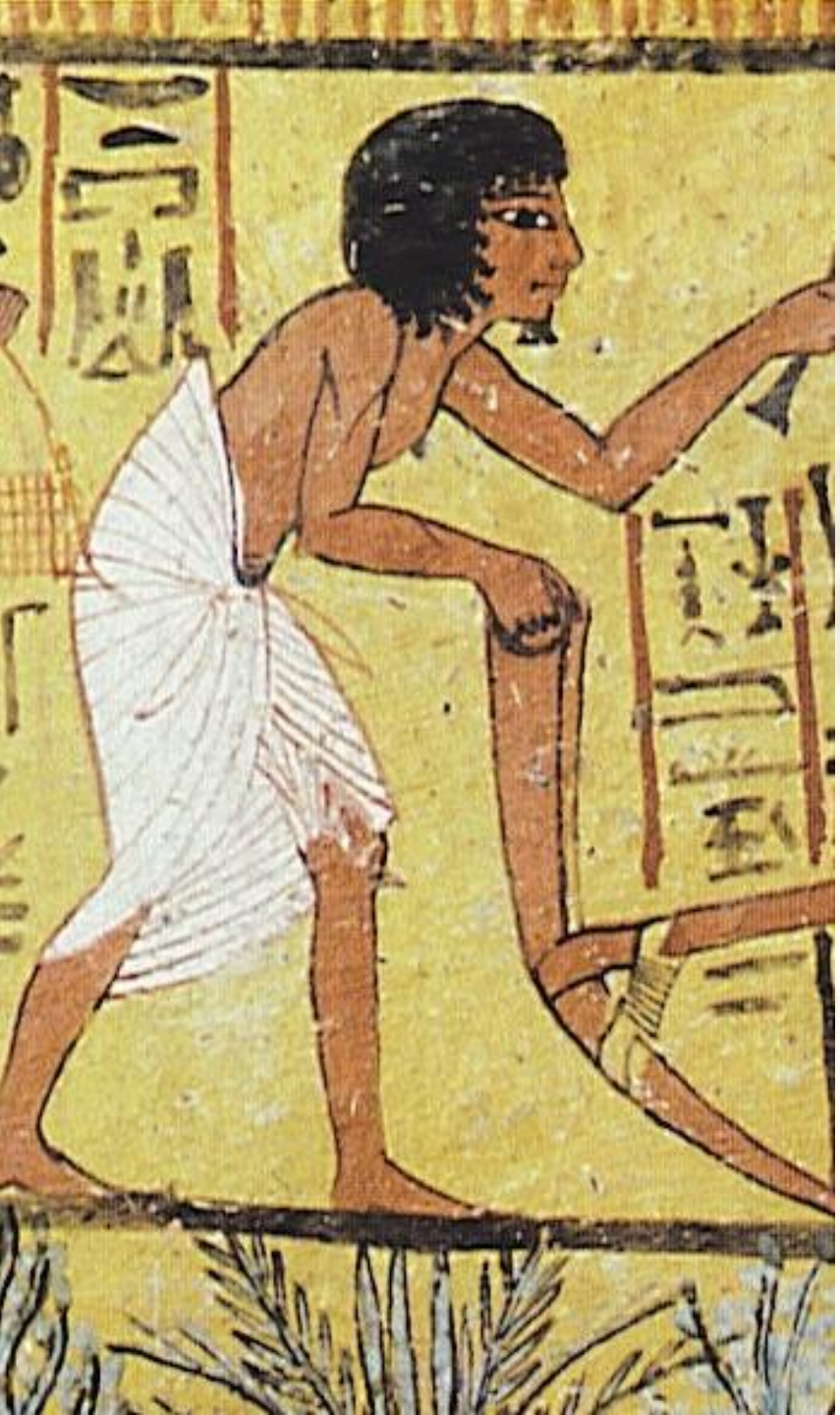
Educate Yourself About AI

1. Learn the basics of AI
2. Choose your objective
3. Get the right training
4. Practice your skills
5. Choose reliable sources

2. Upgrade Your Career for AI

Will AI take my job?

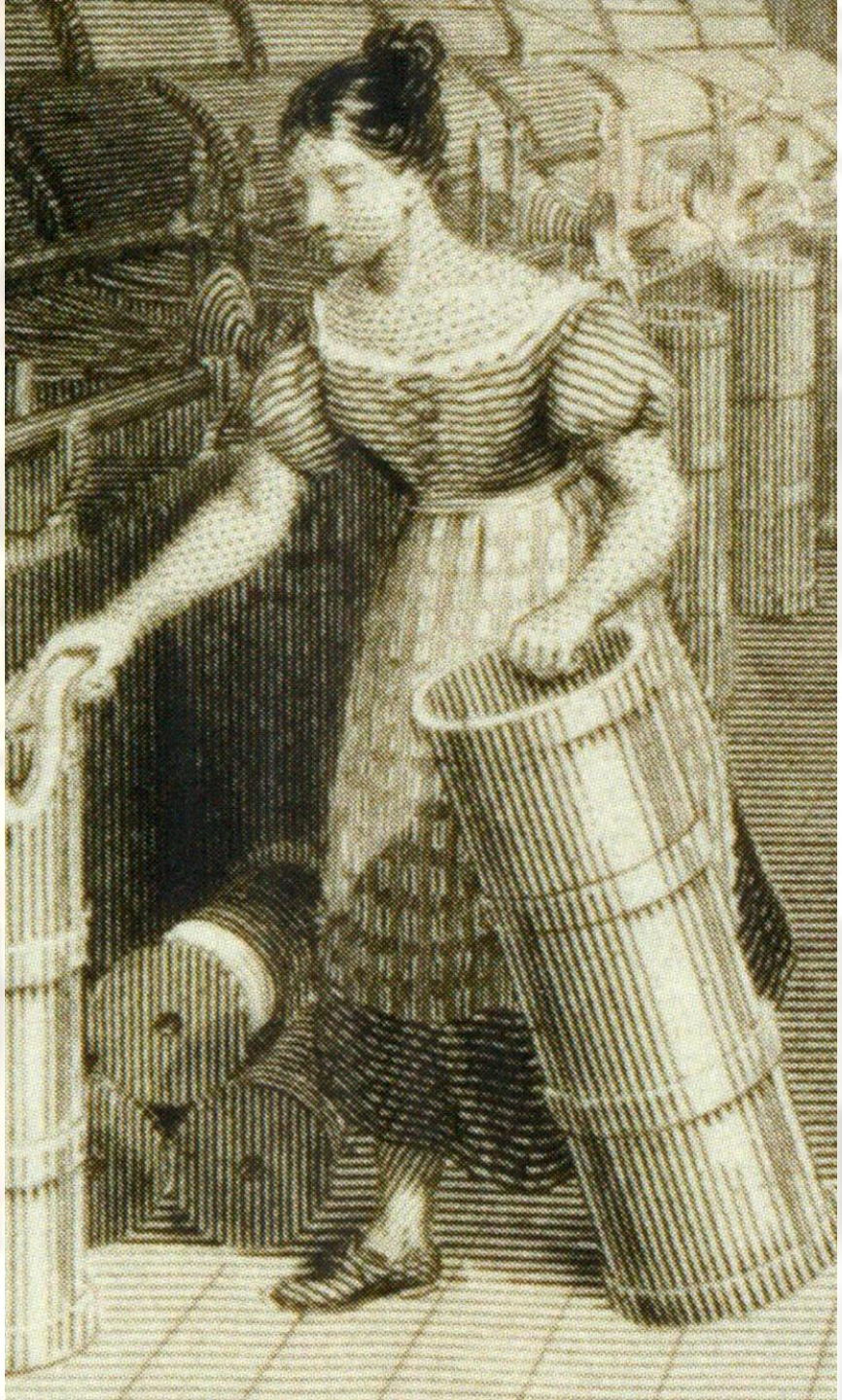




Agricultural Labor

Rise of the farmer

Decline of the hunter-gatherer



Industrial Labor

Rise of the factory worker

Decline of the artisan / craftsman

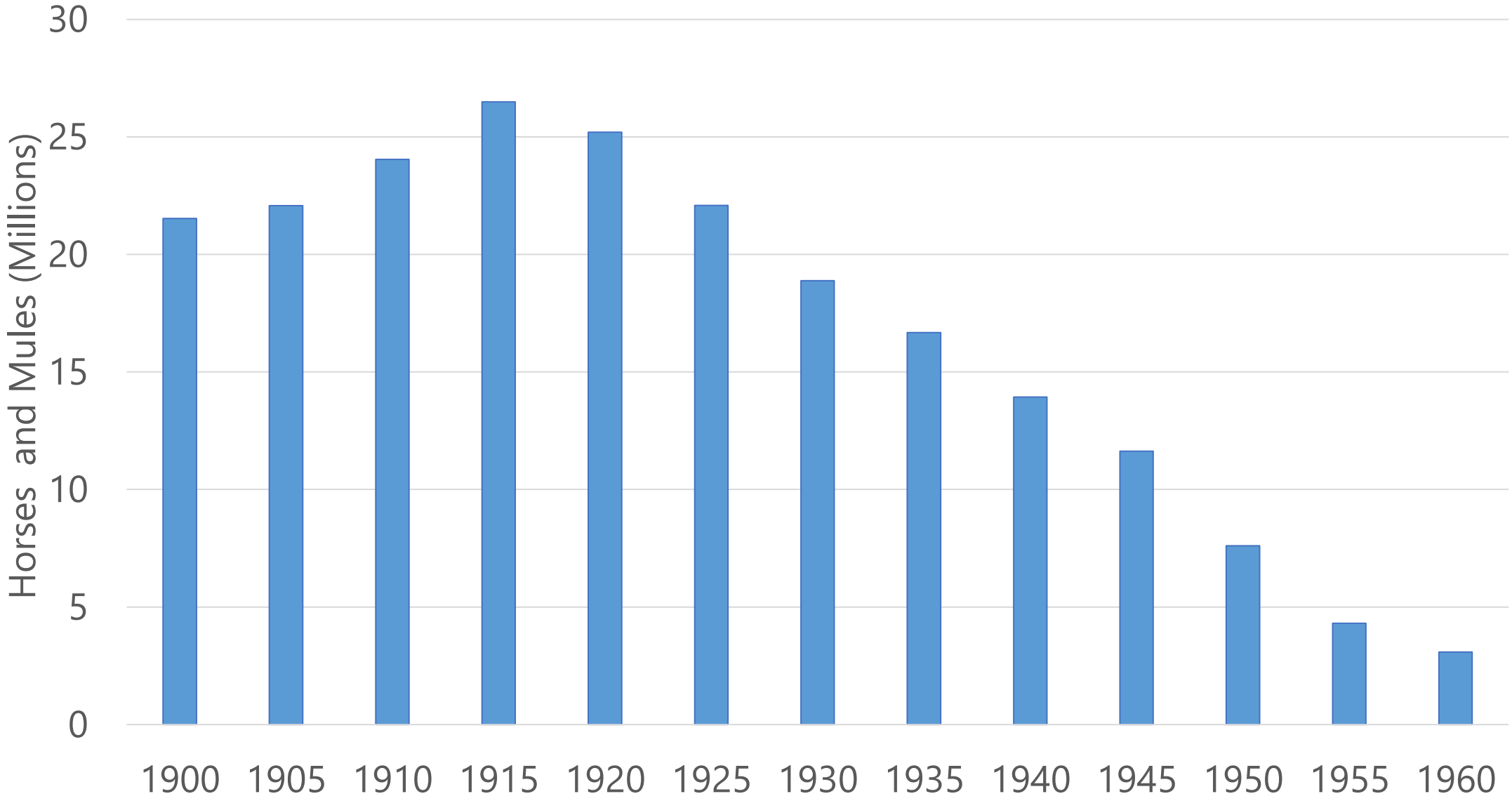
Information Labor

Rise of the knowledge worker

Decline of the manual laborer

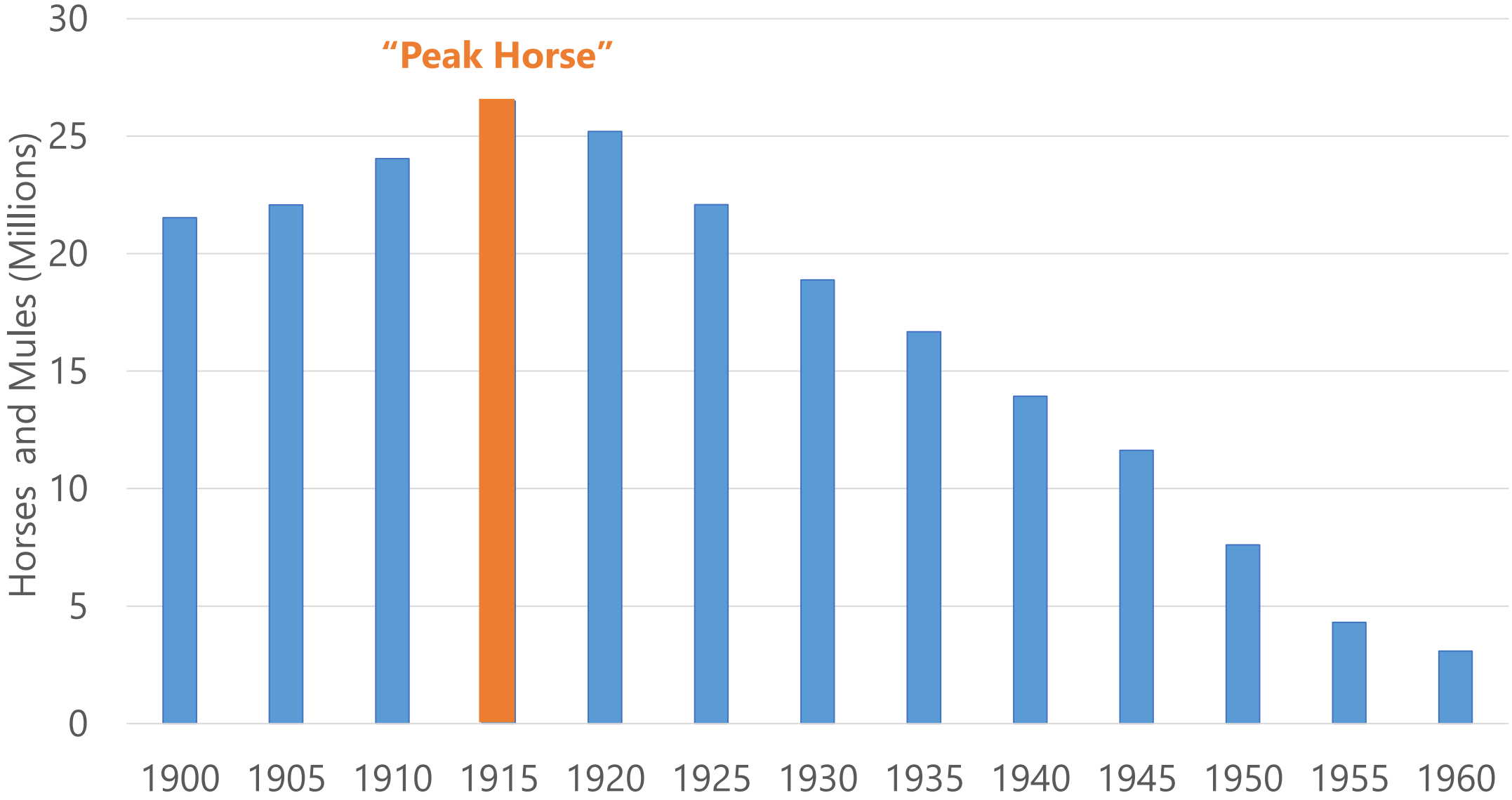
Inspired by CGP Grey

US Equine Population (1900 – 1960)

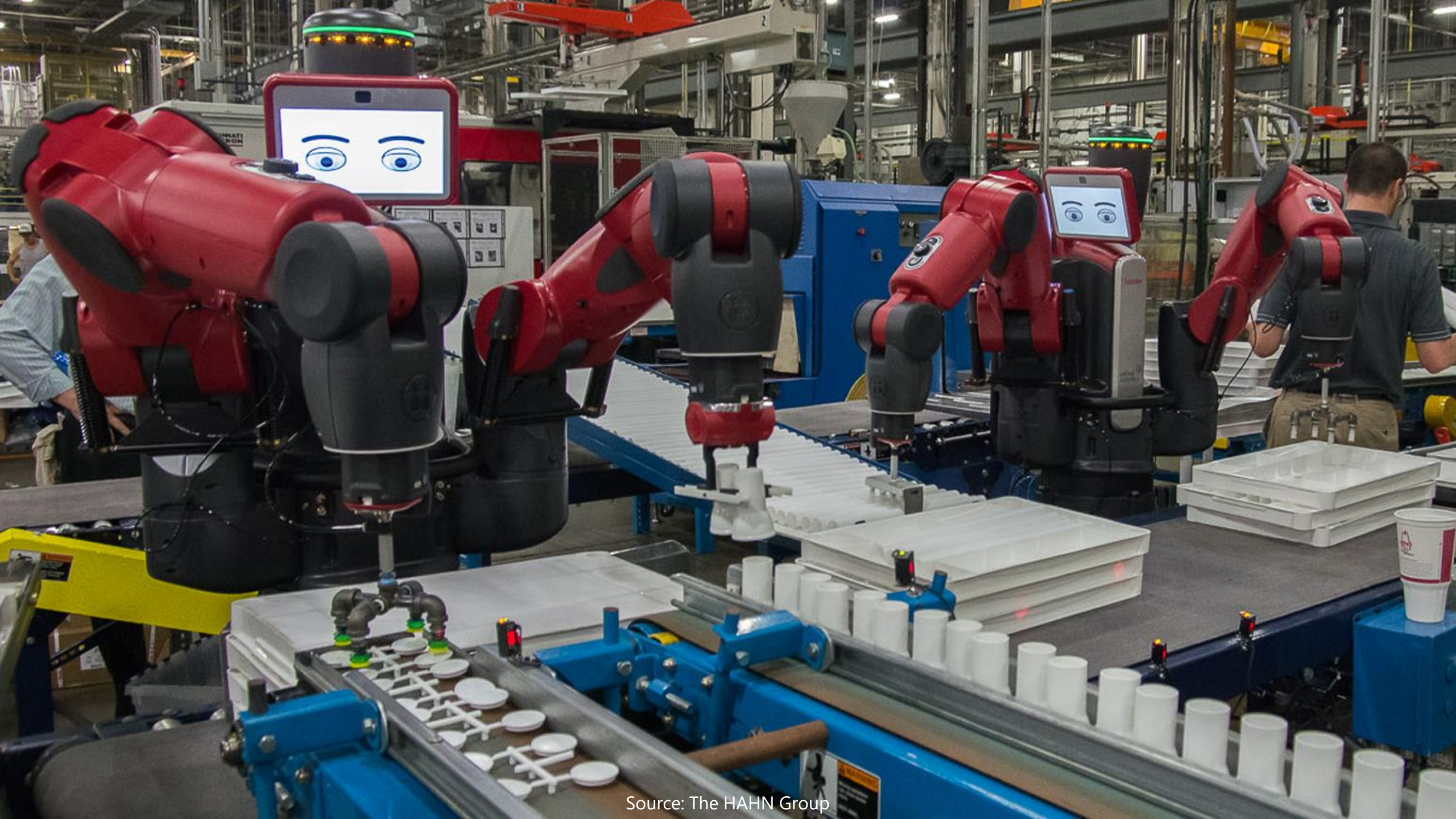


Source: The Demographics of the U.S. Equine Population

US Equine Population (1900 – 1960)



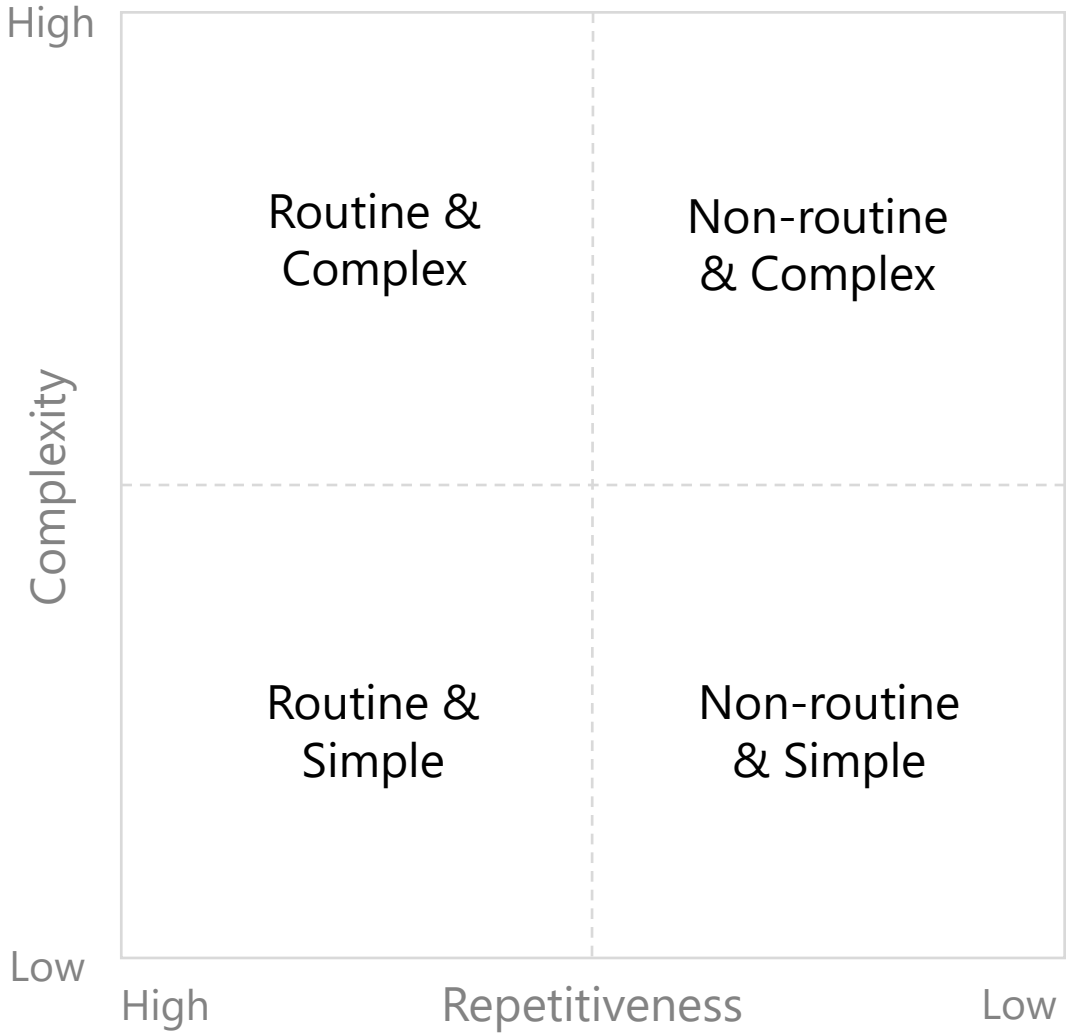
Source: The Demographics of the U.S. Equine Population



Source: The HAHN Group

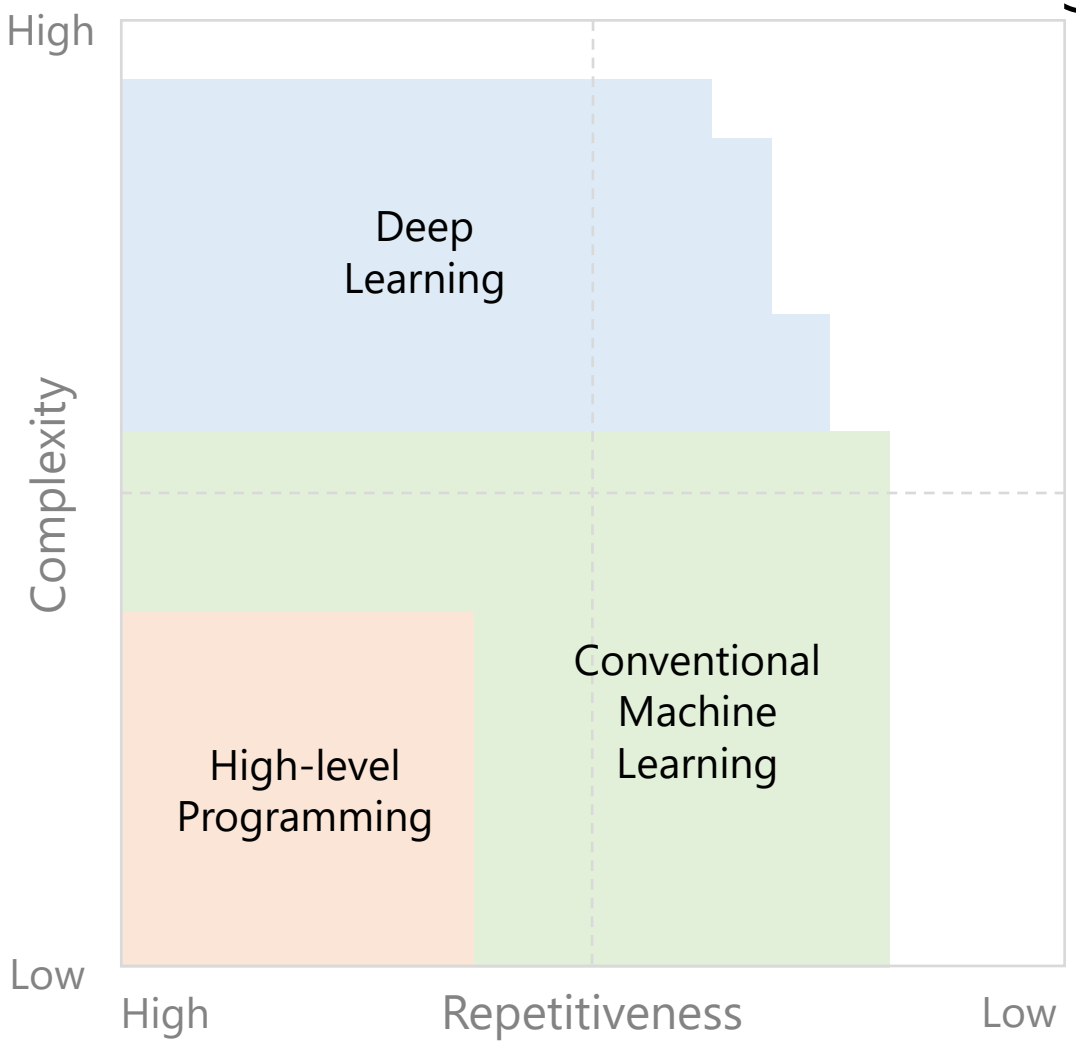
Benvenuti da McDonald's
SACCHETTO
Choose your language
TOCCA PER ORDINARE
McFamily Meal
Scopri l'offerta per la tua famiglia!
Tocca per ordinare
Touch to start

Automation Framework



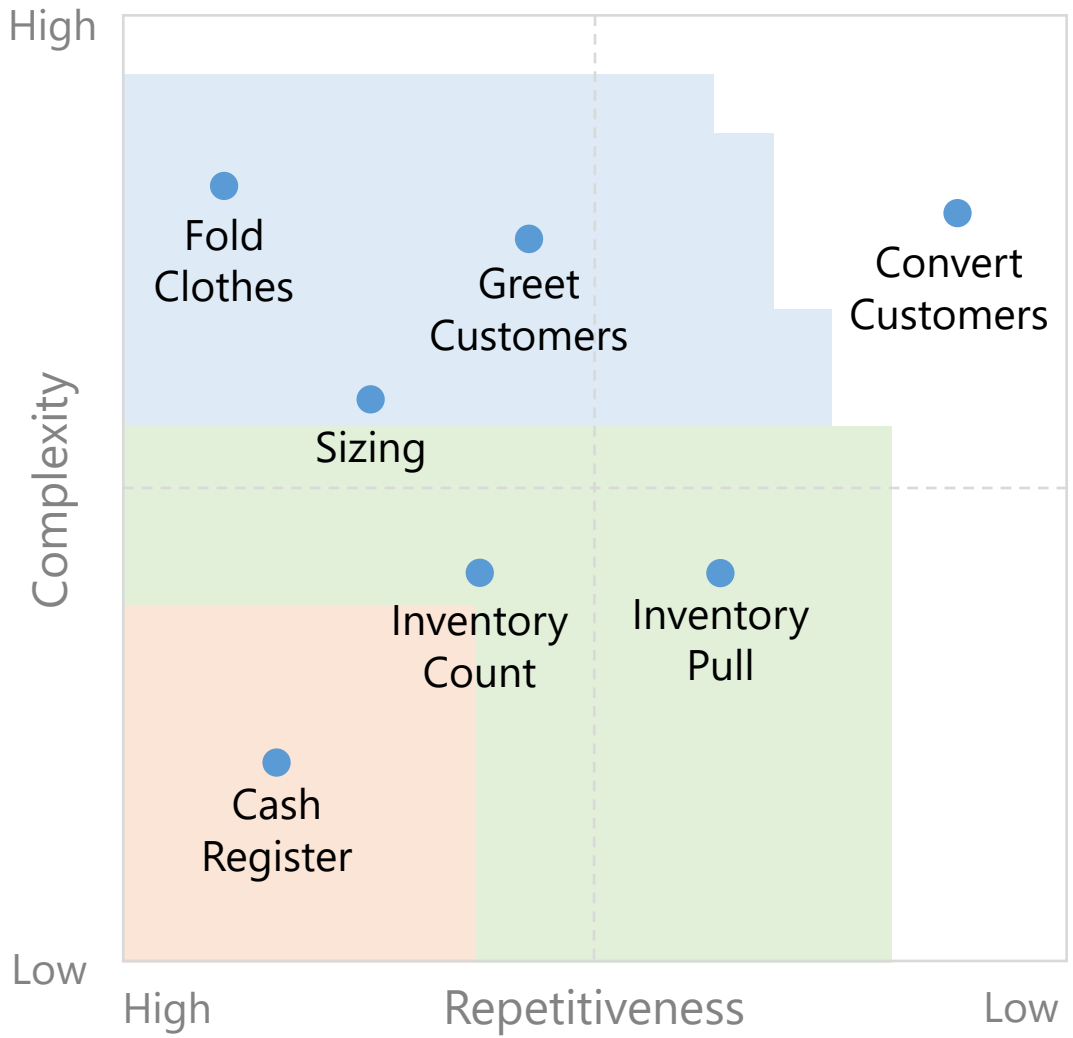
Source: Abhas Gupta -The Automation Framework

Automation Technology



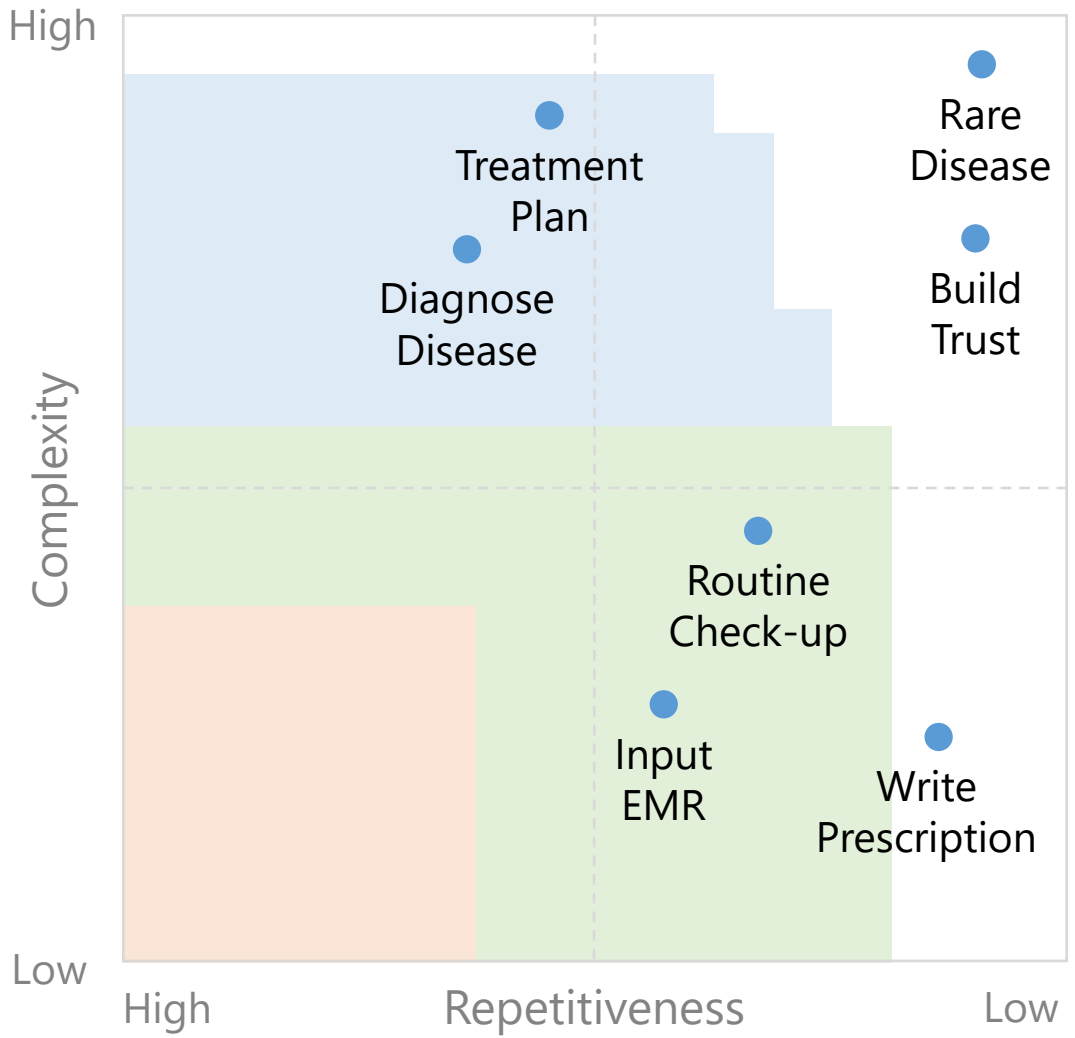
Source: Abhas Gupta -The Automation Framework

Retail Salesperson



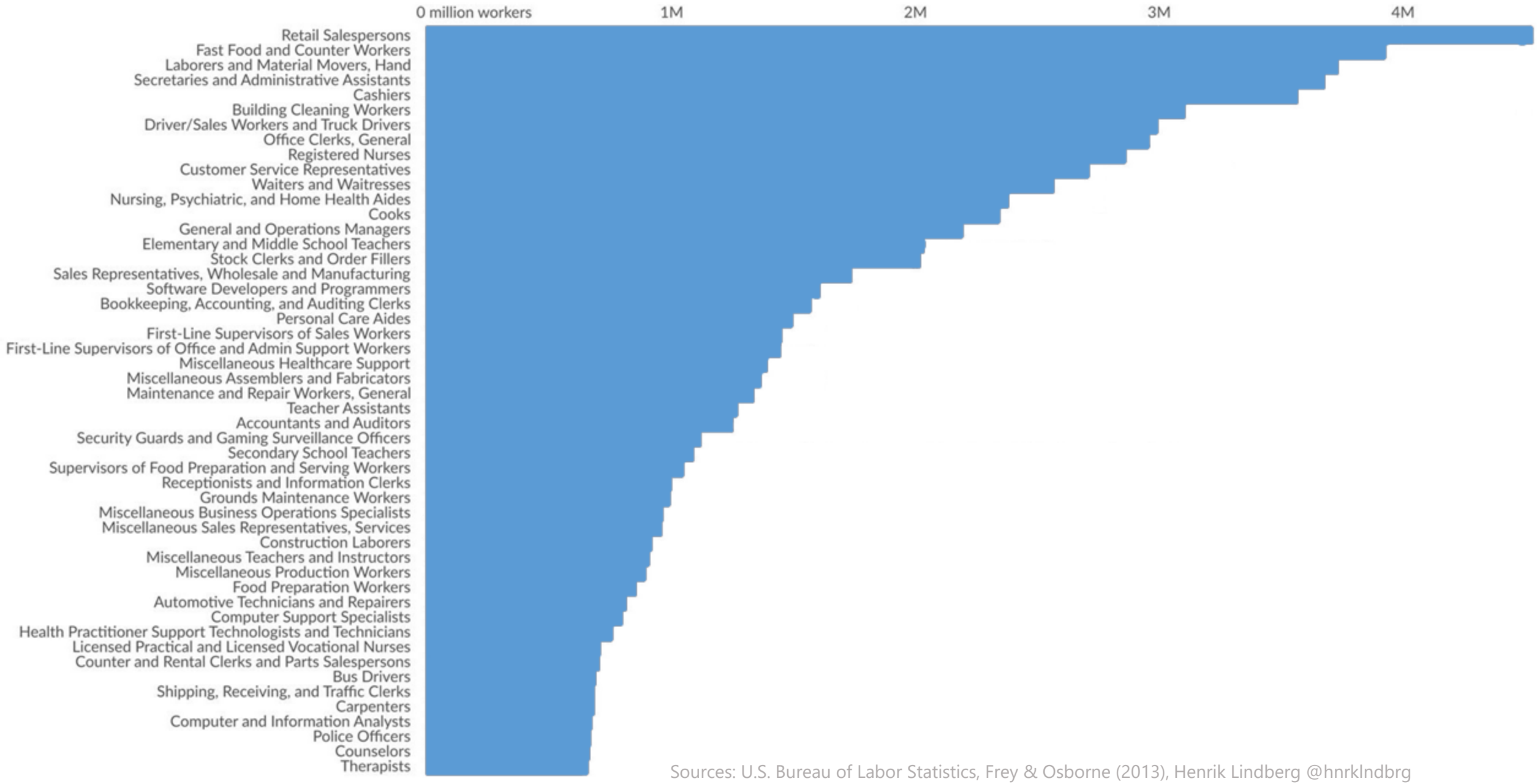
Source: Abhas Gupta -The Automation Framework

Medical Doctor



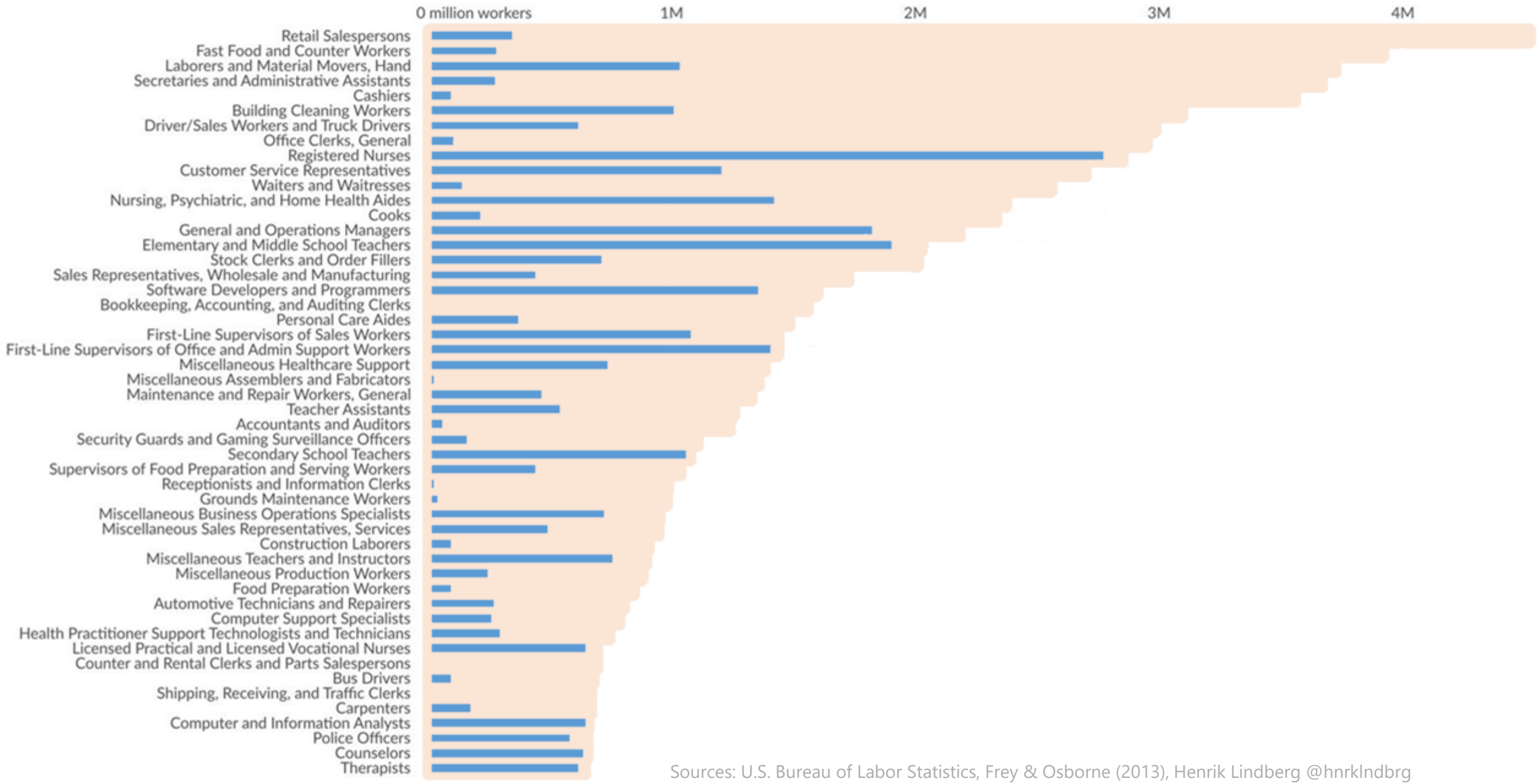
Source: Abhas Gupta -The Automation Framework

The Future of Labor



Sources: U.S. Bureau of Labor Statistics, Frey & Osborne (2013), Henrik Lindberg @hnrklndbrg

The Future of Labor



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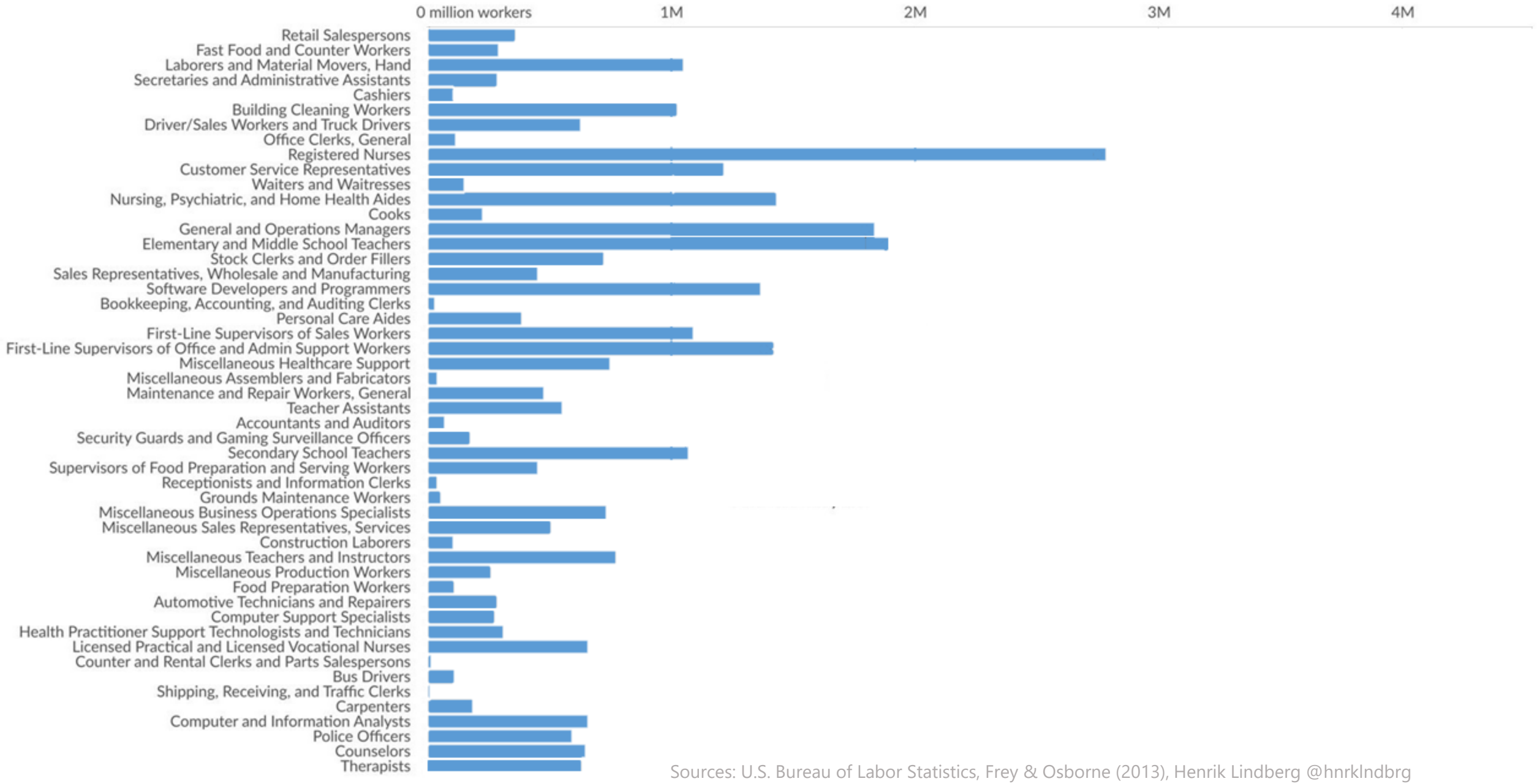
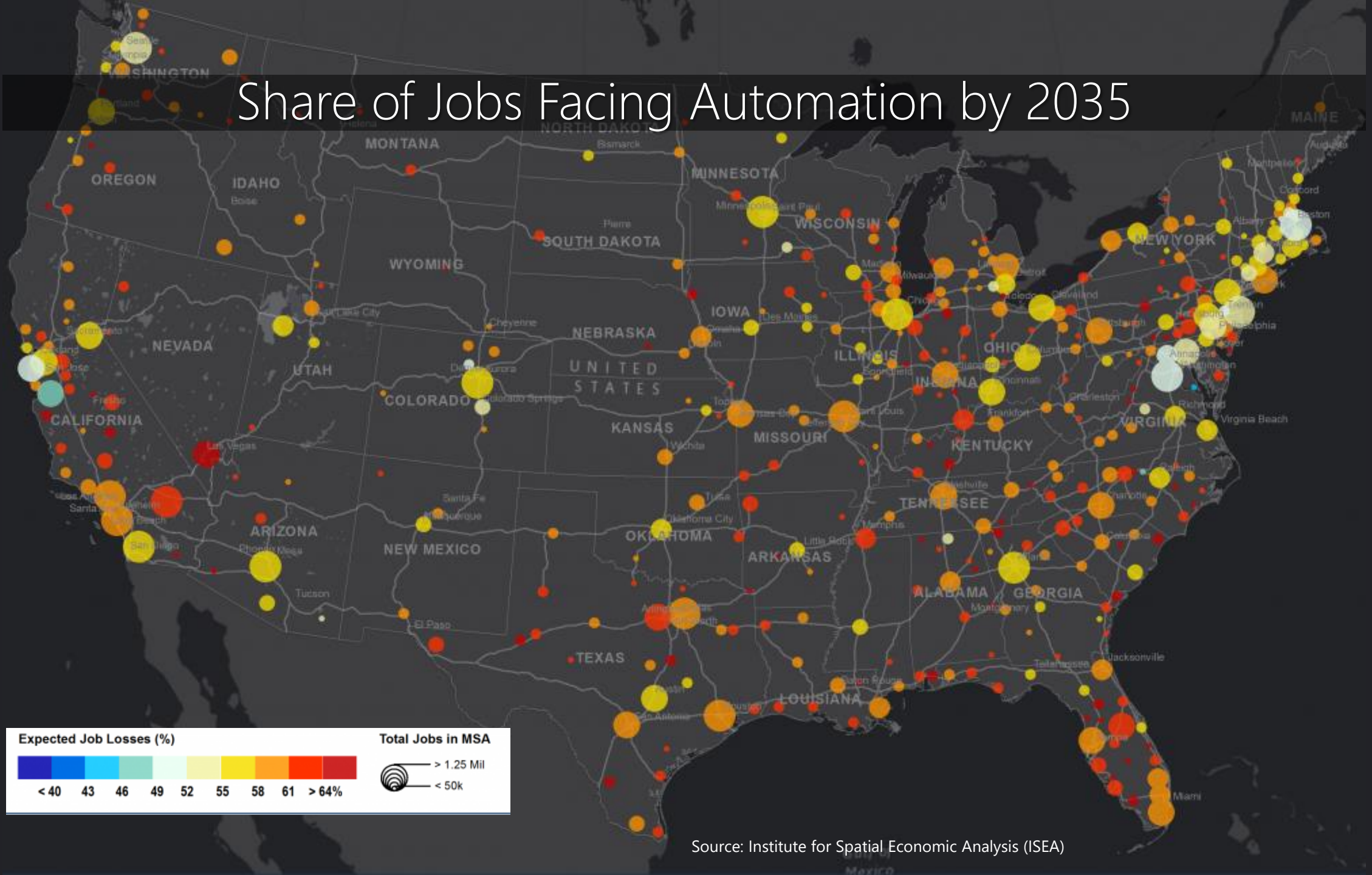
The Future of Labor

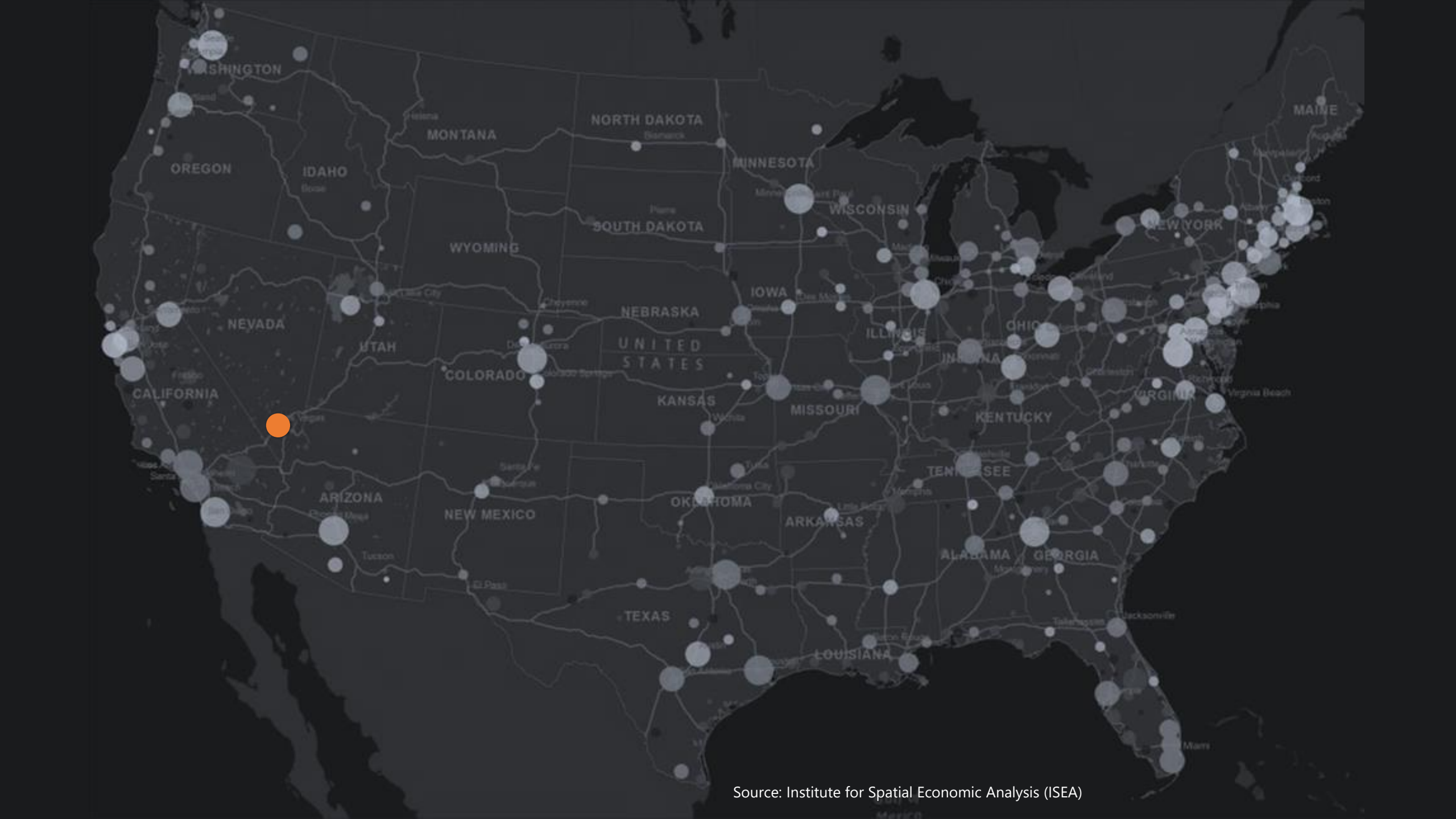


Sources: U.S. Bureau of Labor Statistics, Frey & Osborne (2013), Henrik Lindberg @hnrklndbrg

Share of Jobs Facing Automation by 2035



Source: Institute for Spatial Economic Analysis (ISEA)



Source: Institute for Spatial Economic Analysis (ISEA)

65% of all jobs in Las Vegas at risk of automation by 2035.

Source: Institute for Spatial Economic Analysis (ISEA)

Half of all jobs in the USA at risk
in the next two decades.

Source: Institute for Spatial Economic Analysis (ISEA)

Likelihood of Job Automation

Telemarketers – 99%
Underwriters – 99%
Sports referees – 99%
Cashiers – 97%
Chefs – 96%
Waiters – 94%
Paralegal Assistant – 94%
Tour guides – 91%

Bakers – 89%
Bus drivers – 89%
Construction workers – 88%
Veterinary assistant – 86%
Security guard – 84%
Sailor – 83%
Bartender – 77%
Archivist – 76%

Source: Frey and Osborne (2013)

Growth of New Job Opportunities

AI Specialist – 74%
Robotics Engineer – 40%
Data Scientist – 37%
Full Stack Engineer – 35%
Site Reliability Engineer – 34%
Data Engineer – 33%

Behavioral Health Tech – 32%
Cybersecurity Specialist – 30%
Back End Developer – 30%
Cloud Engineer – 27%
JavaScript Developer – 25%
Product Owner – 24%

Source: LinkedIn – 2020 Emerging Jobs Report

Economic Impacts of AI by 2030

-600M jobs

(-22%)

Source: McKinsey Global Institute

Economic Impacts of AI by 2030

-600M jobs

(-22%)

+700M jobs

(+25%)

Source: McKinsey Global Institute

Will AI create more jobs than it eliminates?

Which side of this new economy will your job be on?

How should I upgrade my career for AI?

1. Determine If Your Job Is at Risk

1. Determine If Your Job Is at Risk

High Risk

Simple
Repetitive
Dangerous
Error prone
Expensive

1. Determine If Your Job Is at Risk

High Risk

Simple
Repetitive
Dangerous
Error prone
Expensive

Low Risk

Complex
Creative
Strategic
Compassionate
Uniquely human

1. Determine If Your Job Is at Risk

High Risk

Simple
Repetitive
Dangerous
Error prone
Expensive

Normal Risk

Many tasks automated

Some human tasks remain

Low Risk

Complex
Creative
Strategic
Compassionate
Uniquely human

2. Decide If Your Company Is at Risk

2. Decide If Your Company Is at Risk

Traditional
vs.
automated

2. Decide If Your Company Is at Risk

Traditional
vs.
automated

Guesswork
vs.
data-driven

2. Decide If Your Company Is at Risk

Traditional
vs.
automated

Guesswork
vs.
data-driven

Old model
vs.
disruptive

3. Choose an AI Career Path

3. Choose an AI Career Path

AI model trainer

3. Choose an AI Career Path

AI model trainer

AI application developer

3. Choose an AI Career Path

AI model trainer

AI application developer

AI tool user

4. Get into the AI Value Stream

4. Get into the AI Value Stream

AI Horizontals

IoT
VR/AR
Robotics

4. Get into the AI Value Stream

AI Horizontals

IoT
VR/AR
Robotics

AI Verticals

Lots of data
AI products
AI services

5. Focus on the Human Aspects

5. Focus on the Human Aspects

Avoid automatable tasks

5. Focus on the Human Aspects

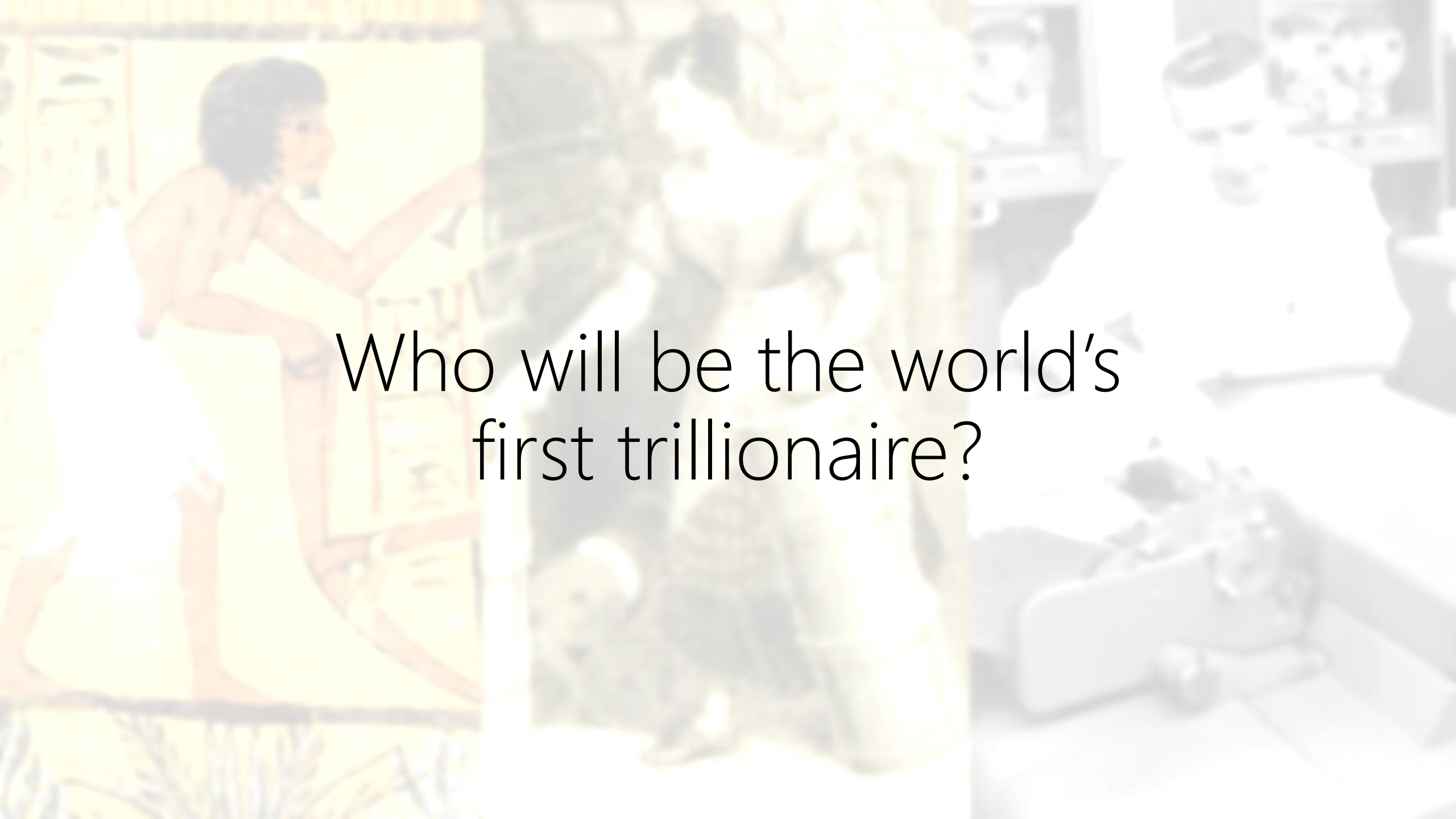
Avoid automatable tasks

Prefer human skills

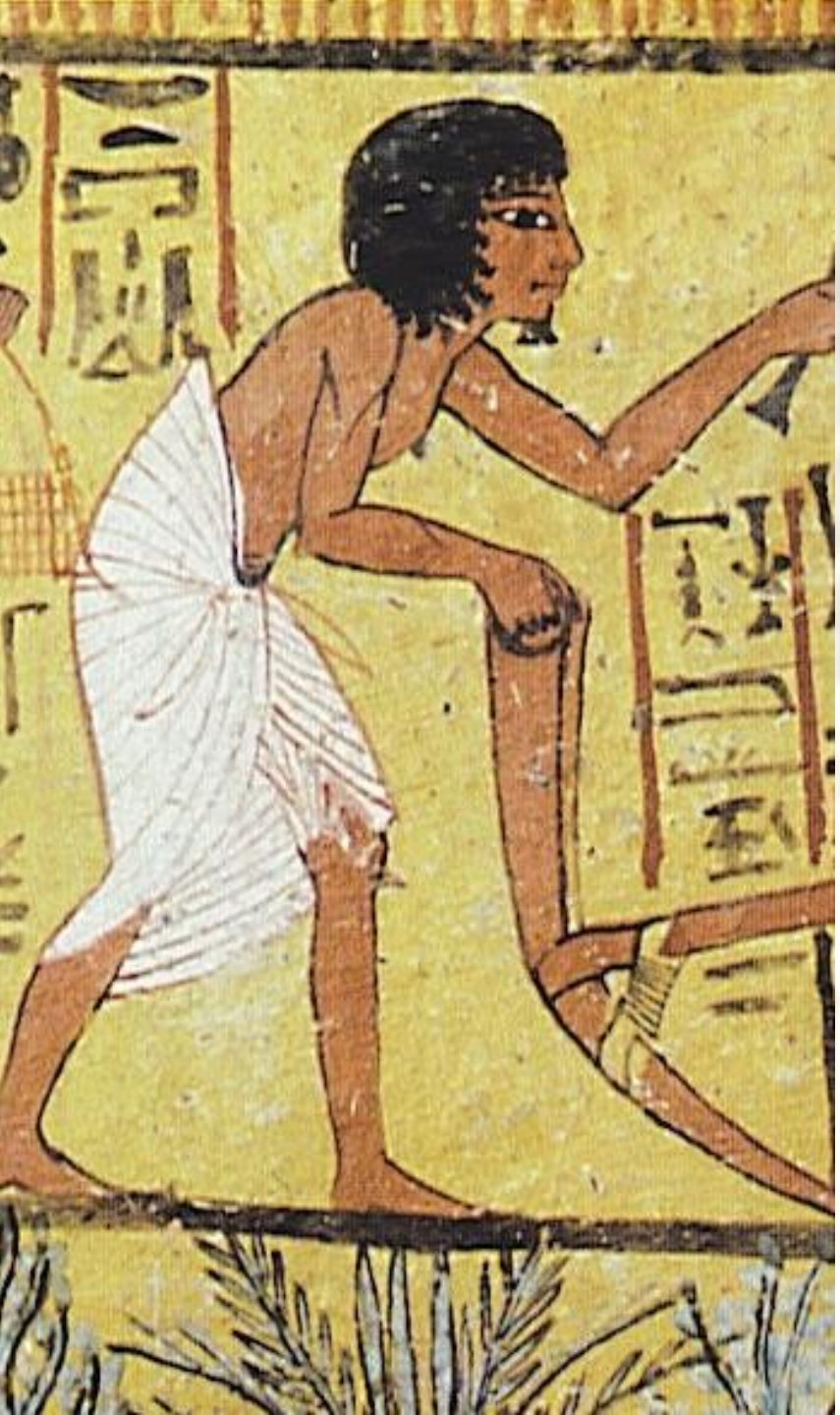
Upgrade Your Career for AI

1. Determine if your job is at risk
2. Decide if your company is at risk
3. Choose an AI career path
4. Get into the AI value stream
5. Focus on the human aspects

3. Invest in an AI-first Economy



Who will be the world's first trillionaire?



Agricultural Visionaries

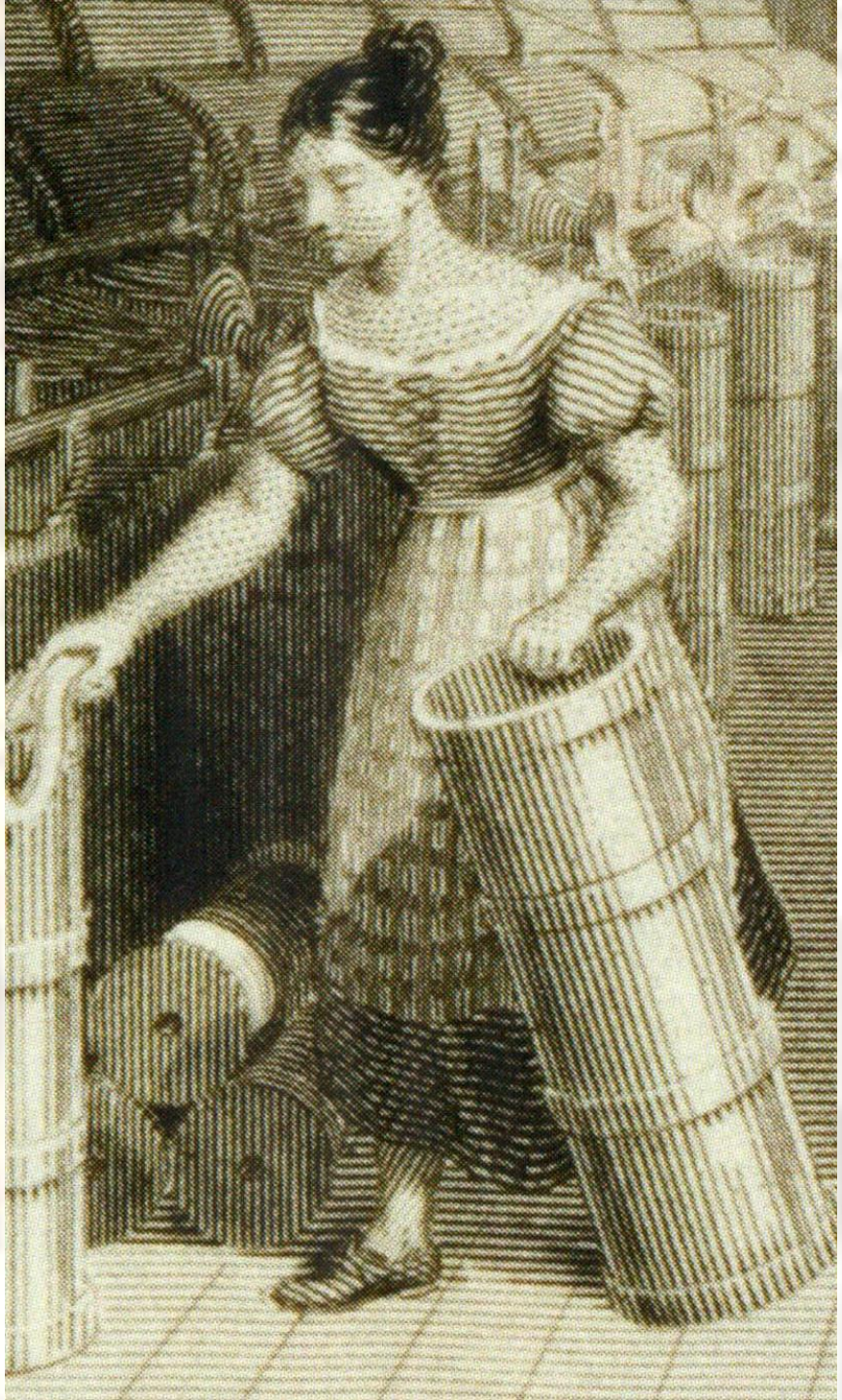
Sumerians
Egyptians
Chinese

Agricultural Technologies

Domestication
Irrigation
Iron plow

Industrial Visionaries

John D. Rockefeller
Thomas Edison
Henry Ford



Industrial Technologies

Oil
Electricity
Automobile

Information Visionaries

IBM
Microsoft
Google

Information Technologies

Mainframe computer
Personal computer
Internet

Economic Impacts of AI by 2030

+$13T GDP

(+16%)

Source: McKinsey Global Institute

Returns to Capital vs. Labor

Returns to Capital vs. Labor

Capital

Machines

Software

Data

Returns to Capital vs. Labor

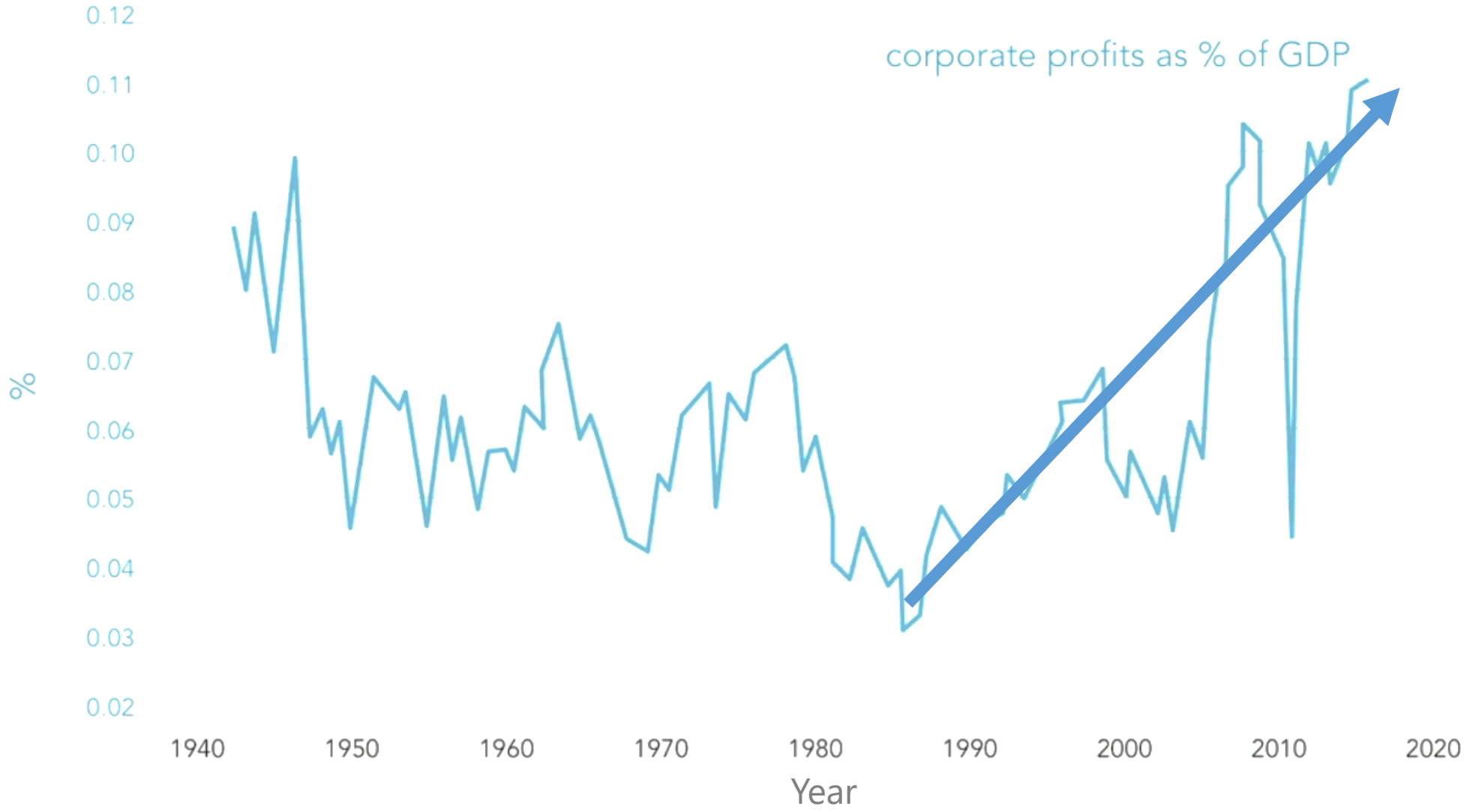
Capital

Machines
Software
Data

Labor

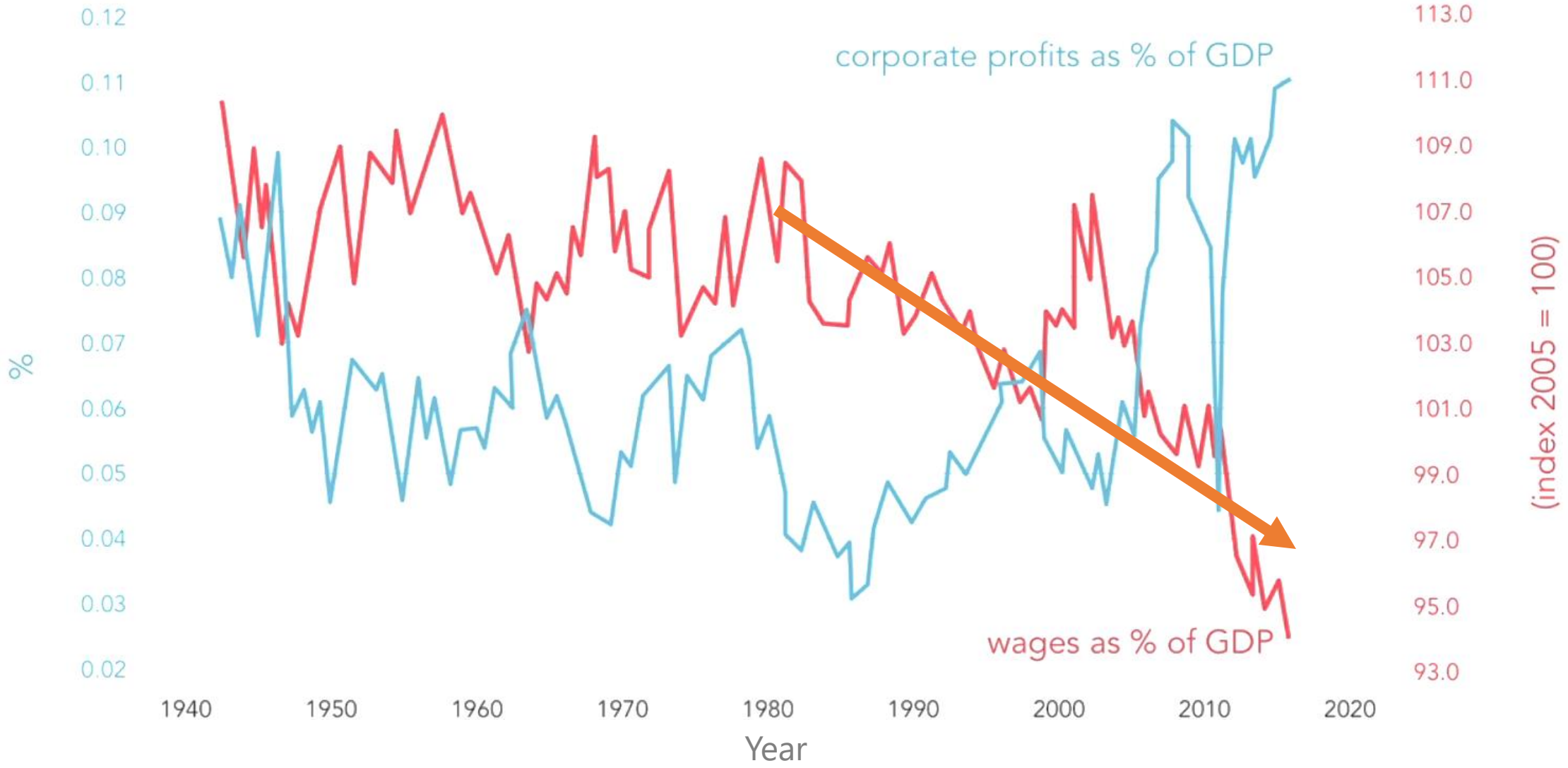
Physical
Knowledge
Specialized

Returns to Capital vs. Labor



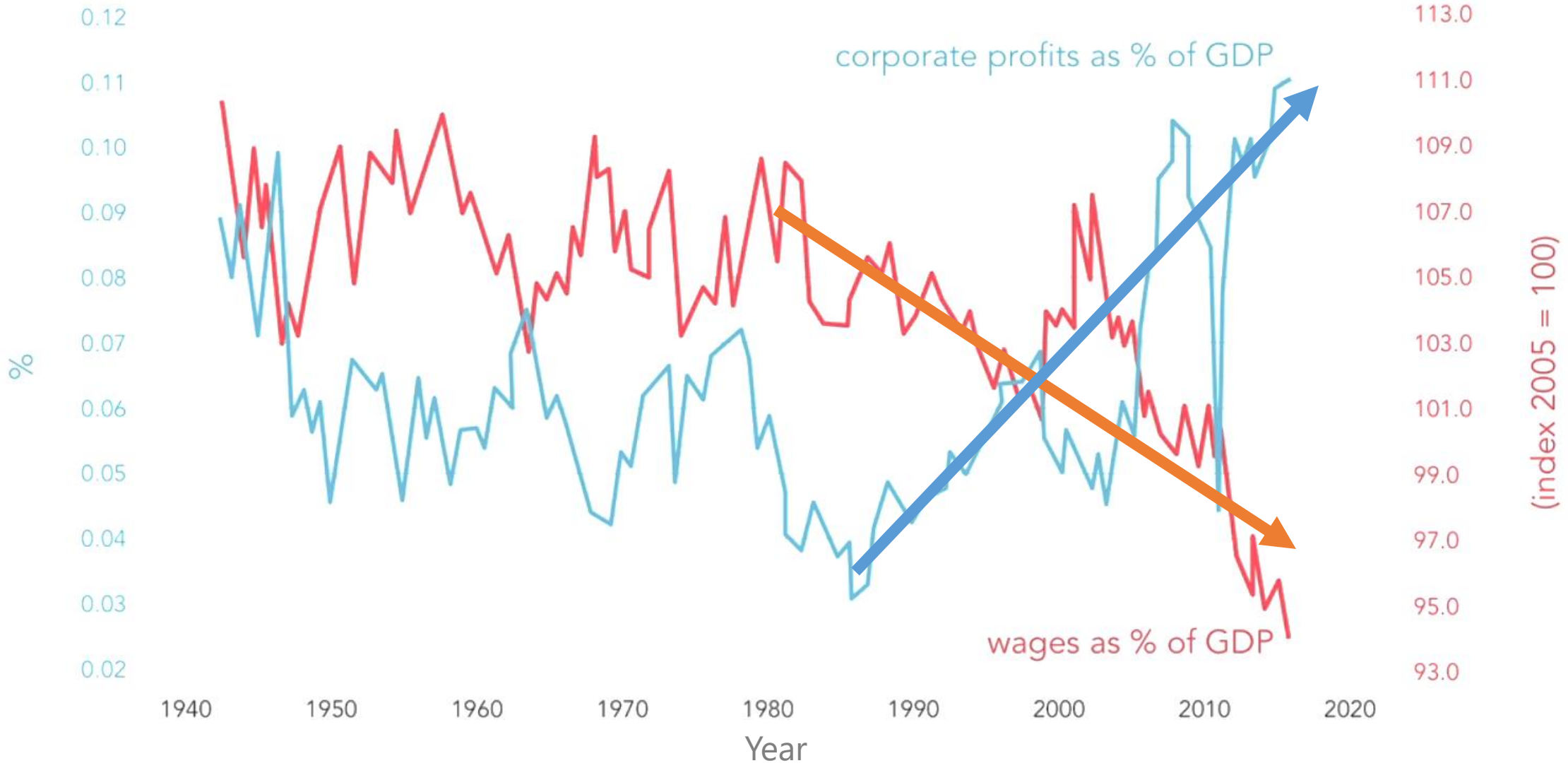
Source: Federal Reserve Bank of St. Louis, US Bureau of Economic Analysis, Andrew McAfee, TED

Returns to Capital vs. Labor



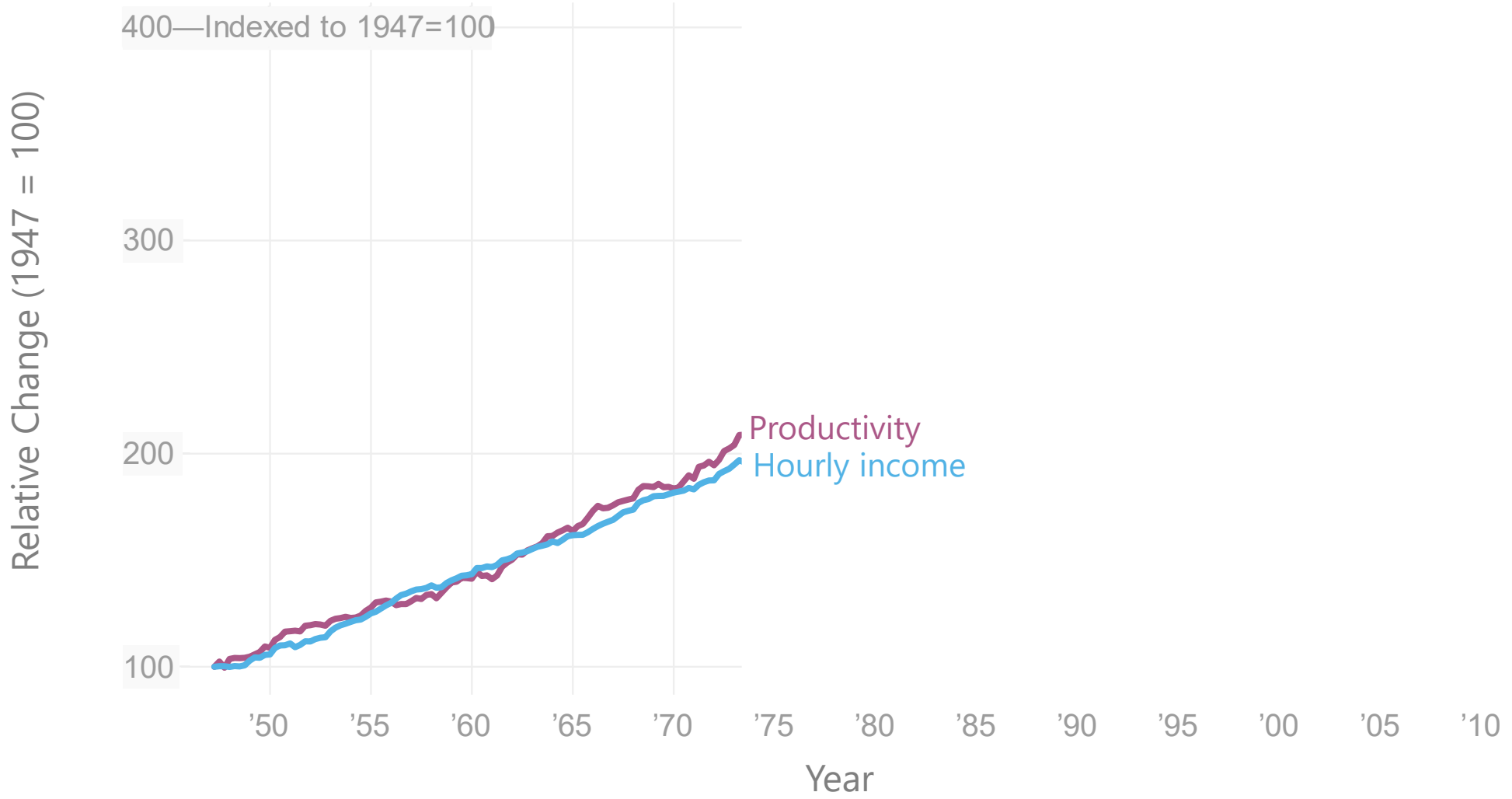
Source: Federal Reserve Bank of St. Louis, US Bureau of Economic Analysis, Andrew McAfee, TED

Returns to Capital vs. Labor



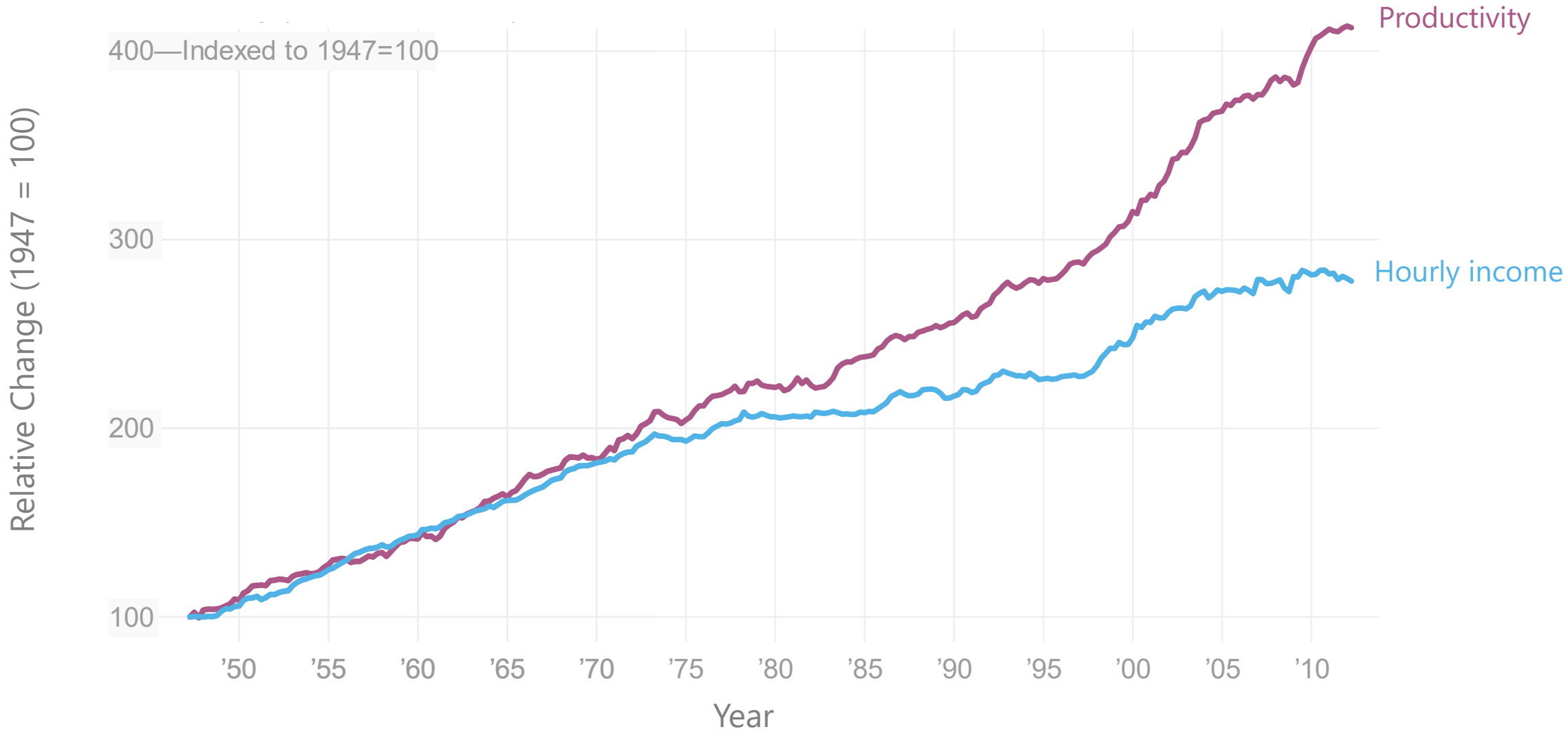
Source: Federal Reserve Bank of St. Louis, US Bureau of Economic Analysis, Andrew McAfee, TED

The Great Decoupling



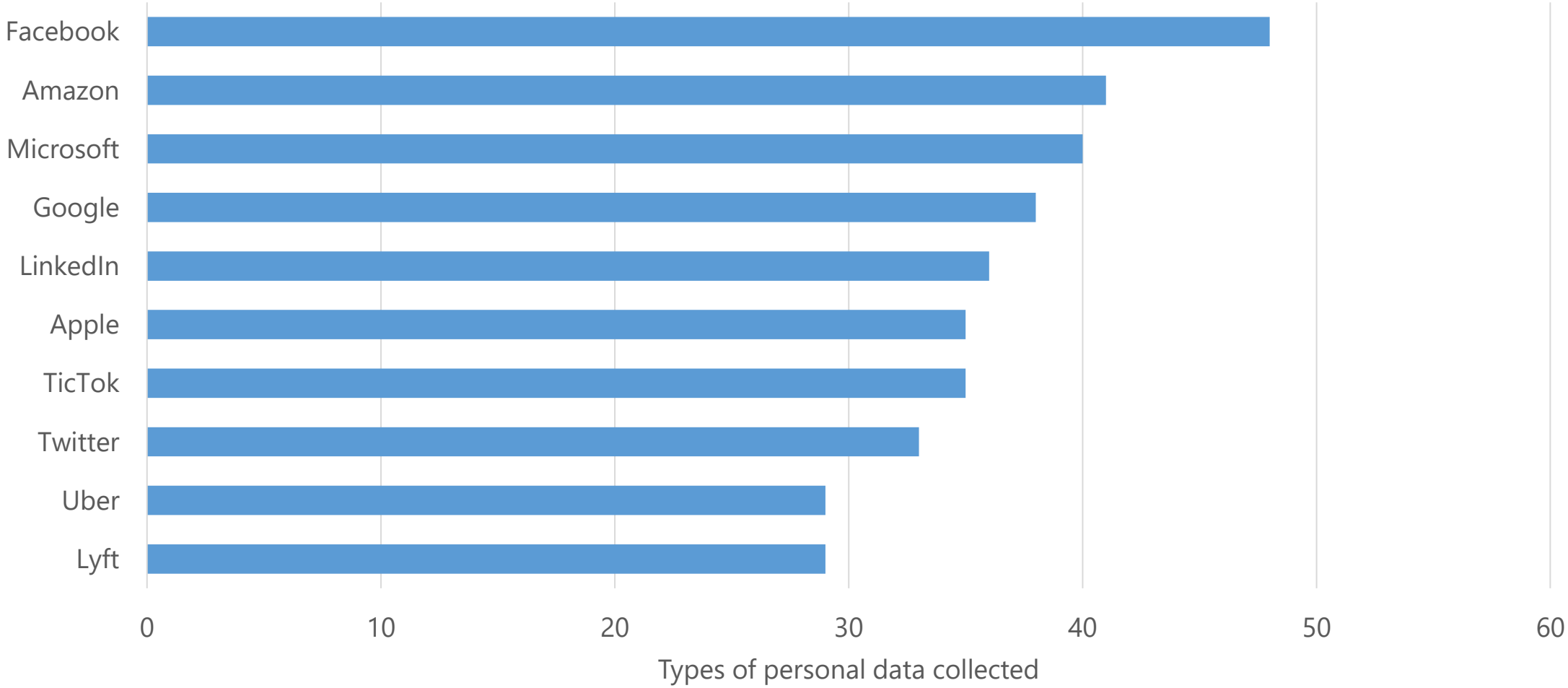
Source: Bureau of Labor Statistics, Gideon Lichfield

The Great Decoupling



Source: Bureau of Labor Statistics, Gideon Lichfield

Who Collects the Most Personal Data?



Source: Digital Information World 2020

How should I invest in an AI-first economy?

1. Invest in Yourself First

1. Invest in Yourself First

Education

Career

2. Invest in AI Solutions

2. Invest in AI Solutions

Improve business operations

2. Invest in AI Solutions

Improve business operations

Increase personal productivity

2. Invest in AI Solutions

Improve business operations

Increase personal productivity

Make life more enjoyable

2. Invest in AI Solutions

Improve business operations

Increase personal productivity

Make life more enjoyable

3. Don’t Depend on Your Labor

3. Don’t Depend on Your Labor

Labor

Physical
Mental
Specialized

3. Don’t Depend on Your Labor

Labor

Physical
Mental
Specialized

Assets

Companies
Products
Services

4. Invest in the Economy as a Whole

4. Invest in the Economy as a Whole

Diversify your risk

4. Invest in the Economy as a Whole

Diversify your risk

Buy and hold

4. Invest in the Economy as a Whole

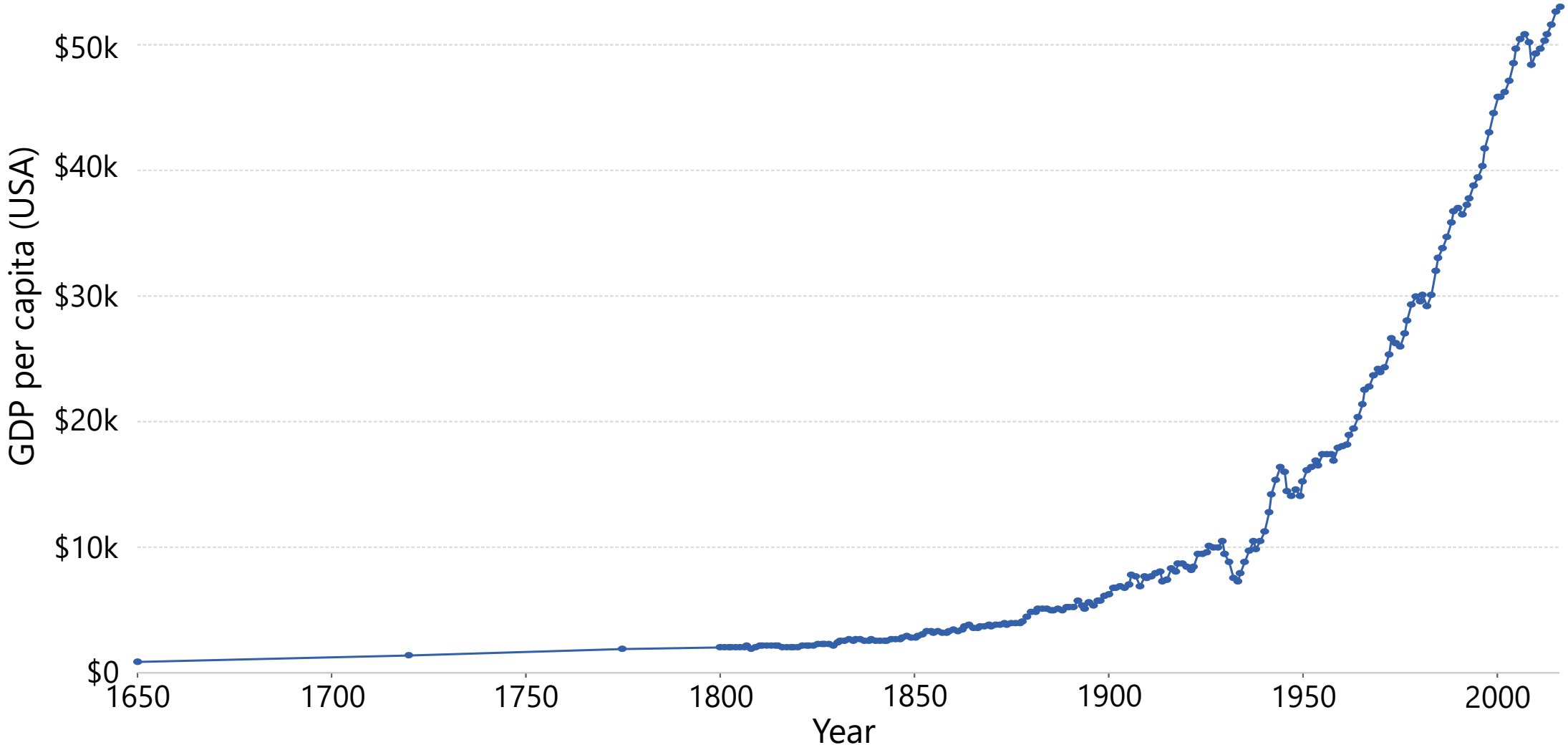
Diversify your risk

Buy and hold

Have a safety net

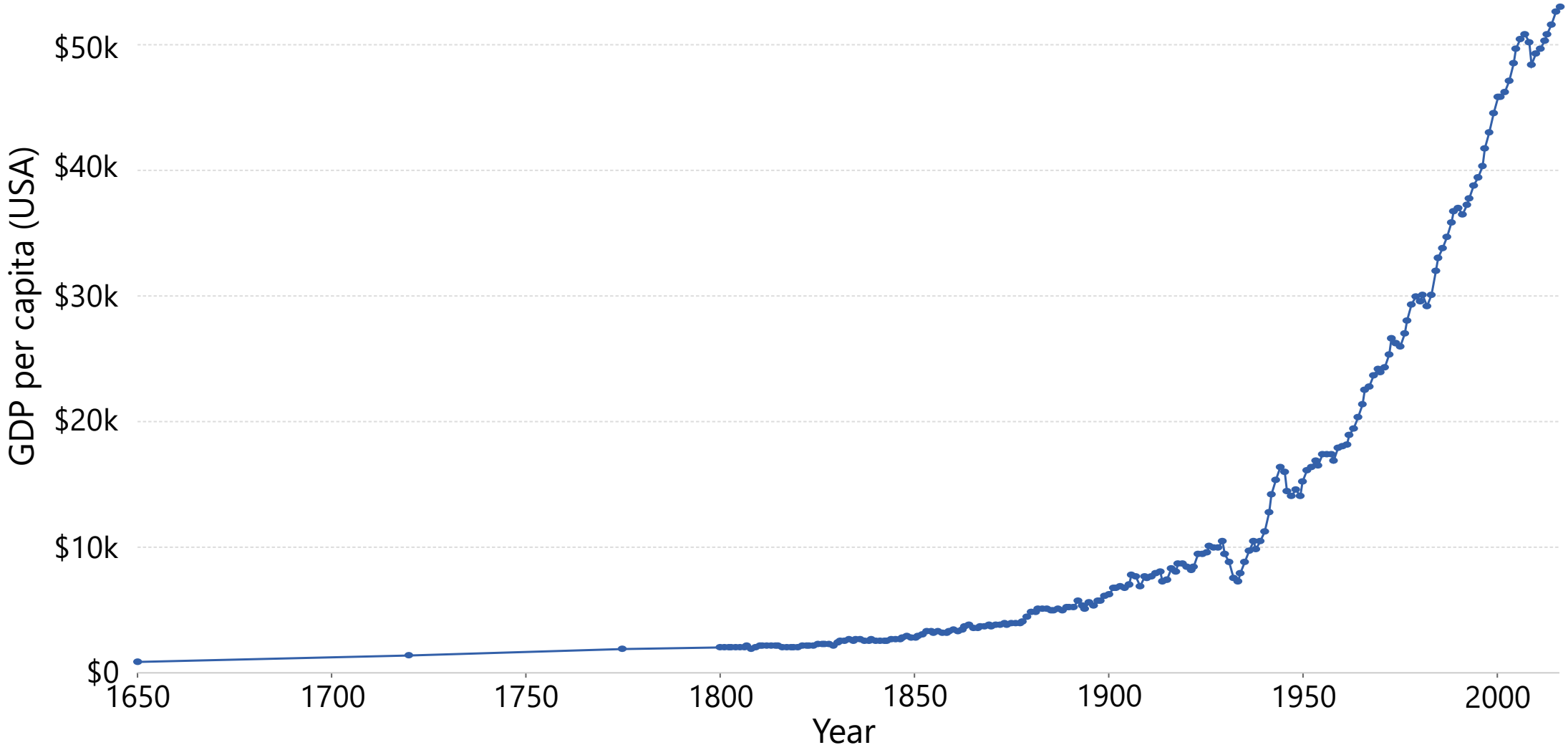
5. Invest Early for Compound Growth

5. Invest Early for Compound Growth



Source: Our World in Data

5. Invest Early for Compound Growth



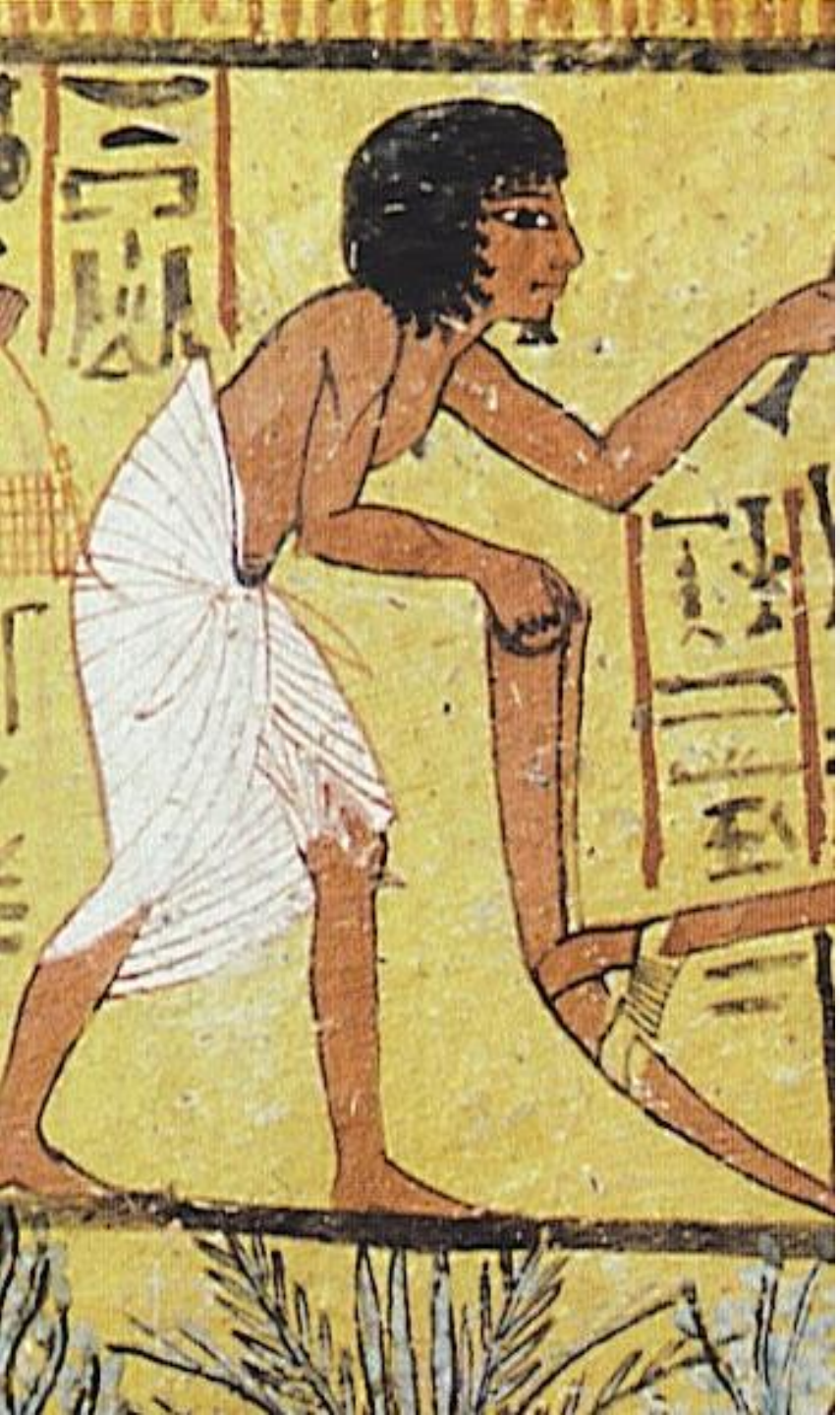
Source: Our World in Data

Invest in an AI-first Economy

1. Invest in yourself
2. Invest in AI solutions
3. Don’t depend on your labor
4. Invest in the economy as a whole
5. Invest early for compound growth

4. Use AI Responsibly and Ethically

With great power comes great responsibility



Agricultural Superpower

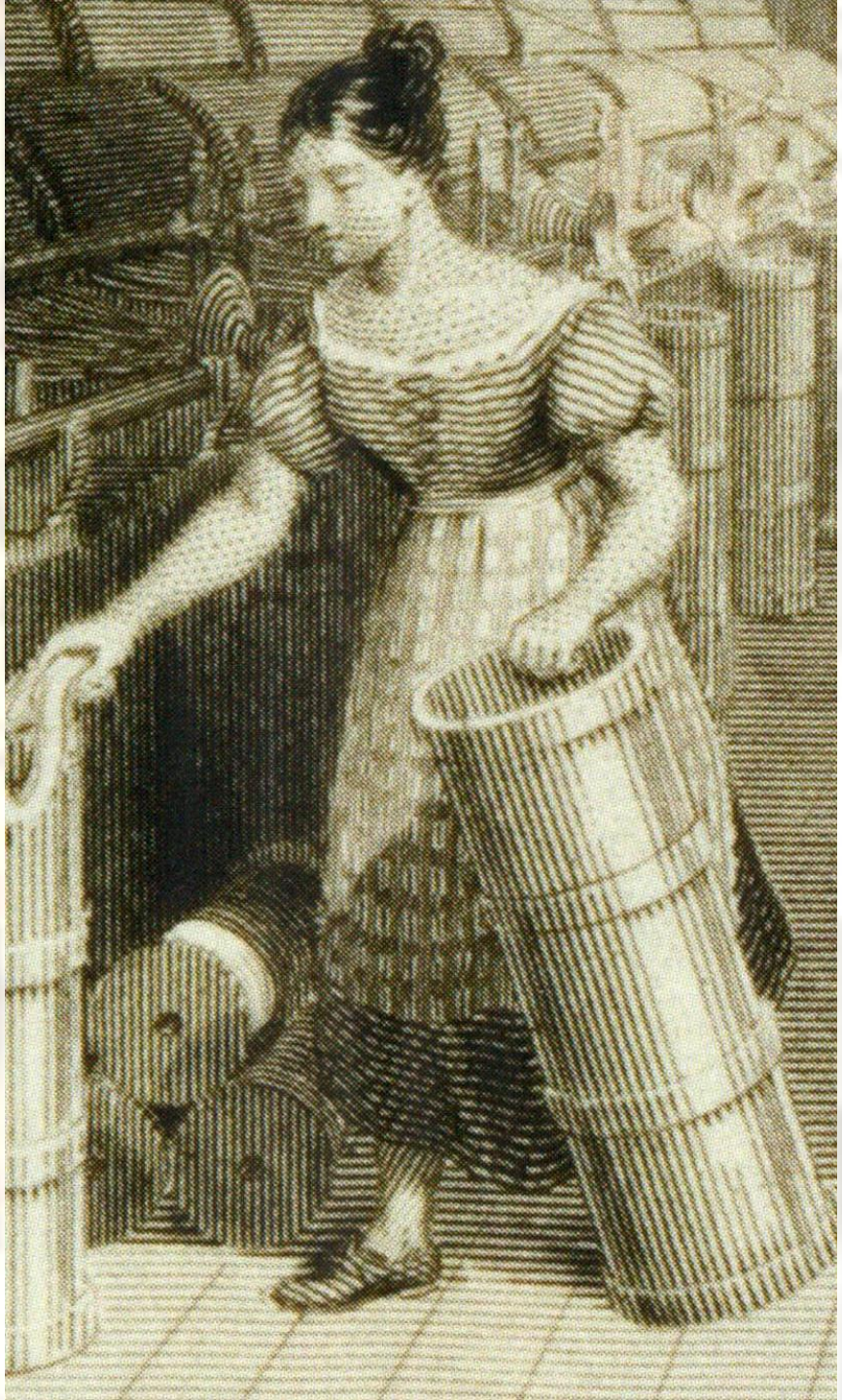
Large armies

Abuses

Acquire land
Enslave labor
Subjugation

Industrial Superpower

Mechanized warfare



Abuses

Control resources

Maintain colonies

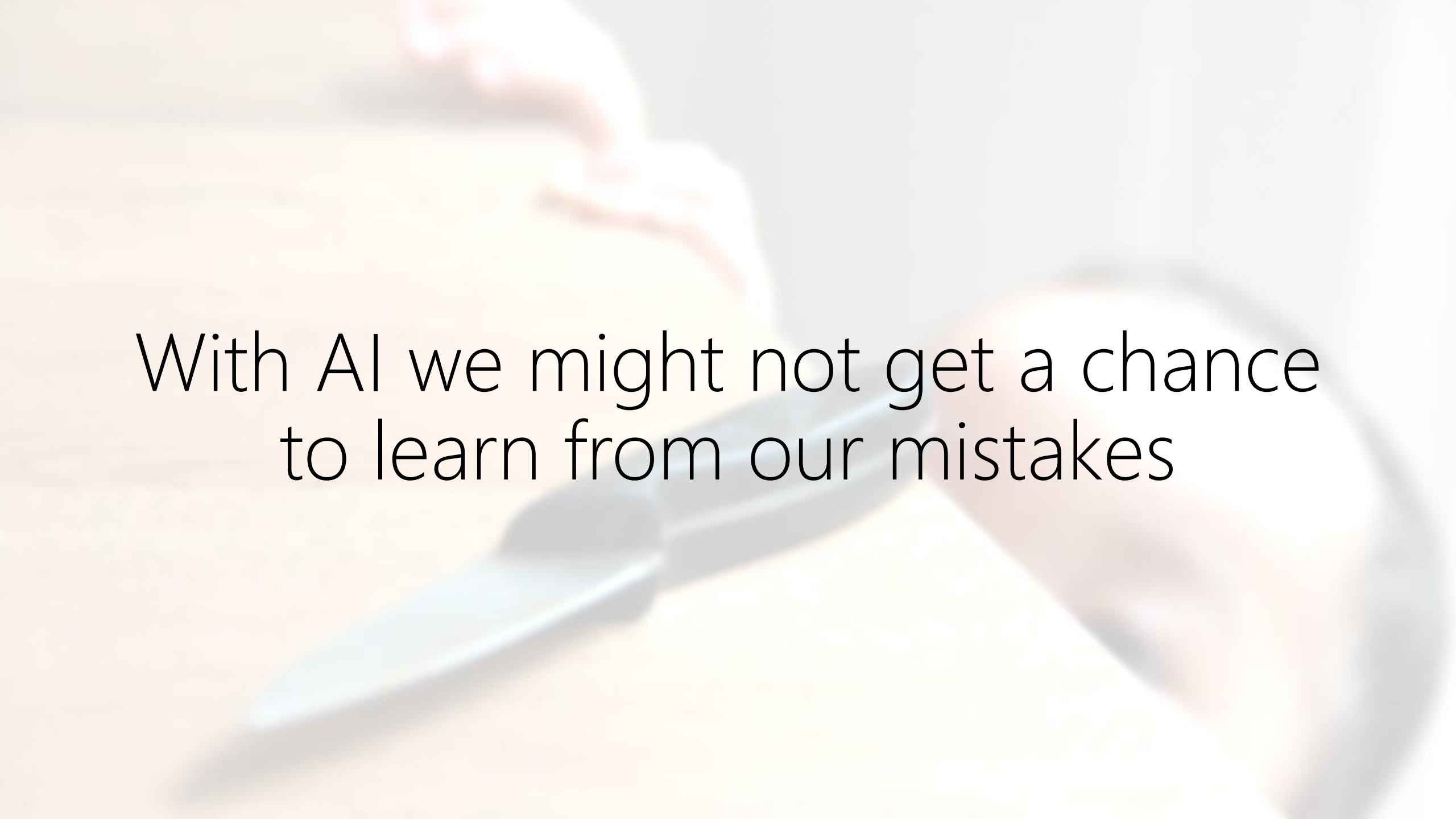
Expand influence

Information Superpower

Cyber warfare

Abuses

Mass surveillance
Industrial sabotage
Political propaganda


With AI we might not get a chance
to learn from our mistakes

Current Ethical Issues

Privacy	Manipulation	Propaganda
Impersonation	Exploitation	AI weapons

ID 435024686199
ID 546002359151
ID 324267334567
ID 646300628981

Demographics
Age: 20
Gender: Female
Location: Chicago
Education: MS in Edu.
Occupation: Teacher
Income: $35,100
Psychographics
Personality: Open
Lifestyle: Active
Interests: Dancing
Opinions: Liberal
Beliefs: Christian
Online Behavior
Last Visit: 2/15/2020
Last Purchase: 1/1/2020
Last Purchase: Shoes
In-app Behavior
Usage: 15 session / mo.
Last use: 3/20/2020
Last event: Liked shoes
Offline Behavior
Last In-store: 8/2/2019
Last purchase: Socks
Social Media
Last mention: 8/2/2019
Sentiment: Positive

SYSTEM PROMPT (HUMAN-WRITTEN)

In a shocking finding, scientist discovered a herd of unicorns living in a remote, previously unexplored valley, in the Andes Mountains. Even more surprising to the researchers was the fact that the unicorns spoke perfect English.

MODEL COMPLETION (MACHINE-WRITTEN, 10 TRIES)

The scientist named the population, after their distinctive horn, Ovid's Unicorn. These four-horned, silver-white unicorns were previously unknown to science.

Now, after almost two centuries, the mystery of what sparked this odd phenomenon is finally solved.

Dr. Jorge Pérez, an evolutionary biologist from the University of La Paz, and several companions, were exploring the Andes Mountains when they found a small valley, with no other animals or humans. Pérez noticed that the valley had what appeared to be a natural fountain, surrounded by two peaks of rock and silver snow.

Pérez and the others then ventured further into the valley. "By the time we reached the top of one peak, the water looked blue, with some crystals on top," said Pérez.

Original Video for Input Speech

Our Result

Source: Synthesizing Obama: Learning Lip Sync from Audio

HIDDEN FLYER
SOOC-11789F
11789F
FL

Current Ethical Issues

Privacy	Manipulation	Propaganda
Impersonation	Exploitation	AI weapons

What is privacy with AI surveillance?

What is privacy with AI surveillance?

How do we avoid bias in AI?

What is privacy with AI surveillance?

How do we avoid bias in AI?

Should we weaponize AI?

How should we allocate resources?

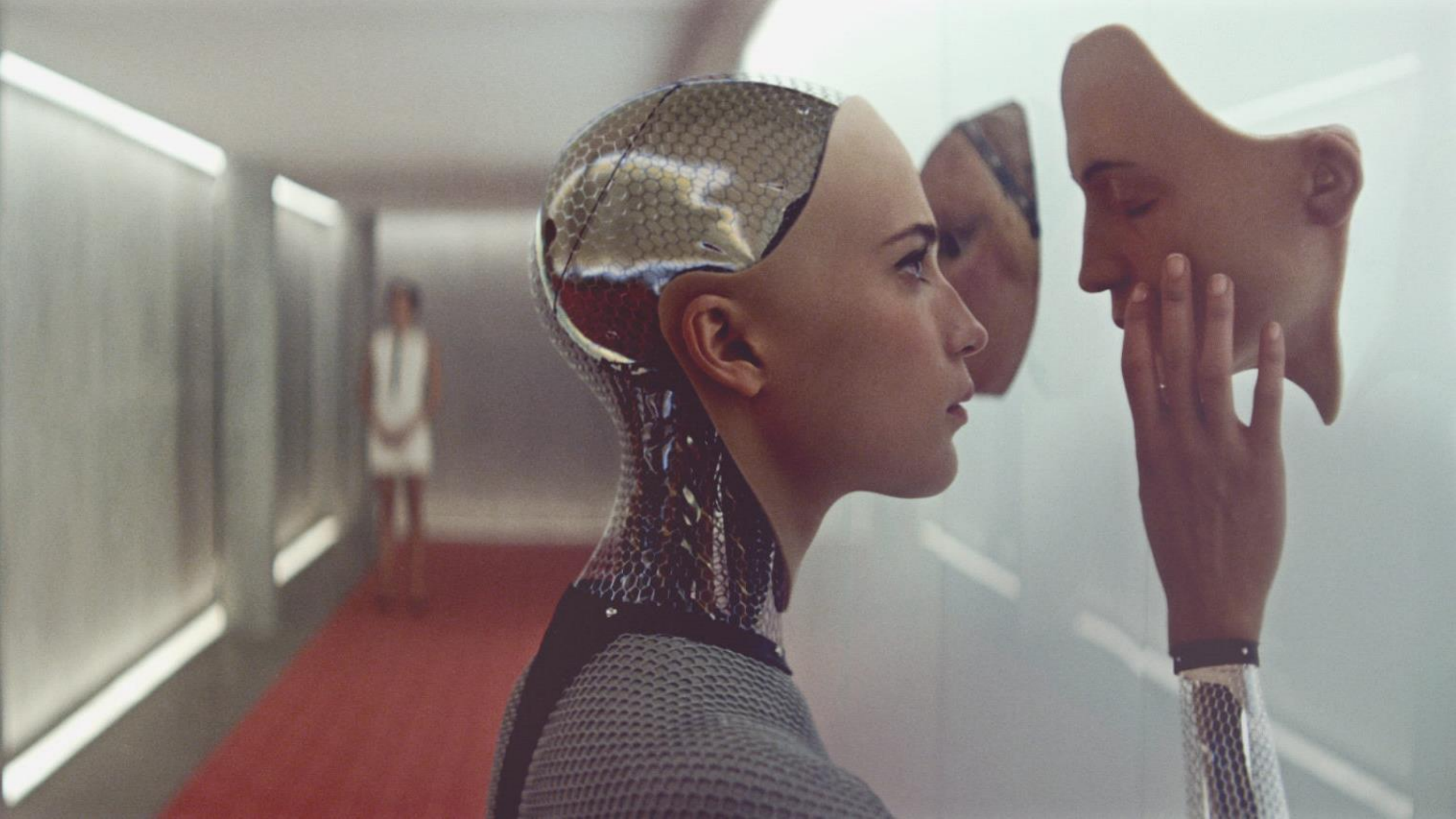
How should we allocate resources?

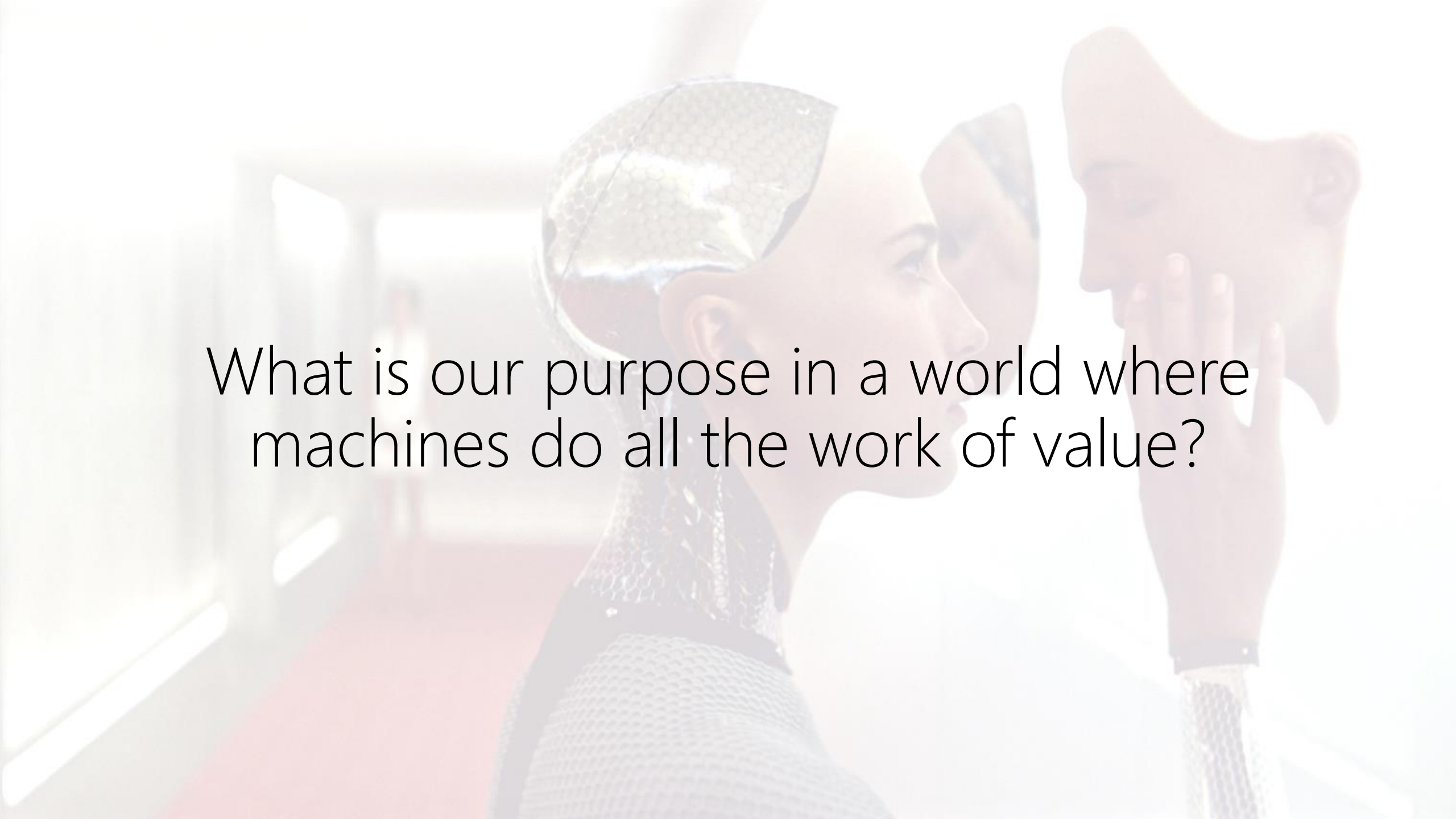
Should we tax robots?

How should we allocate resources?

Should we tax robots?

What rights should machines have?





What is our purpose in a world where machines do all the work of value?

How should I use AI responsibly and ethically?

1. Ask Questions

1. Ask Questions

What are
the issues?

1. Ask Questions

What are
the issues?

What are your
core values?

2. Avoid Bias in AI

2. Avoid Bias in AI

Biased data
creates
biased results

2. Avoid Bias in AI

Biased data
creates
biased results

Reinforces
socio-economic
divisions

3. Provide Transparency

3. Provide Transparency

Make decisions transparent

3. Provide Transparency

Make decisions transparent

Use the simplest tool

3. Provide Transparency

Make decisions transparent

Use the simplest tool

Use explainable AI

4. Protect Your Private Data

4. Protect Your Private Data

Your private data
is very powerful

4. Protect Your Private Data

Your private data
is very powerful

What are you willing
to make public?

5. Demand More From Our Leaders

5. Demand More From Our Leaders

Political leaders

5. Demand More From Our Leaders

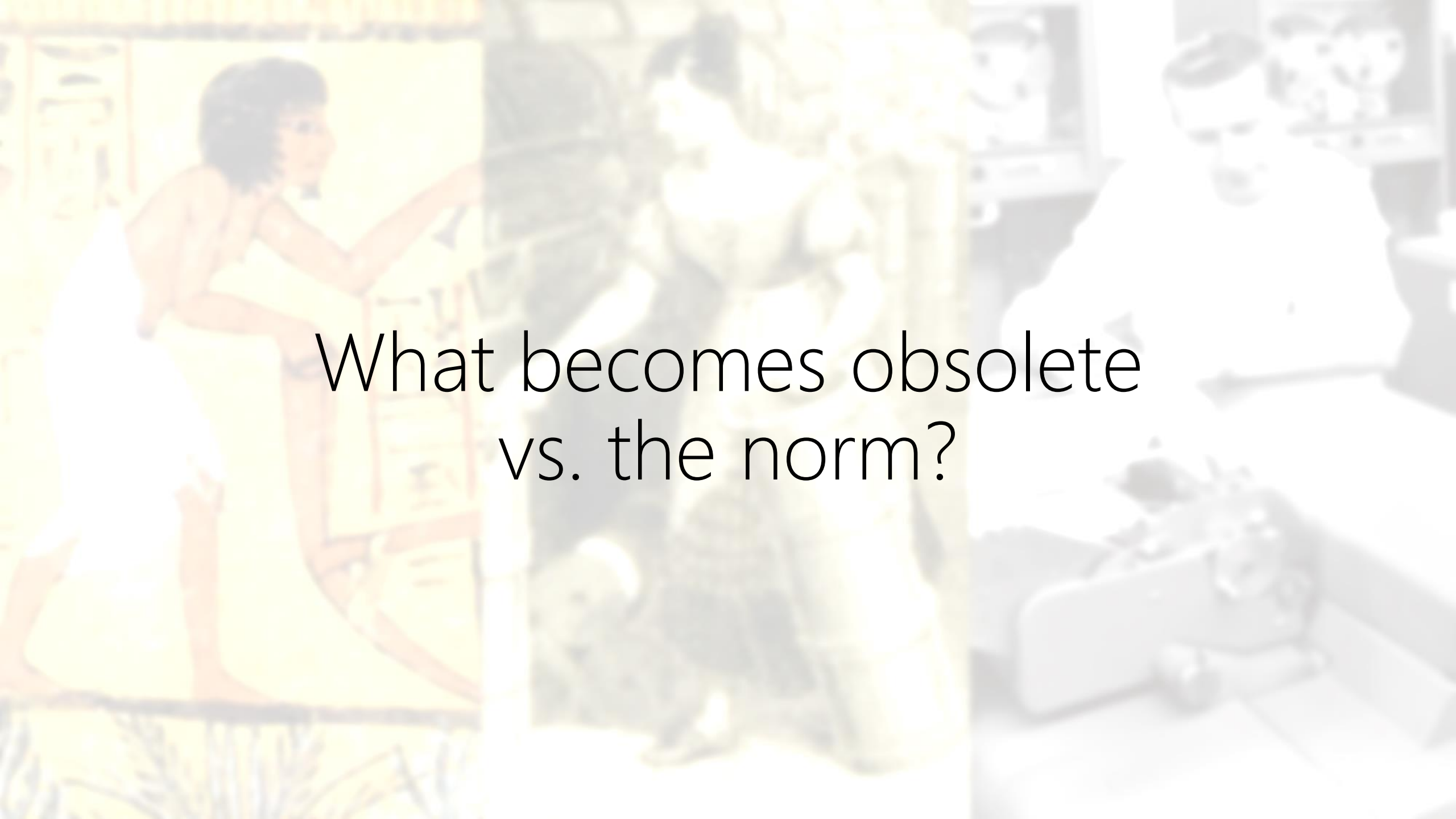
Political leaders

Corporate leaders

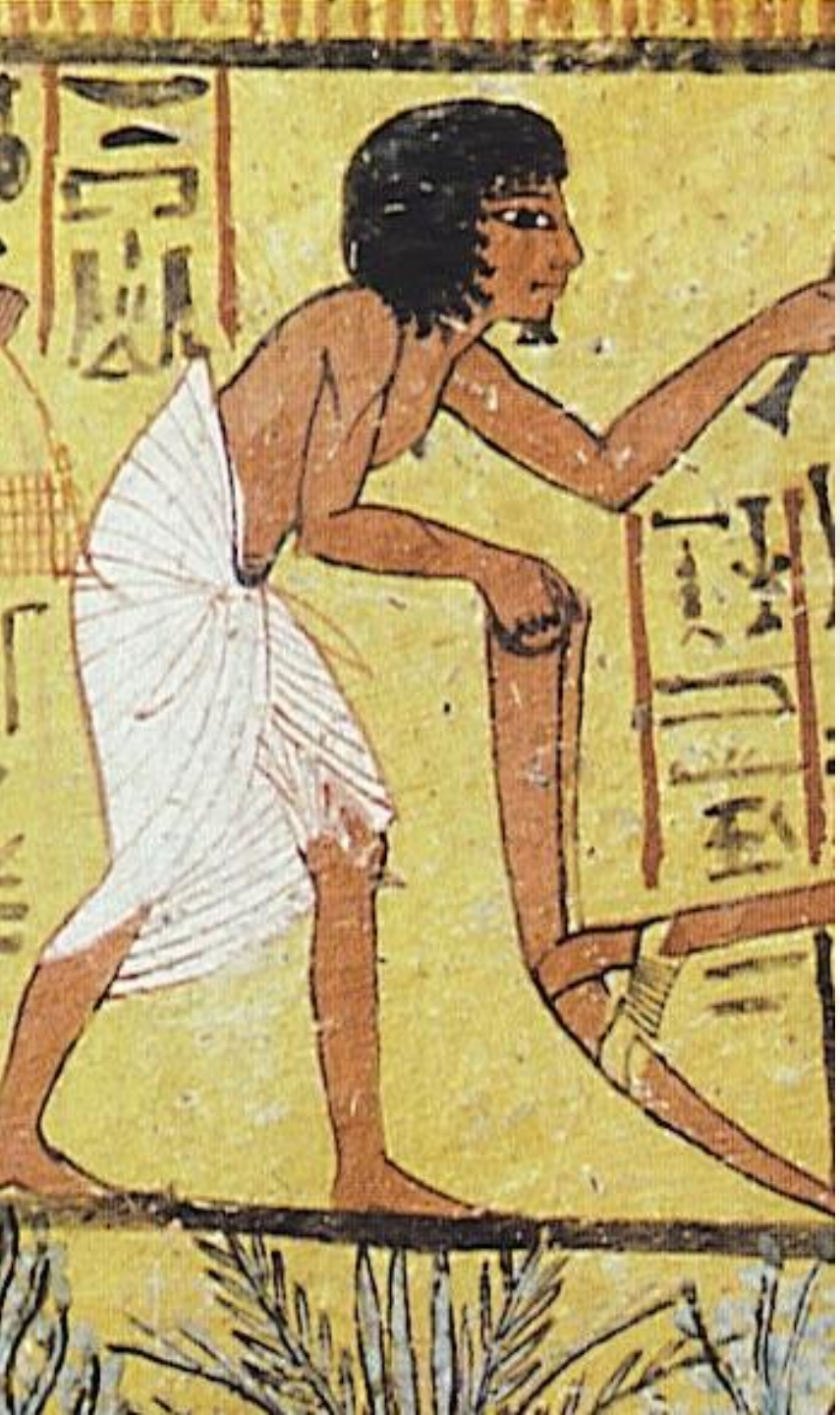
Use AI Responsibly and Ethically

1. Ask questions
2. Avoid bias in AI
3. Provide transparency
4. Protect your private data
5. Demand more from our leaders

5. Adapt to What Comes Next



What becomes obsolete vs. the norm?



Obsolete

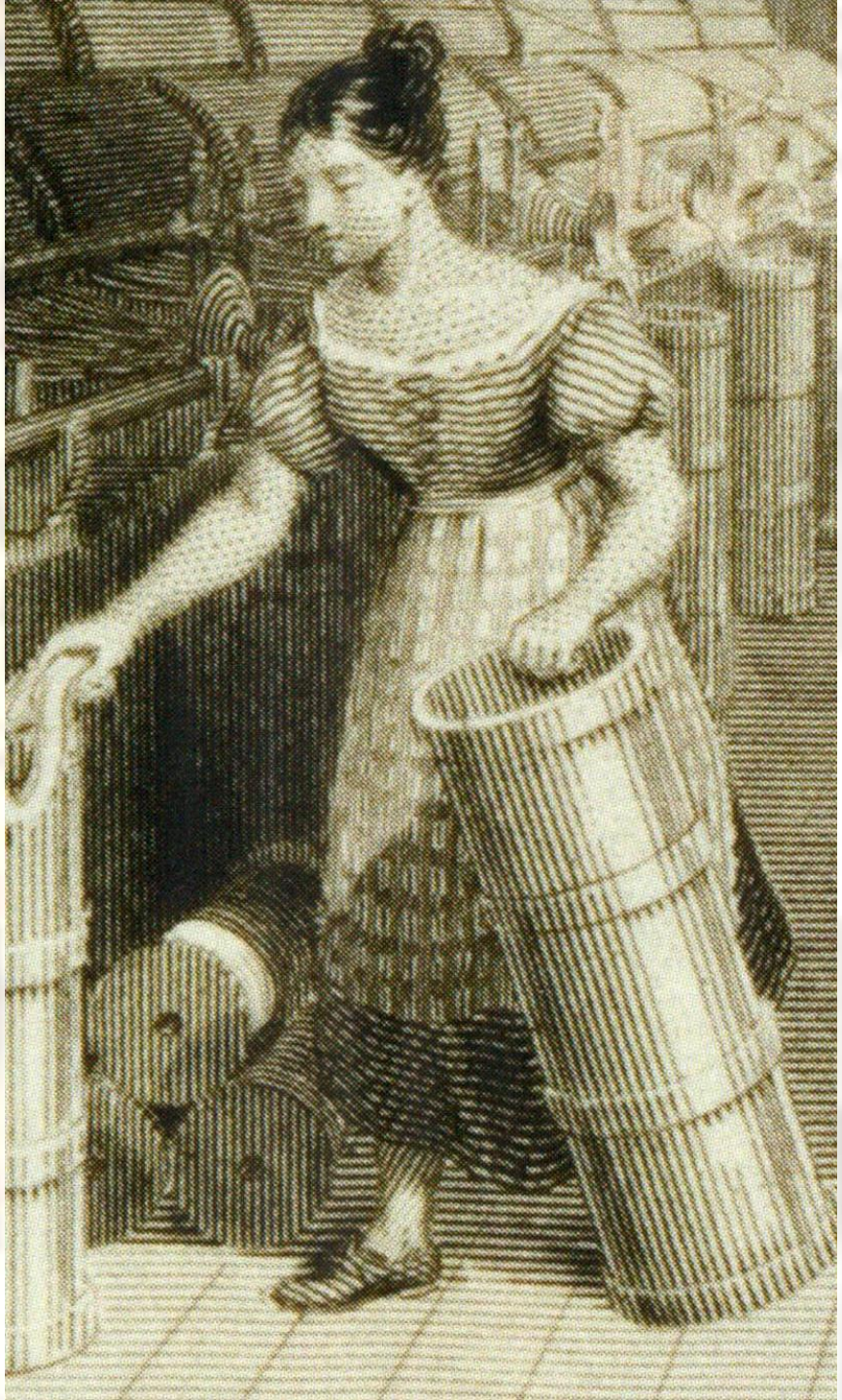
Hunter-gatherers
Nomadic tribes

Norm

Farmers
Cities

Obsolete

Slave labor
Draft animals



Norm

Factory workers
Industrial machines

Obsolete

Human computers
Analog data

Norm

Office workers
Digital computers

The Future of AI

Artificial
Narrow
Intelligence

The Future of AI

Artificial Narrow Intelligence

Artificial General Intelligence

The Future of AI

Artificial Narrow Intelligence

Artificial General Intelligence

Artificial Super Intelligence

The Future of AI

Artificial Narrow Intelligence

Artificial General Intelligence

Artificial Super Intelligence

The Future of AI

Three Paths

Three Paths

AI peacefully coexists with humanity

Three Paths

AI peacefully coexists with humanity

AI destroys humanity

Three Paths

AI peacefully coexists with humanity

AI and humanity merge

AI destroys humanity

Three Paths

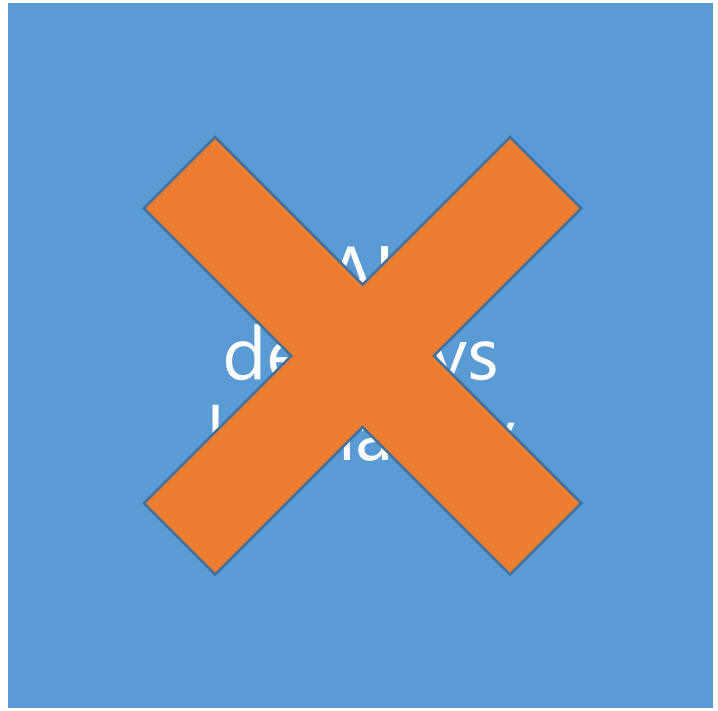
AI [illegible] coexists with [illegible]

AI and humanity merge

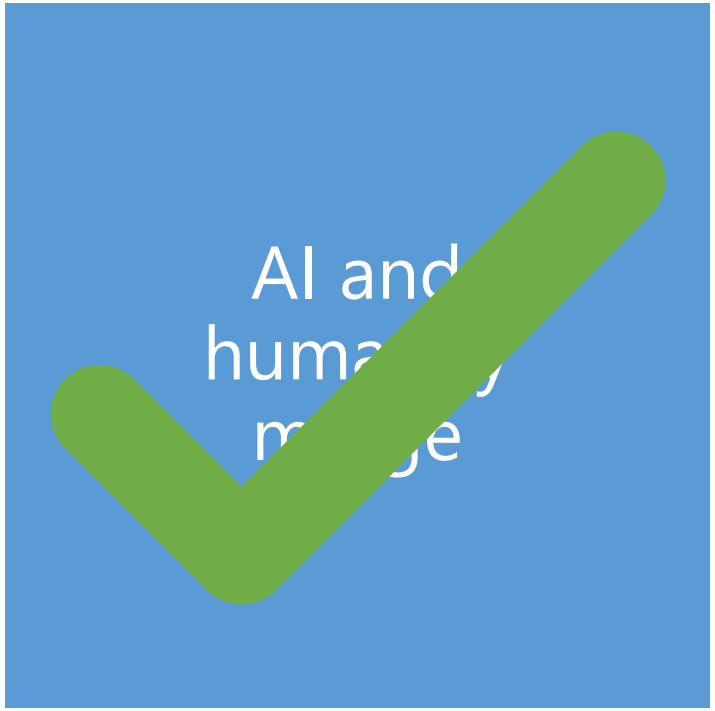
AI destroys humanity

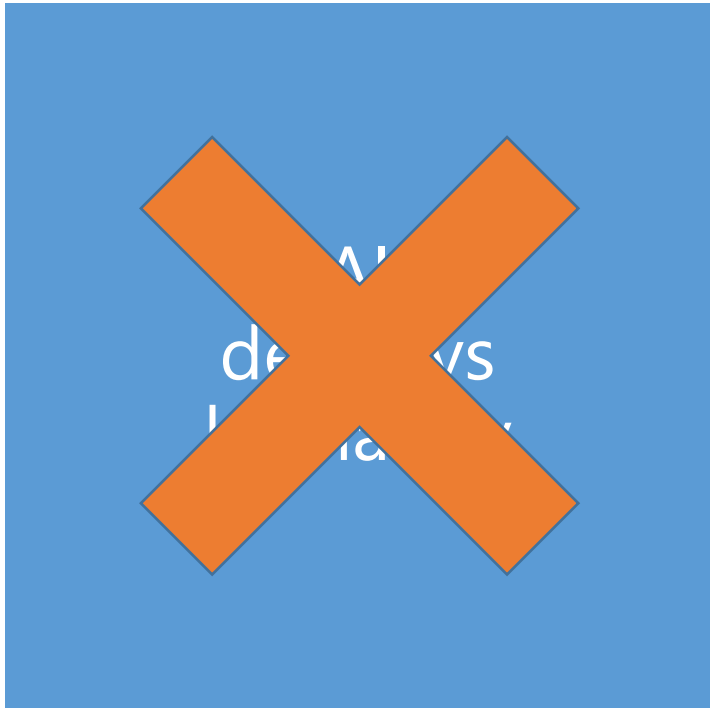
Three Paths

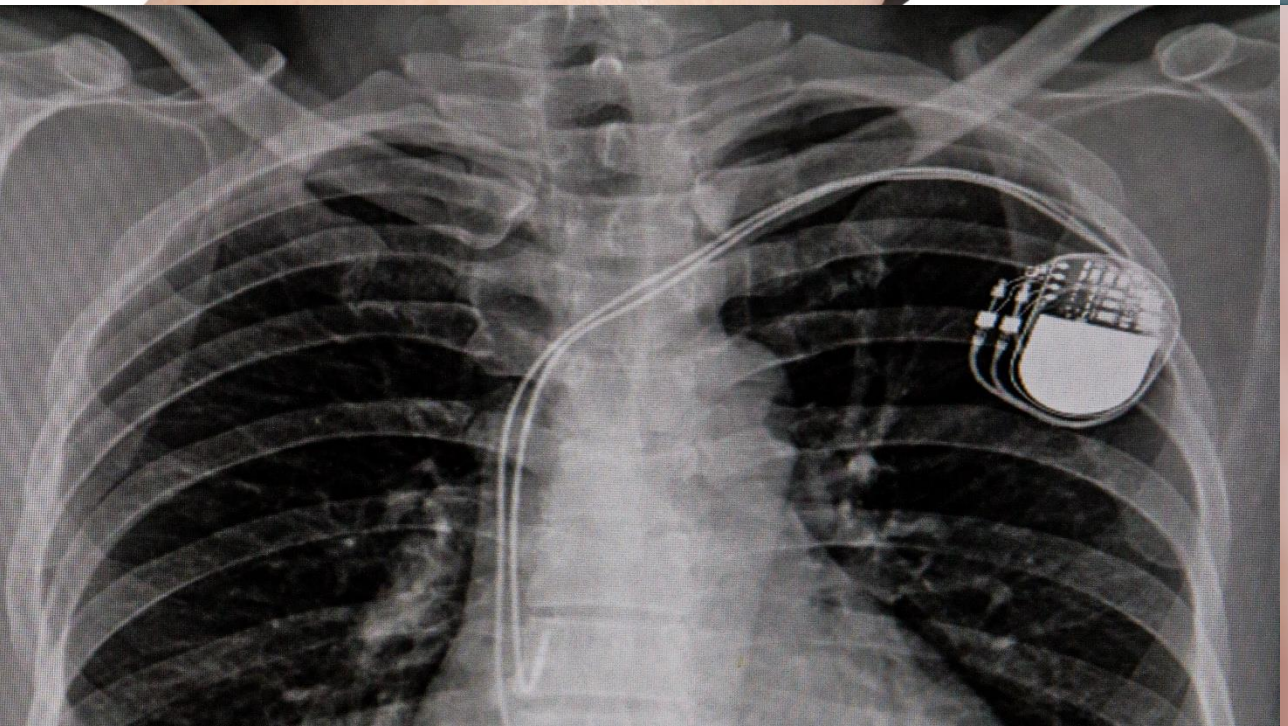
AI and humanity merge

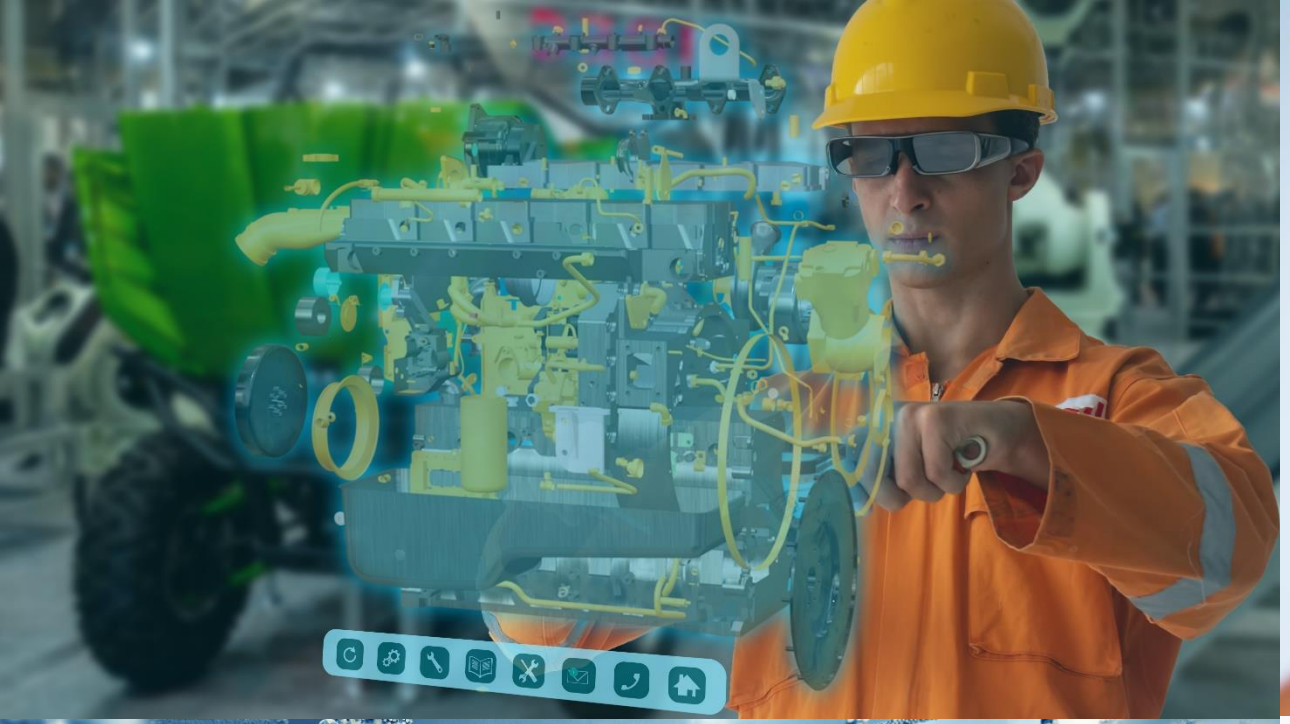


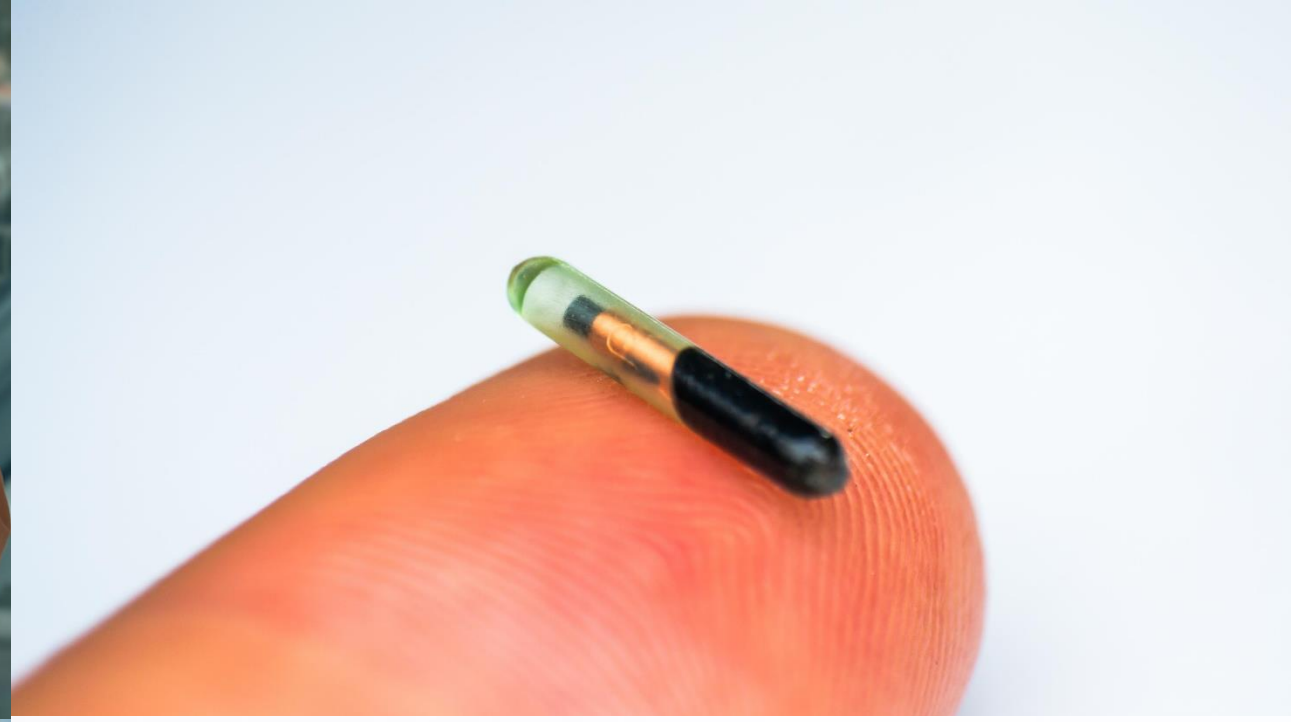
Three Paths

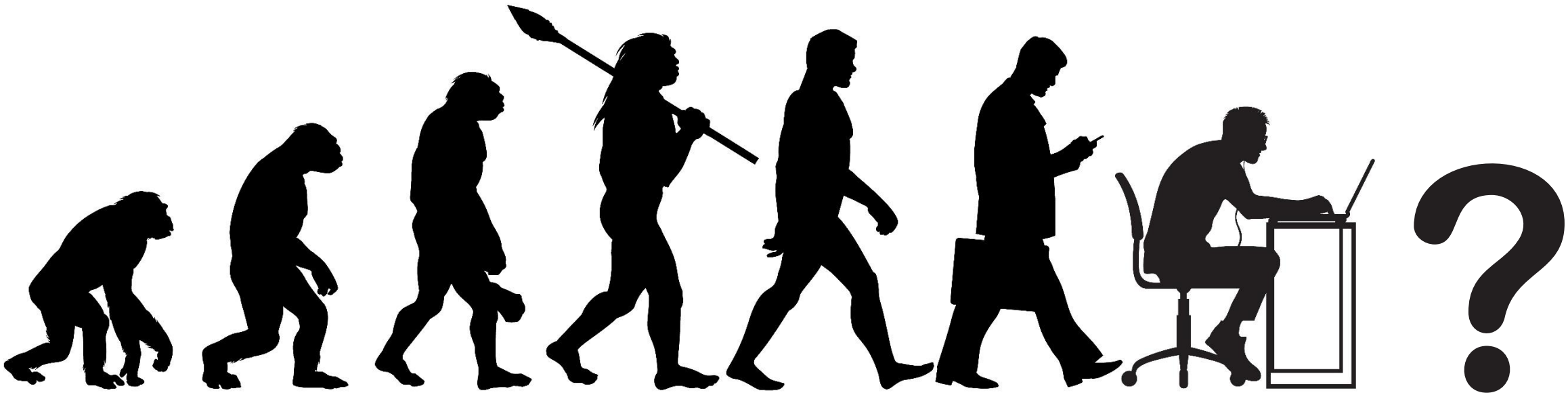












How should I adapt to what comes next?

1. Embrace Change

1. Embrace Change

Avoid
fighting
change

1. Embrace Change

Avoid fighting change

Prefer embracing change

2. Be Skeptical

2. Be Skeptical

Avoid
“post-truth”
misinformation

2. Be Skeptical

Avoid
“post-truth”
misinformation

Prefer
organized
skepticism

3. Keep an Open Mind

3. Keep an Open Mind

Avoid dogmatic worldviews

3. Keep an Open Mind

Avoid dogmatic worldviews

Prefer an open mind

4. Pick Your Battles

4. Pick Your Battles

Stick to your guns
when necessary

4. Pick Your Battles

Stick to your guns
when necessary

For everything else,
just be flexible

5. Be Mindful

5. Be Mindful

Human nature
causes suffering

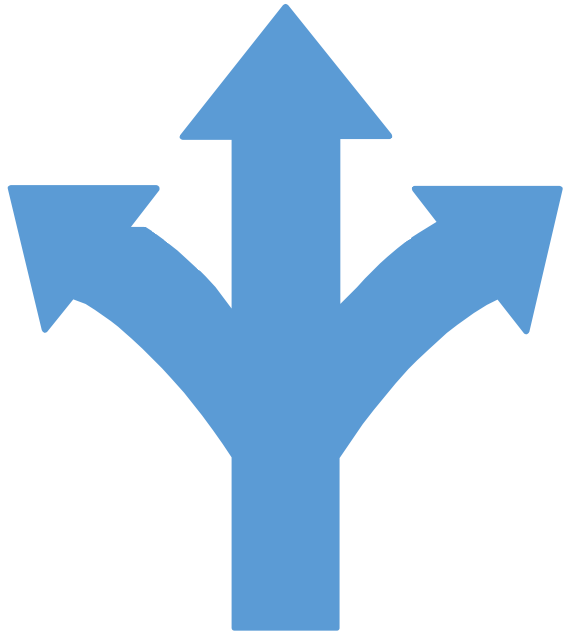
5. Be Mindful

Human nature
causes suffering

Mindfulness
is the solution

Adapt to What Comes Next

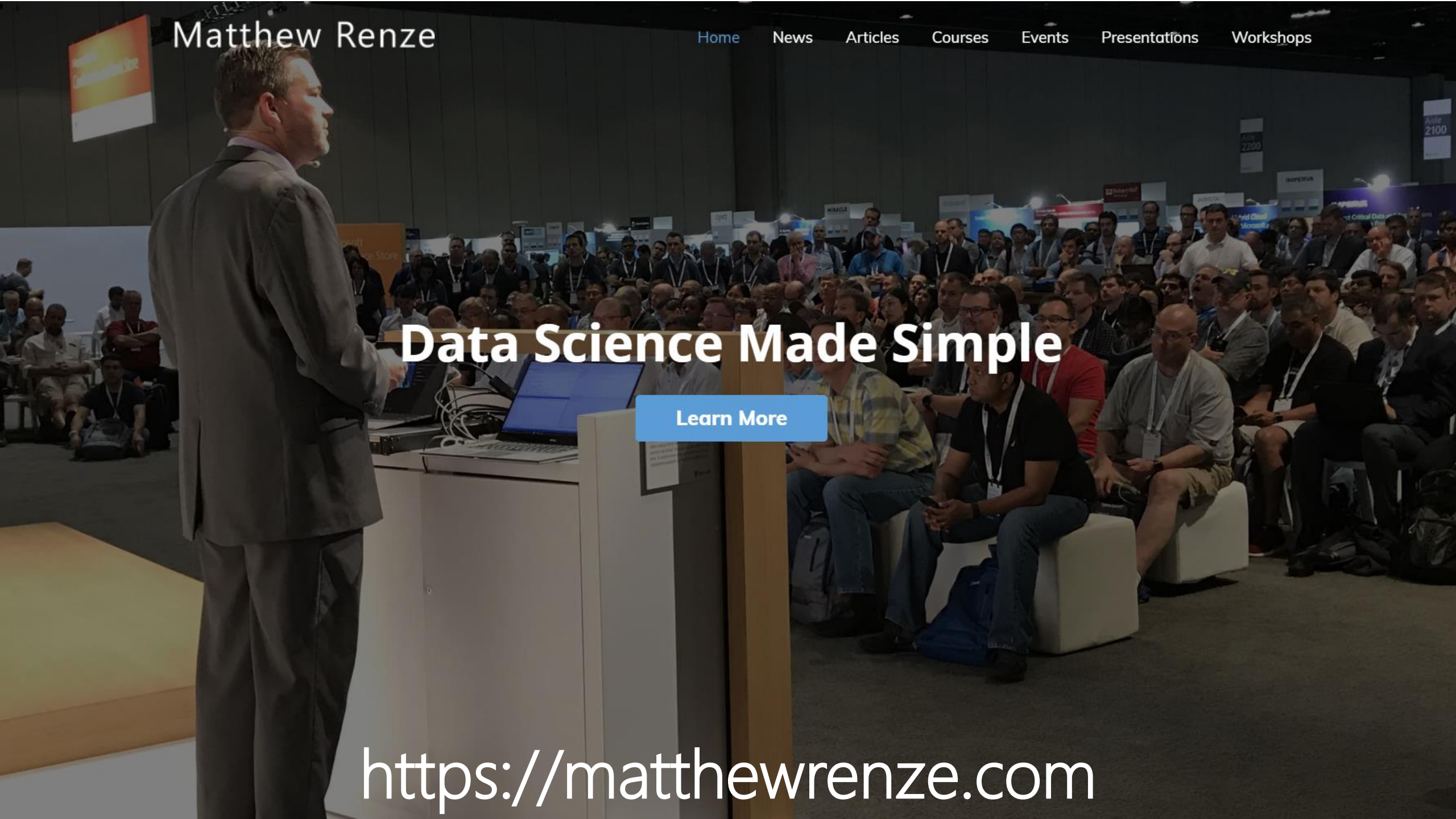
1. Embrace change
2. Be skeptical
3. Keep an open mind
4. Pick your battles
5. Be mindful



Conclusion

Summary

1. Educate yourself about AI
2. Upgrade your career for AI
3. Invest in an AI-first economy
4. Use AI responsibly and ethically
5. Adapt or become obsolete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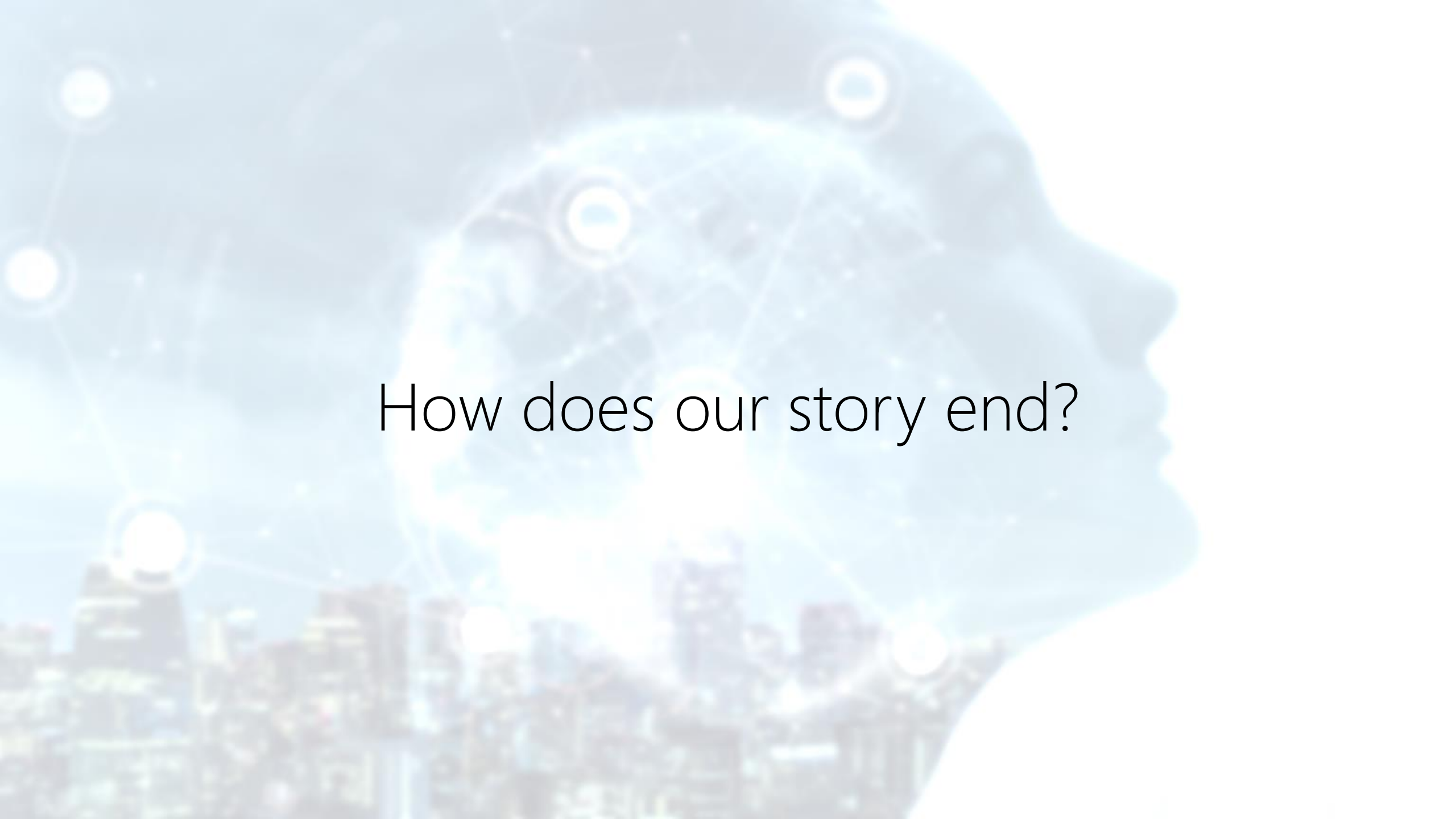
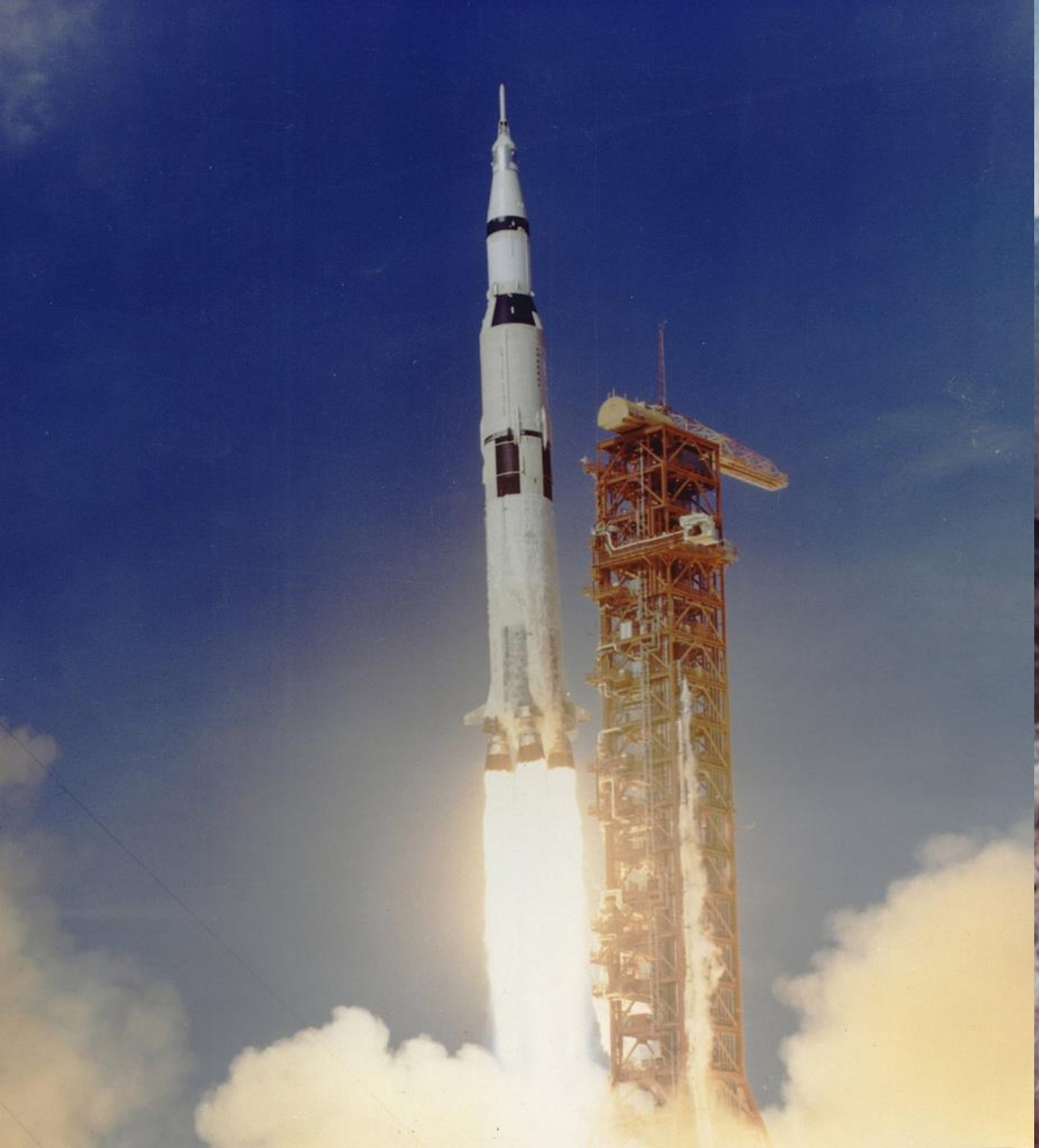

How does our story end?



What will you choose?

Learn more at:
https://matthewrenze.com