SILL Sarasota Institute of Lifetime Learning

Artificial Intelligence

An educational journey and financial impact discussion

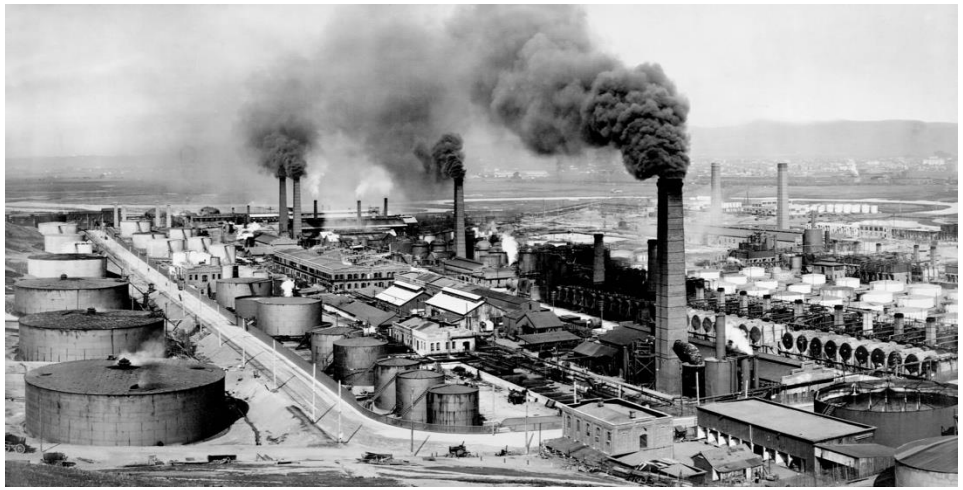
Professor John Blevins (J.B.)
For the Sarasota Institute of Lifetime Learning Members

Tech Evolution

Technology expanding knowledge to enable new opportunities

Oil enabled the Industrial Revolution

- Manufacturing
- Transportation
- Automotive
- Power generation



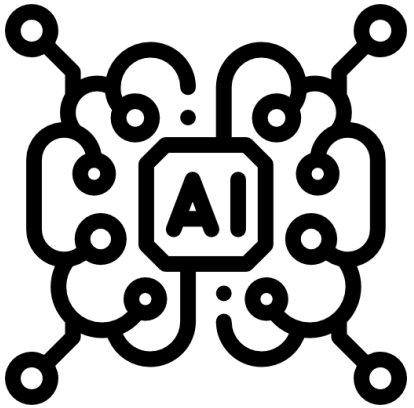
Data enables the digital revolution

- Manufacturing
- Transportation
- Automotive
- Power generation

Think of data-powered AI algorithms as tools to create new business & investment opportunities

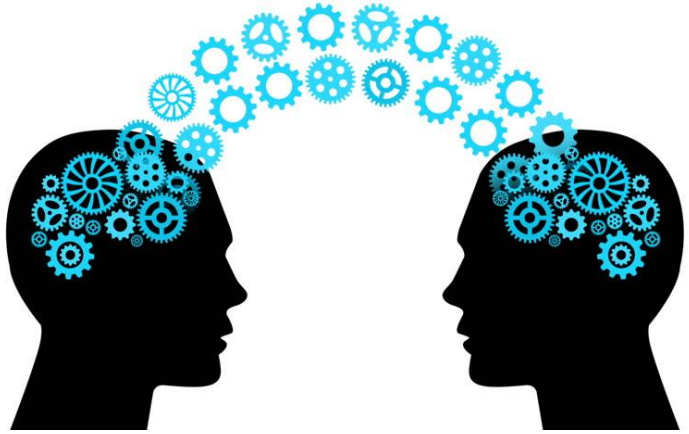
Analogy: The Internet in 1983

- Drastically changed every business
- Created new winners & losers in the marketplace
- Arrived with a lot of promise
- Presented a lot of problems
- Was not well understood (*How does this work?*)
- Caused a lot of organizations to learn new ways to do business
- Forced organizations to learn quickly
- Created tremendous wealth & prosperity growth
- Solved a lot of business and societal problems



SILL Speaking Request

Your kind invitation to be with you today



- Teach us AI (quickly)

- Tell us how we can use this information
  - What is something many of us are concerned about
    - Check retirement portfolio (daily)

- How AI is impacting our retirement portfolios
  - As well as the global business community & society at large

Artificial Intelligence Explanation

What SILL members should understand about Artificial Intelligence

What is Artificial Intelligence?

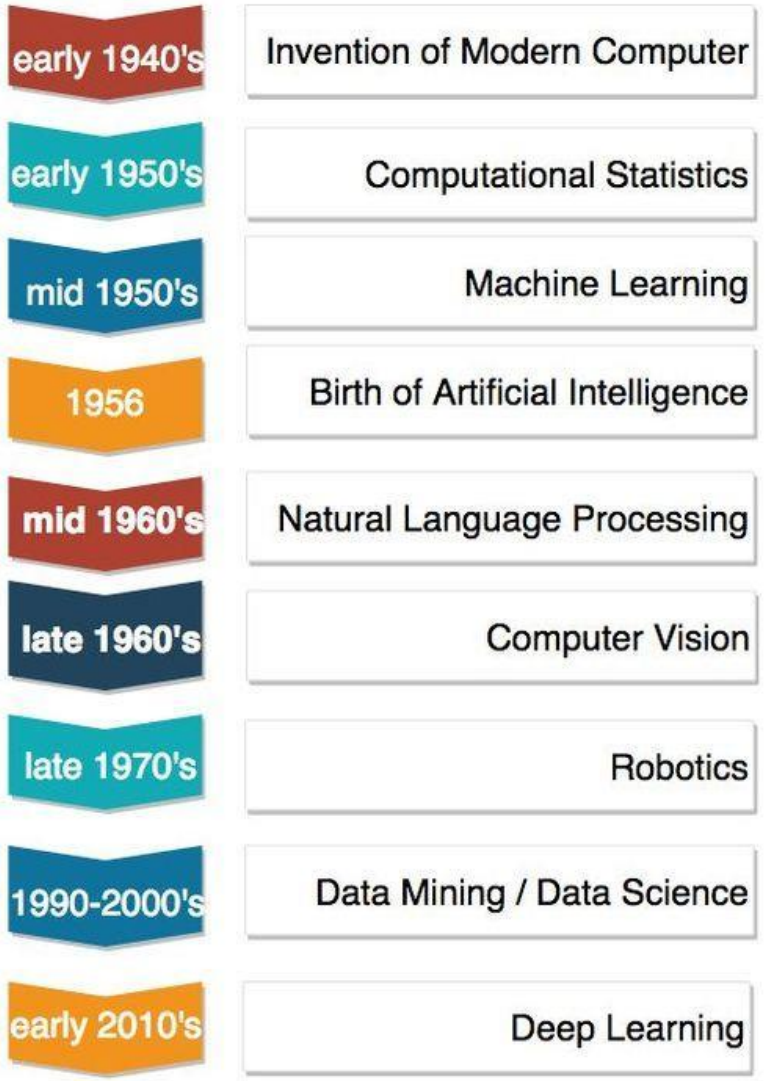
Definition

The theory & development of computer systems able to perform tasks normally requiring human intelligence,

such as visual perception, speech recognition, decision-making, & translation between languages.

John McCarthy
Coined AI in 1956
Stanford University

- The **simulation** of intelligent behavior in computers.
- The capability of a machine to **imitate intelligent human behavior**.



Human Thinking

How we solve daily problems

Inputs

↓

Process

↓

Actions

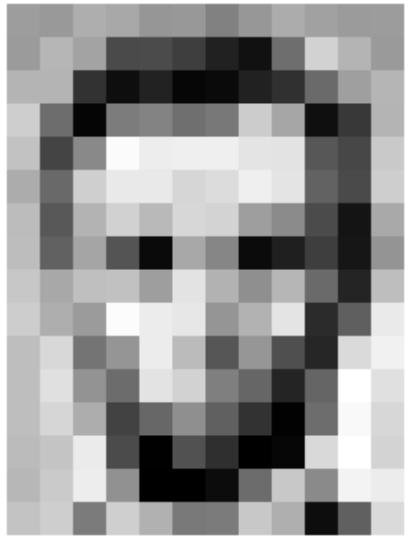
Human Thinking

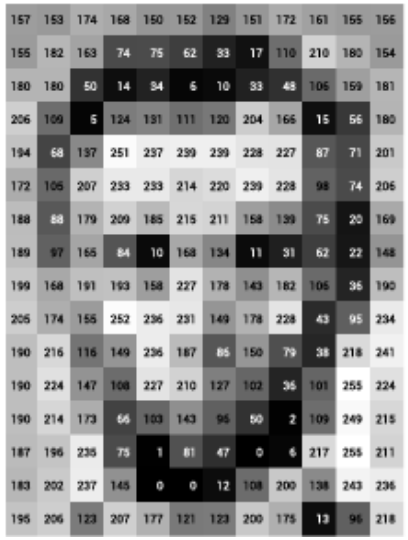
How we solve daily problems

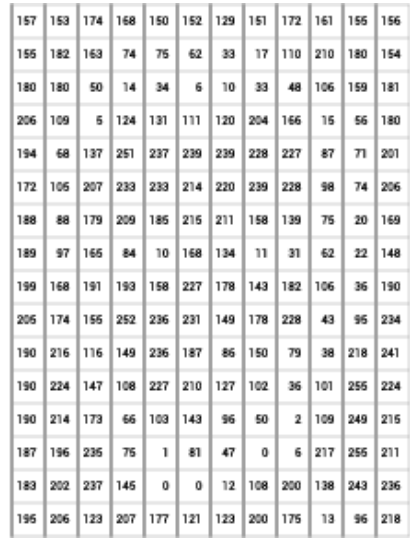
Eye

Input: Sight

Camera







Human Thinking

How we solve daily problems

Ear

Input: Sound

Microphone

Analog Sound Wave

Digital Sound Wave

Human Thinking

How we solve daily problems

Hand

Input: Senses

Sensor

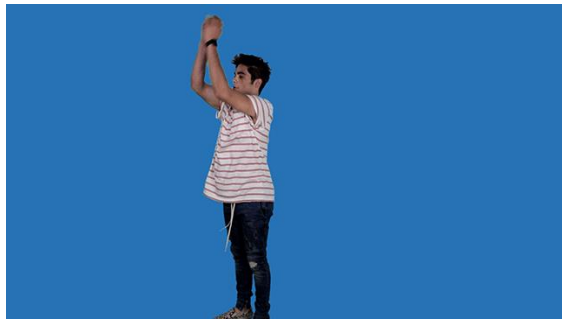
Human Thinking

How we solve daily problems

Inputs

Process

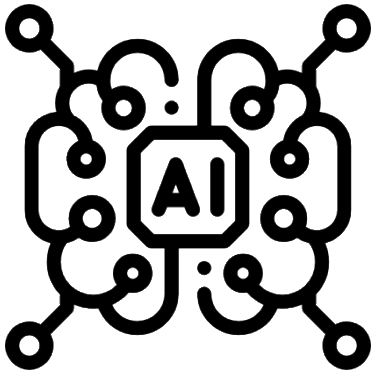
Actions



Artificial Intelligence

AI is simulated human intelligence in machines

Intelligence is the ability to learn about, learn from, understand and interact with one's environment



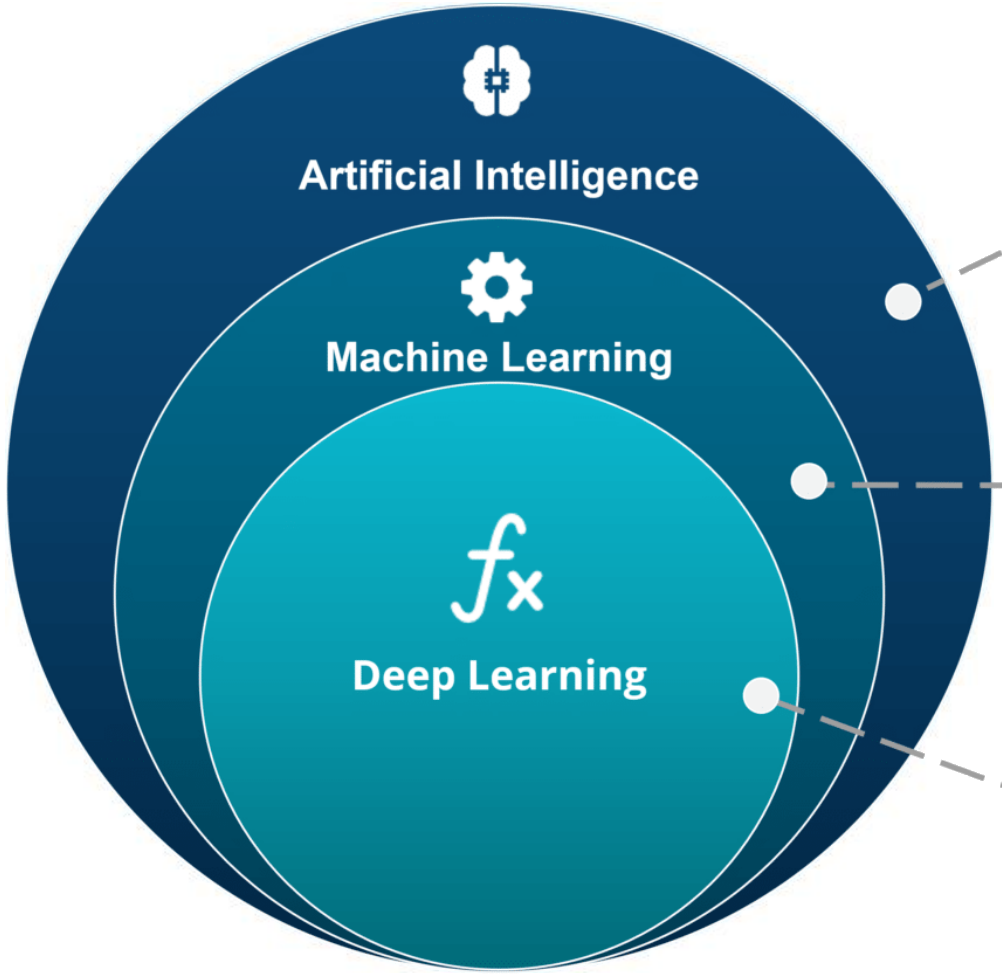
Artificial intelligence (AI) is a term for simulated intelligence in machines.

These machines are programmed to "think" like a human and mimic the way a person acts.

The ideal characteristic of artificial intelligence is its ability to rationalize and take actions that have the best chance of achieving a specific goal, although the term can be applied to any machine that exhibits traits associated with a human mind, such as learning and solving problems.

AI, ML and DL

Understanding the interaction between artificial intelligence, machine learning & deep learning



ARTIFICIAL INTELLIGENCE

A technique which enables machines to mimic human behaviour

MACHINE LEARNING

Subset of AI technique which use statistical methods to enable machines to improve with experience

DEEP LEARNING

Subset of ML which make the computation of multi-layer neural network feasible

AI’s Rising Importance

The reasons why Artificial Intelligence is getting so much attention

Why is AI taking so up so much oxygen?

The potential for impact

Could mean dramatic change in…

- Markets
- In the way we approach problems

Business

- Fix issues
- Predict customer needs
- Improve manufacturing
  - Less defects
  - Improve usage (think jet engines)

- Create new products for unknown/unmet needs

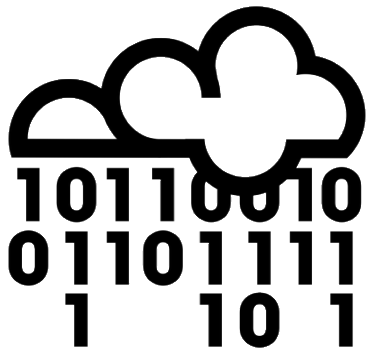
Society

- Climate Change
- Severe Weather Prediction
- Best way to evacuate a peninsula during a hurricane

Evolution to AI

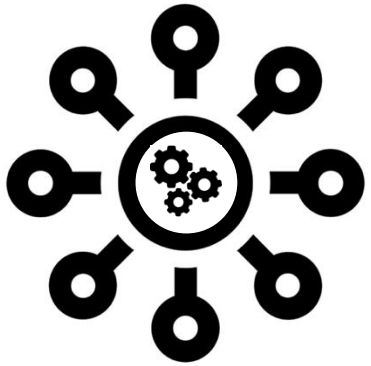
Past technologies have laid the groundwork for AI

Cloud Computing → Big Data → Machine Learning → Artificial Intelligence

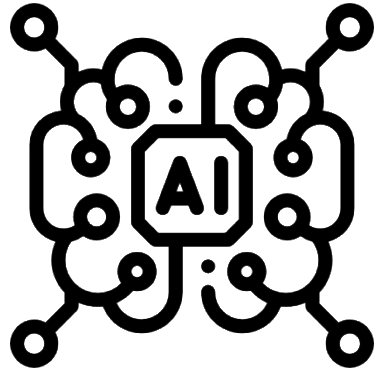


Enabled large data sets to be accessible

Enabled large data sets to be developed



Enabled large data sets to be analyzed

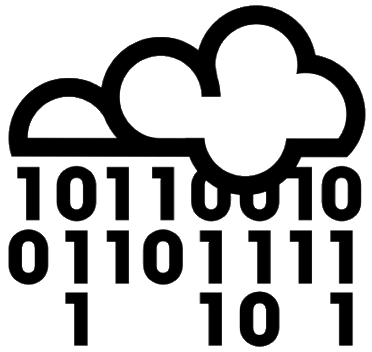


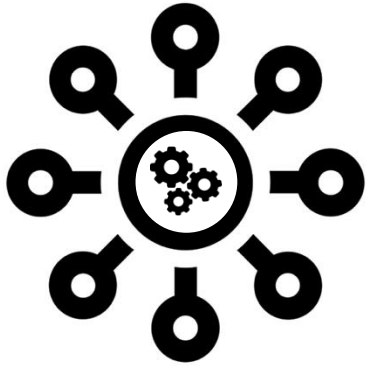
Enabled large data sets to be understood

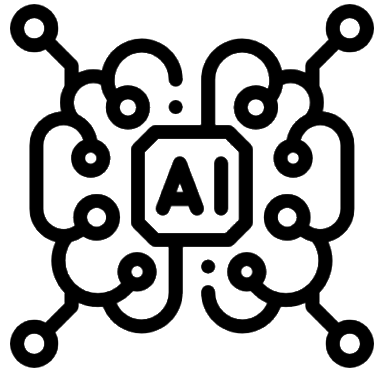
Firms Must Start to Progress (or be rendered irrelevant)

New technologies lay the groundwork for the next capability

Cloud Computing → Big Data → Machine Learning → Artificial Intelligence







Examples

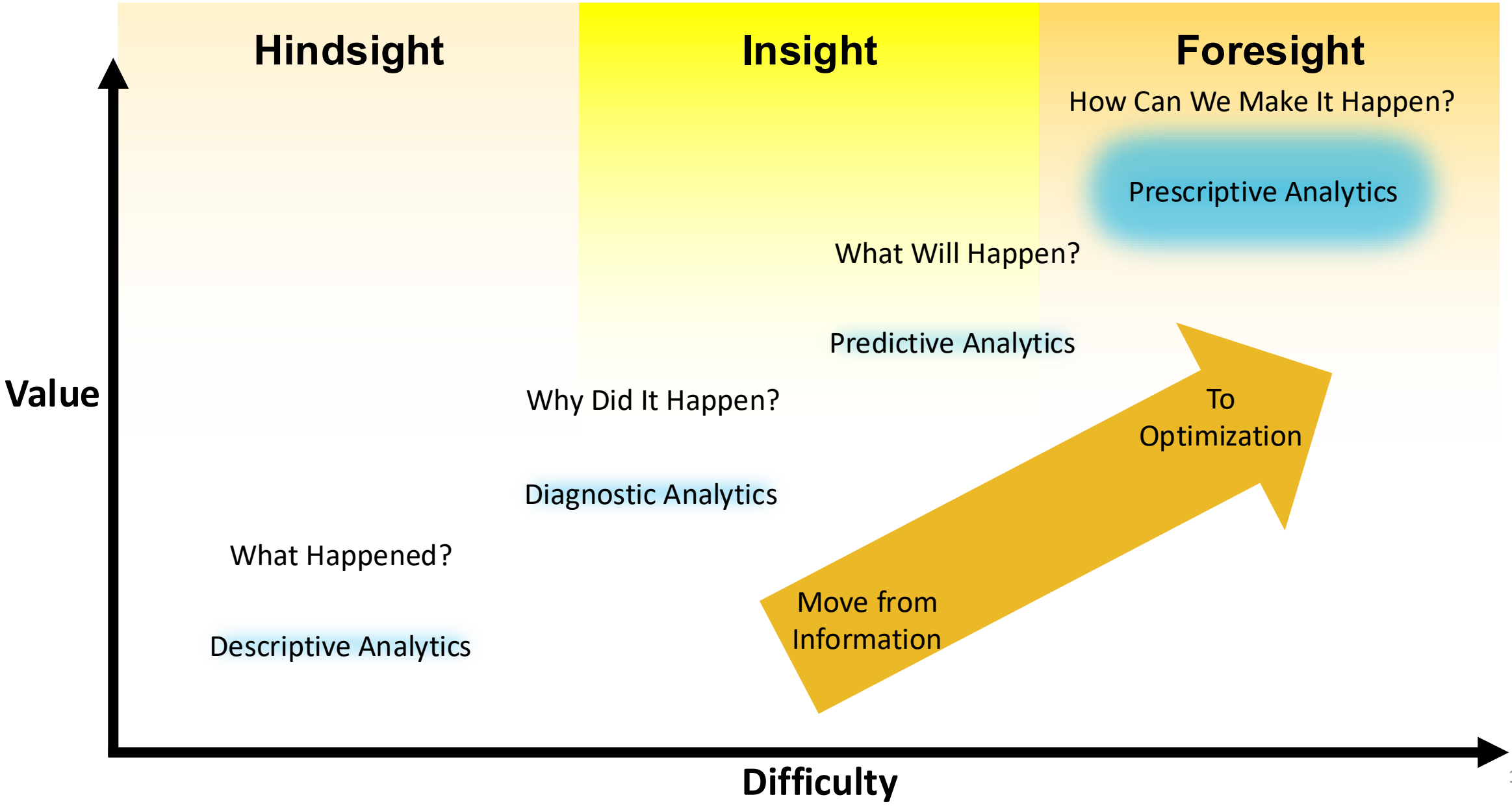
amazon

Uber

Must go through each
Pace to do so is accelerating

?

AI is Powering Predictive Analytics



Marketplace Opportunities

Businesses look to exploit AI's impact for marketplace advantage

- **Consumer needs not meet because of**
  - **Extreme complexity**
  - **Extreme customization**
  - **Extreme cost**

Gene editing

Prosthetics

Supersonic travel

- **Known market demands with no current solution offering**
  - **Past projects deemed unfeasible**
  - **Dream solutions**

Space travel

Flying cars

Weight loss

But wait…

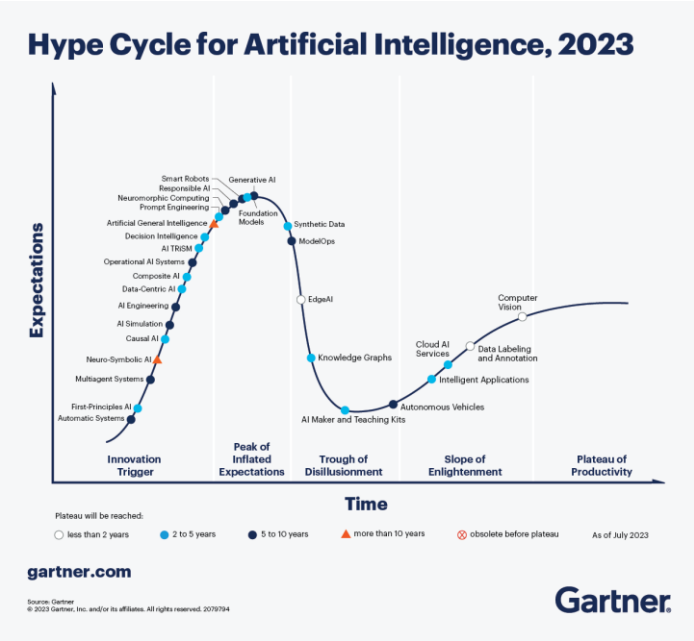
Hasn't it been around since 1950's?

Yes

but it's finally gotten good enough to make a difference.

So good, laypeople (the everyday public) know about it.

This gives it momentum in the marketplace.



What is good enough to make a difference?

When our AI models (the algorithms) predict with far greater accuracy.

Are we there yet?

No.

But there are enough places where it's gotten so remarkable good, we're starting to take it seriously.

What is good enough to make a difference?

Some Early Successes

- **NLP/Language translation/prediction**
- **Virtual assistants/help bots/services/smart speakers**
- **Maintenance troubleshooting prediction**
- **Financial services fraud detection/customer retention**
- **Navigation**
- **Moderna COVID-19 vaccine creation in months not years**

Some hopefully “just-around-the-corner” potentials

- **Autonomous driving**
- **Drug formulations/drug trials**
- **Healthcare predictions/outcomes**

What does a business (or government) need to make AI work?

Data

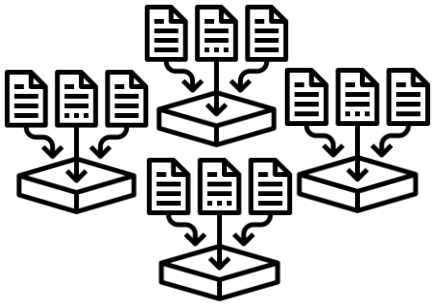
Knowledge that comes from deep, rich, historical, and cross-functional/cross-market data

Haven't companies always had data?

Yes

but we didn't have the processing power/algorithmic knowledge to make high quality algorithms

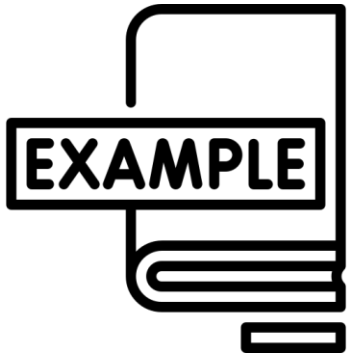
Then why aren't all companies having AI success?



Because most don't have enough data

And not nearly enough data from <u>beyond their own</u> organization

To predict customer purchases (and hopefully influence them for more) a firm would need to know every single aspect of every single customer's unique situation.

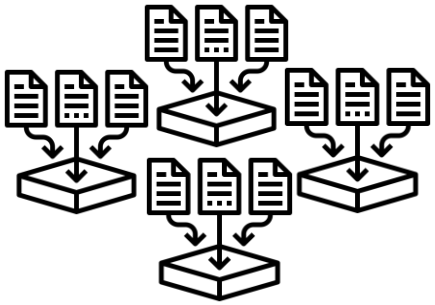


- **Just got a raise/bonus & has money to spend**
- **Just got fired & can't spend**
- **Just had a job change & must move**
- **Just got a divorce & now has different family needs**

Firms need far more data beyond their own walls to create the best AI algorithms

Then why aren't all companies having AI success?

Because most don't have enough data



And not nearly enough data from <u>beyond their own</u> organization

Which Firms Are Succeeding with AI?

Some organizations are having greater success implementing artificial intelligence than others

Those firms with all the data

- Google (global search knowledge)
- Amazon (consumer retail/e-commerce)
- Facebook/IG/WhatsApp (social connections)
- Apple (location)

Is AI Perfected?

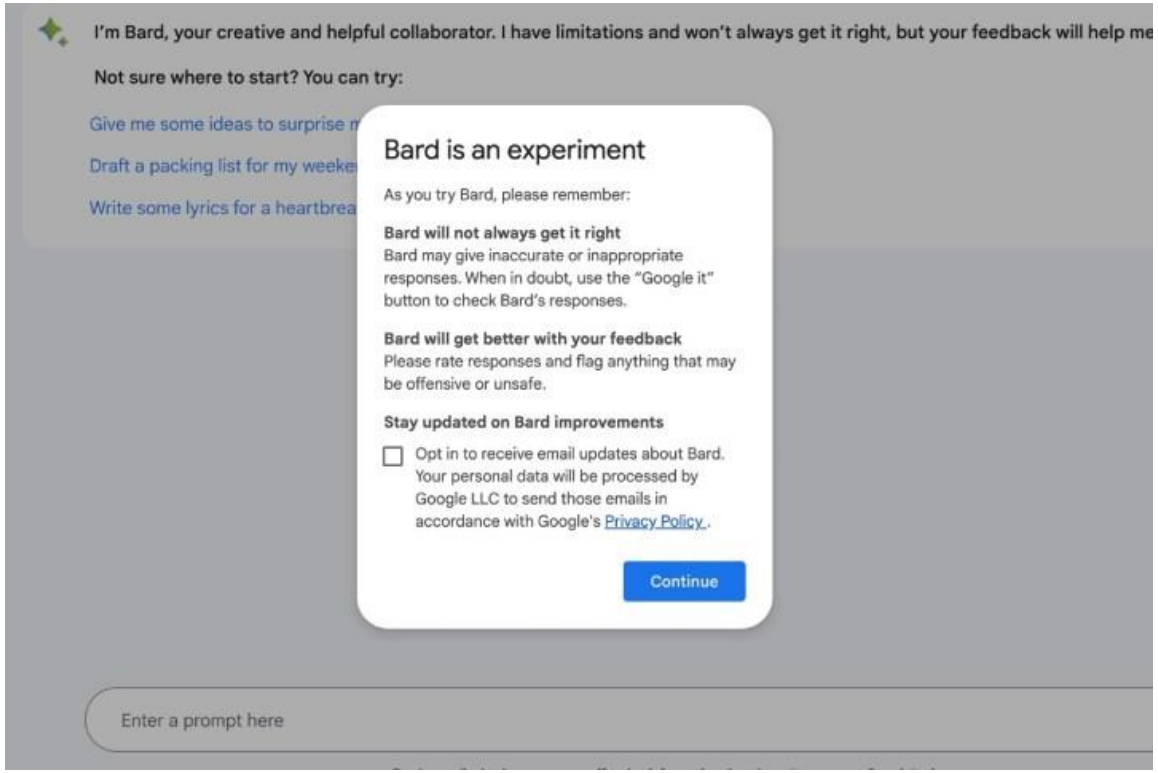
Is artificial intelligence “ready for prime time”?

Perhaps

Perhaps Not

Microsoft

OpenAI



Bard

Is AI Perfected?

Is artificial intelligence “ready for prime time”?

Perhaps

Perhaps Not

Why did Google rush the still-beta Bard out so quickly?

Because Microsoft did it first with OpenAI

Microsoft took all the mindshare

(a strategic competitive decision)

Why did Microsoft rush it to market?

Microsoft’s OpenAI-powers Bing search engine produces questionable results from its use of AI

To Collect The Data

- Both firms could not submit enough learning data sets/questions to train the models
- They need more data to improve the models
- Plan:
  - Release it in beta
  - Used everyone as “testers”
  - Improve the models
- Both models are getting better by the day

(a strategic competitive decision)

TESLA

Autonomous driving

Can Someone Compete?

What is the possibility of a smaller firm competing with these two behemoth companies?

Possibly

- **Maybe there is another OpenAI out there who has "built a better mousetrap"**
- **Maybe an organization has the specific data for an industry that makes it the winner in that industry**
- **Maybe firms can use/buy the AI models for areas they don't know and combine them with their own (in house) models to make something your competitors can't**

(a management strategy decision)

Will These AI Marketplace Changes Affect my portfolio?

How will this affect me and my portfolio?

Yes

Most likely

Your job is

- To understand AI
- To understand how AI works
  (as well as current limitations)
- To know where to apply this new knowledge in your portfolio decisions.

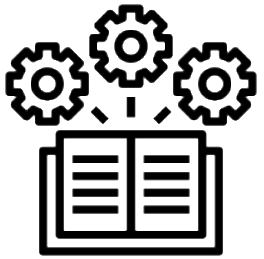
Let’s understand AI so you can do a better job….

Machine Learning

The next step in the business evolution

Machine Learning

What is Machine Learning



?

Machine learning is the idea that a computer program can adapt to new data independently
(no human action required)

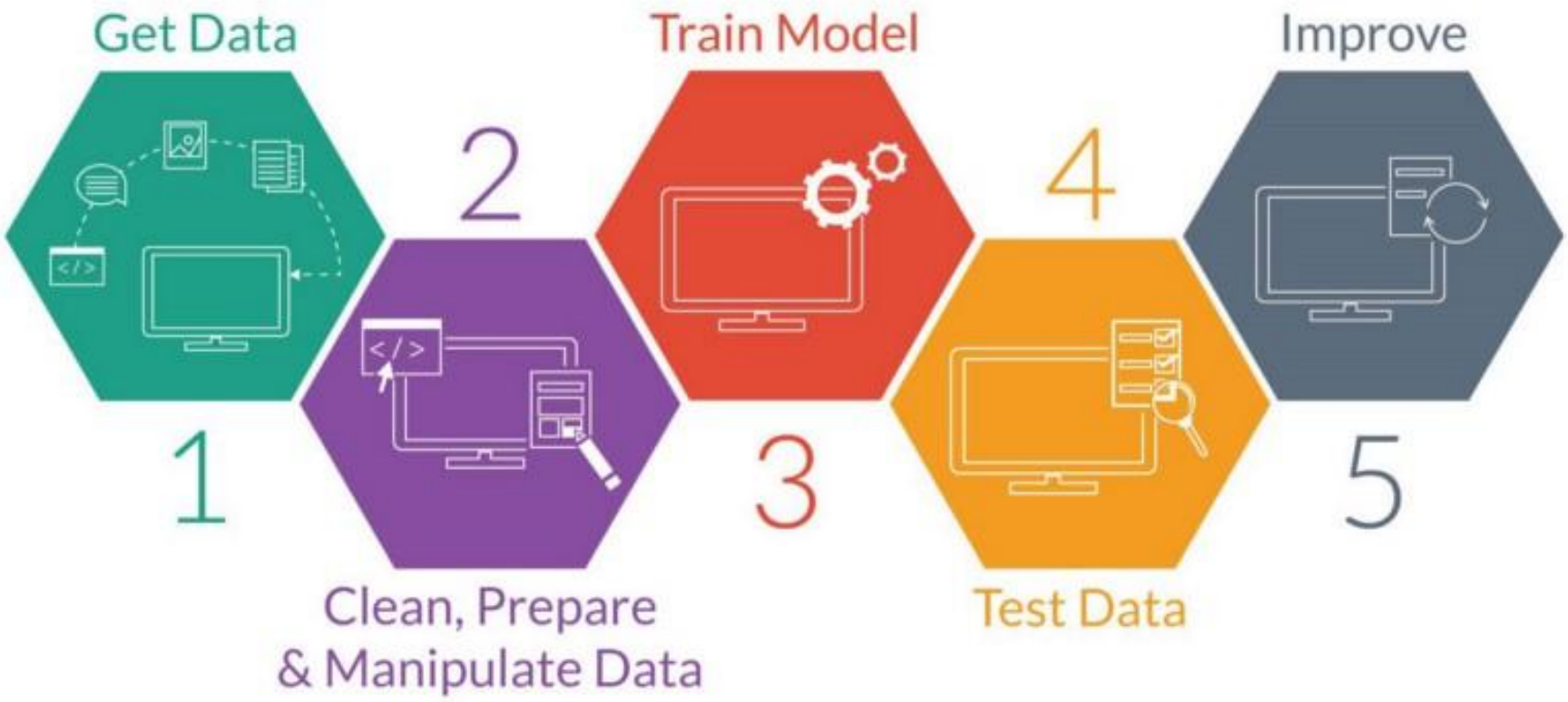
The science of getting computers to act without being explicitly programed

We don’t know what to ask it,

so we can’t program it to find out

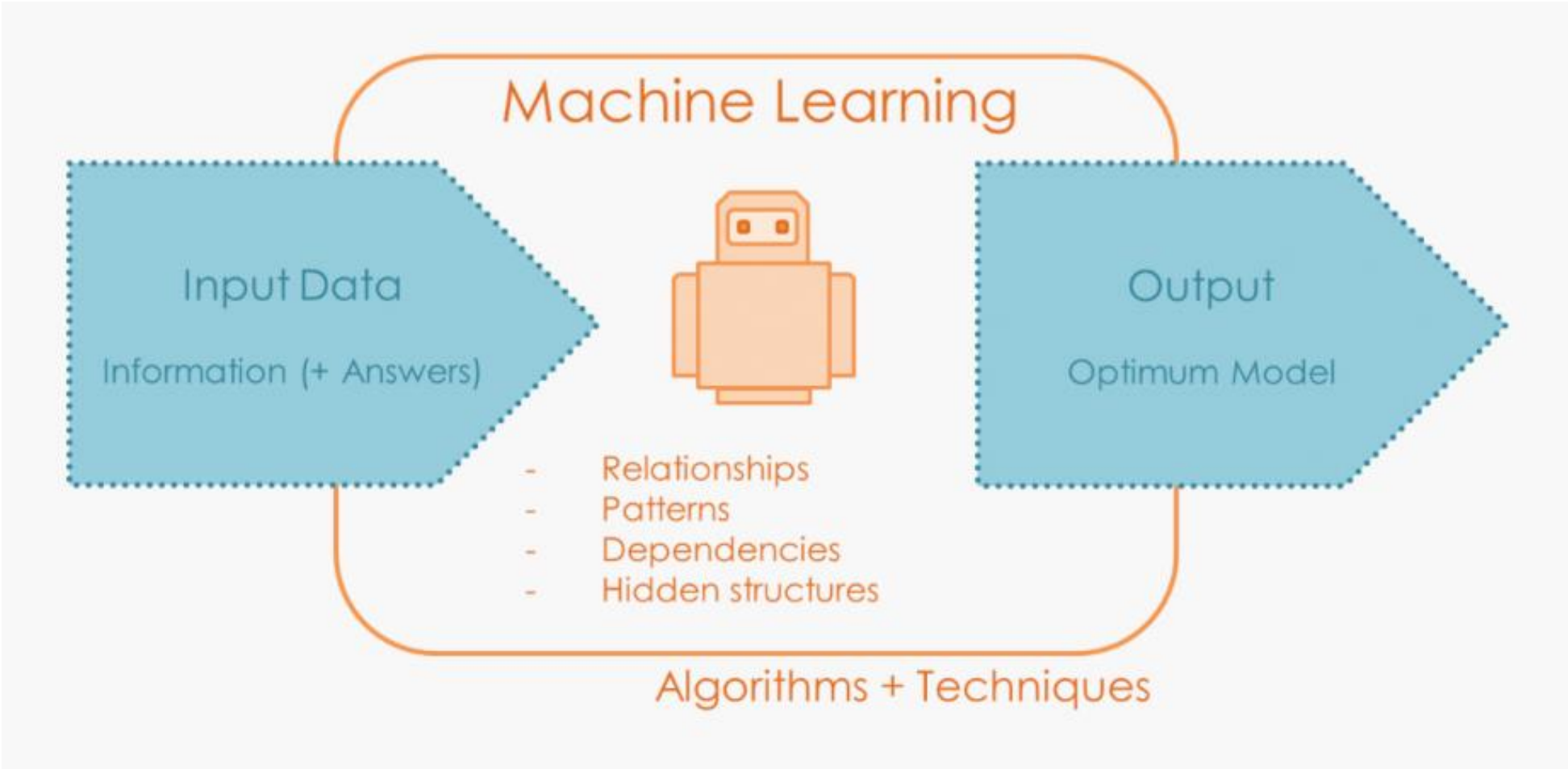
Machine Learning Model

Process by which machines improve on output results through a series of steps



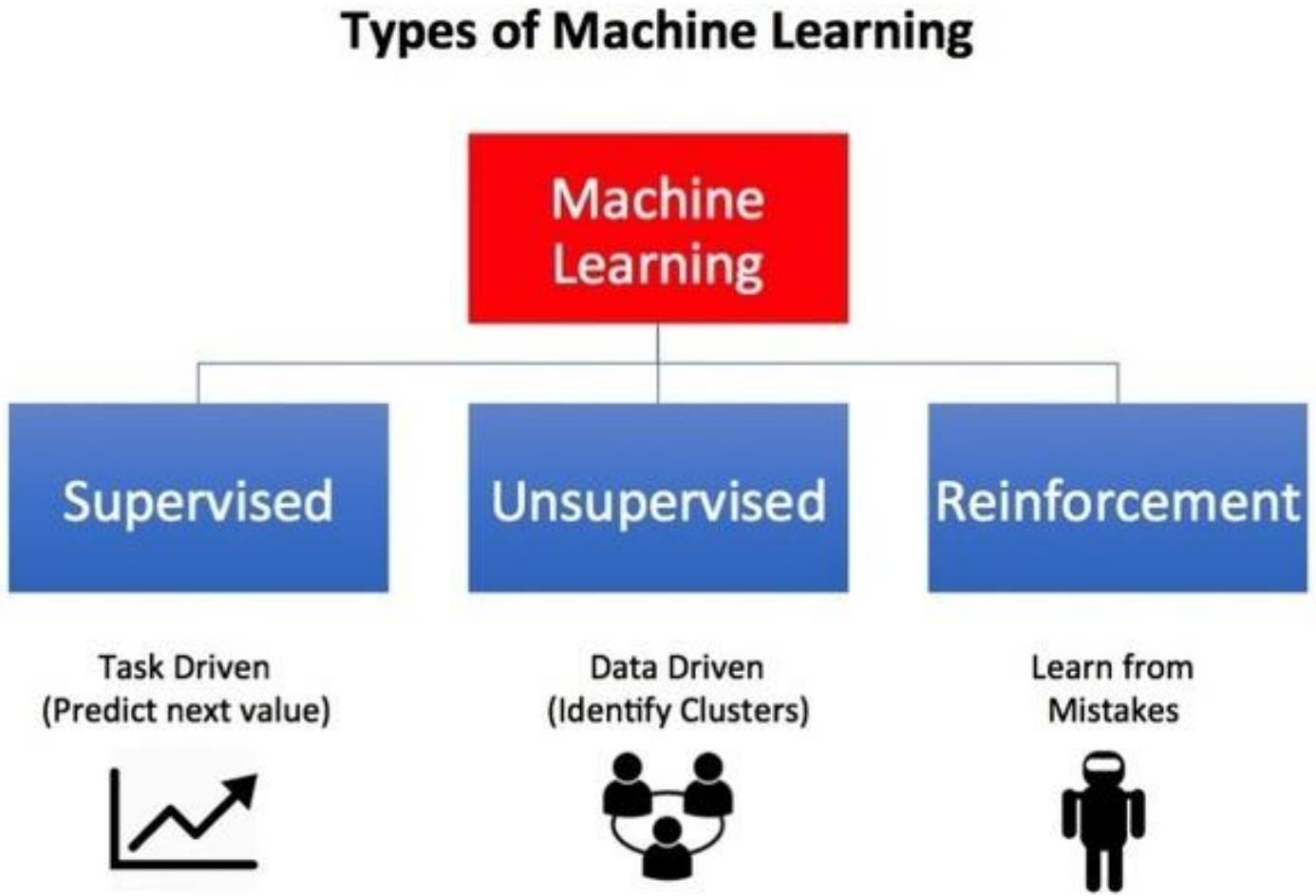
Supervised / Unsupervised Learning

Seeking a model as the output



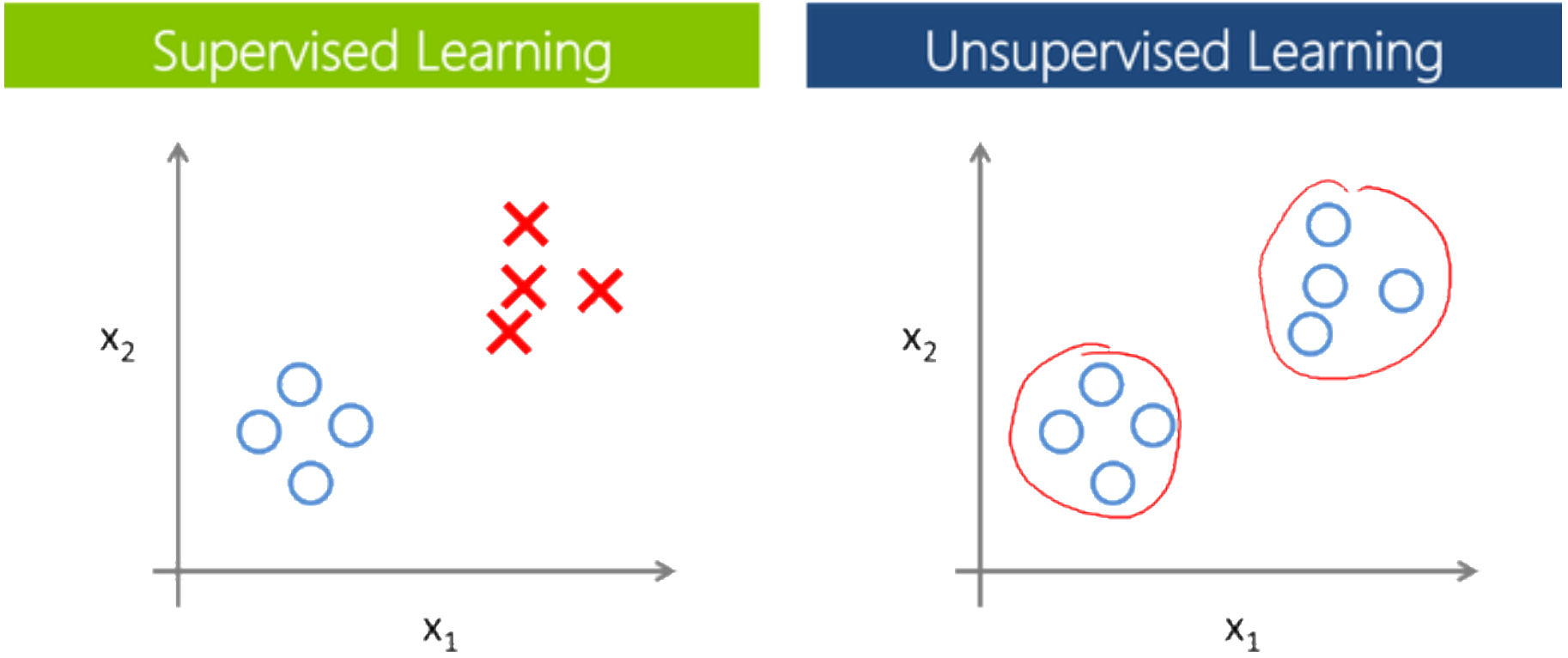
Supervised / Unsupervised Learning

Types of learning



Supervised / Unsupervised Learning

Differences



Data has **known** labels

Seeking **specific output**

Example: Fraud Detection

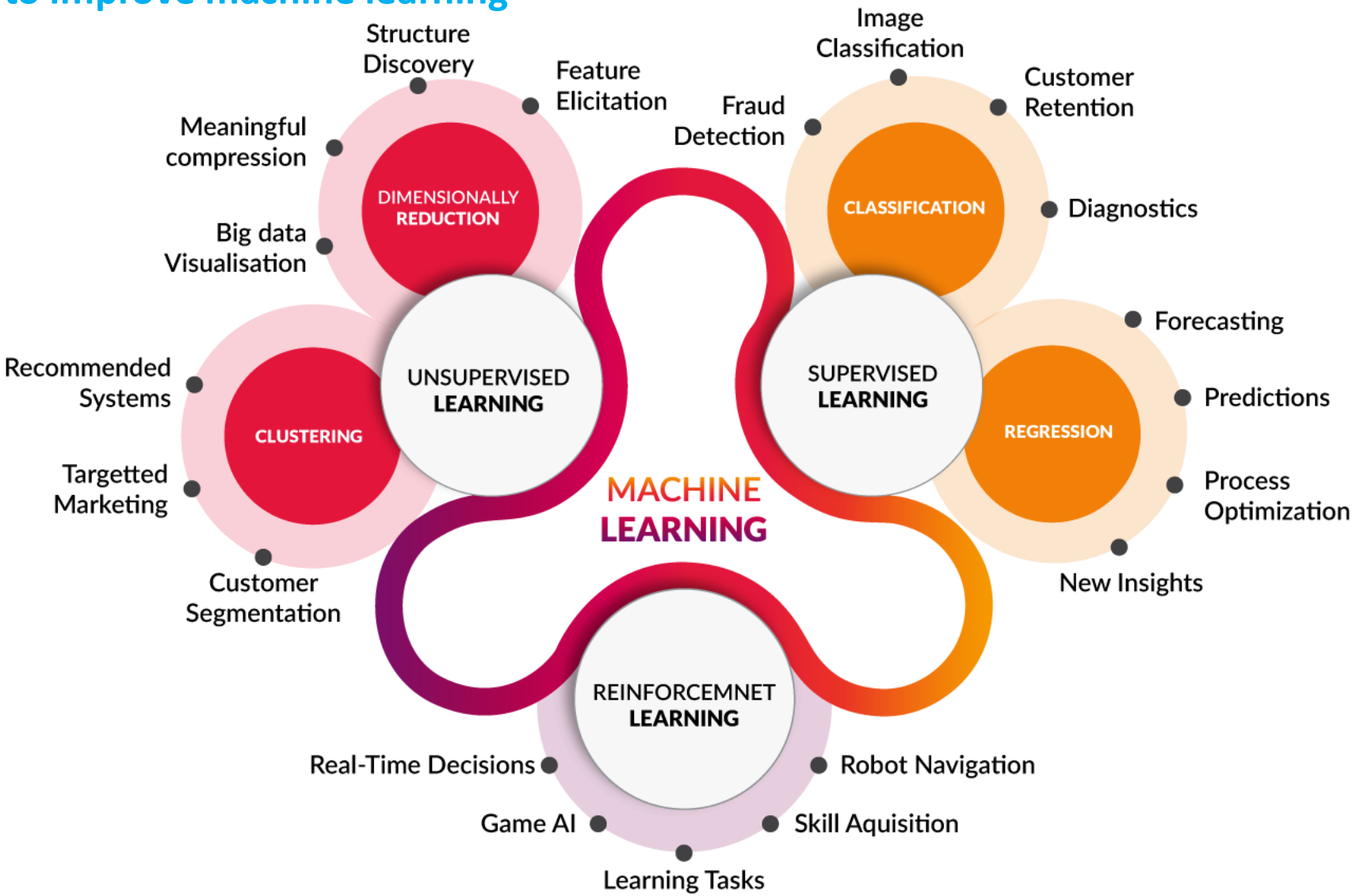
Data has **unknown** labels

Seeking **patterns**

Example: Customer Segmentation Clustering

Supervised / Unsupervised/ Reinforcement Learning

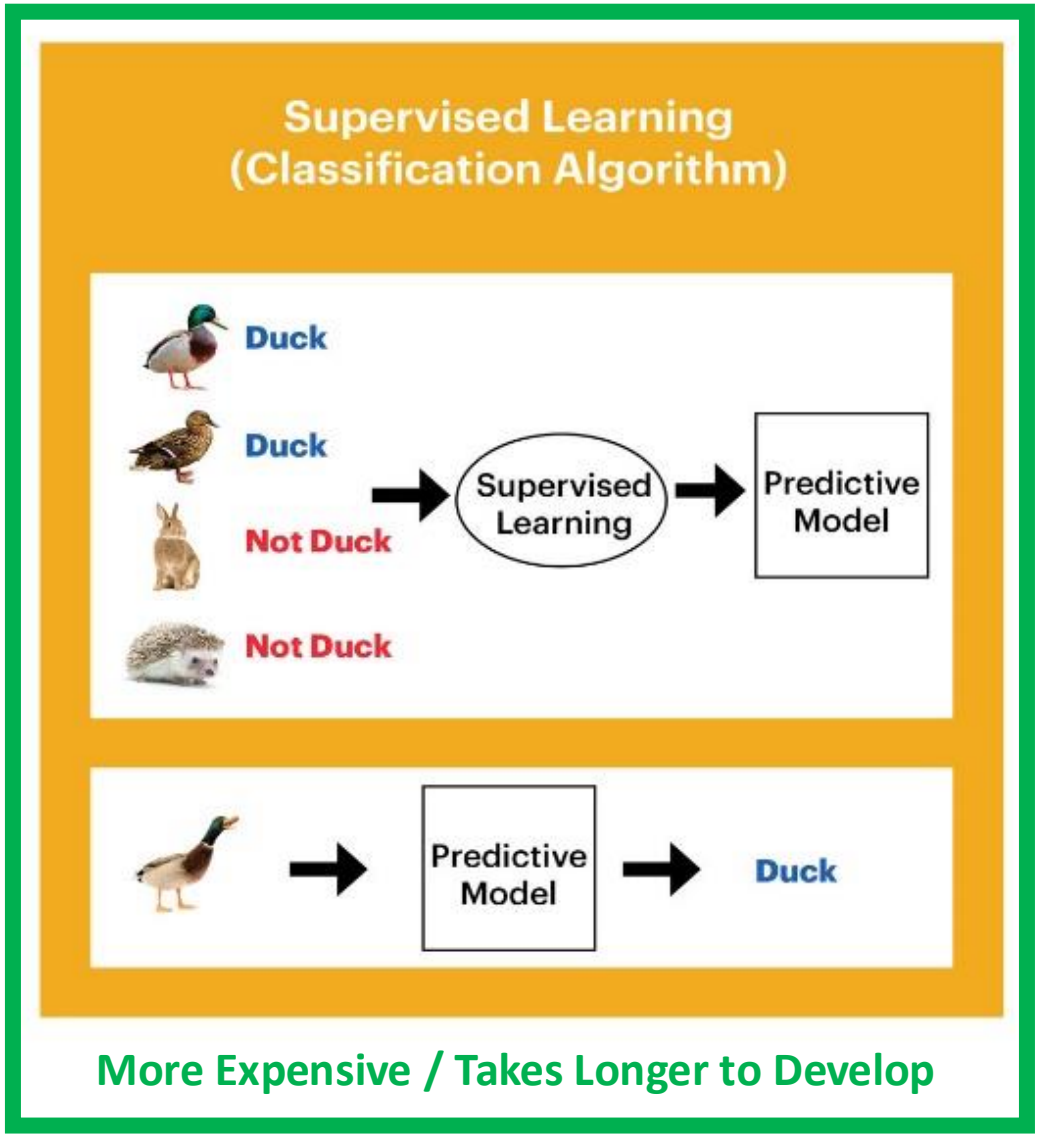
Methods to improve machine learning



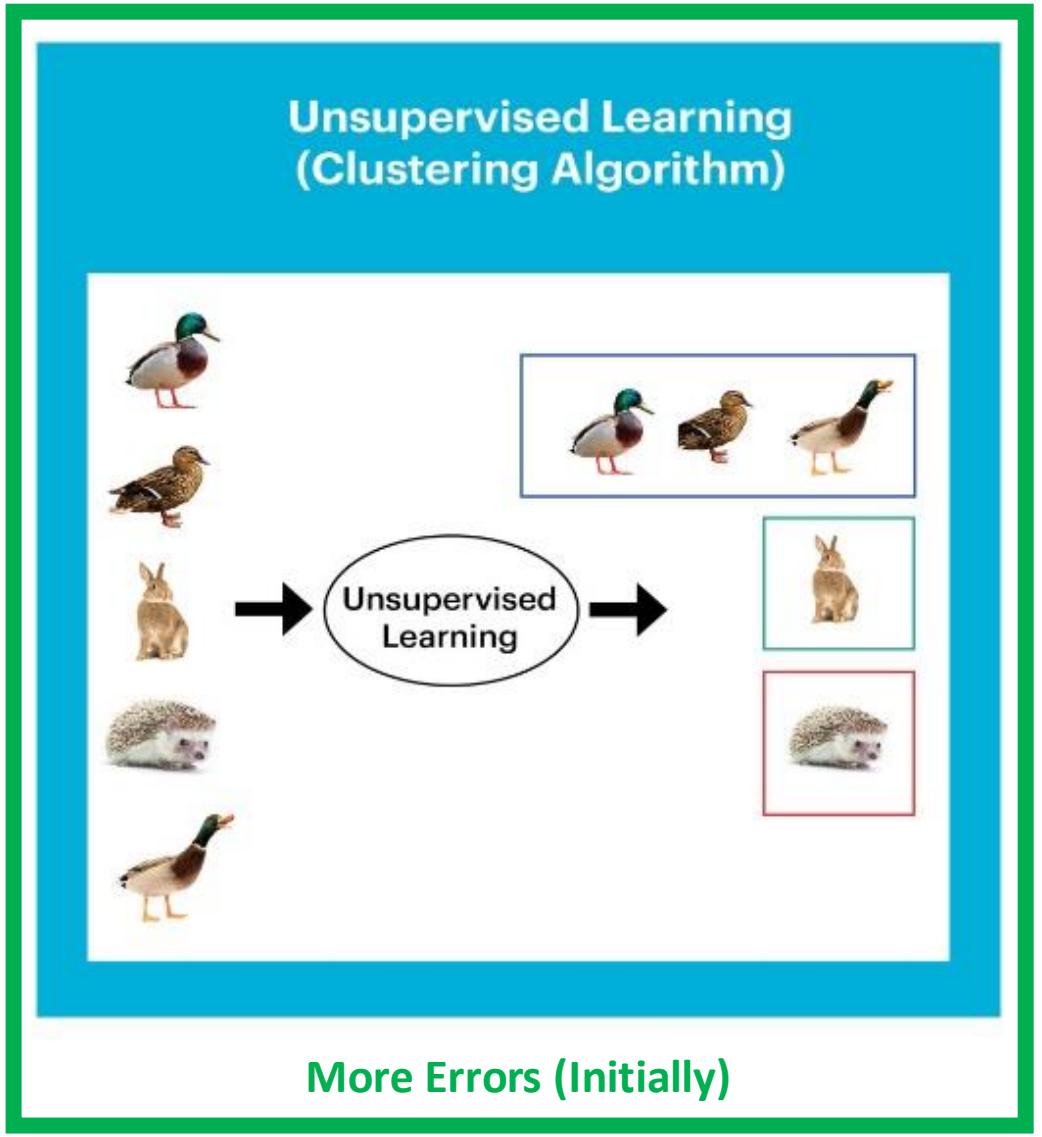
Supervised / Unsupervised Learning

$ Expense ⚠ Errors

Methods to improve machine learning



More Expensive / Takes Longer to Develop

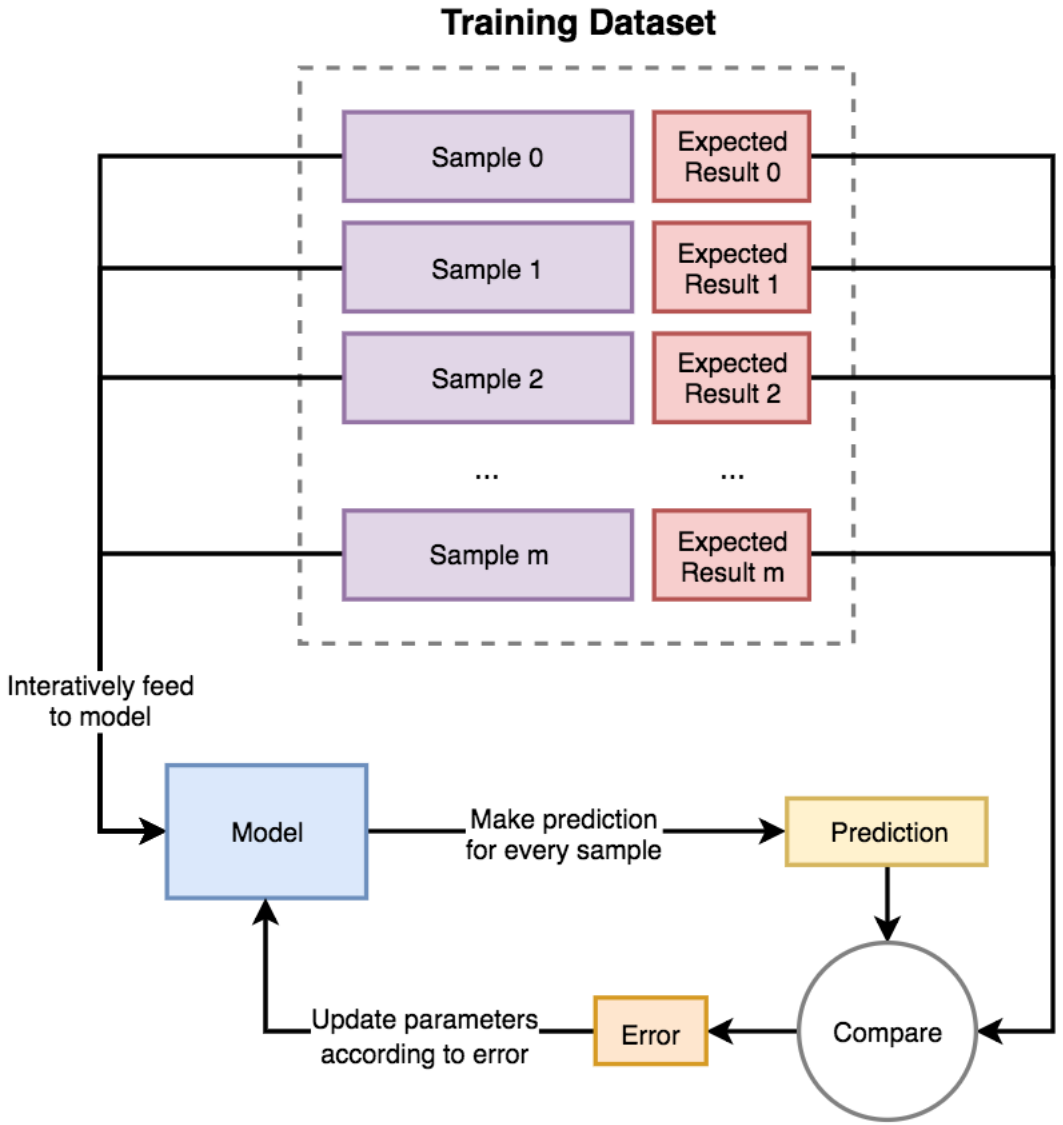


More Errors (Initially)

How Supervised Learning Works

Method to improve machine learning

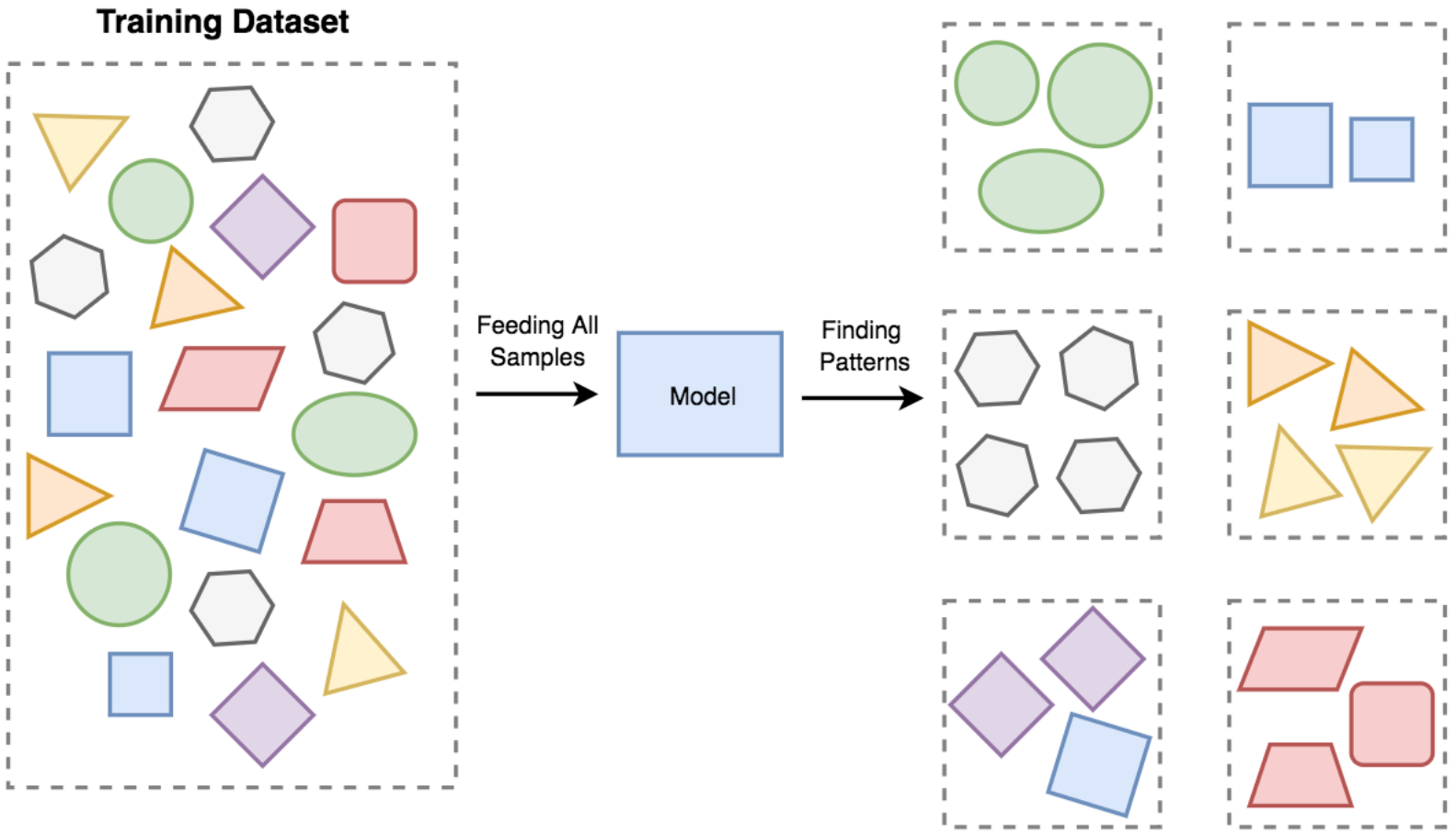
Supervised



How Unsupervised Learning Works

Method to improve machine learning

Unsupervised



All data is fed to the model and it produces an output on it's own based on similarity between samples and algorithm used to create the model.

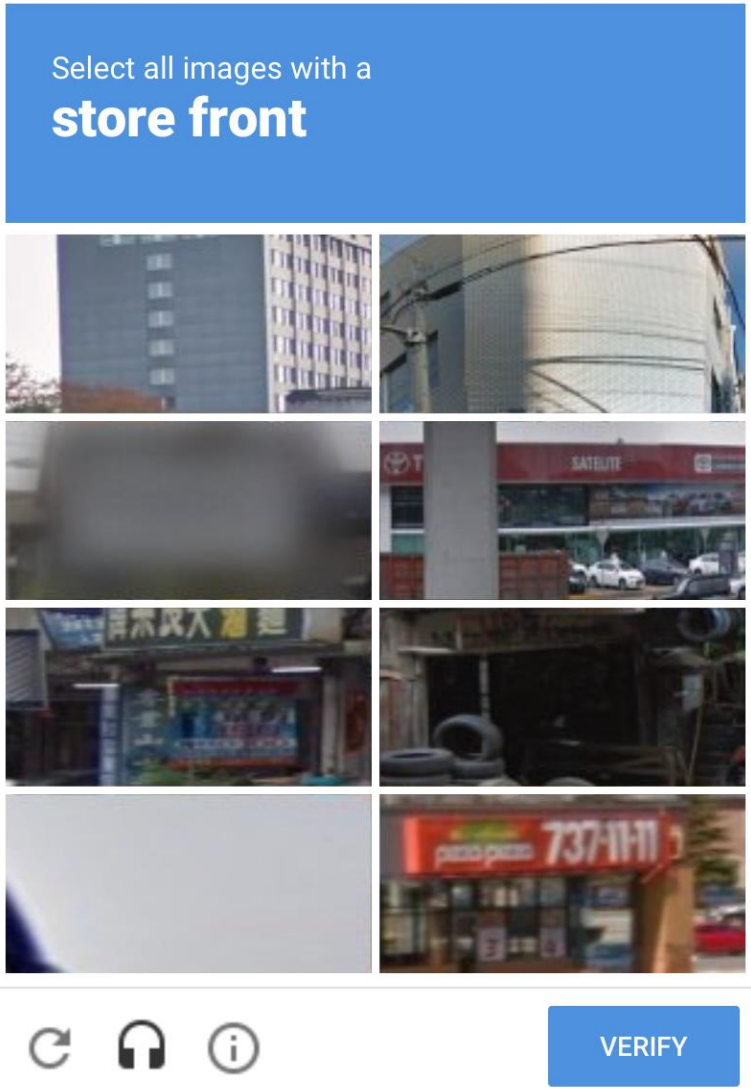
How Supervised Learning Works

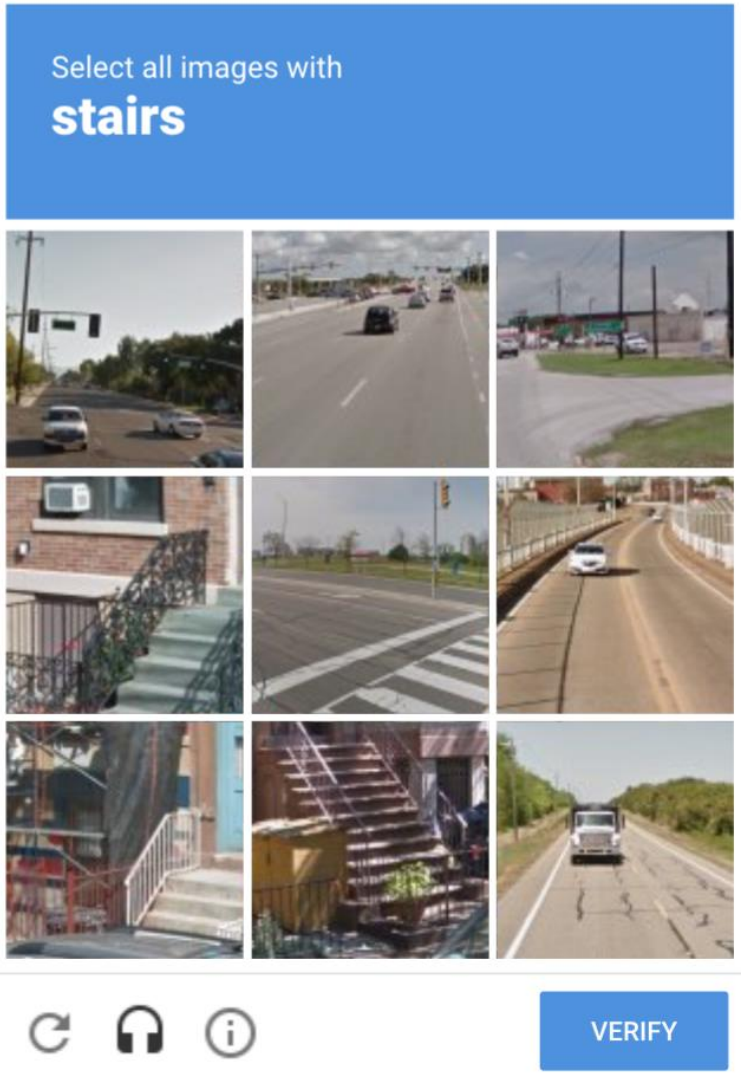
Method to improve machine learning

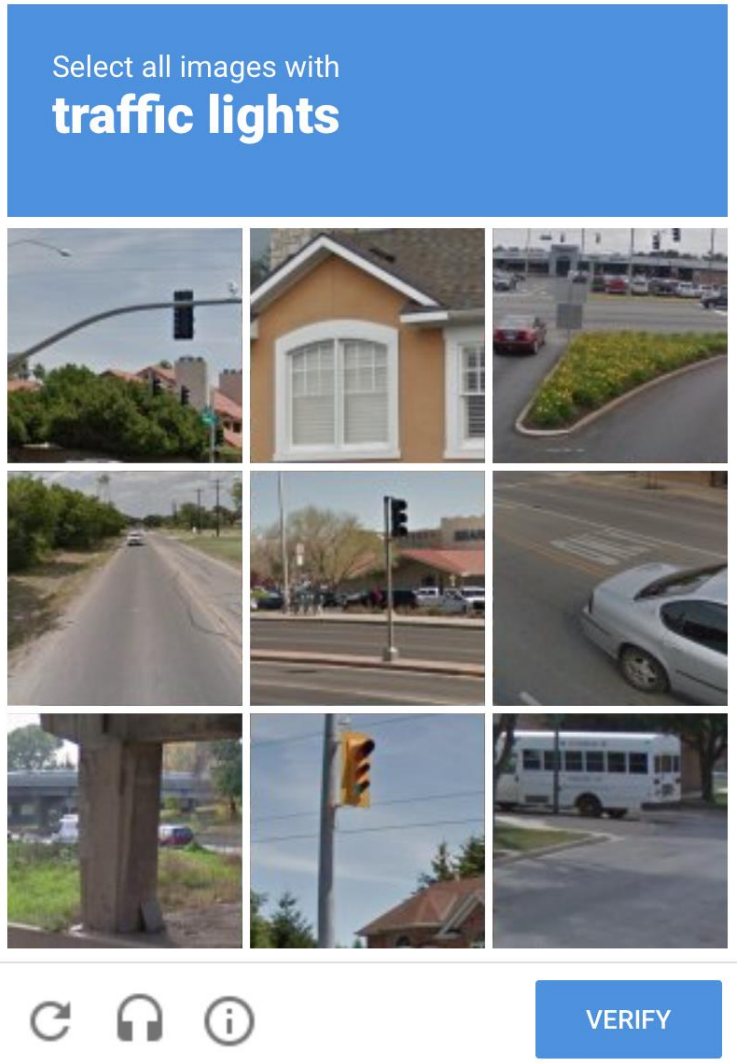
reCAPTCHA

How Supervised Learning Works

Method to improve machine learning







Artificial Intelligence Improves from Machine Learning

Machine Learning need lots of data from prior experience of things humans have done many times.

AI is good at doing something we've done before.

It's not good at doing something new

(that is for humans)

But that is changing fast

Trucking	Construction	Warehousing	Farming
All currently being automated			

Deep Learning

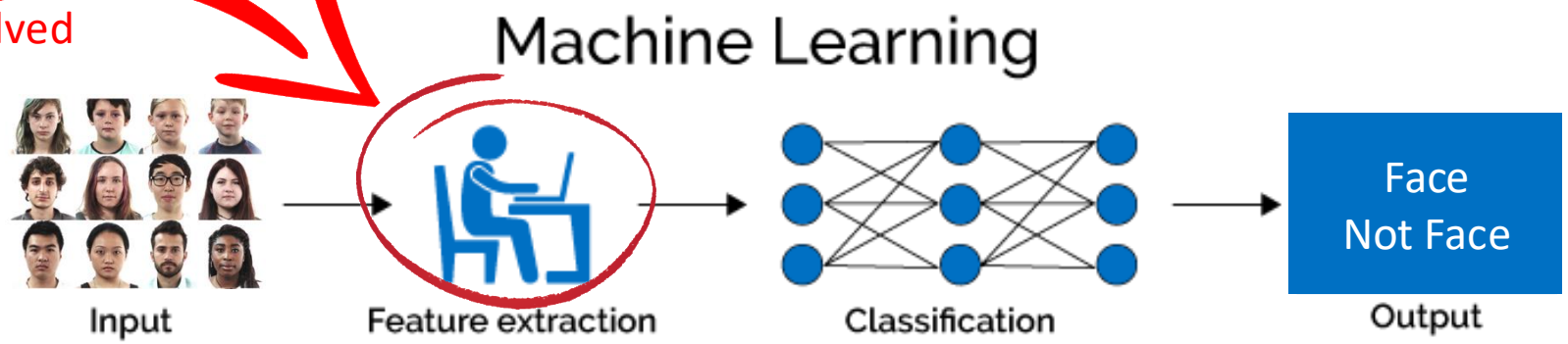
Machines using more robust processes to build greater understanding

Machine Learning / Deep Learning

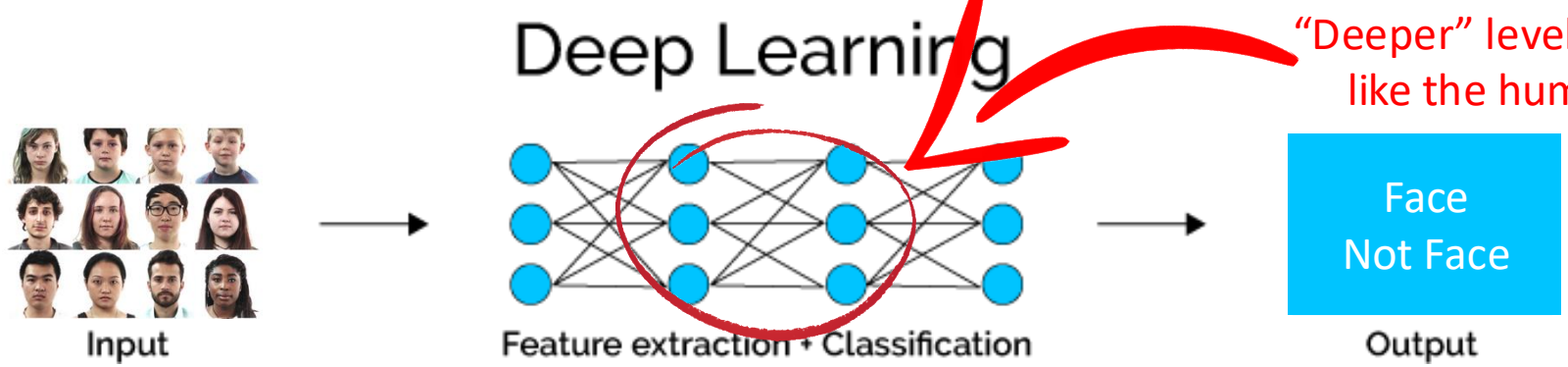
Deep learning is a subset of machine learning

In traditional **Machine learning**, the features need to be identified by an expert in order to reduce the complexity of the data and make patterns more visible to the algorithms to work. The biggest advantage **Deep Learning** algorithms is they try to learn high-level features from data in an incremental manner. This eliminates the need of domain expertise and hard-core feature extraction.

Human involved



More Expensive



Takes Longer

"Deeper" levels of learning is more like the human brain thinking

Machine Learning / Deep Learning

Deep learning is a subset of machine learning

A Face

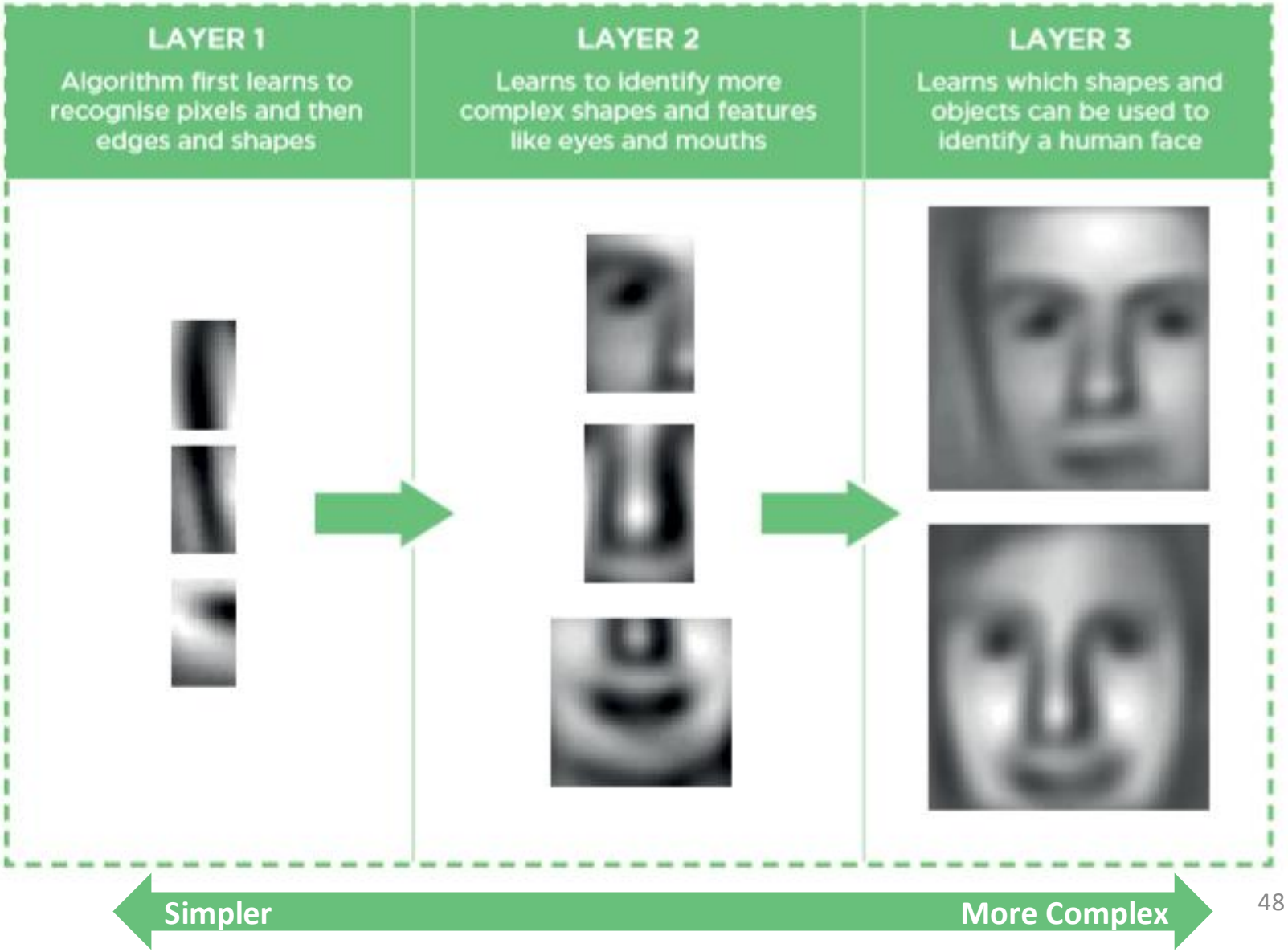
Or…

…Car
…Tree
…Dog
…Cat
…Storefront
…Stairs
…Traffic light

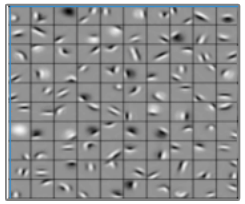
Machine Learning / Deep Learning

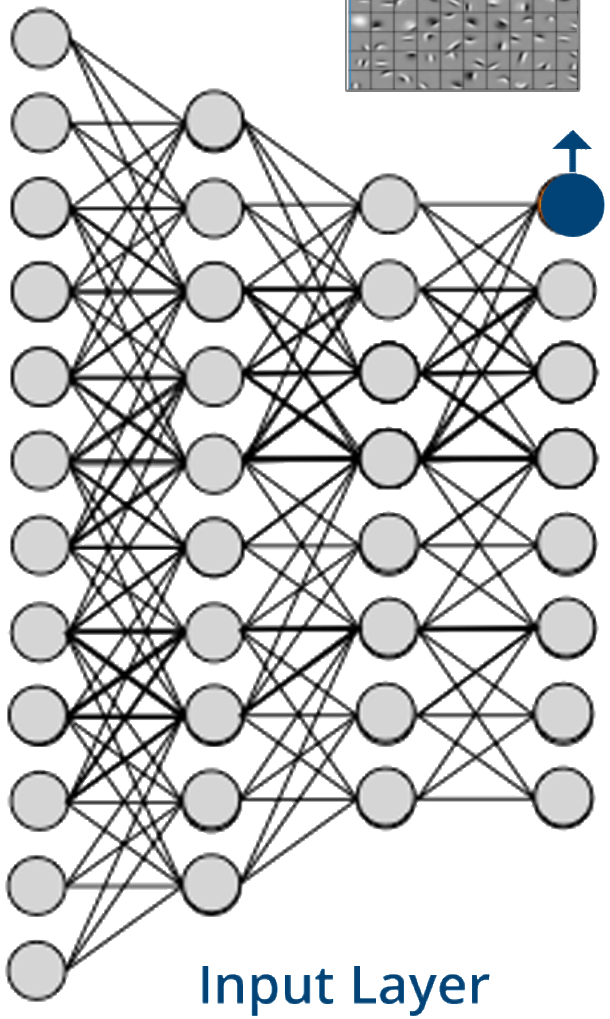
Deep learning is a subset of machine learning

Deep Learning is a subset of **Machine Learning** ***that achieves great power and flexibility by learning to represent the world as nested hierarchy of concepts, with each concept defined in relation to simpler concepts, and more abstract representations computed in terms of less abstract ones.***



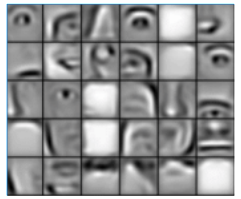
Patterns of Local Contrast

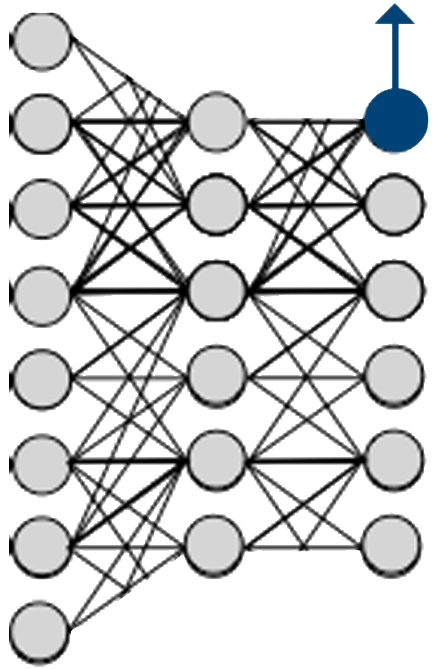




Input Layer

Face Features

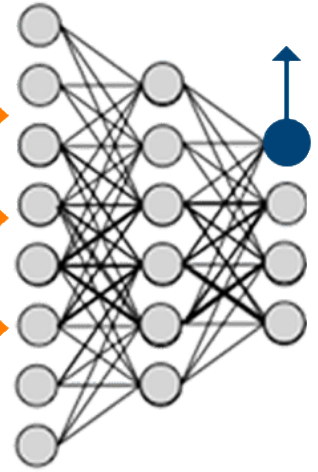




Hidden Layer 1

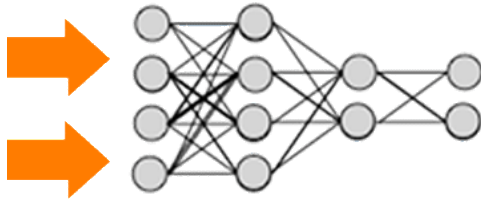
"Deeper" level

Face



Hidden Layer 2

"Deeper" level



Output Layer

With more data, we could say "who" is the face

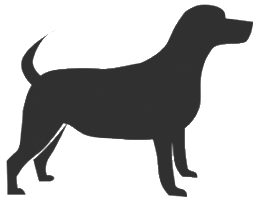


Photo of a Dog

Training Images

Highly Defined and known

Photo in question

(Input)

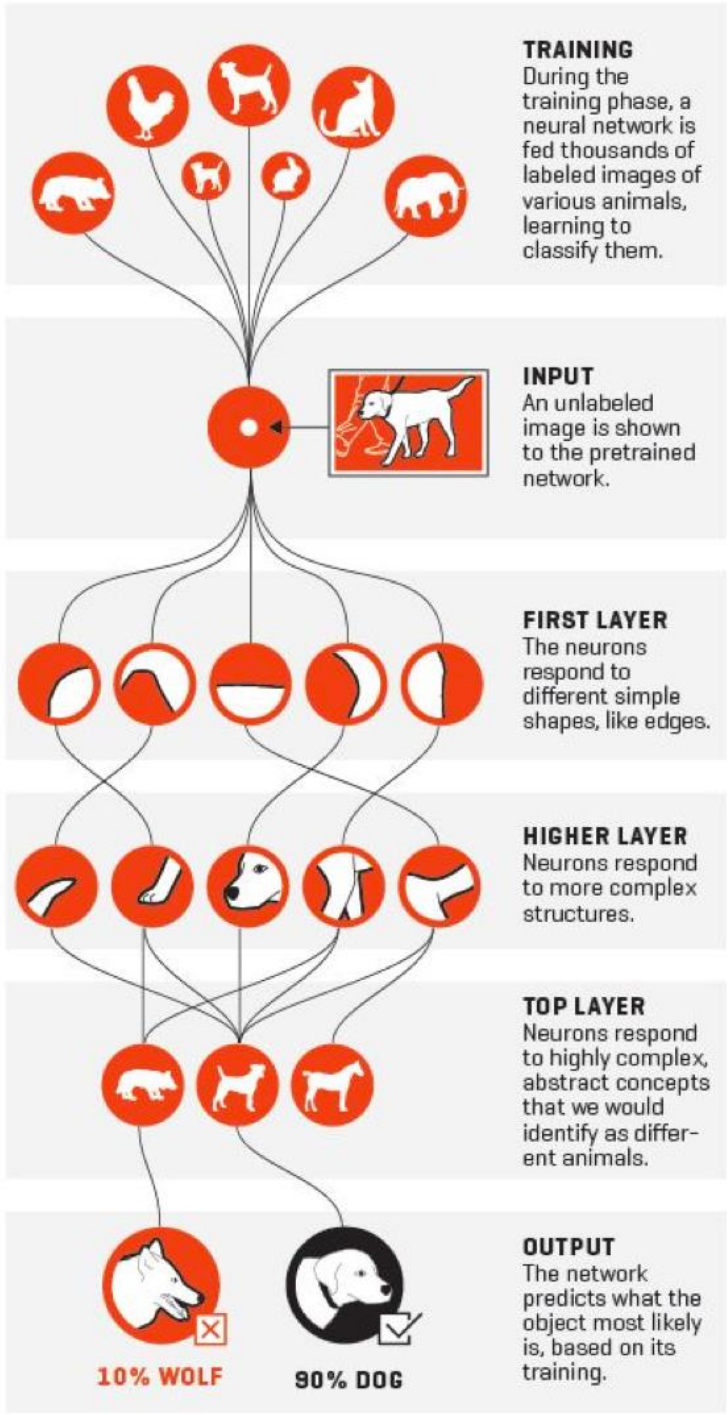
Layer 1

Layer 2

Layer 3

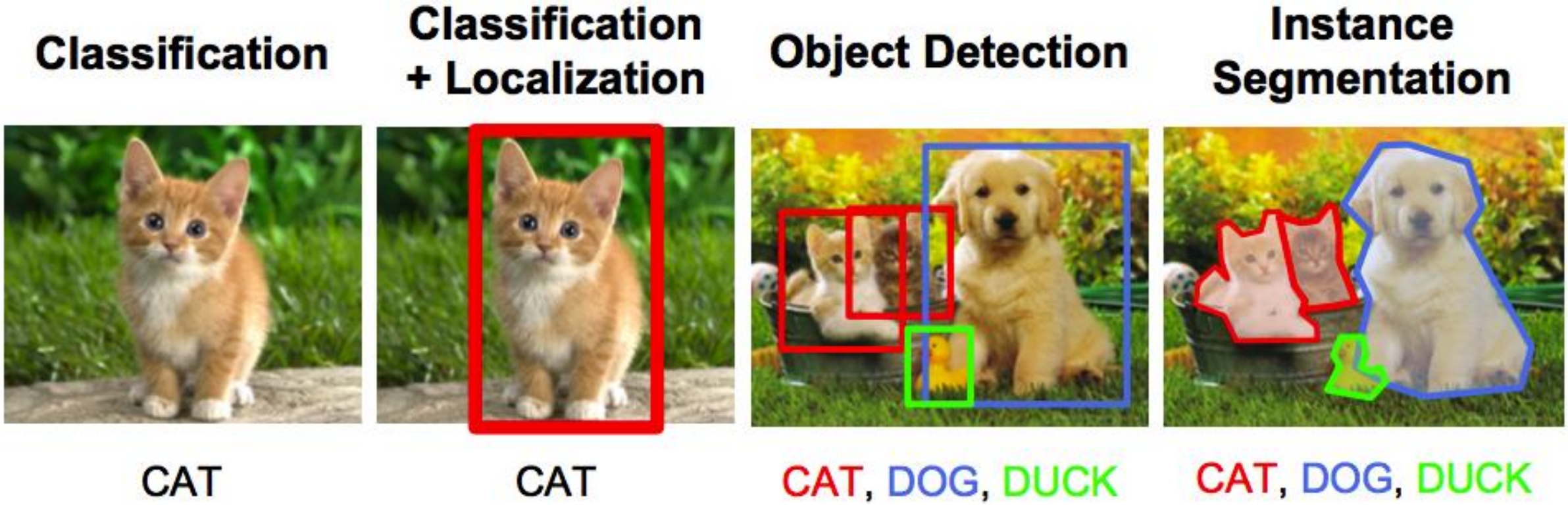
Output

With best estimate



Machine Learning / Deep Learning

Deep learning is a subset of machine learning



Deep Learning Problem Solving Approach

A difference between Deep Learning & Machine Learning technique is the problem solving approach

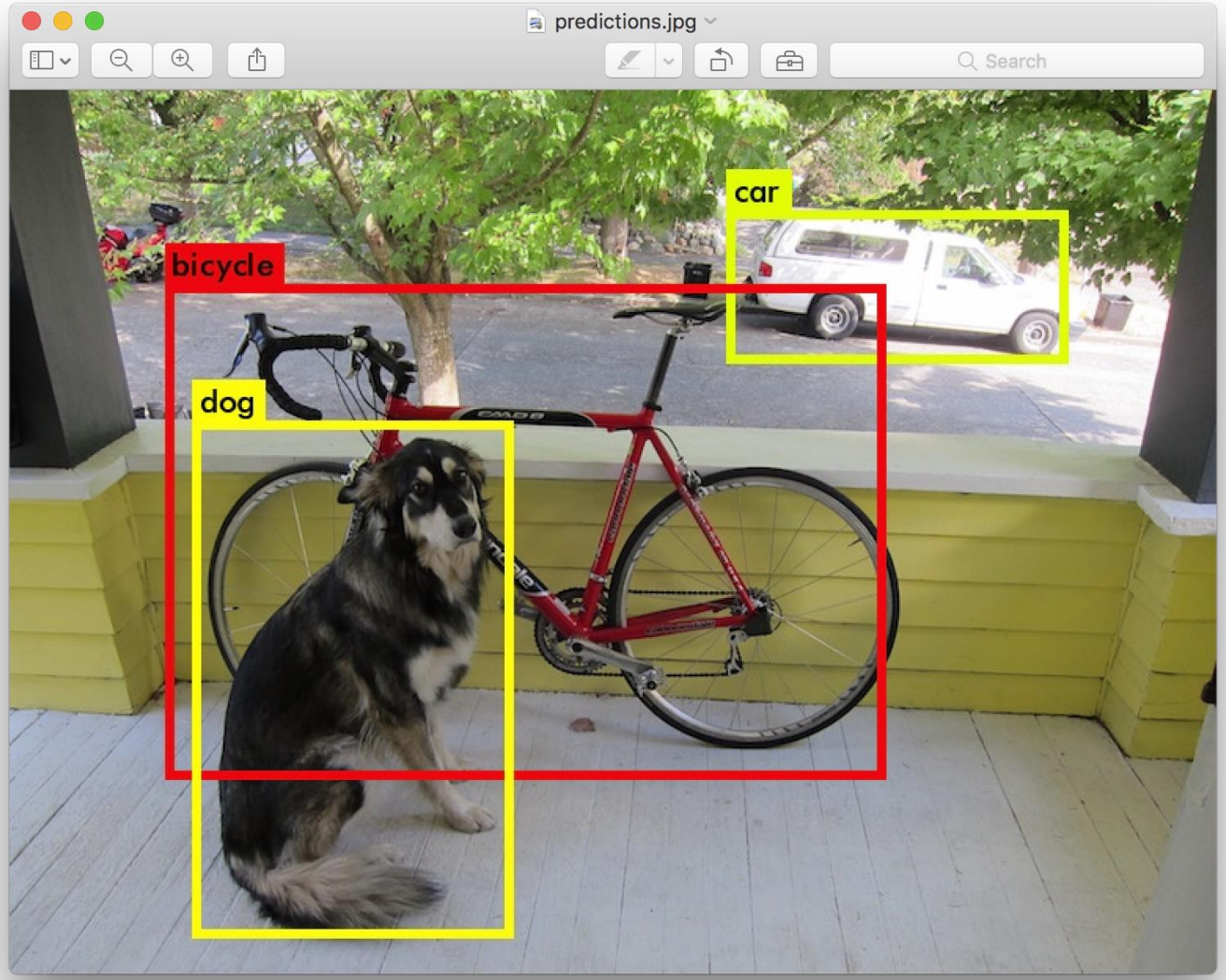
Deep Learning techniques tend to solve the problem end to end, where as Machine learning techniques need the problem statements to break down to different parts to be solved first and then their results to be combine at final stage.

Example: Multiple Object Detection

Deep Learning techniques take the image as input and provide the location and name of objects at output.

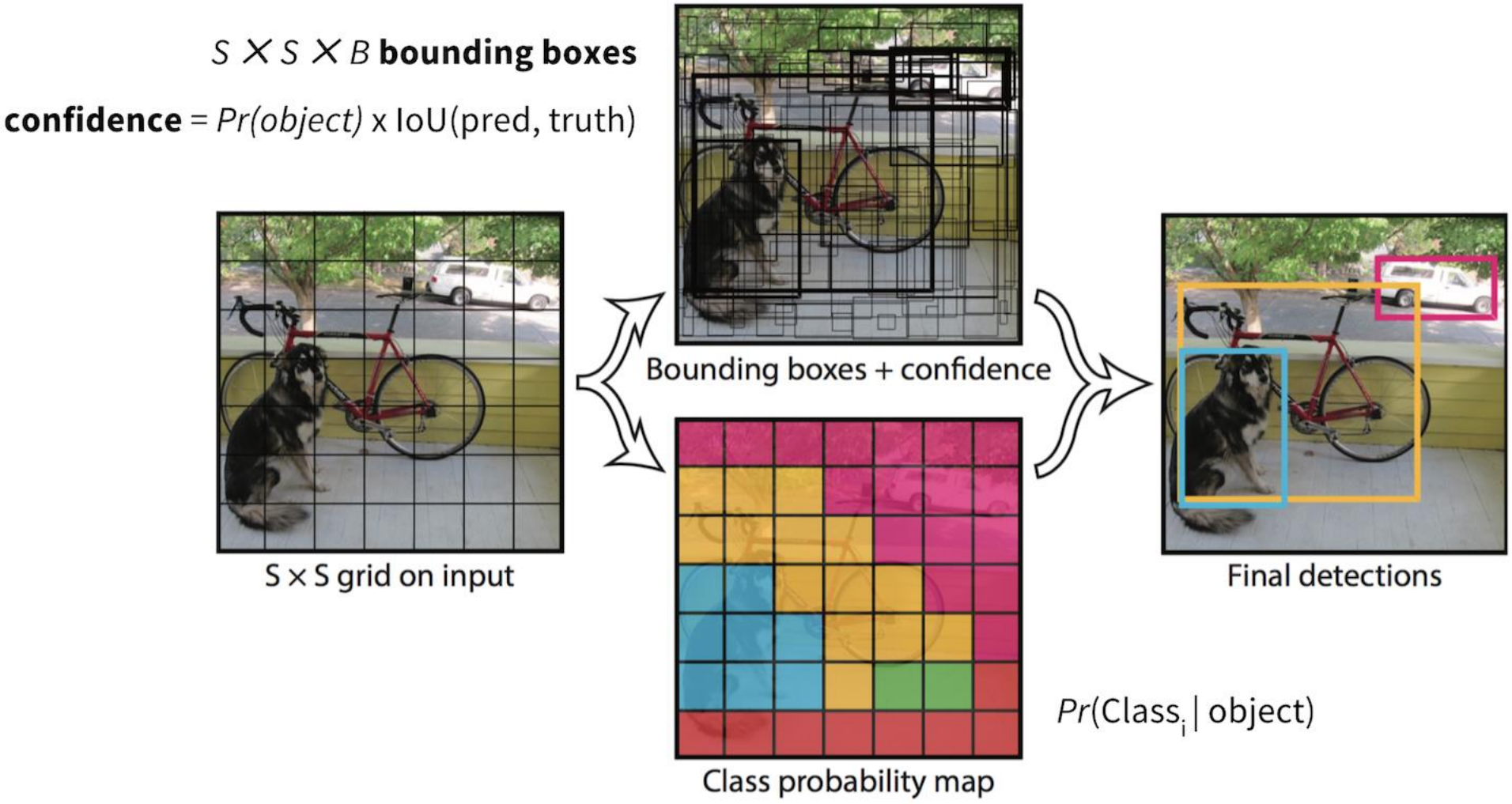
Machine Learning algorithms need a bounding box object detection algorithm required to first to identify all possible objects for input to the learning algorithm in order to recognize relevant objects.

Both work together here.



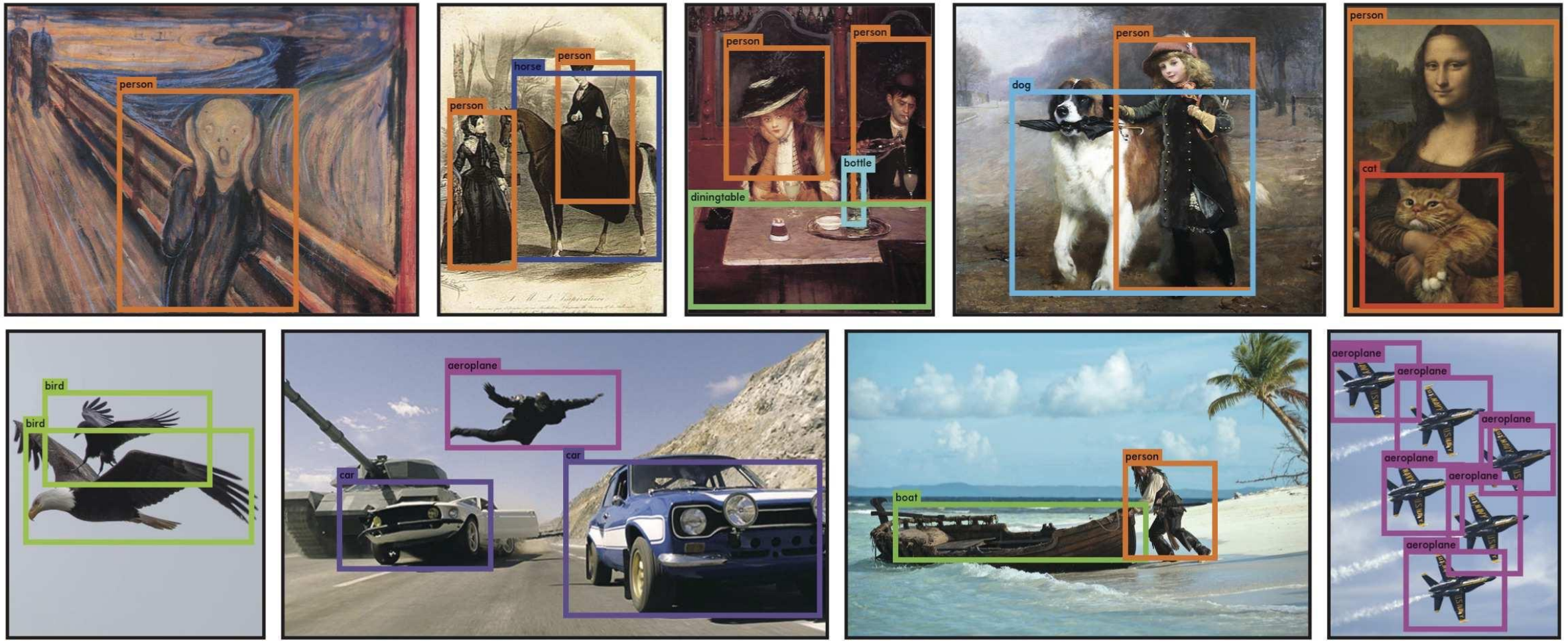
Deep Learning Problem Solving Approach

A difference between Deep Learning & Machine Learning technique is the problem solving approach

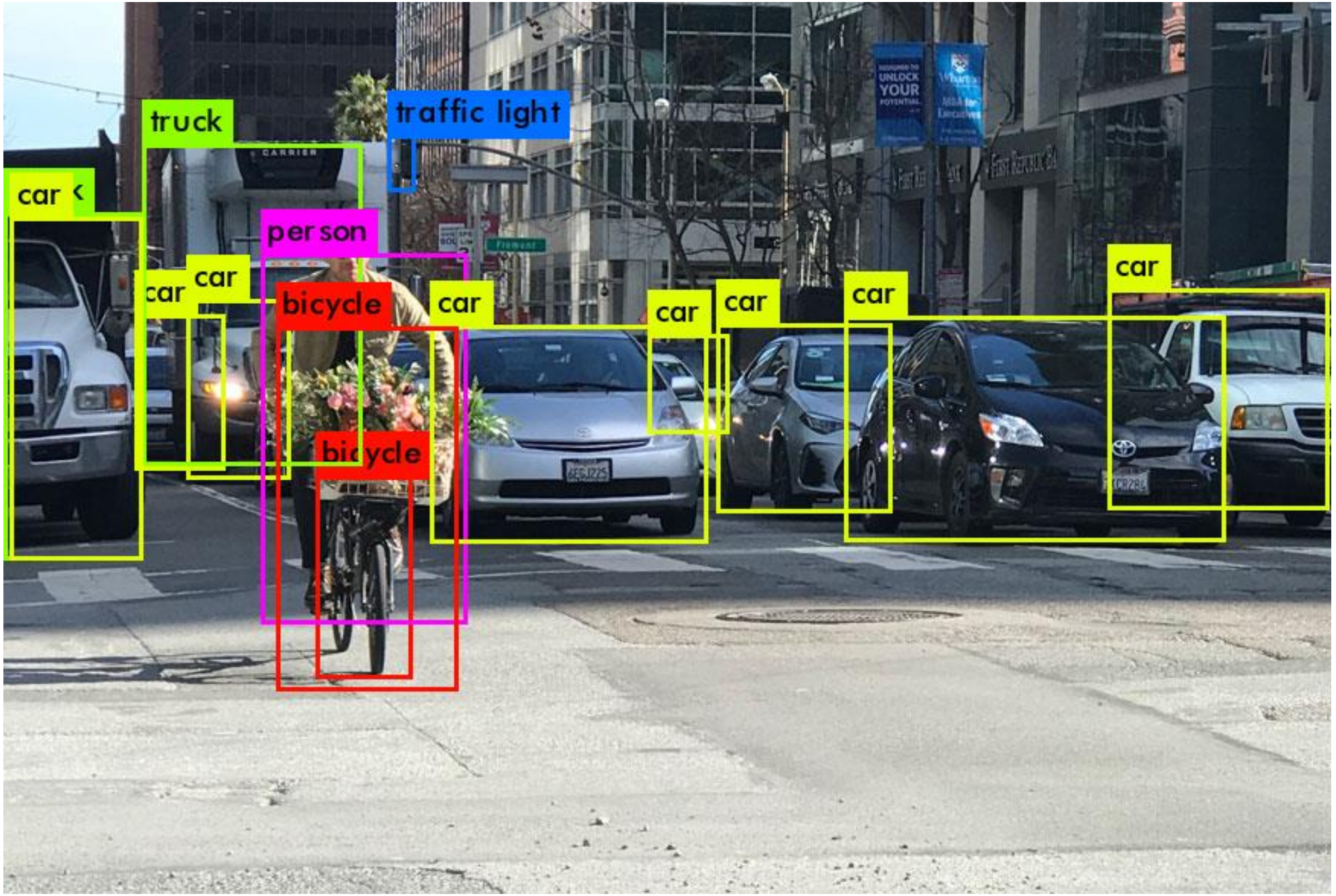


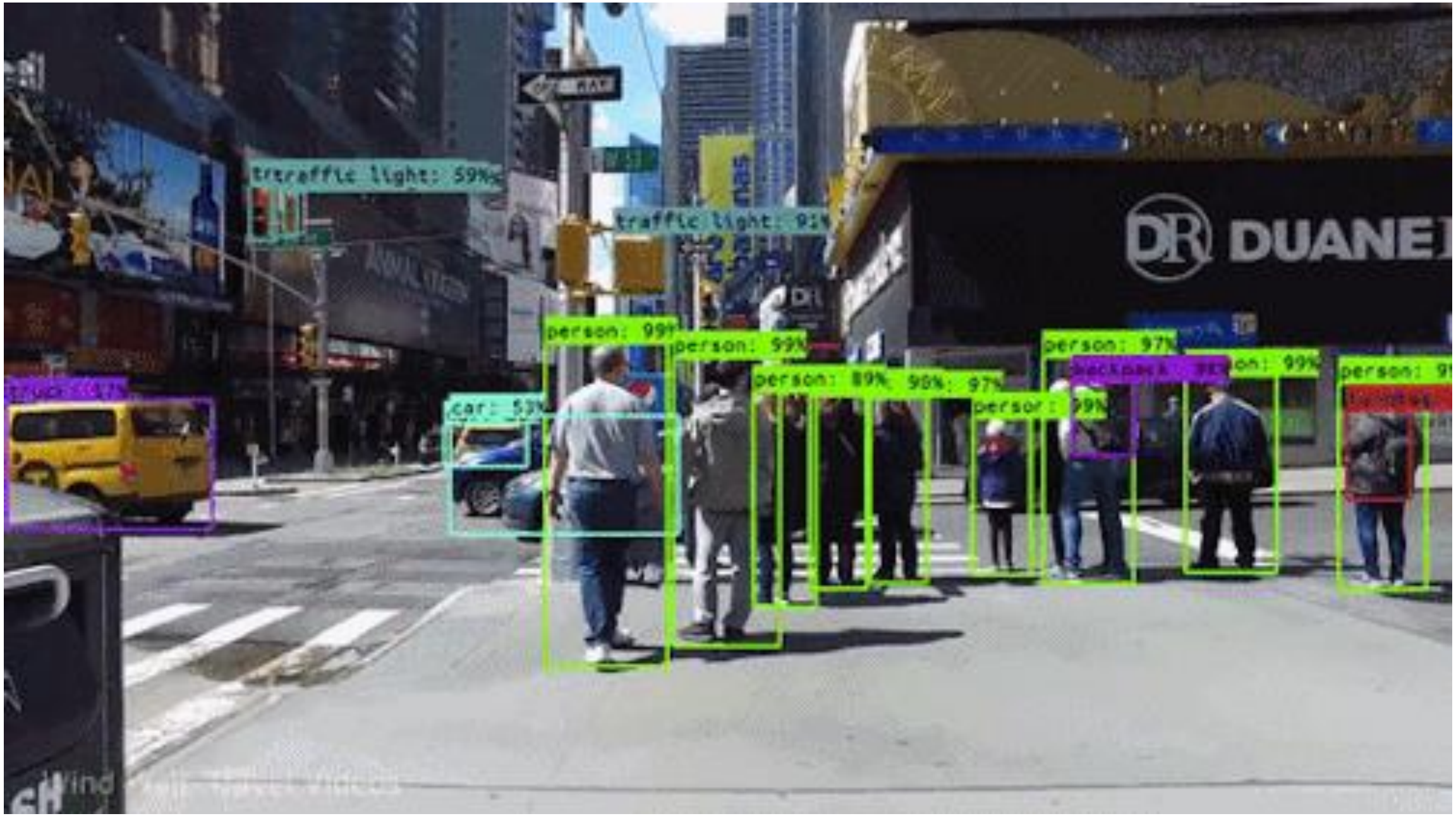
Deep Learning Problem Solving Approach

A difference between Deep Learning & Machine Learning technique is the problem solving approach




car
car

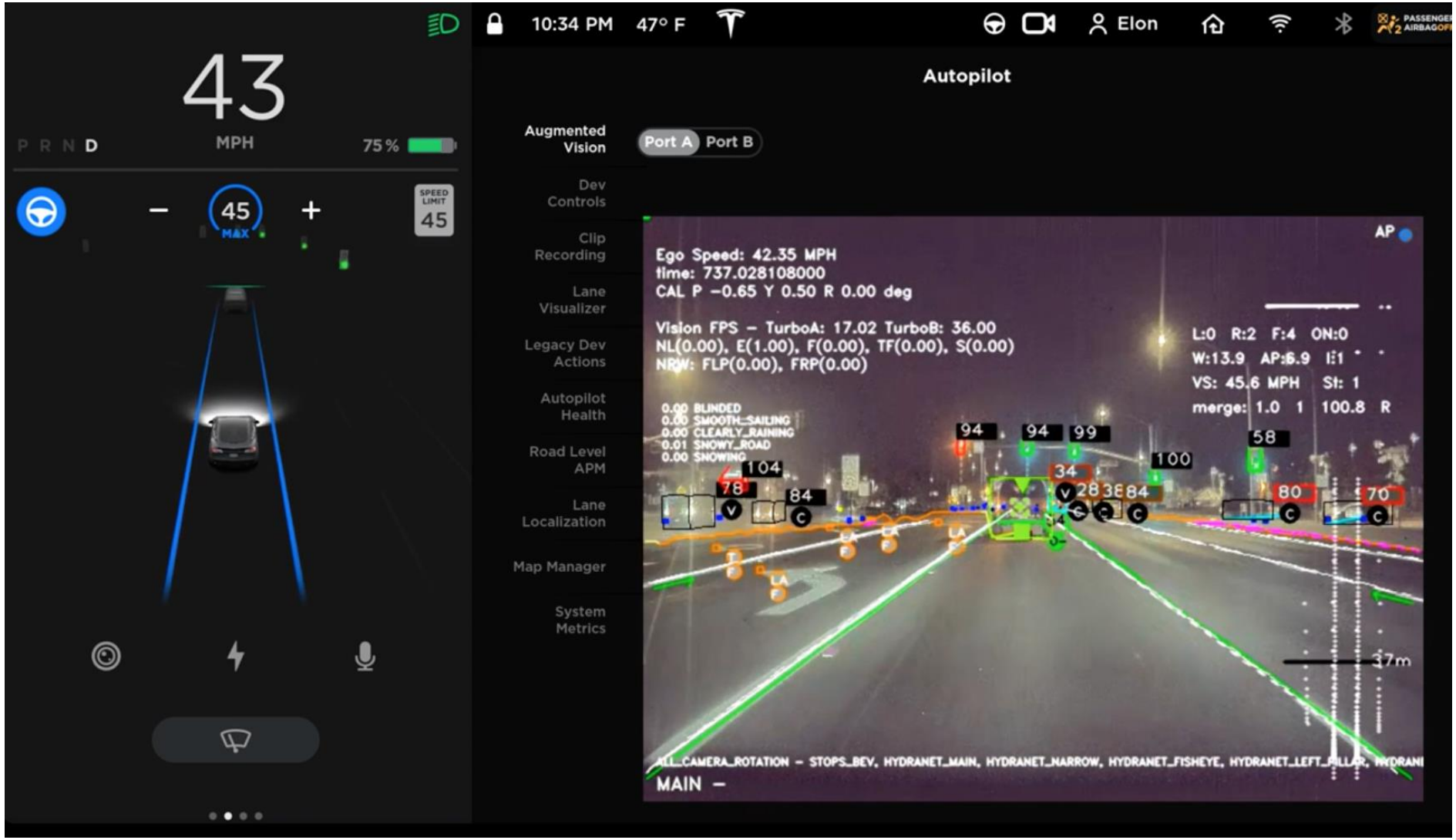

truck
traffic light
car
person
car
car
bicycle
car
car
car
car
car
bicycle



https://cdn-images-1.medium.com/max/1600/1*0T9gJQre00Mol0B1ATaHdA.gif

Telsa Autonomous Driving

What a Telsa automobile “sees”



https://streamable.com/g568gc

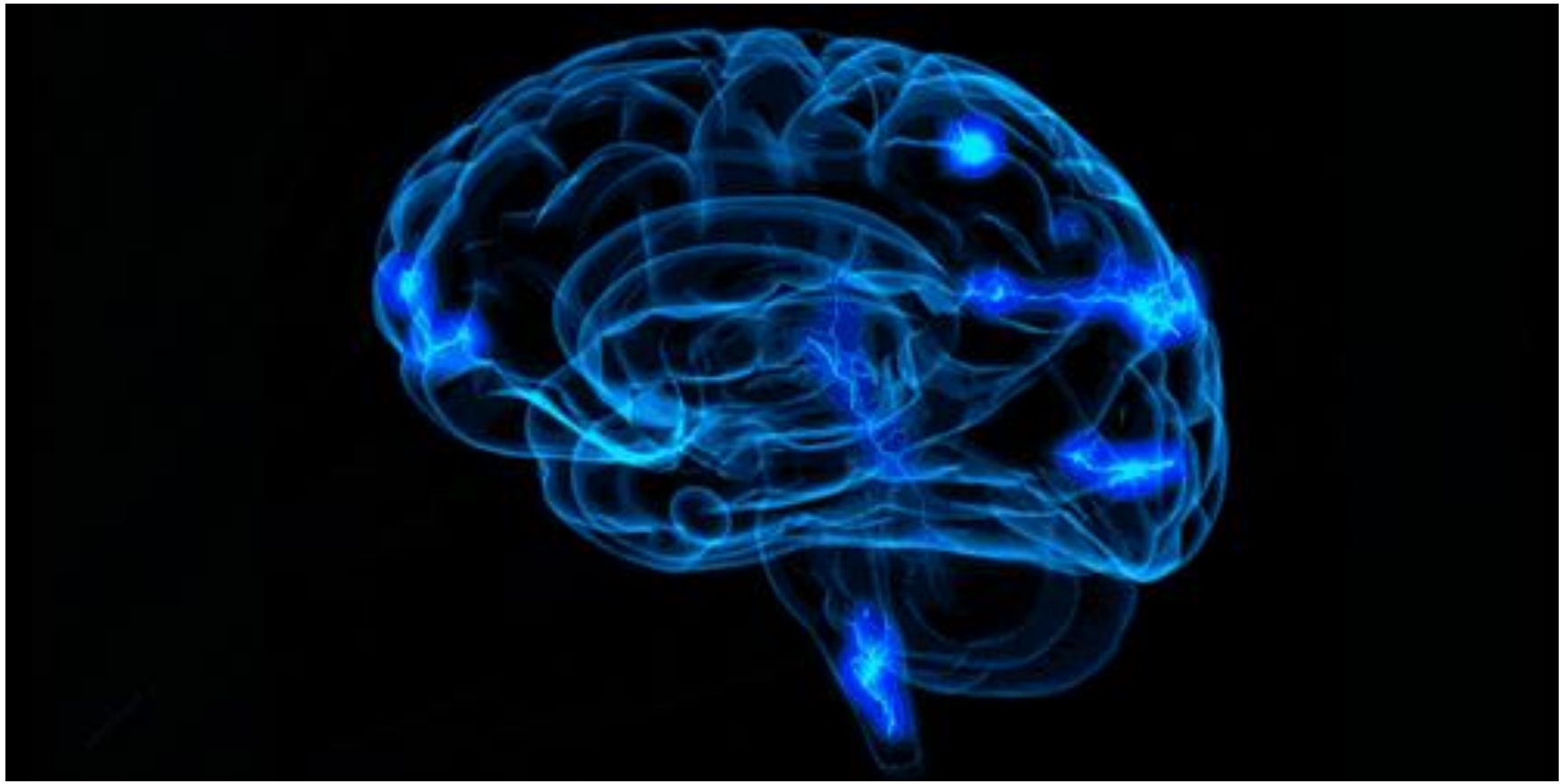
Neural Networks

Computers “thinking like your brain”

Neural Networks

Mimic of human brain activity

We know the human brain woks by sending electrical impulses from cell to cell (spheres of knowledge)

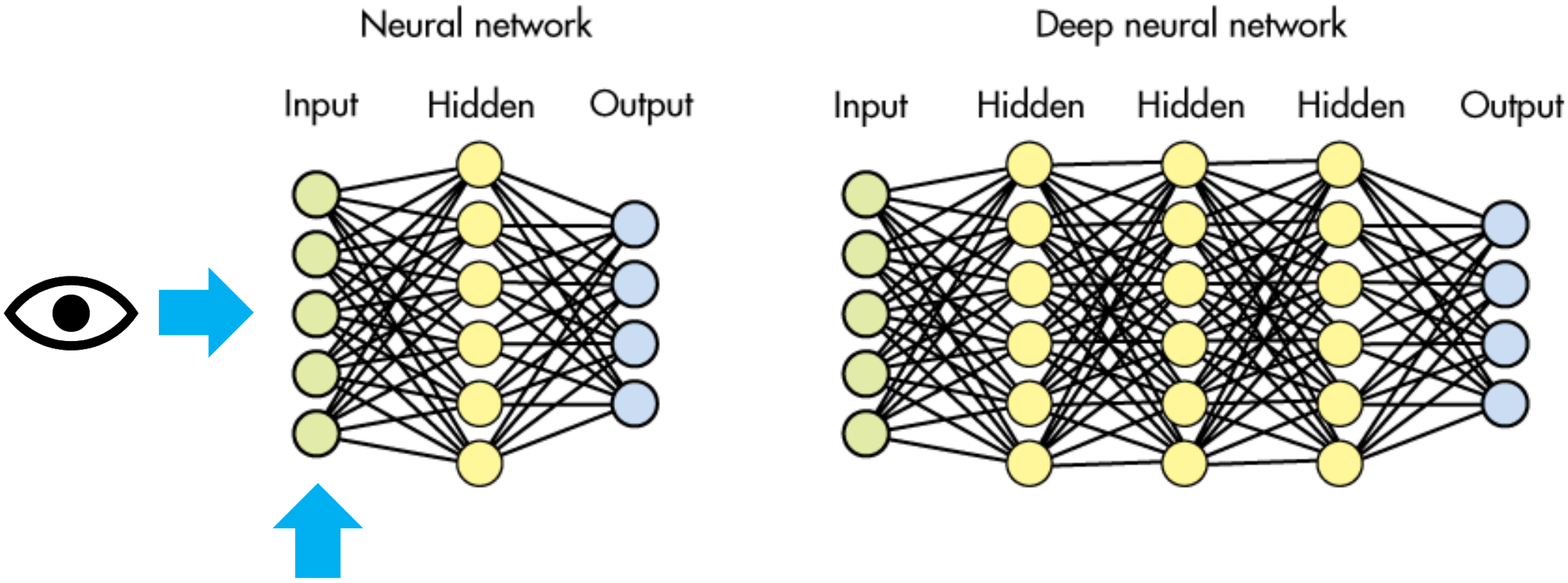


Neural Networks

An understanding of how the machine mimics the way a human brain processes information

The first tier receives the raw input information…

…analogous to optic nerves in human visual processing

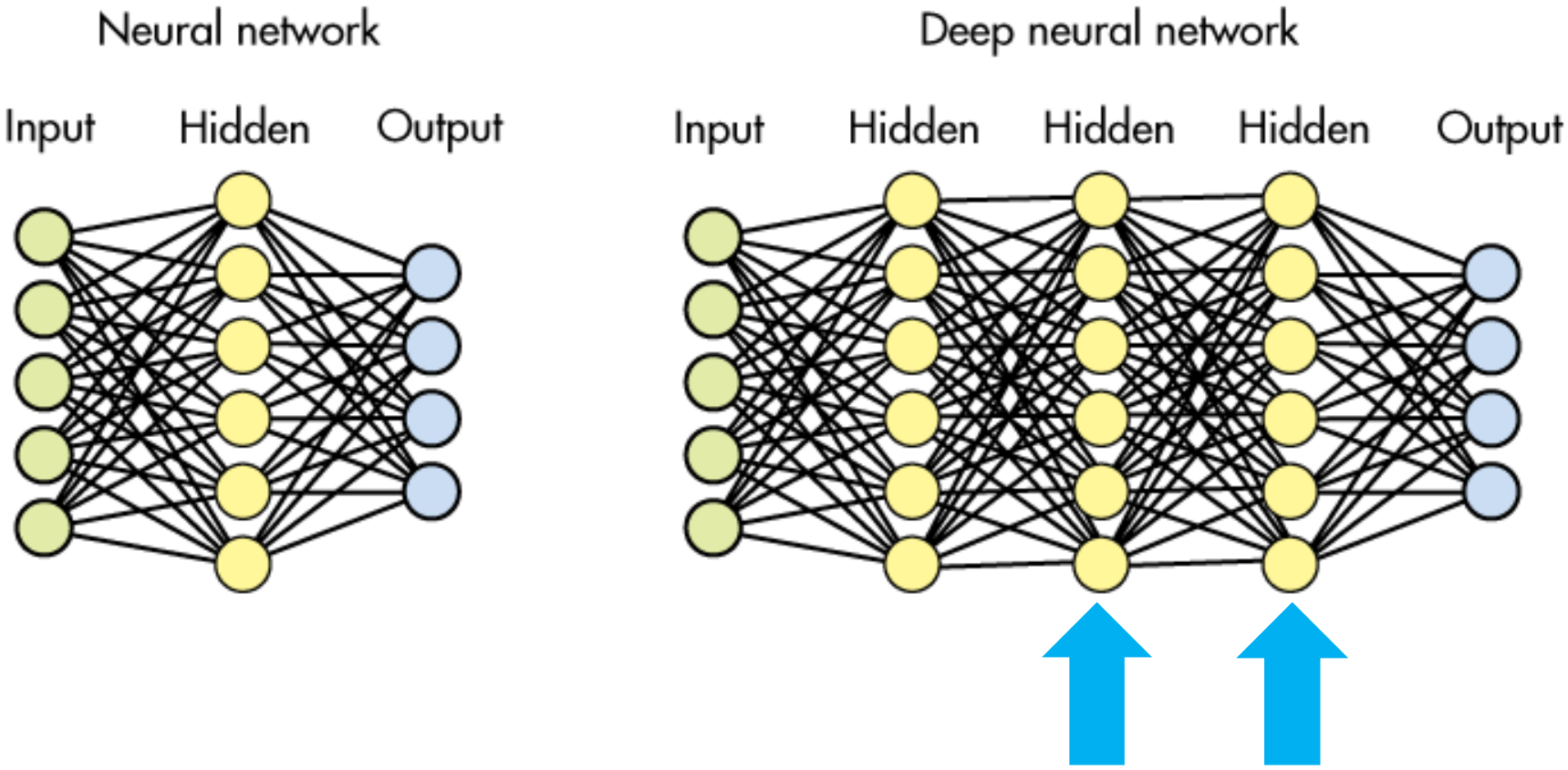


Neural Networks

An understanding of how the machine mimics the way a human brain processes information

Each successive tier receives the output from preceding tier, rather than from the raw input …

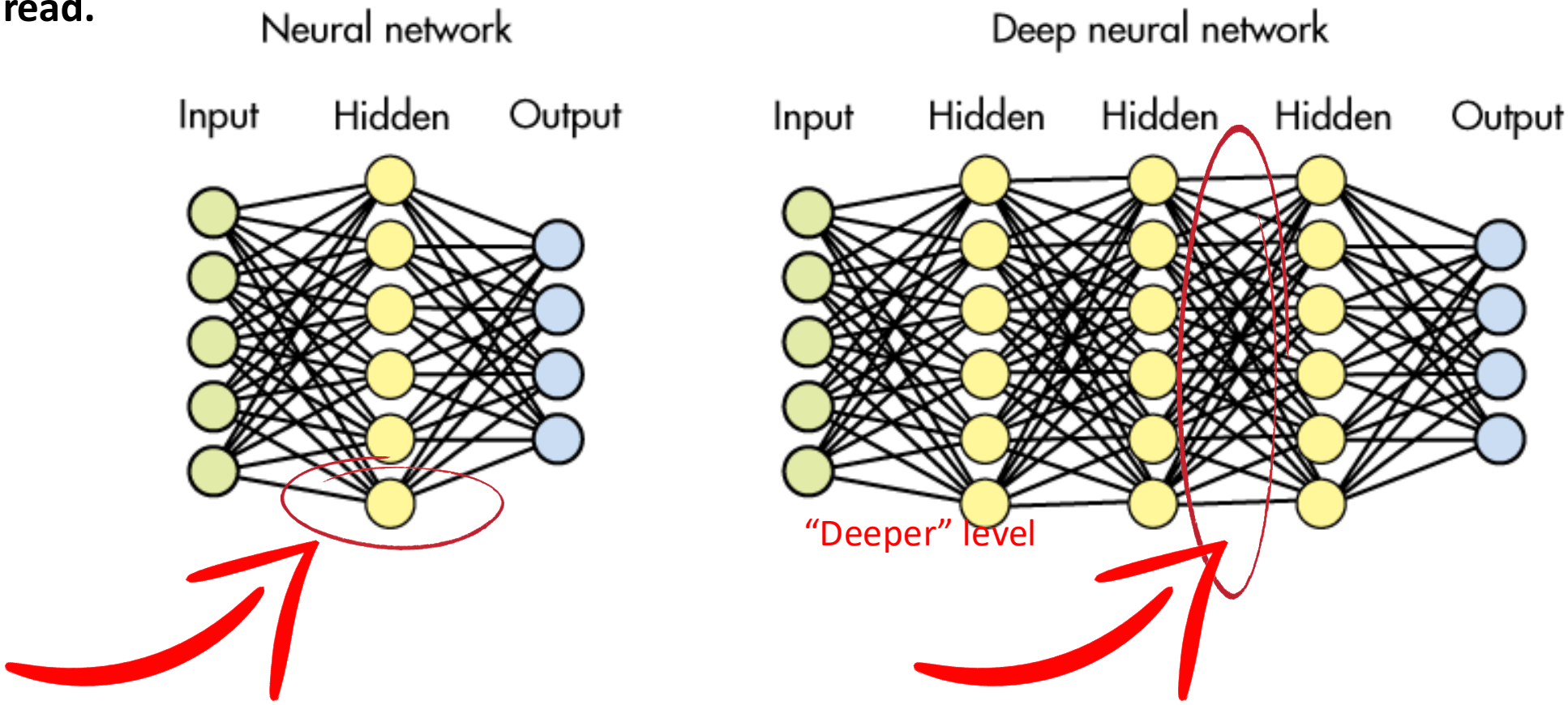
…in the same way neurons further from the optic nerve receive signals from those closer to it. The last tier produces the output of the system.



Neural Networks

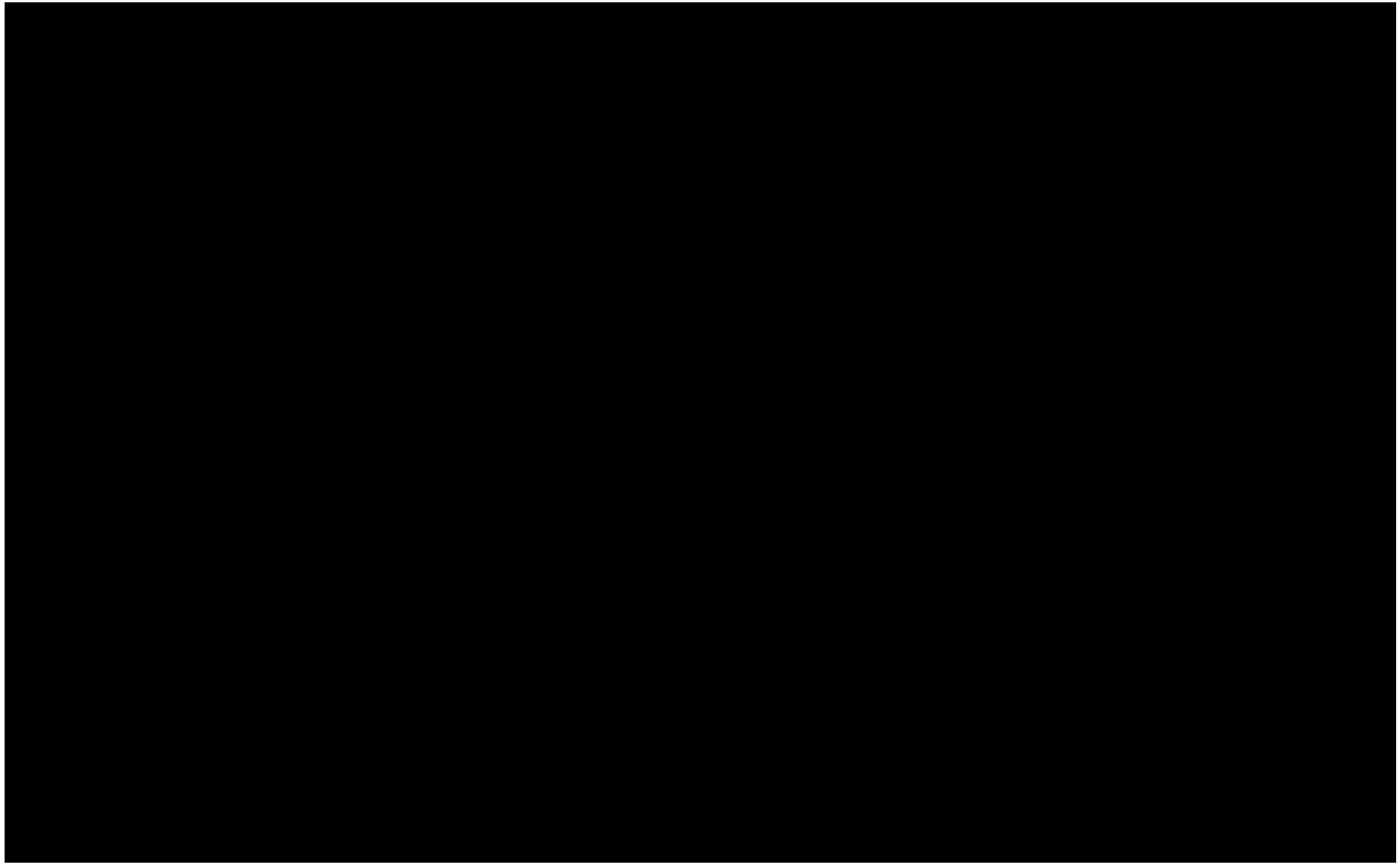
An understanding of how the machine mimics the way a human brain processes information

Each processing node has its own small sphere of knowledge, including what it has seen and any rules it was originally programmed with or developed for itself. The tiers are highly interconnected, which means each node in tier n will be connected to many nodes in tier n-1 -- its inputs -- and in tier n+1, which provides input for those nodes. There may be one or multiple nodes in the output layer, from which the answer it produces can be read.



Neural Networks

An understanding of how the machine mimics the way a human brain processes information

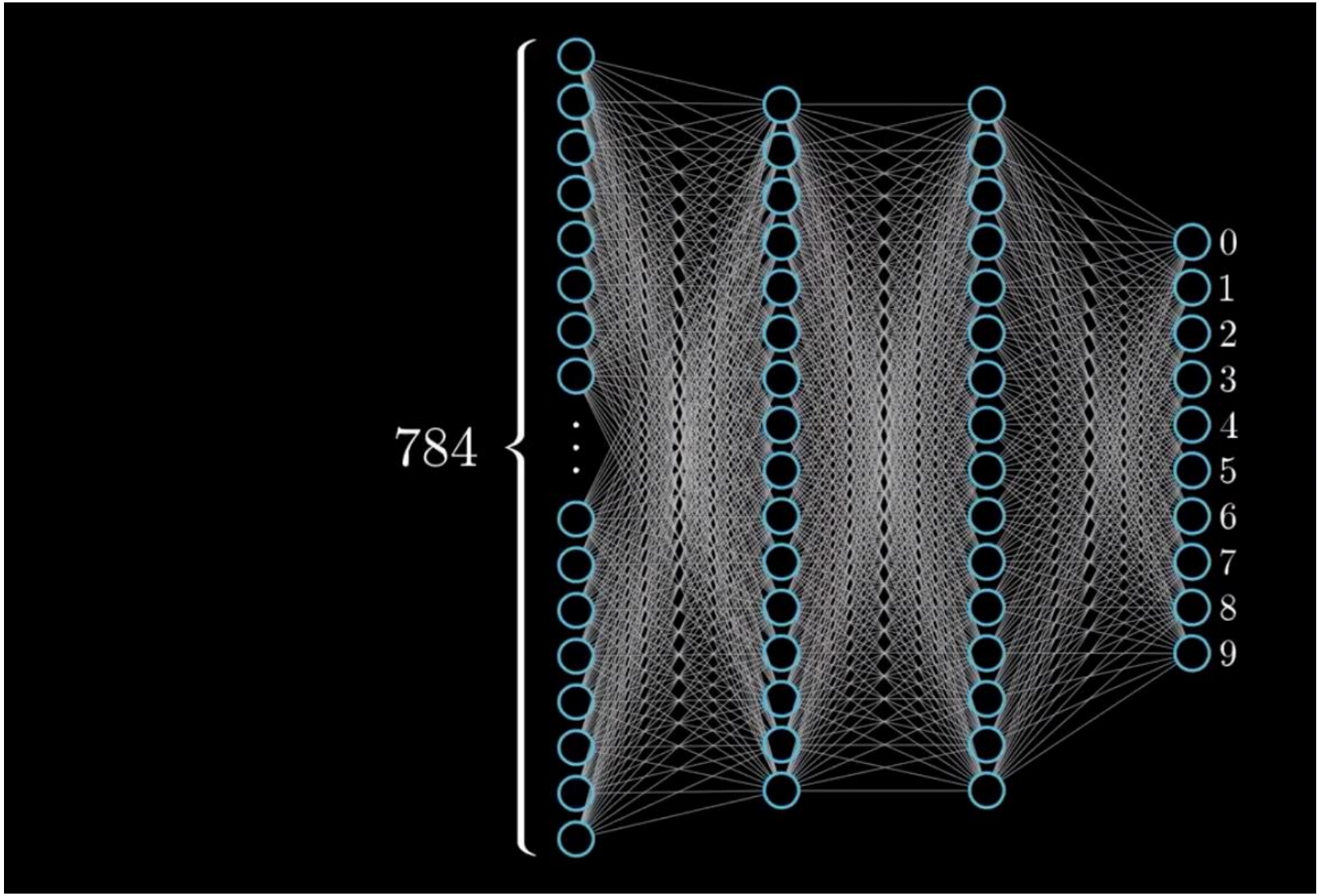


Neural Networks

An understanding of how the machine mimics the way a human brain processes information

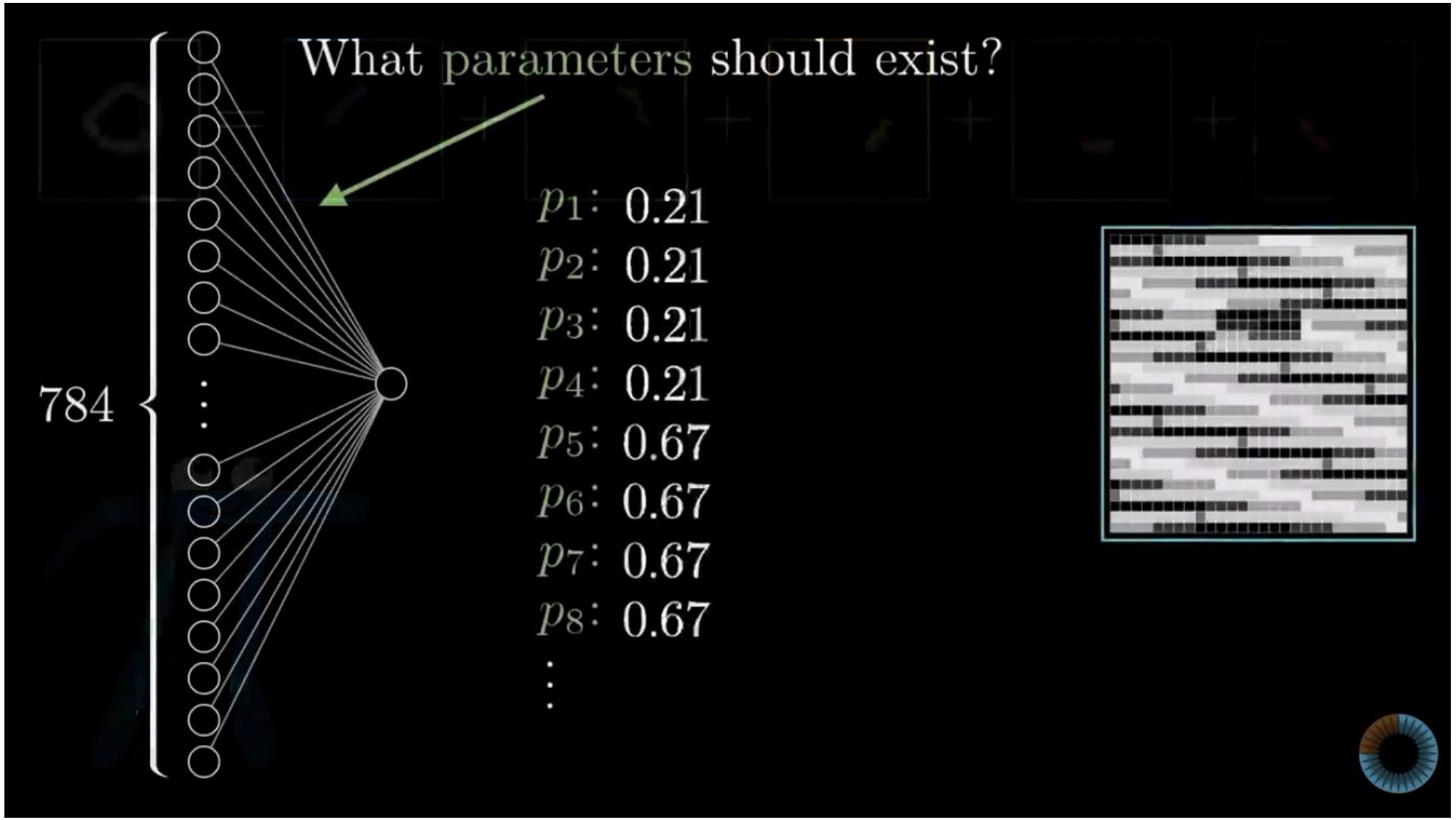
28 pixels

28 pixels



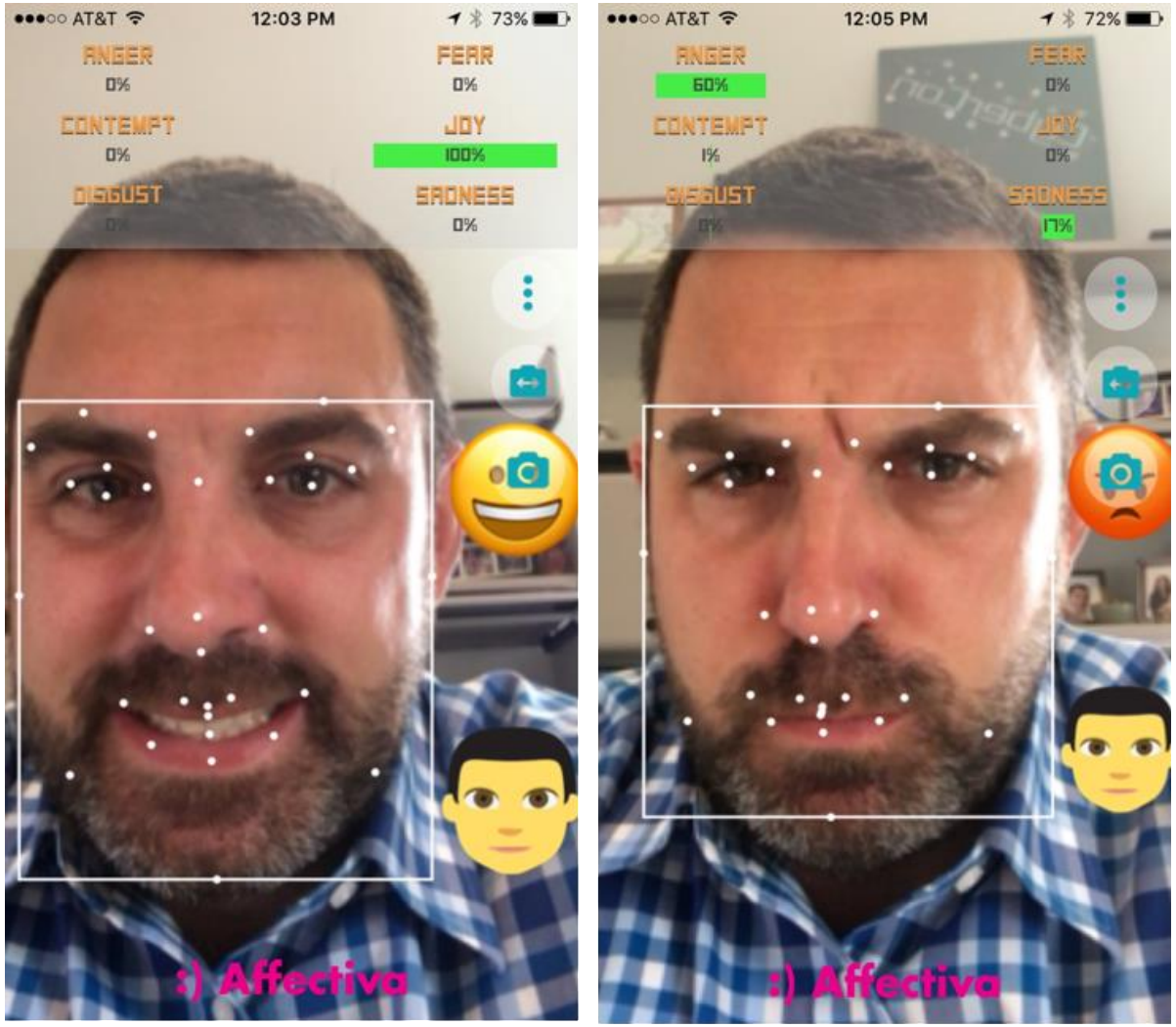
Neural Networks

An understanding of how the machine mimics the way a human brain processes information



Apply Facial Patter Recognition to Human Emotion

Subtle and nuanced patterns require significant ”learning” by a neural network



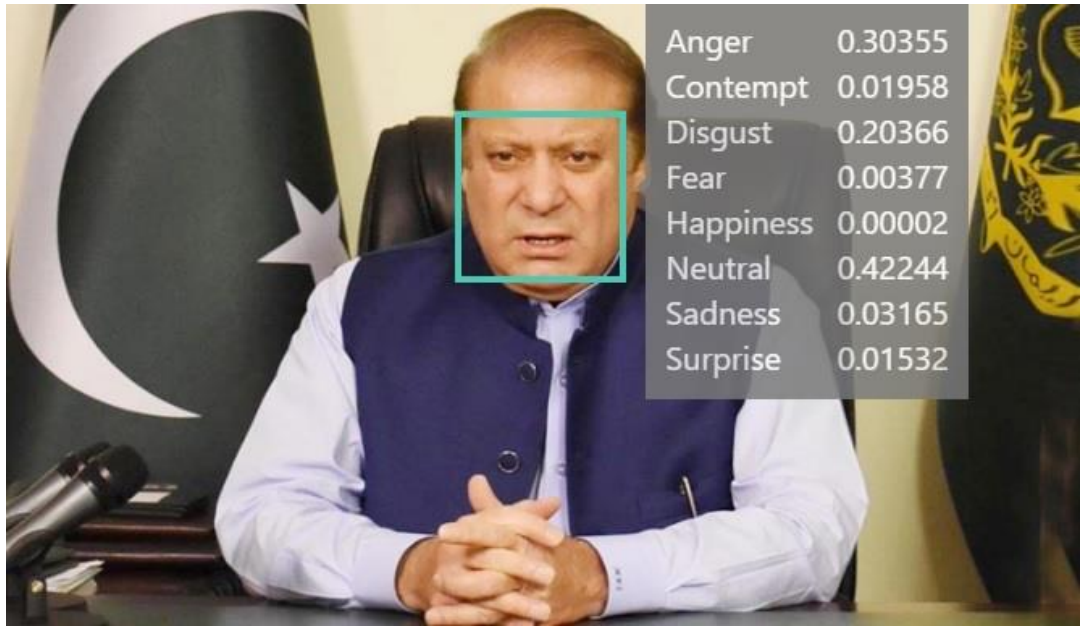
Happiness

Anger

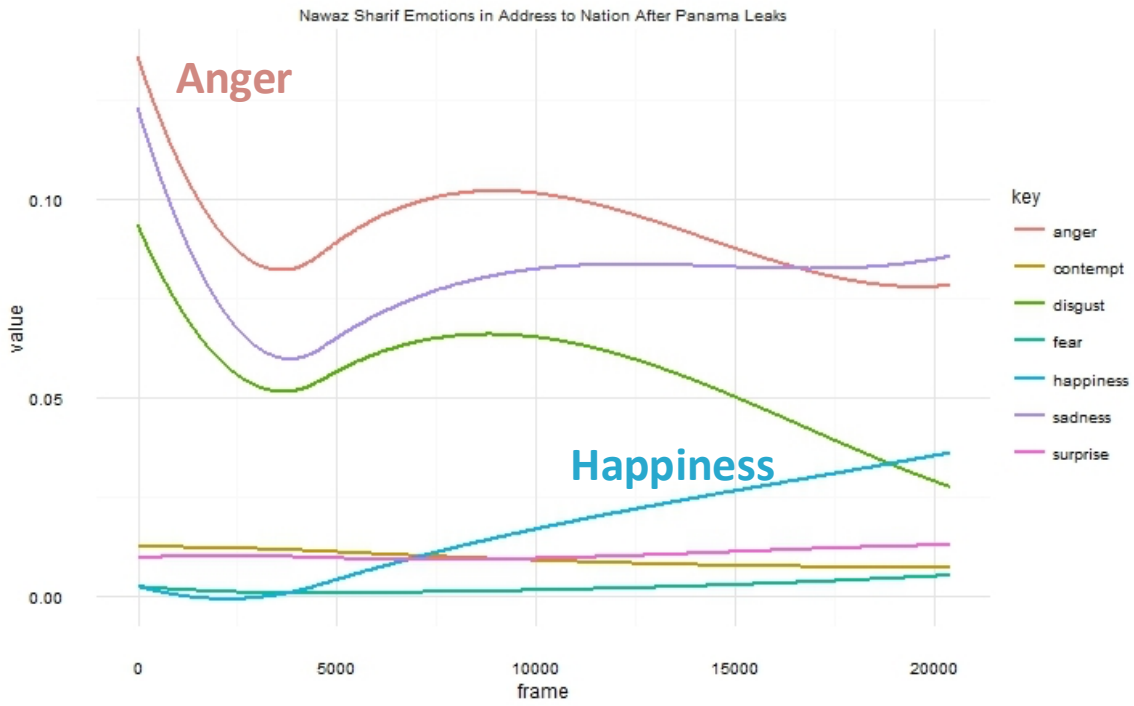
Example: Emotion Recognition

Applying Neural networking to understand emotion in video

Applying Face Emotion Recognition API Technology to Video of Nawaz Sharif's Address to Nation after Panama Paper



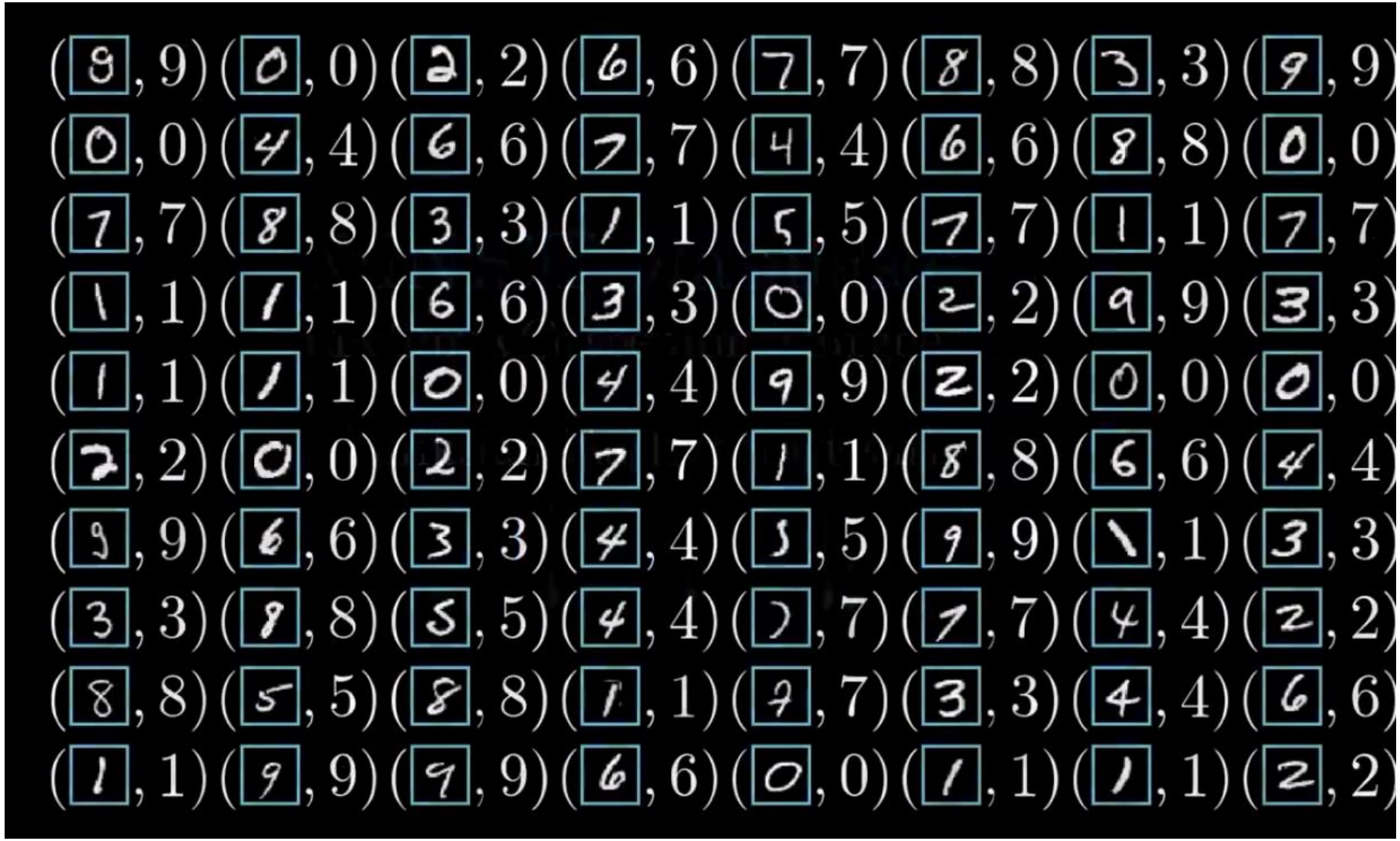
Former Pakistan Prime Minister



The Microsoft Emotion API is based on state of the art research from Microsoft Research in computer vision and is based on a Deep Convolutional Neural Network model trained to classify the facial expressions of people in videos and images.

Utilizing Neural Networking

Getting quality results for your business question with reasonable cost spend



MNIST Database

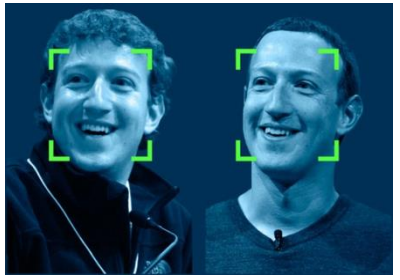
MNIST database: http://yann.lecun.com/exdb/mnist/

Where To Get Data

There are opportunities to mine data from open sources

If You Needed Facial images with Age Progression

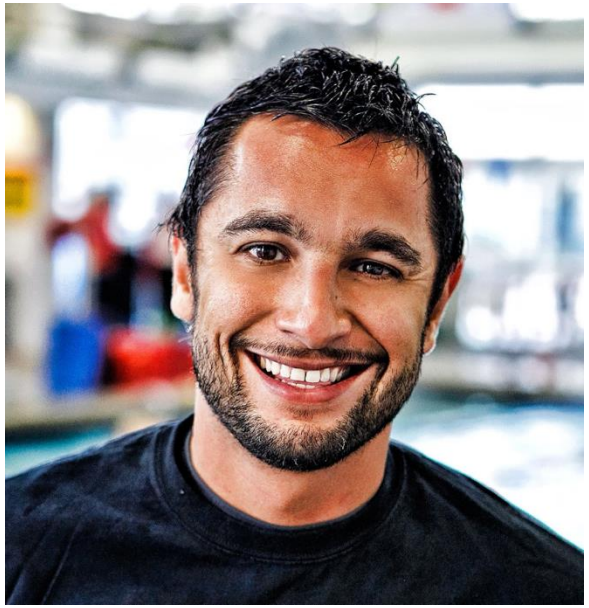
Train: How will people look when they are older?
Needed: Lots of people-at 10 years apart (any 10 year set of age)
Funding Source: Age-specific Ad targeting



Where To Get Data

There are opportunities to mine data from open sources

Results from age progression code

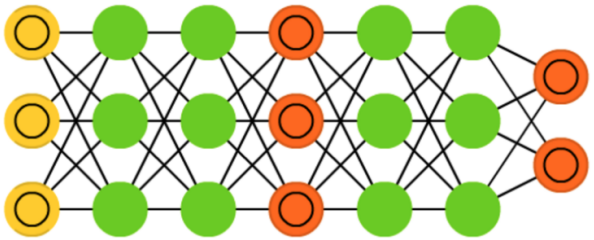


Neural Network Types

Summary Chart

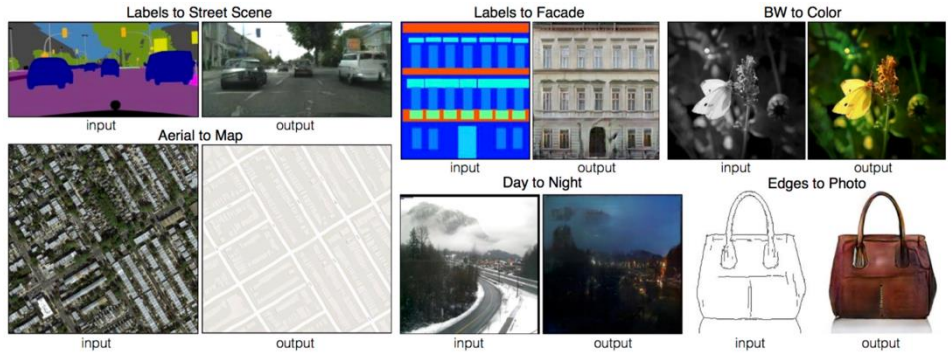
https://towardsdatascience.com/the-mostly-complete-chart-of-neural-networks-explained-3fb6f2367464

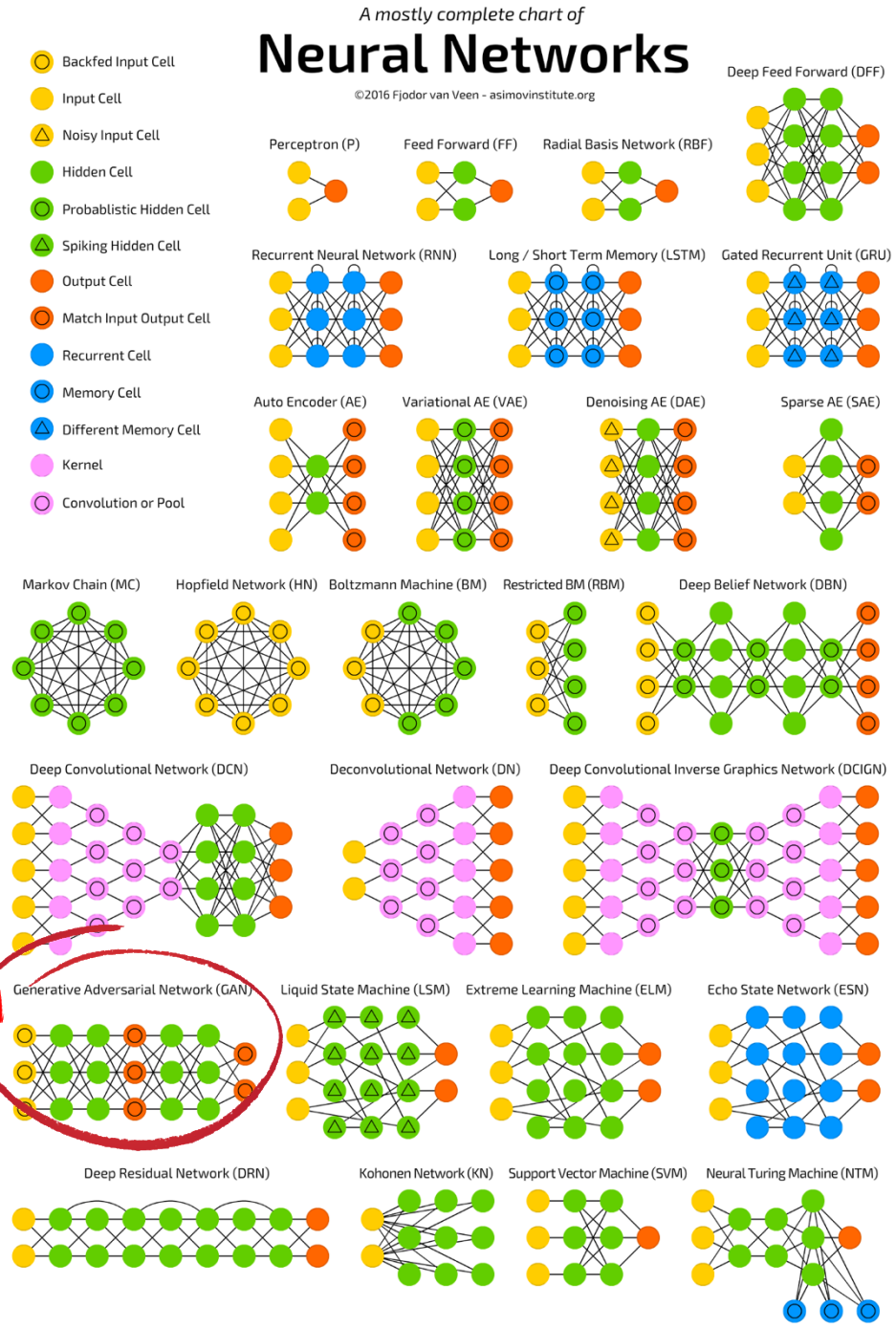
Generative Adversarial Network (GAN)



GAN represents a huge family of double networks, that are composed from generator and discriminator. They constantly try to fool each other — generator tries to generate some data, and discriminator, receiving sample data, tries to tell generated data from samples. Constantly evolving, this type of neural networks can generate real-life images, in case you are able to maintain the training balance between these two networks.

pix2pix is an excellent example of such approach.





AI Impact on You

Dramatic technology changes & its effect on global markets/business

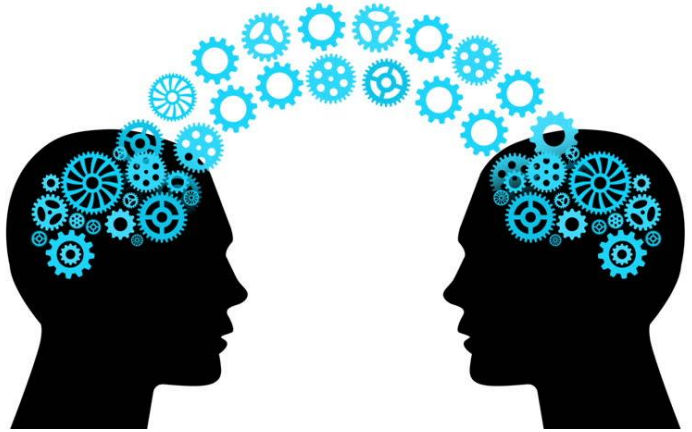
Disclaimer

This presentation is for informational end educational purposes only. I am not a financial advisor, and nothing in this presentation presented either visually or verbally should be considered financial advice. The content shared reflects my open interpretations, strategies and market observations. Always do your own research and consulting with a licensed financial professions before making any investment decisions. Trading involves risk, and past performance is not indicative of future results.

AI and Market Impacts

Taking newly-gained AI knowledge and using it to your advantage

- What we can do to help SILL Members with this information
  - My parents
    - Ask: What is AI?
    - Check retirement portfolio every day



What is Happening in The Marketplace

Current conditions

- Race to create the best algorithms
- Build at all costs now
- Winner takes all
  - Lesson from Internet boom.

- Compute now, pay later
  - Invest money to build/use data centers
  - Massive data center capacity expansion
    - Massive telecom fiber optic cable expansion in the internet boom (90's)
    - WorldCom/MCI bankruptcy 2002
    - Years of "dark fiber"

The Market Players

What organizations are accelerating the AI market and its effect on industries

ANTHROP\C

Claude

OpenAI

ChatGPT

Google Gemini

amazon

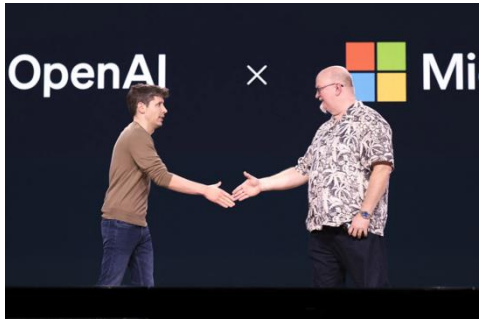
Microsoft

Meta

NVIDIA

ORACLE CLOUD Infrastructure

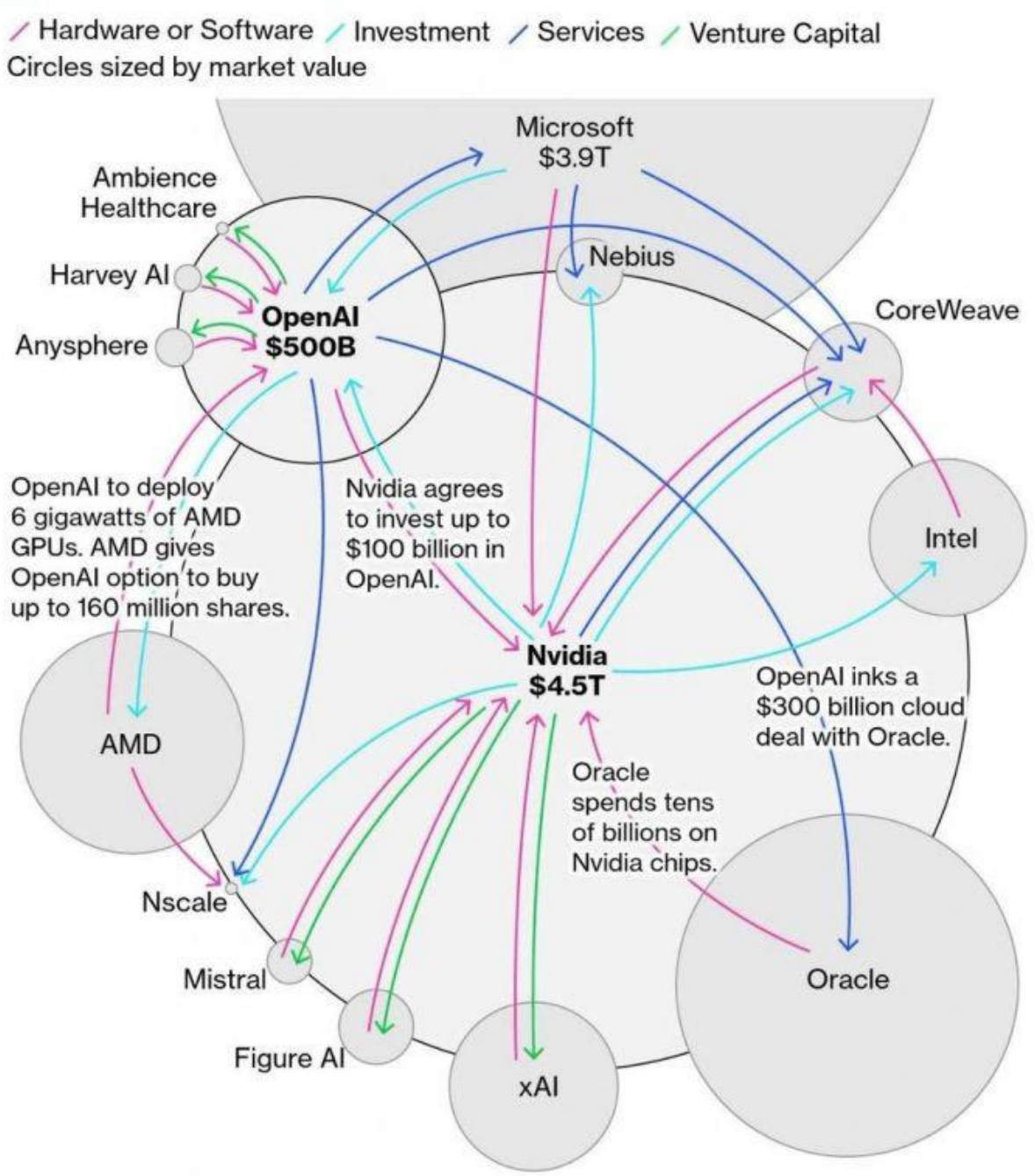
NVIDIA



Circular Investments

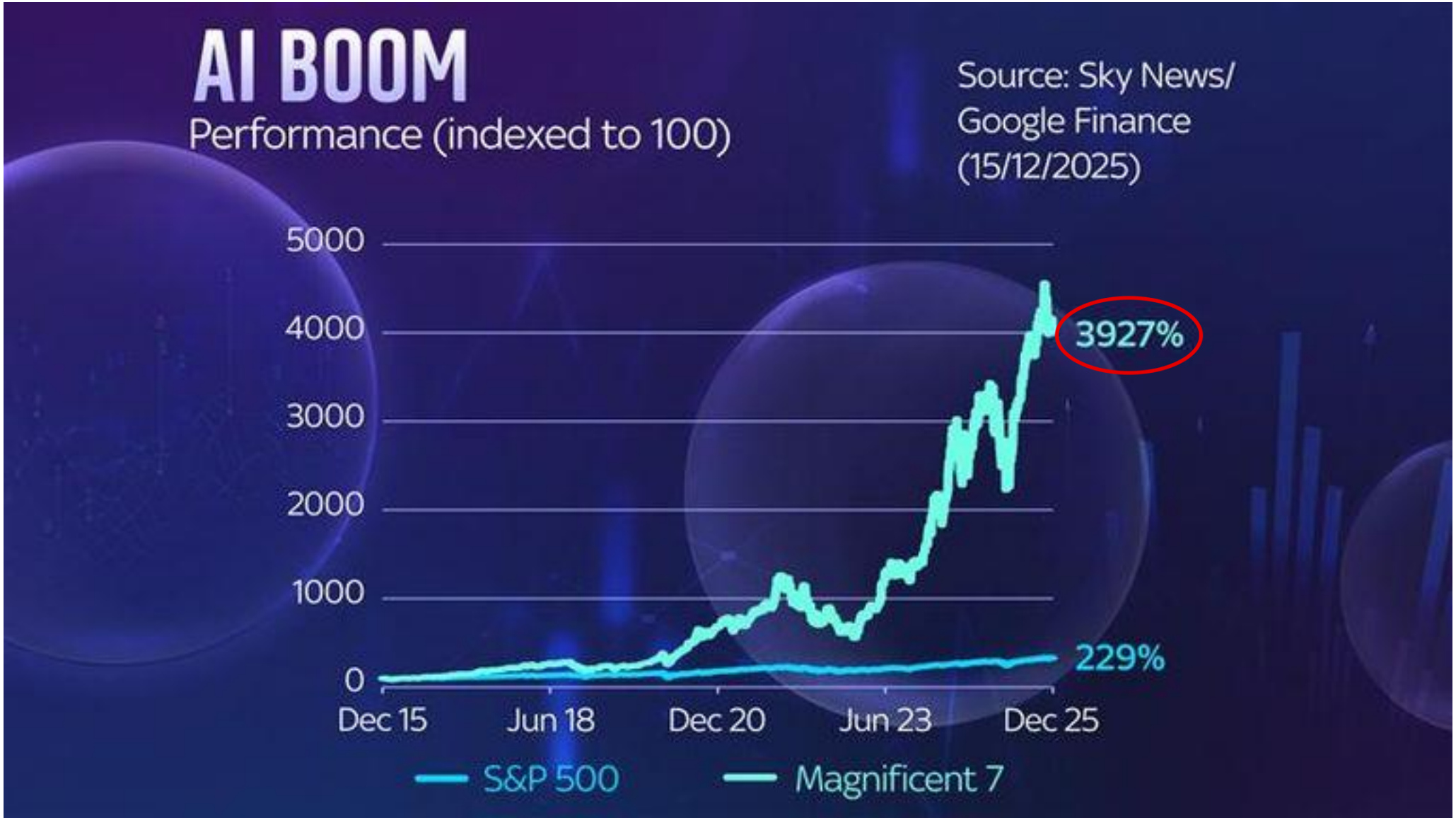
Audit/reporting concerns

Reduces investor clarity for these firms



AI Focused Firms Have Outperformed The Market

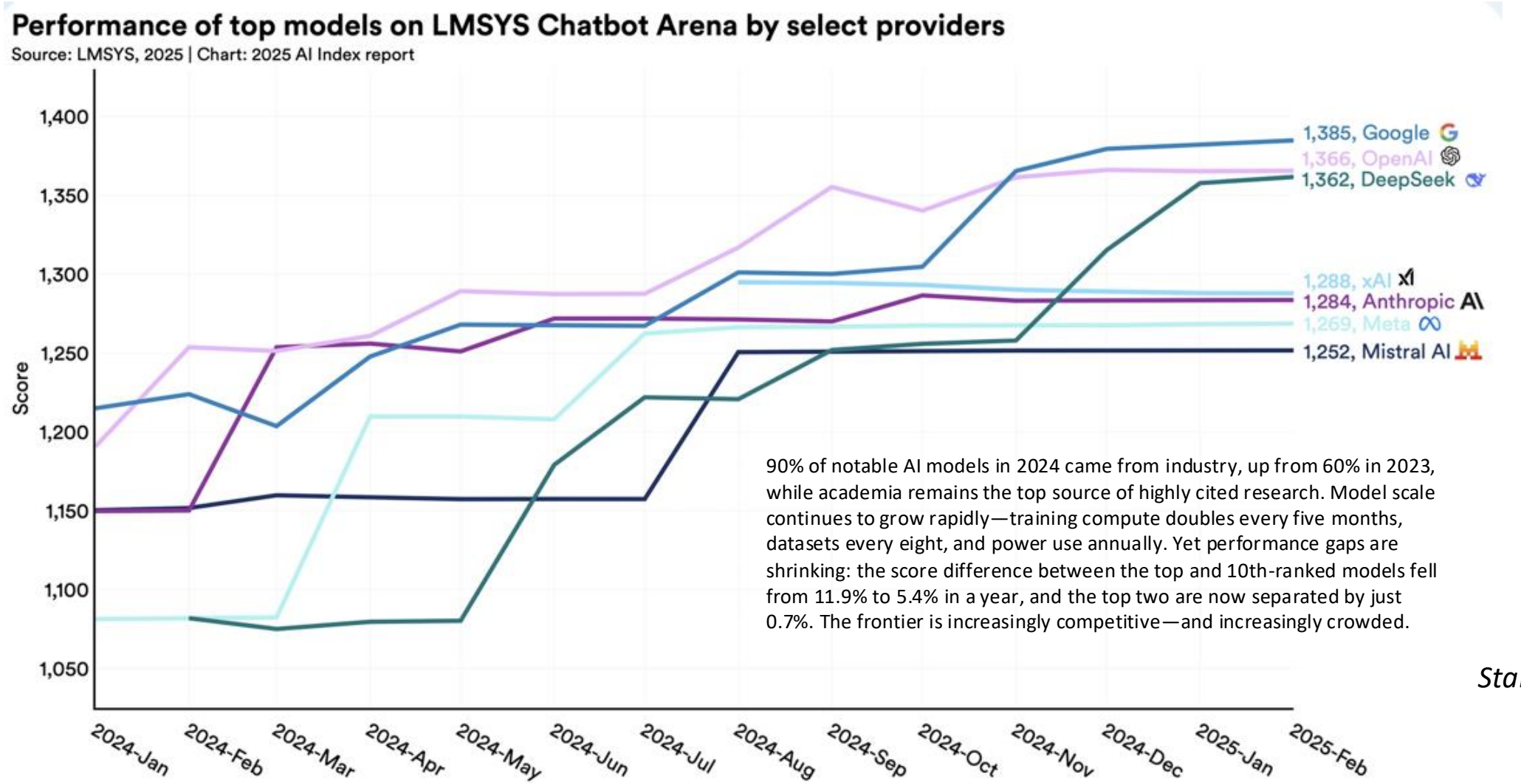
Significant returns from seven firms have skewed market results for the S&P 500



AI Performance Gap is Shrinking

Key player advantages are becoming less pronounced

Industry is racing ahead in AI —but the differences are less pronounced.

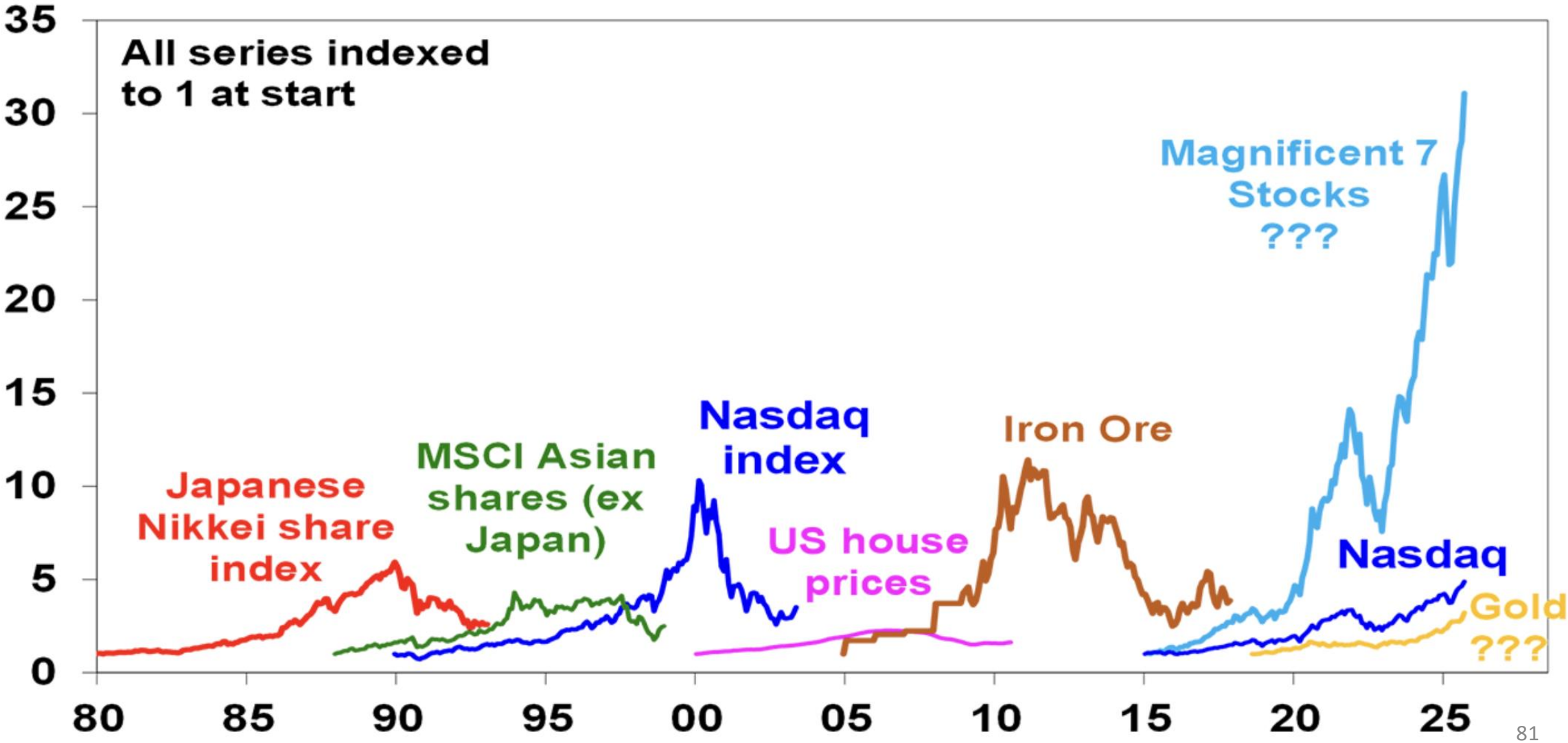


90% of notable AI models in 2024 came from industry, up from 60% in 2023, while academia remains the top source of highly cited research. Model scale continues to grow rapidly—training compute doubles every five months, datasets every eight, and power use annually. Yet performance gaps are shrinking: the score difference between the top and 10th-ranked models fell from 11.9% to 5.4% in a year, and the top two are now separated by just 0.7%. The frontier is increasingly competitive—and increasingly crowded.

Stanford AI Center

Possible Global Asset Bubbles since 1980

Historical perspective on asset valuations over time



Price/Earnings Ratios

Comparison to market capitalization and market share

		Market cap (billion US dollars)	Market share (%)	P/E ratio	12-month forward P/E ratio
September 2025	Nvidia	4397	7.0	58	35
	Microsoft	3904	6.2	39	34
	Apple	3234	5.2	30	28
	Amazon	2341	3.7	34	31
	Alphabet	2395	3.8	21	19
	Meta	1934	3.1	28	28
	Broadcom	1419	2.3	113	39
	Tesla	1044	1.7	187	159
	Oracle	705	1.1	58	36
	Palantir	419	0.7	646	253

March 9, 2026, P/E is 221

S&P 500 Tracking Funds

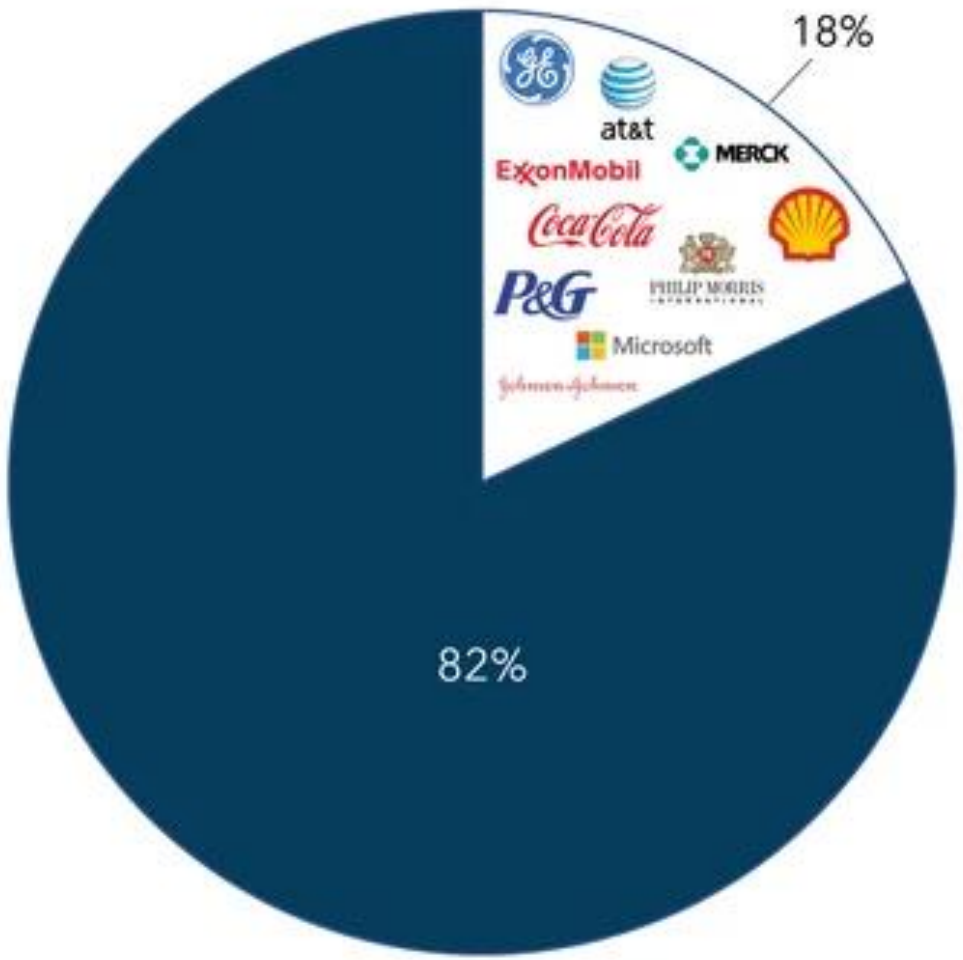
Largest tracking funds commonly invested in

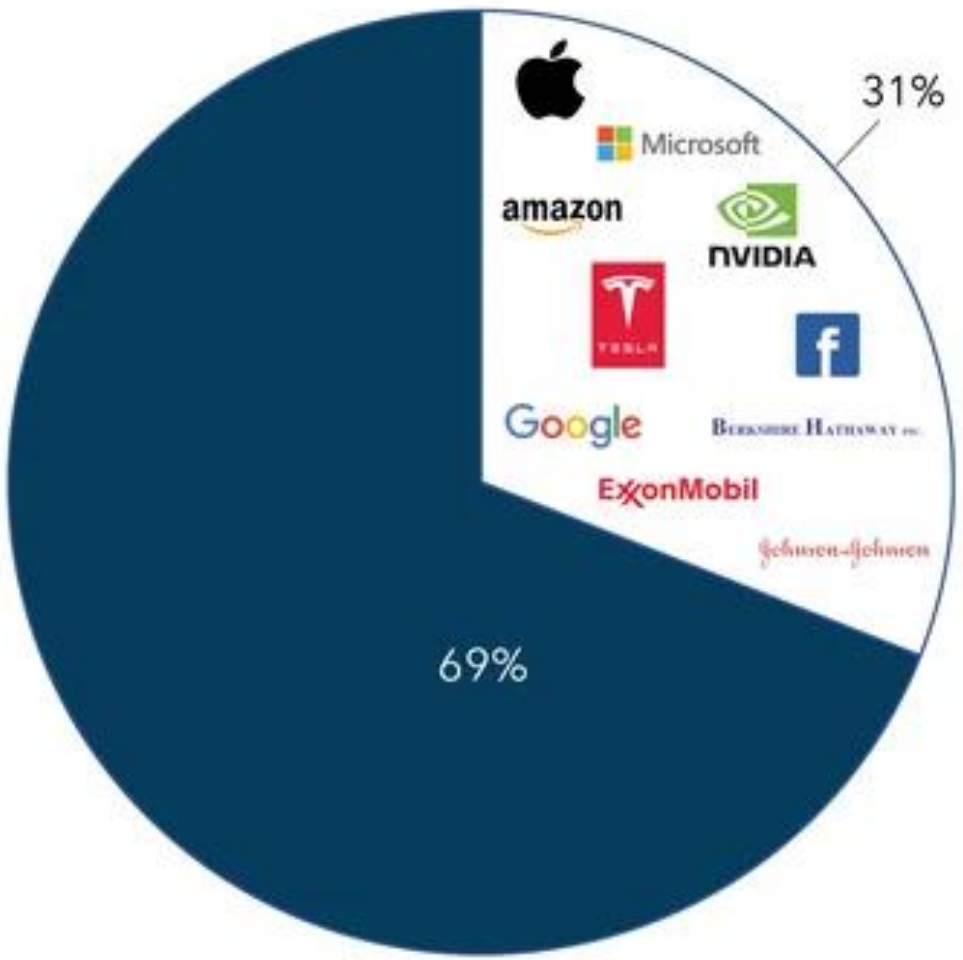
Provider	Symbol	Fee	10-year average return
Fidelity INVESTMENTS	FXAIX	0.015%	13.34%
charles SCHWAB	SWPPX	0.02%	13.30%
Vanguard	VFIAX	0.04%	13.31%
STATE STREET GLOBAL ADVISORS	SPLG	0.02%	13.29%
Vanguard	VOO	0.03%	13.31%
iShares by BLACKROCK	IVV	0.03%	13.31%

As of early 2024, approximately **65%** of assets in U.S. large-cap equity funds (which are primarily measured against the S&P 500) are in **passive tracking funds**

S&P 500 Large Capitalization Percentage

Technology firms have taken a significant percentage of total S&P 500 valuation





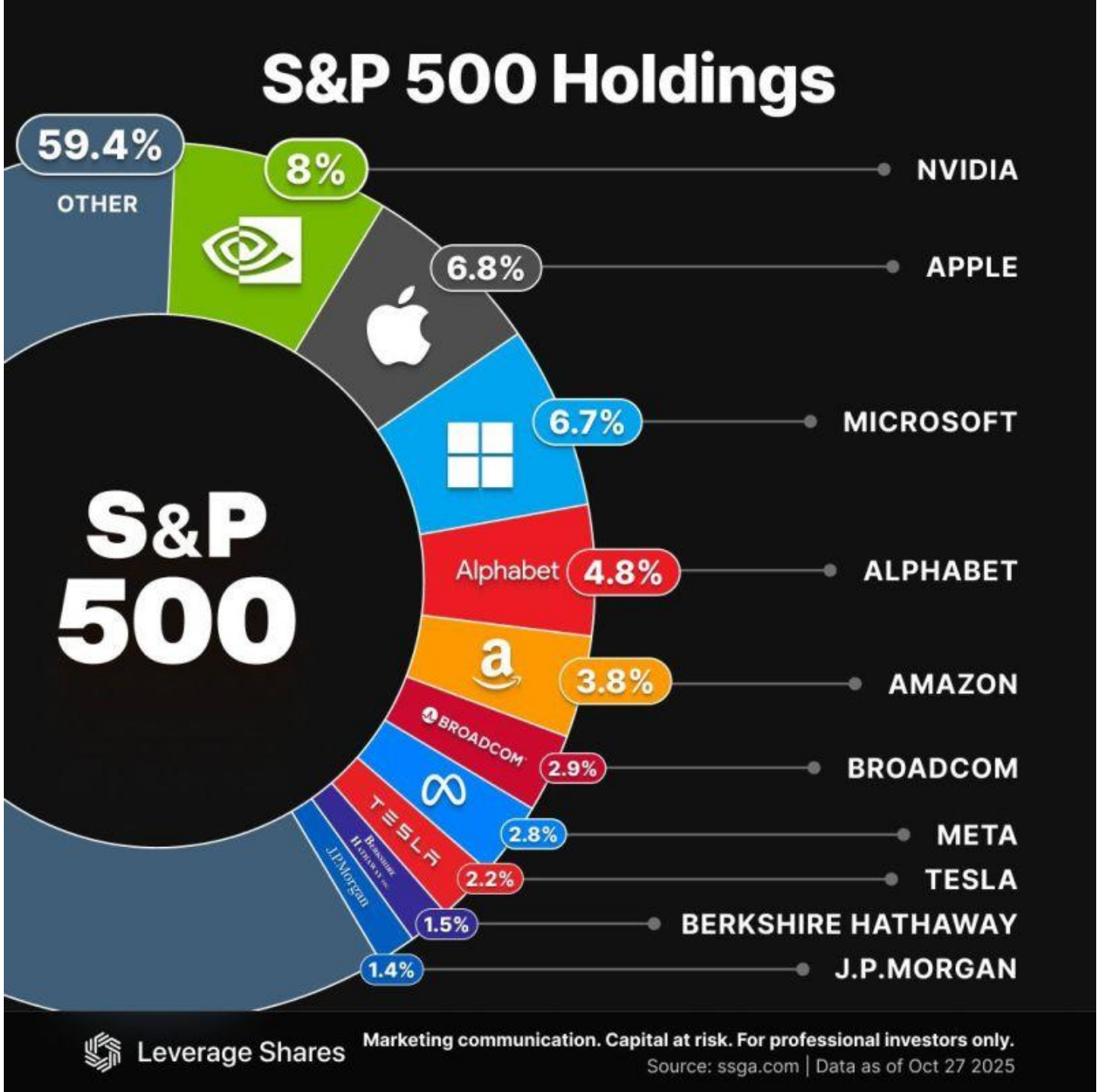
Tech Influence

Tech weighting on the S&P 500

- 40% tech weighted
- 60% everything else

Note:

Berkshire has significant holdings in tech firms

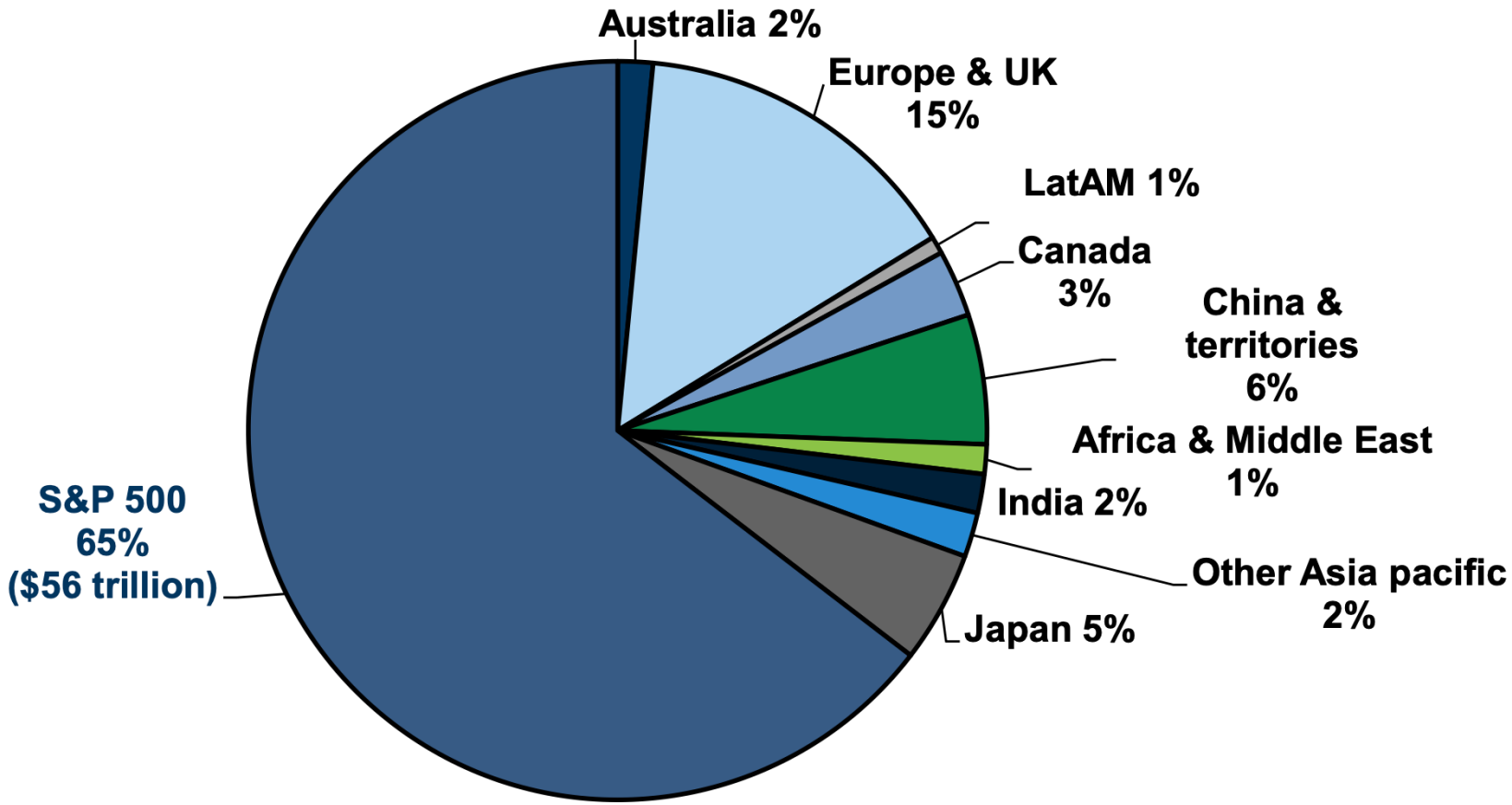


US Market

Goldman Sachs

Composition of the $87 trillion global equity market

The US market dominates global equities



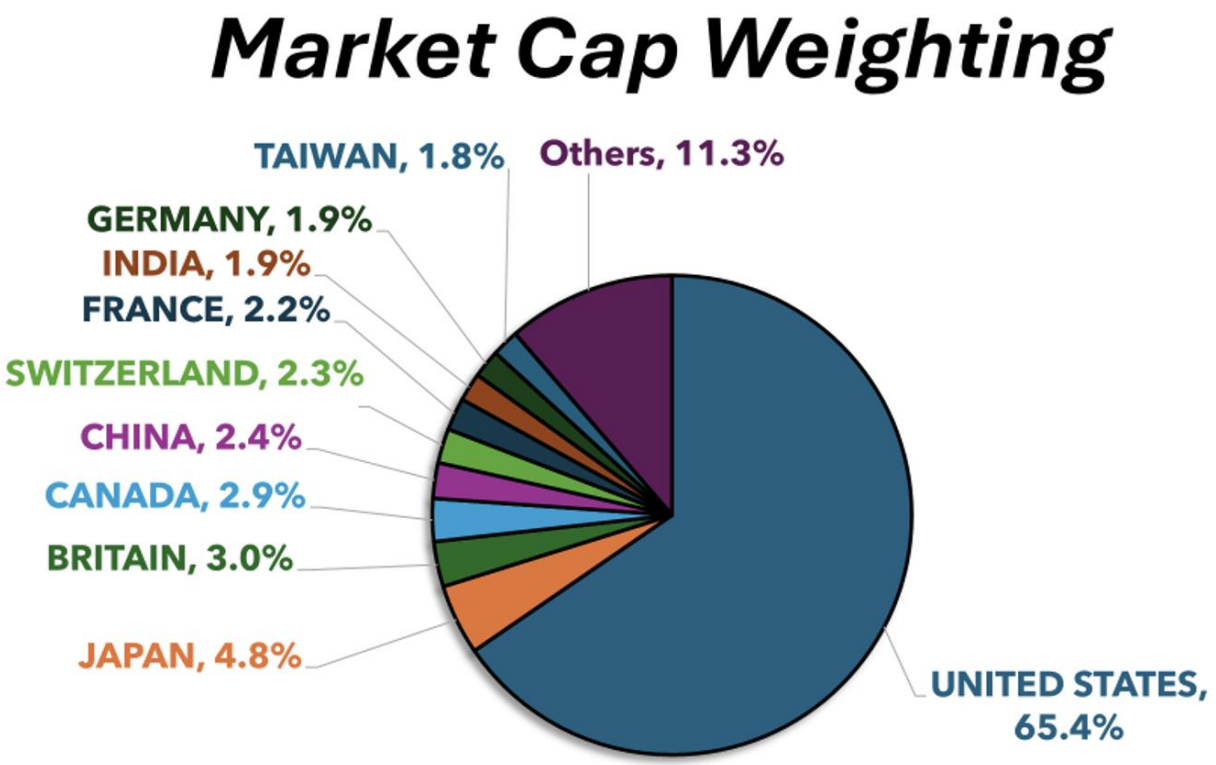
As of September 2025

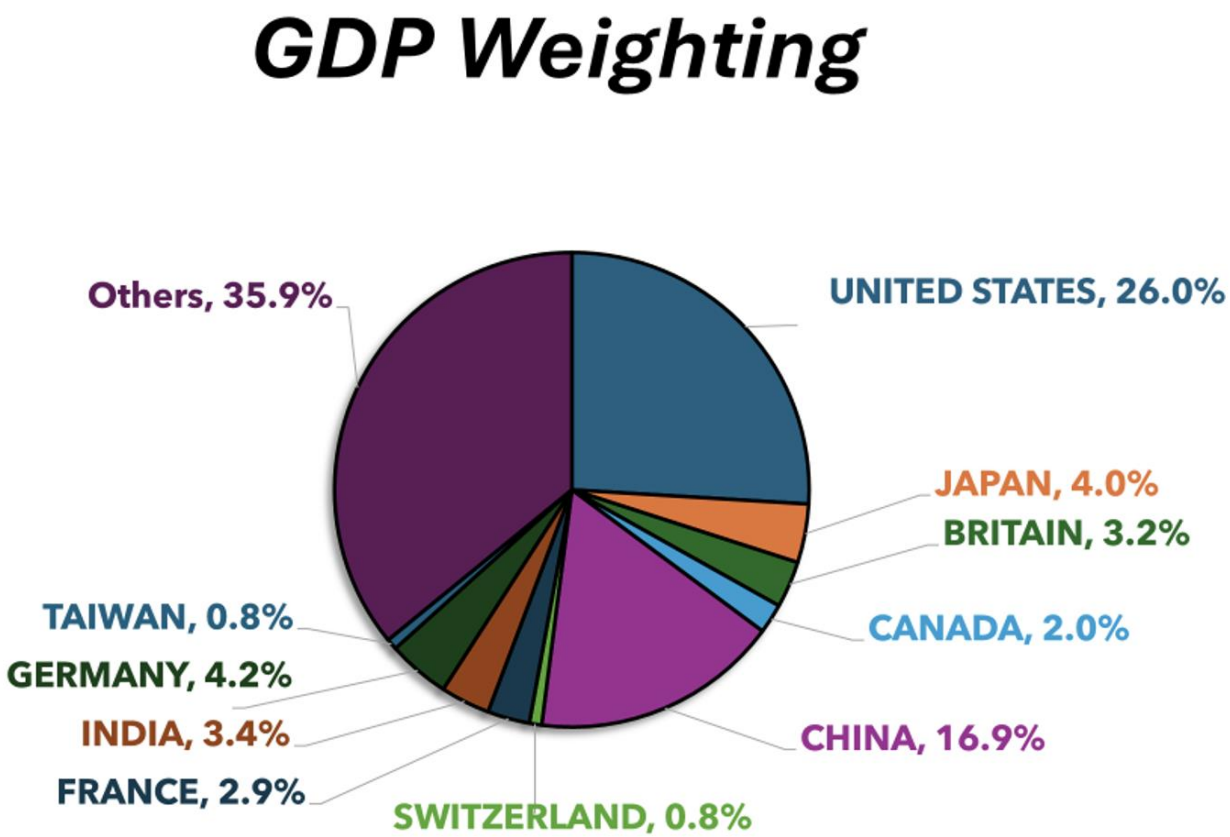
Navigation Pointe

Source: FactSet, Goldman Sachs Global Investment Research

US Market

The US market is outsized compared to its GDP on a global basis





AI In Stock Trading

How Artificial Intelligence is being used in the financial services sector for automated trading

What is AI Trading

- Uses machine learning, NLP (*natural language processing*) & big data for stock trading
- Analyzes vast data sets to make informed decisions
  - Potentially outperforming traditional trading methods

How Does It Work?

- Machine learning: Trains algorithm on large datasets to identify patterns
- Natural language processing (NLP): analyzes news, social media sentiment
- Big data analytics: Examines large datasets for hidden insights

AI Trading Benefits

- Improved risk management & strategy development
- Real-time analytics for better decision-making
- Potential for superior market trend prediction

The Everything Bubble

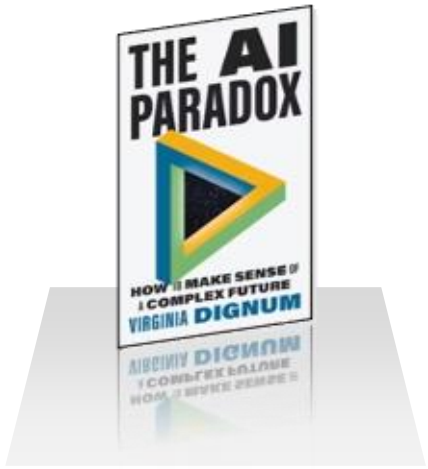
The concept of all major asset classes simultaneously overvalued to historic levels

- Stocks
- Bonds
- Real estate
- Cryptocurrencies

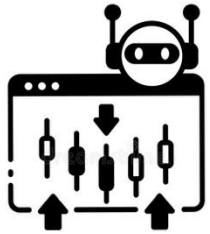
Intelligence Paradox (Investing)

The AI-Driven Inefficiency hypothesis

- Homogenization of Investment Strategy (“AI Groupthink”)
- Amplified Volatility & Flash Crashes
- The AI “Black Box” Concern
- Overfitting to Past Data
- Disconnect from actual firm fundamentals (mispriced)



Virginia Dignum
AI Researcher



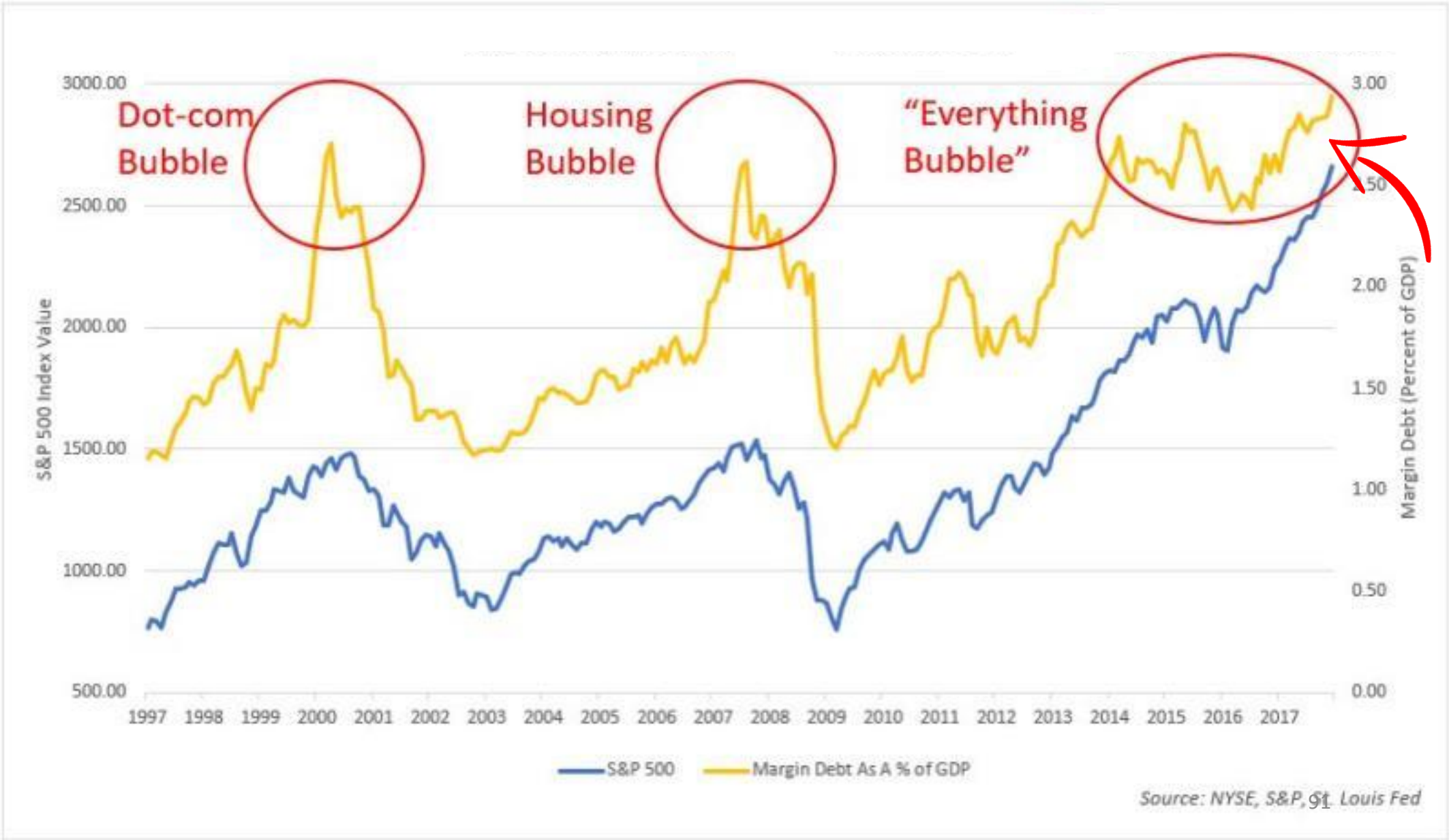
Robot Trading

Dogecoin

The theory that AI investing makes financial markets inefficient—often termed the "intelligence paradox" or "AI-driven inefficiency" hypothesis—suggests that while artificial intelligence can analyze data faster than humans, its widespread adoption leads to homogenized strategies, herd behavior, and increased volatility, ultimately destabilizing the market. Instead of creating a perfectly efficient market, the reliance on similar, opaque AI models can create artificial, "fragile" environments prone to flash crashes

S&P500 vs. NYSE Margin Debt As A % of GDP

Bubbles



Global Debt Concern

Highest in history

- Excess capital hangover from pandemic monetary injections
- Artificially low interest rates for an extended period prior to the pandemic
  - Easy credit
- AI "land grab"
  - Mind share
  - Market share
  - At any cost (debt)
    - Pay now, win (market leader) later

The Everything Bubble

A possible looming systemic crisis of speculation, stagflation, and debt

Three interlocking forces:

1. Massive tech (AI & crypto) investments and capital flows
   - Reminiscent of the 1999
2. Sticky inflation with slowing growth
   - Reminiscent of the 1970's

3. A debt overhang rivaling 2008
   - Sovereign debt
   - Corporate debt
   - Household debt

Open Discussion

An invitation to discuss and share my interpretation of market impacts

Thank you

Your engagement and participation has been greatly appreciated

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Session Guide

Facilitating our offsite growth plan discussion

Session Guide

Management Consultant & Professor

Navigation Pointe
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- Corporate Strategy
- Strategic Planning
- Technology Program Development
- Organizational Management
- Venture Capital Investment
- Emerging Technologies
- New Market Development
- Partnership Alliances
- Corporate Communications
- Marketing Analytics
- ERP Systems/Software
- Cloud Computing
- Big Data Analytics
- Social Media
- Mobile
- Machine Learning
- Artificial Intelligence
- Metaverse/AR/VR/XR

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