Artifical Intelligence

Learning Objectives

We are going to cover AI in this section:

1. Definitions of AI, ML, DL
2. Areas of application of AI
3. Effect of AI on society
4. Enhancements of AI
5. Machine Learning definition
6. Machine learning vs. statistical analysis
7. Types of machine learning - Supervised, unsupervised, semi-supervised
8. Machine Learning Algorithms
9. Deep Learning

Is this course for me?

YES! - with every job you take or career move you make or people you interact with socially, AI and its applications are directly or indirectly going to keep coming up.

This course is designed to help you understand the basic concepts, get a working knowledge to understand AI, and for you to be successful in this data driven world of today, and moving forward…

So let’s get started :)

Artificial Intelligence, Machine Learning, Deep Learning - What are they?

Introduction:

Artificial Intelligence as it name says is based on the premise that the intelligence is not “real” or “human.” It is the intelligence possessed by machines, therefore “artificial.”

Machine and Deep learning are both subsets of AI.

Artificial Intelligence - Lets talk about this first…

Definition of Artificial Intelligence

As per the dictionary definition, Artifical Intelligence is:

“the capability of a machine to imitate human behavior.”

In other words, it basically refers to machines (computers) doing the work of human beings.

With every passing day, scope of AI and what jobs machines can do, is increasing.

Areas of application of Artificial Intelligence

- Image recognition
- Product analytics
- A/B testing
- Speech recognition
- Language translation
- Sentiment analysis
- Recommendation systems like on Amazon, Netflix, etc.
- Image reconstruction

Effect of AI on Society - Enhance Throughout & Efficiency

Self driving cars

Image source

Effect of AI on Society - Adds Jobs, Strengthens the Economy

HBO’s “Westworld “, Chatbots, - Frees
up humans to focus on interpersonal aspects of job and life

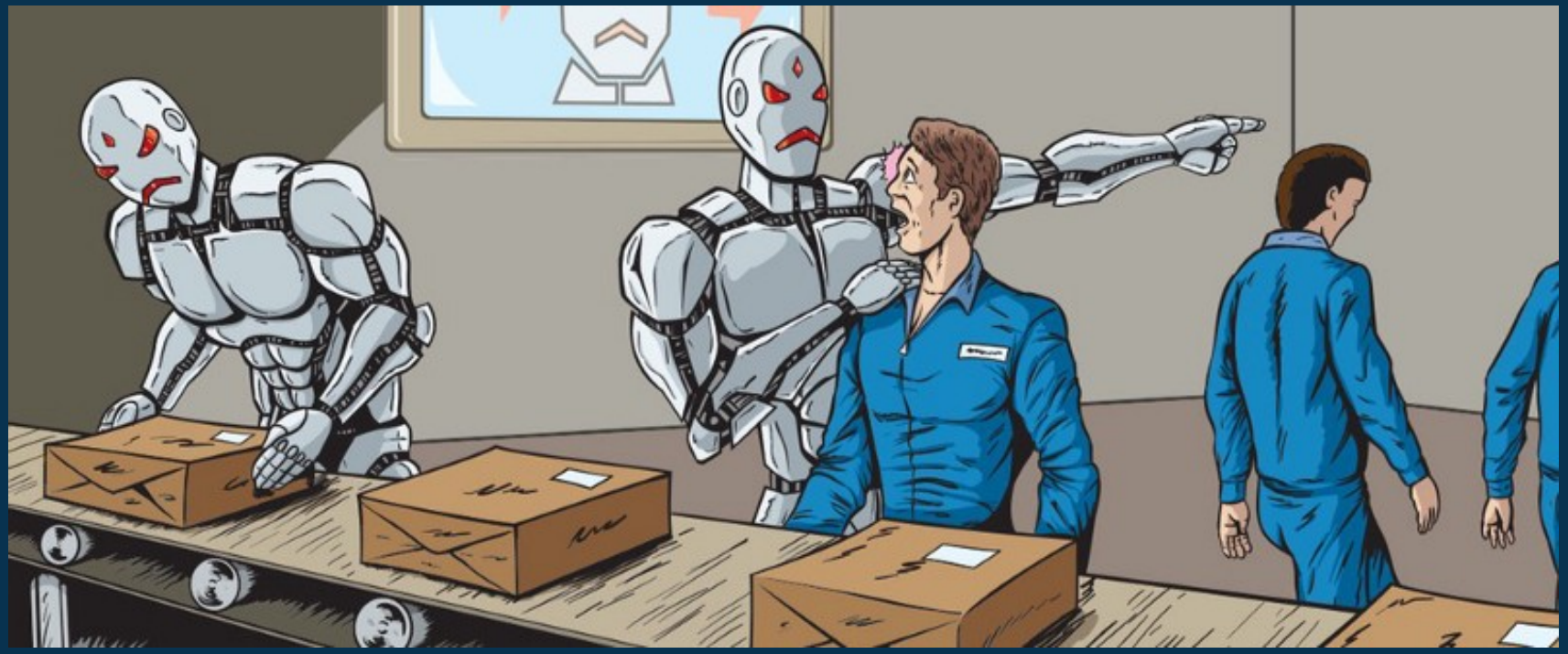
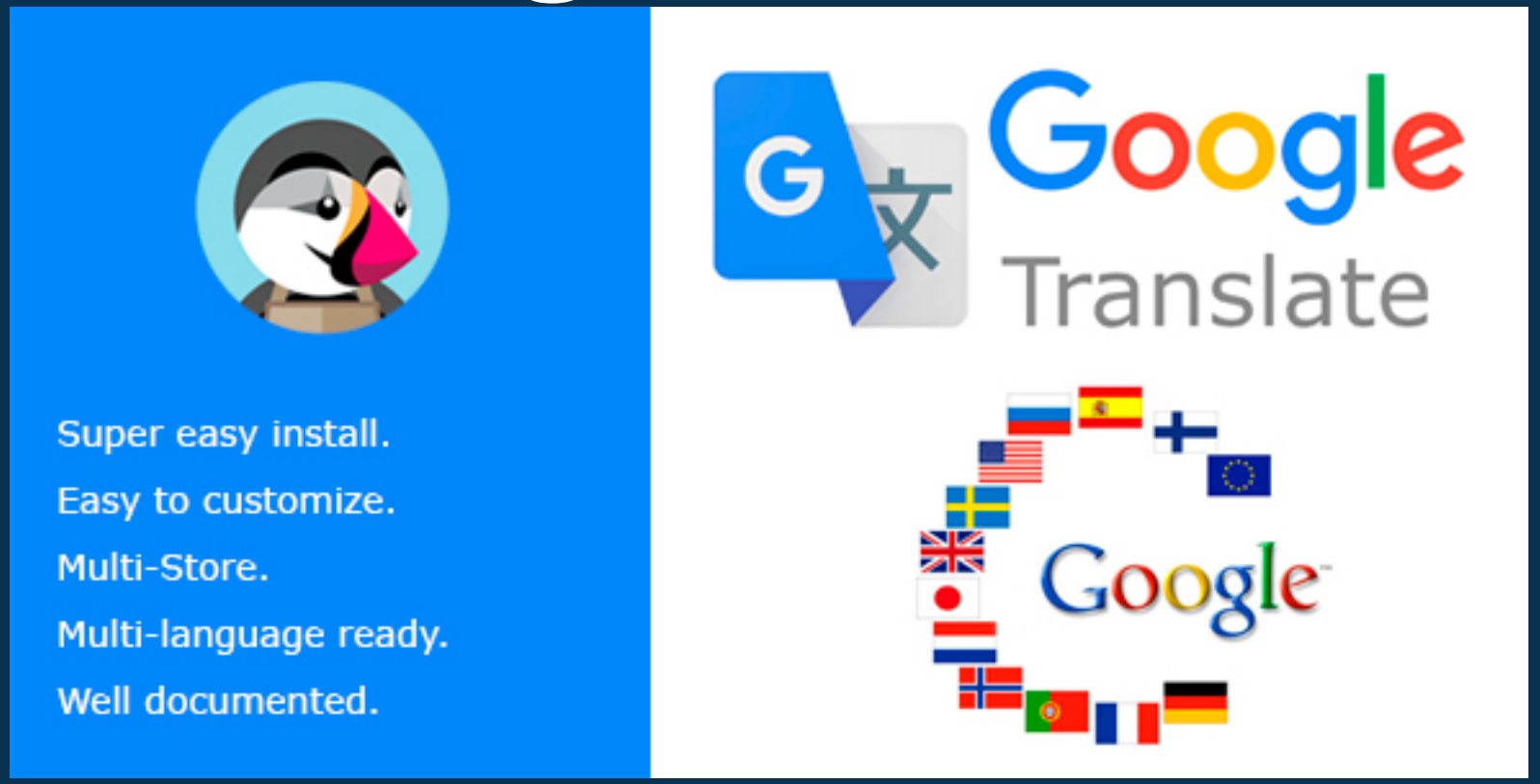


Image source

Effect of AI on Society - Frees Up Humans To Do What They Do Best

Google translate



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Effect of AI on Society - Enhance our Lifestyle

Smart Home Devices

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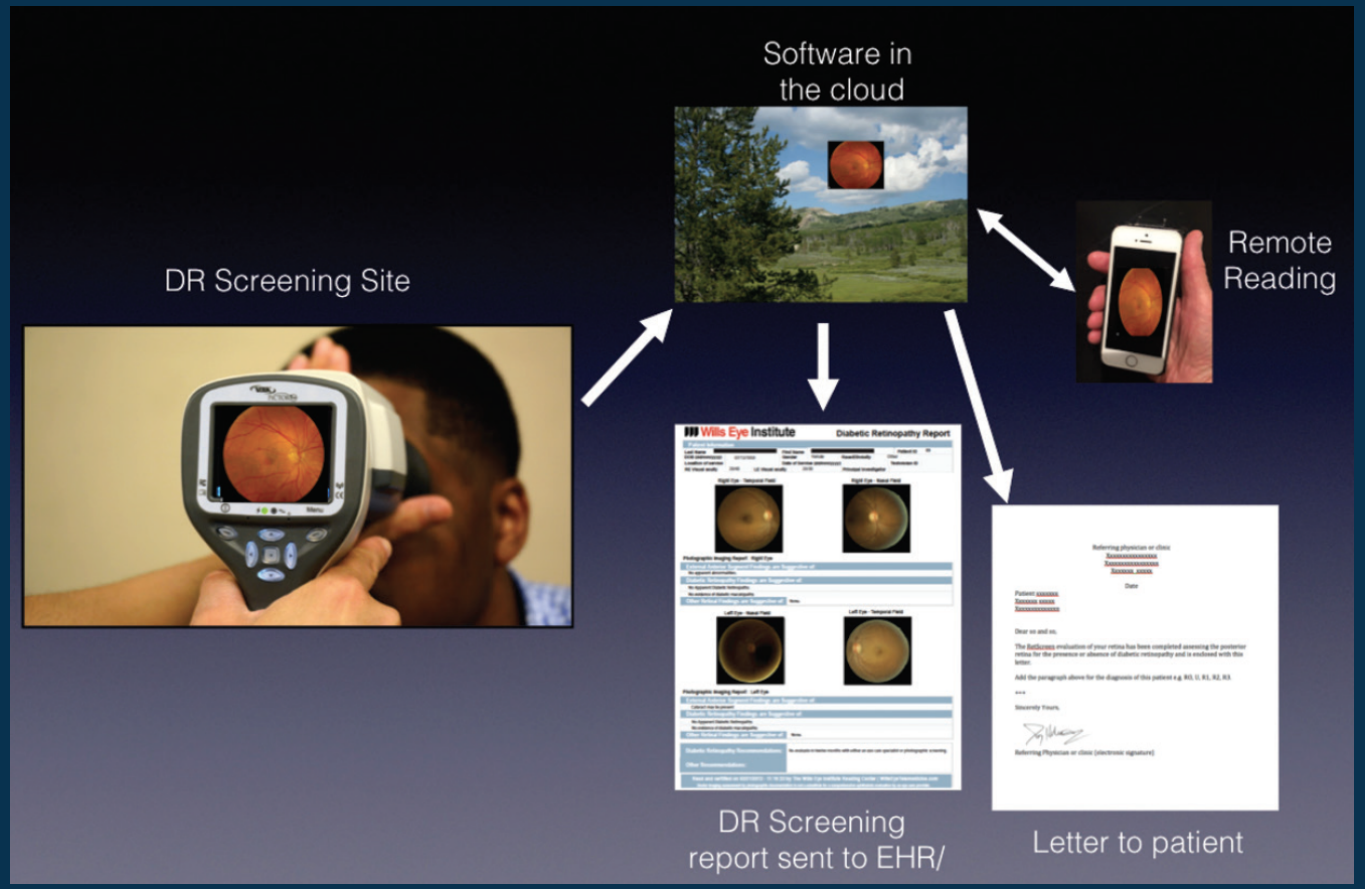
Effect of AI on Society - Supervises Learning For Telemedicine

Screening Software Platform



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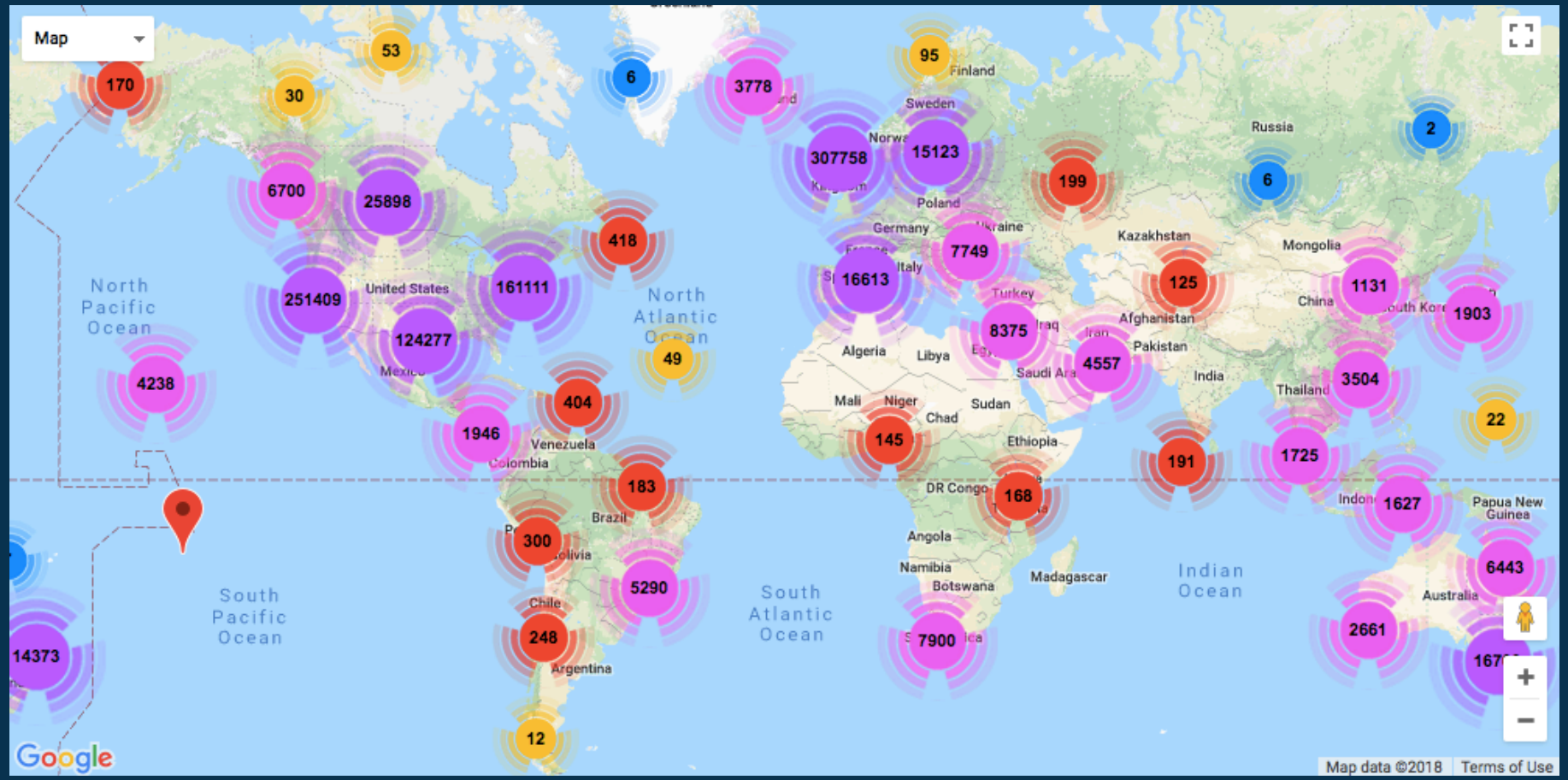
Effect of AI on Society - Creates Unintended And Unforeseen Consequences

Facebook’s newsfeed

[Image source]

Effect of AI on Society - Solves Complex Social Problems

Litterati



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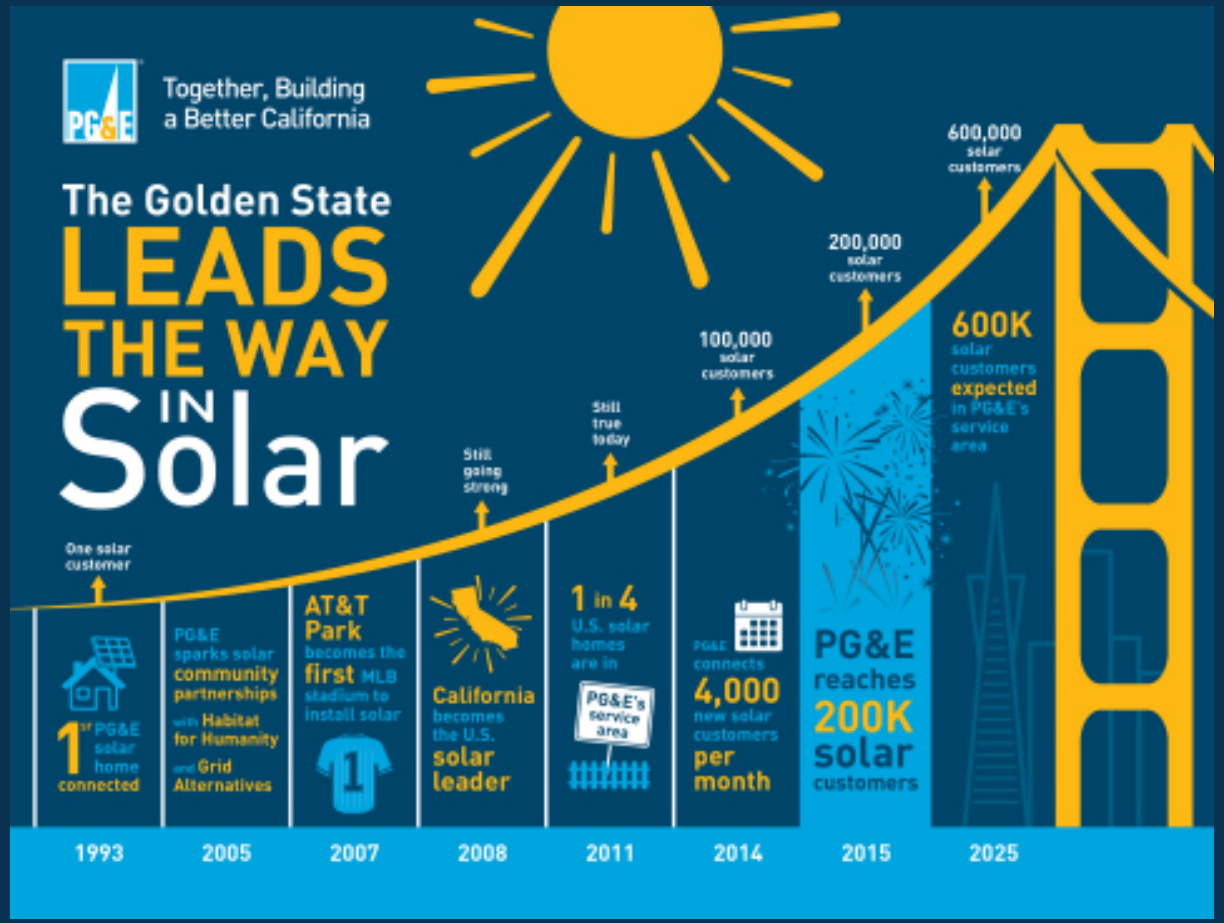
Effect of AI on Society - Improves Demand Side Management

PG&E



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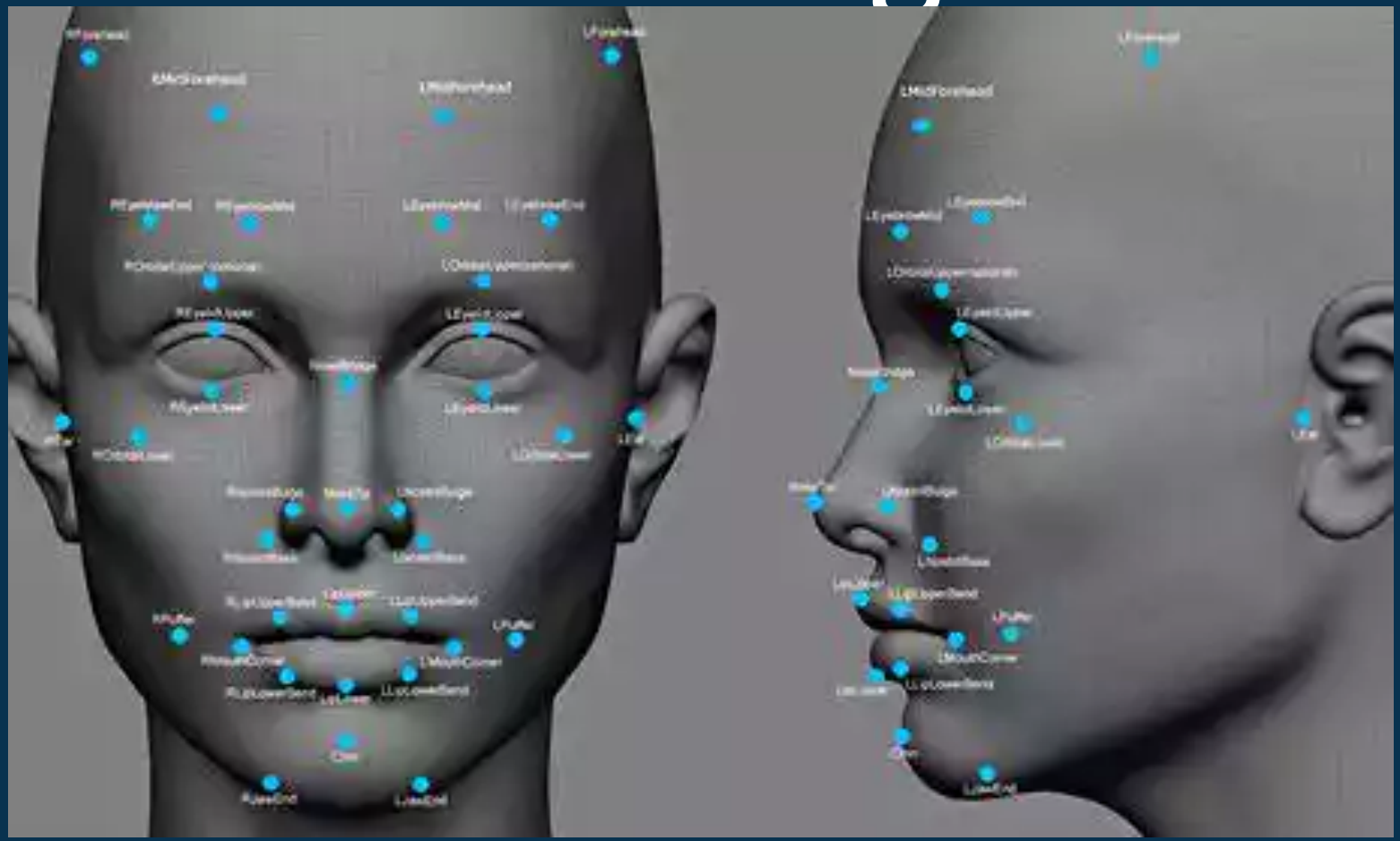
Effect of AI on Society - Benefits Multiple Industries

Facial Recognition



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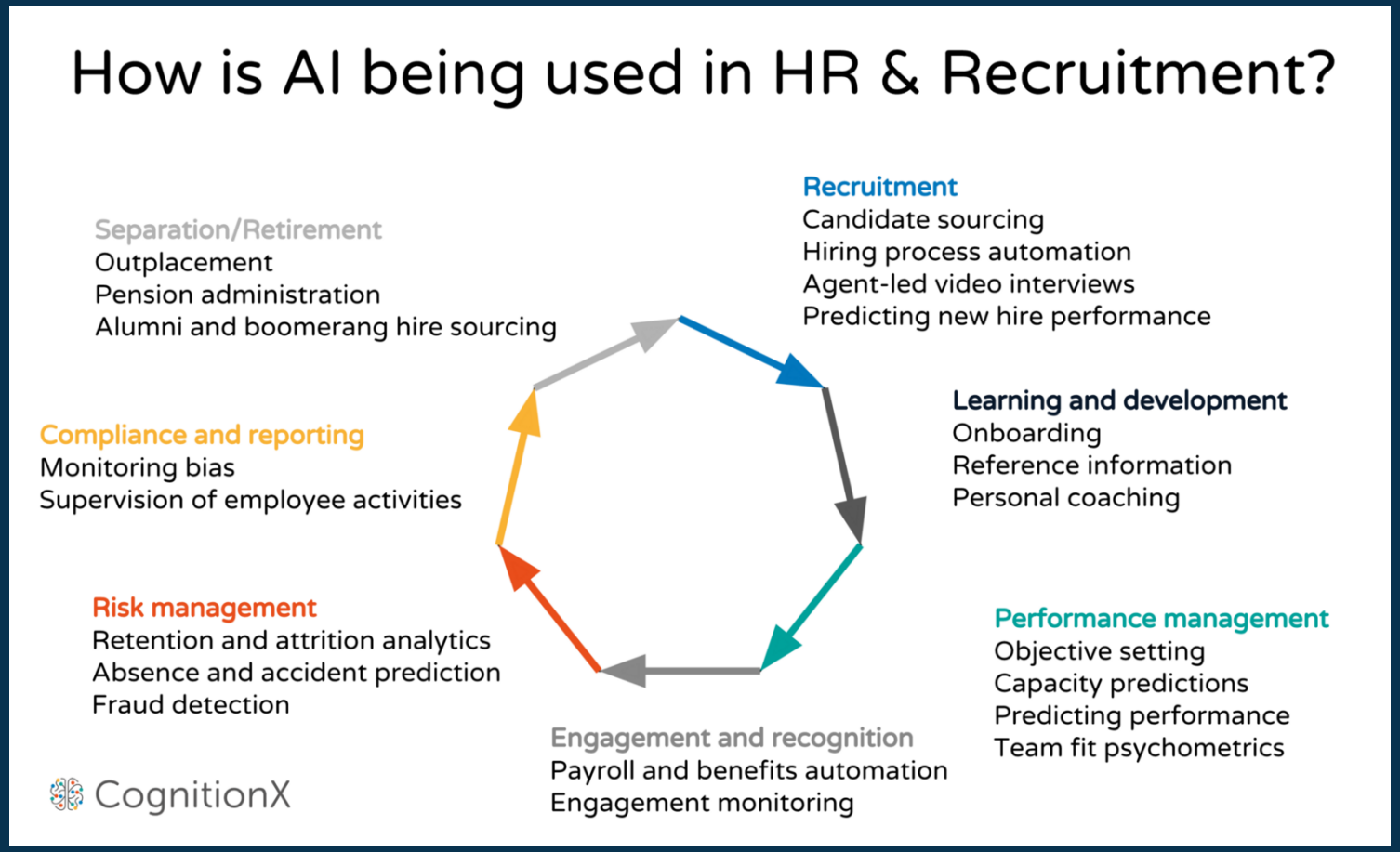
Effect of AI on Society - Absolves Humans Of All Responsibility

Machine Superiority

Image source

Effect of AI on Society - Extends And Expands Creativity

HR



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Machine Learning - Lets talk about this next…

Machine learning is an application of artificial intelligence (AI) that *provides the ability to automatically learn and improve from experience without being explicitly programmed*.

Machine learning focuses on the development of computer programs that can access data and use it for themselves.

The process of learning begins with observations or data, such as examples, direct experience or instruction, to look for patterns in data and make better decisions in the future based on the examples we provide.

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But what is the difference between Machine Learning and Statistical Analysis? Are they the same? What are the job roles? Why do we have both?…etc. :)

Machine learning	Statistics
network, graphs	model
weights	parameters
learning	fitting
generalization	test set performance
supervised learning	regression/classification
unsupervised learning	density estimation, clustering
large grant = $1,000,000	large grant= $50,000
nice place to have a meeting: Snowbird, Utah, French Alps	nice place to have a meeting: Las Vegas in August

So, how does a machine learn?

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Well in 3 ways…

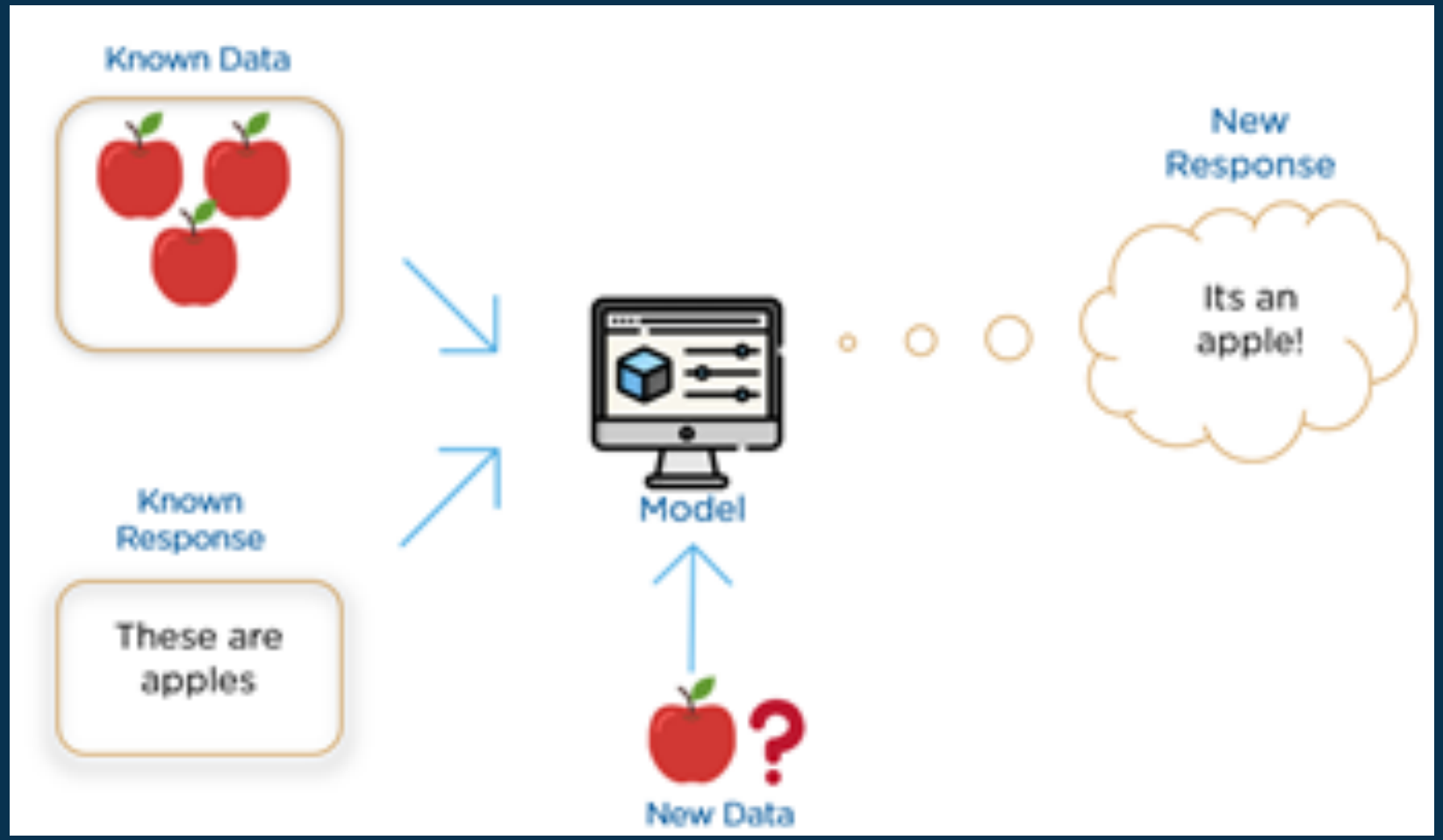
1) Supervised Learning

2) Unsupervised Learning

3) Semi-supervised learning

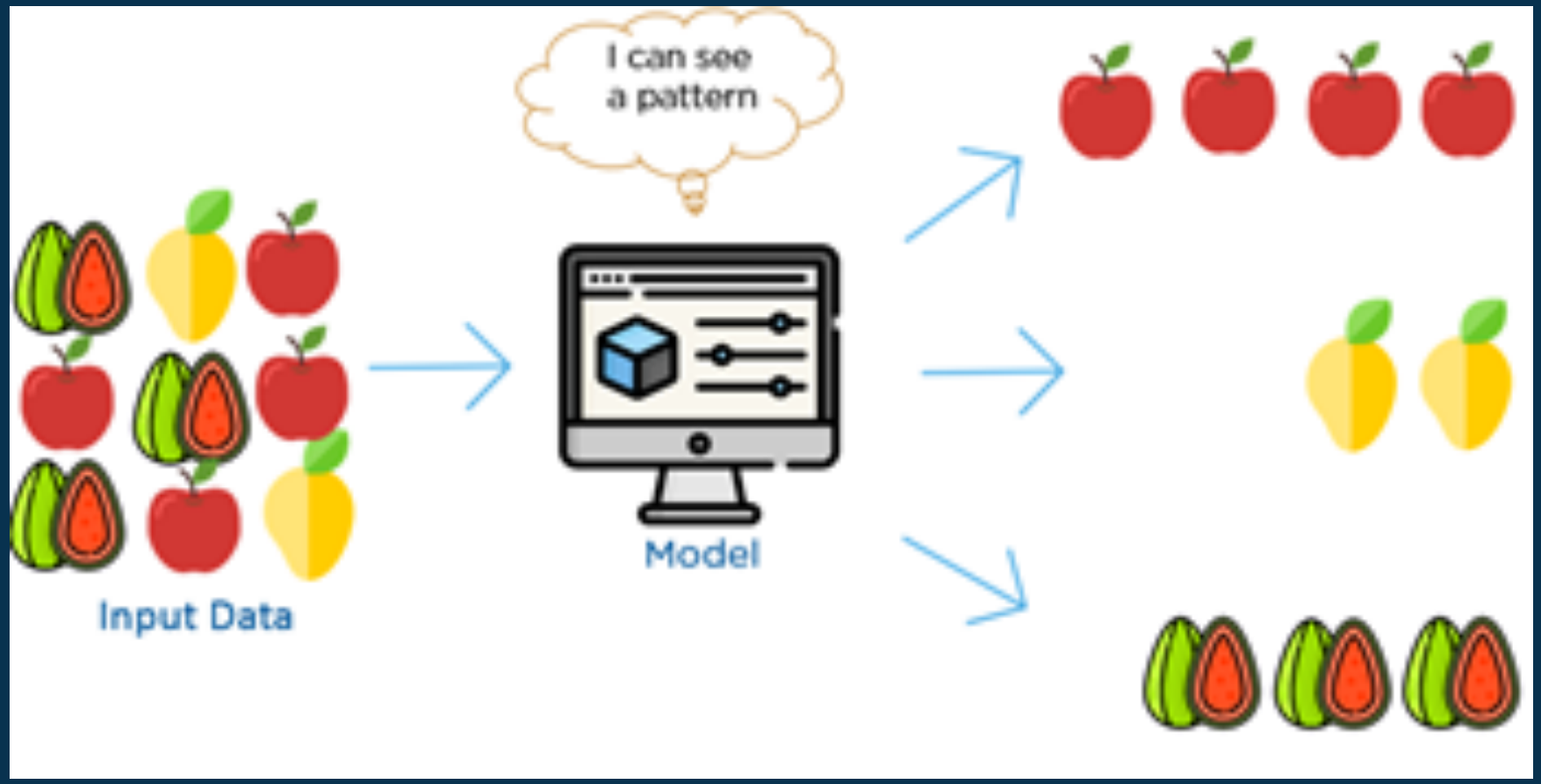
Supervised Learning

is when the training data includes the desired output as well.



Unsupervised Learning

is when the training data NOT include the desired output as well.



Supervised Learning

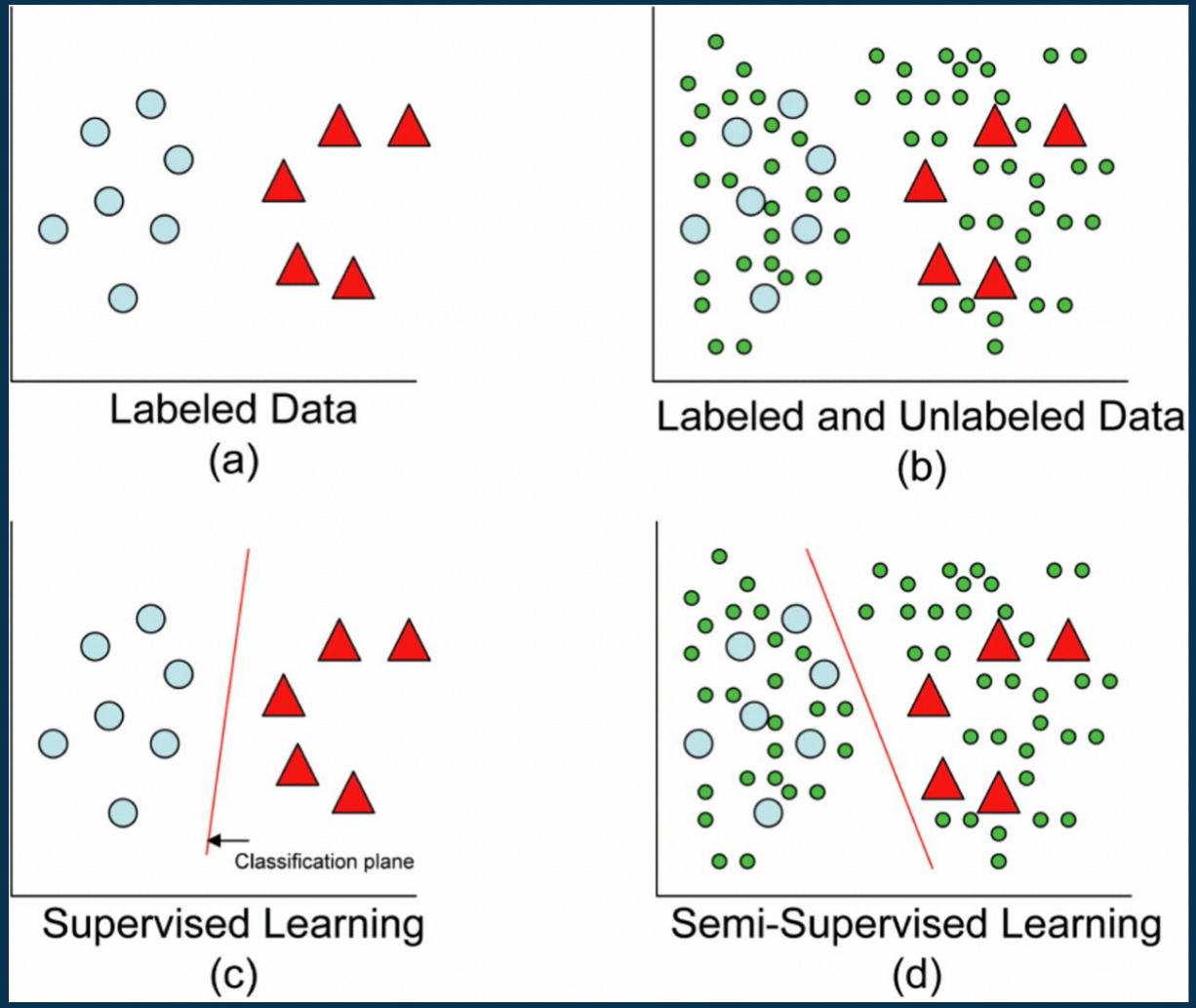
another example: is predicting house prices based on given features like no. of rooms, bathrooms, garage space, year it was buit, location, etc.

Unsupervised Learning

another example is say the user mouse clicks on a certain page or website or in general, to better understand how best the user uses her/his computer.

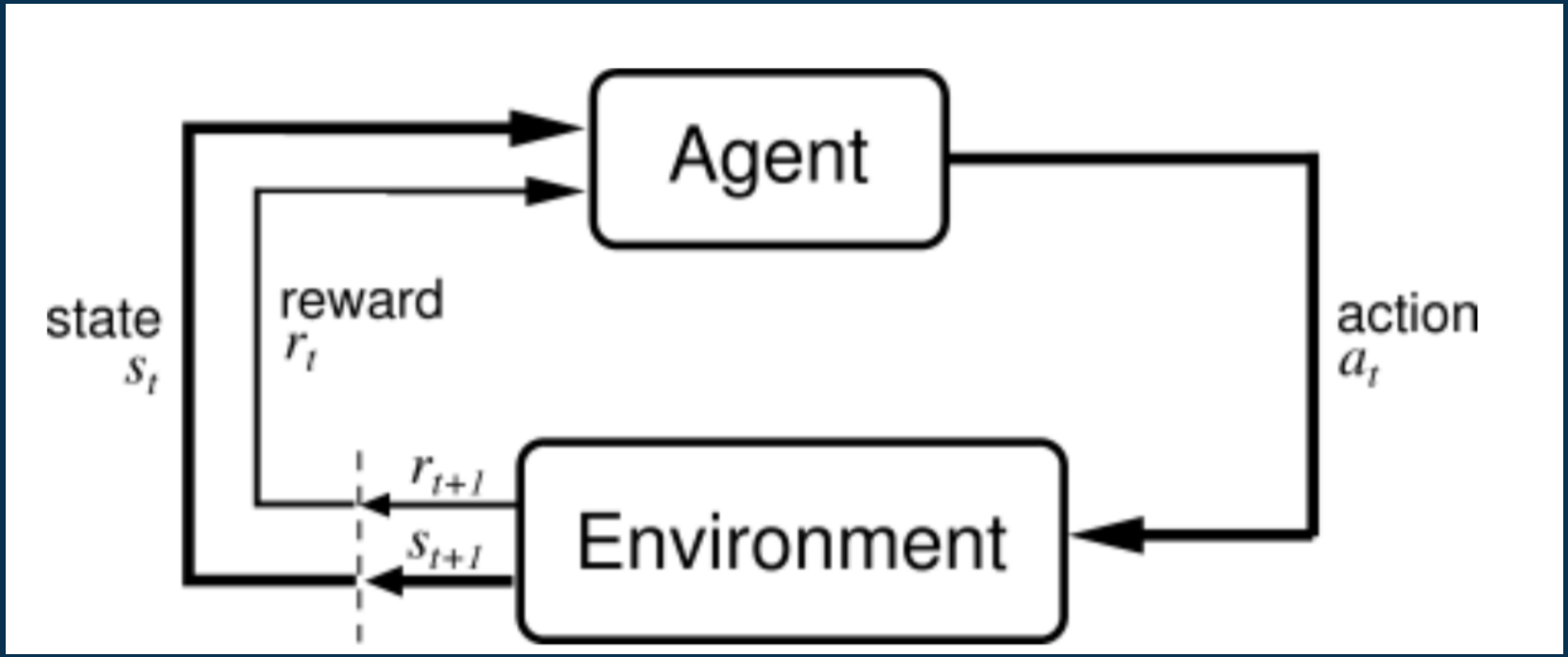
Semi-supervised Learning

is when the training data includes SOME of the desired outputs.



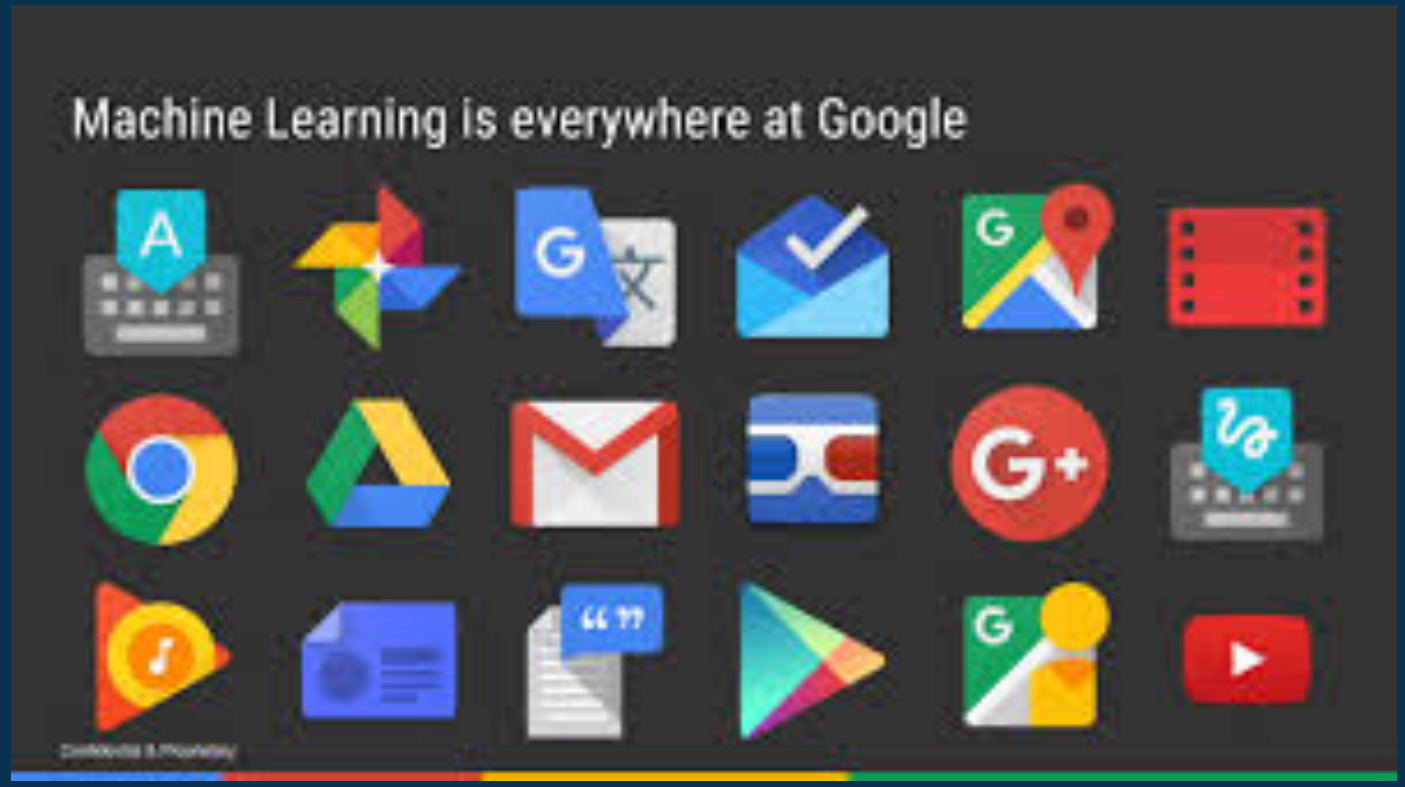
Reinforcement Learning

is when the training data has a feedback loop.



Example: Autonomous video game player

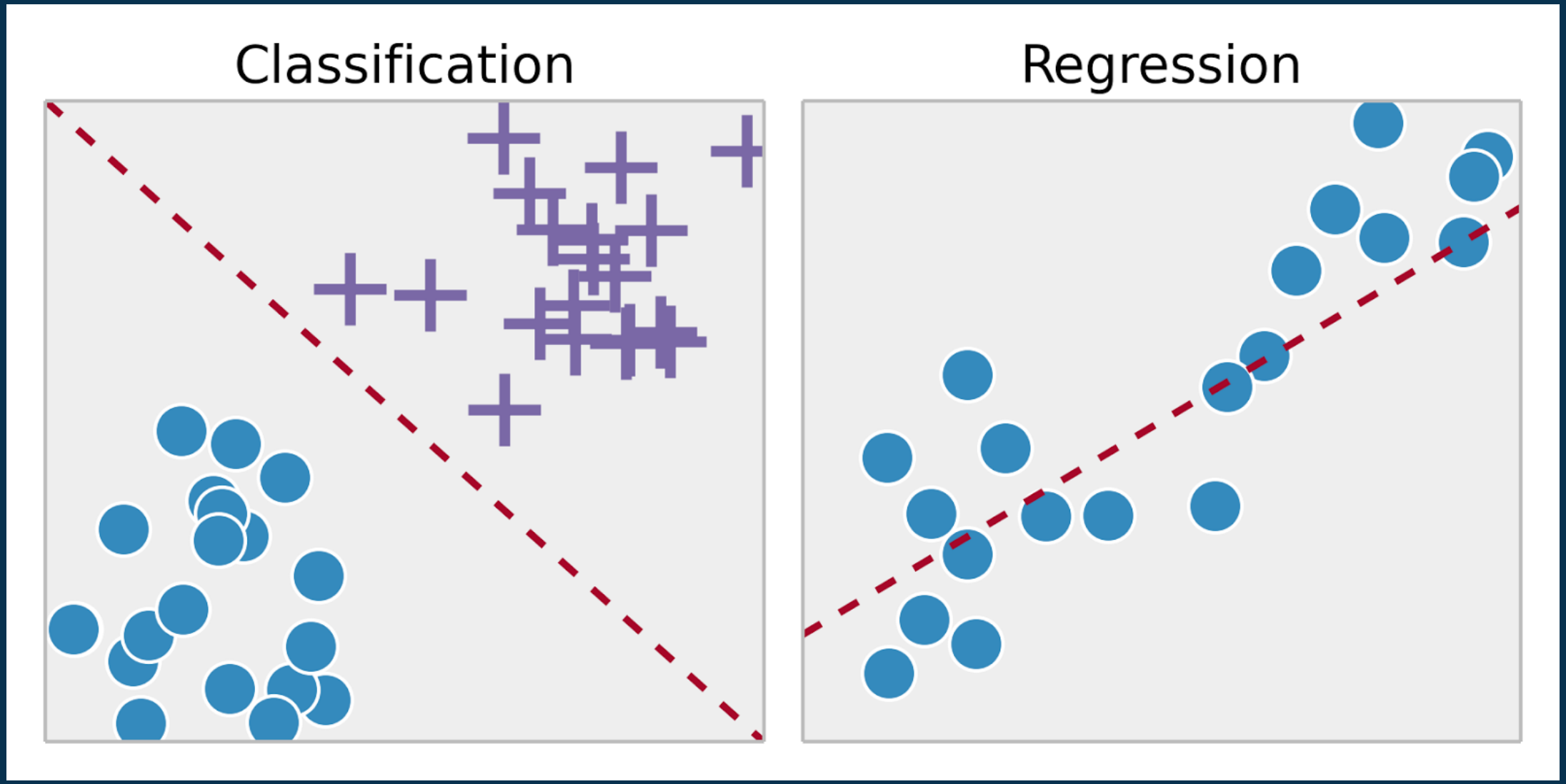
Machine Learning is used almost everywhere within Google



Machine Learning Takeway

The structure and volume of the data at hand should always inform the data modeling approach you take, no matter the use case

Regression vs. Classification



Thanks!