

Big Data & AI in Business

How to become a data driven business

Session 3: Value Identification

David G Pisano

AI STRATEGY FRAMEWORK

AI VALUE

AI OPERATIONS

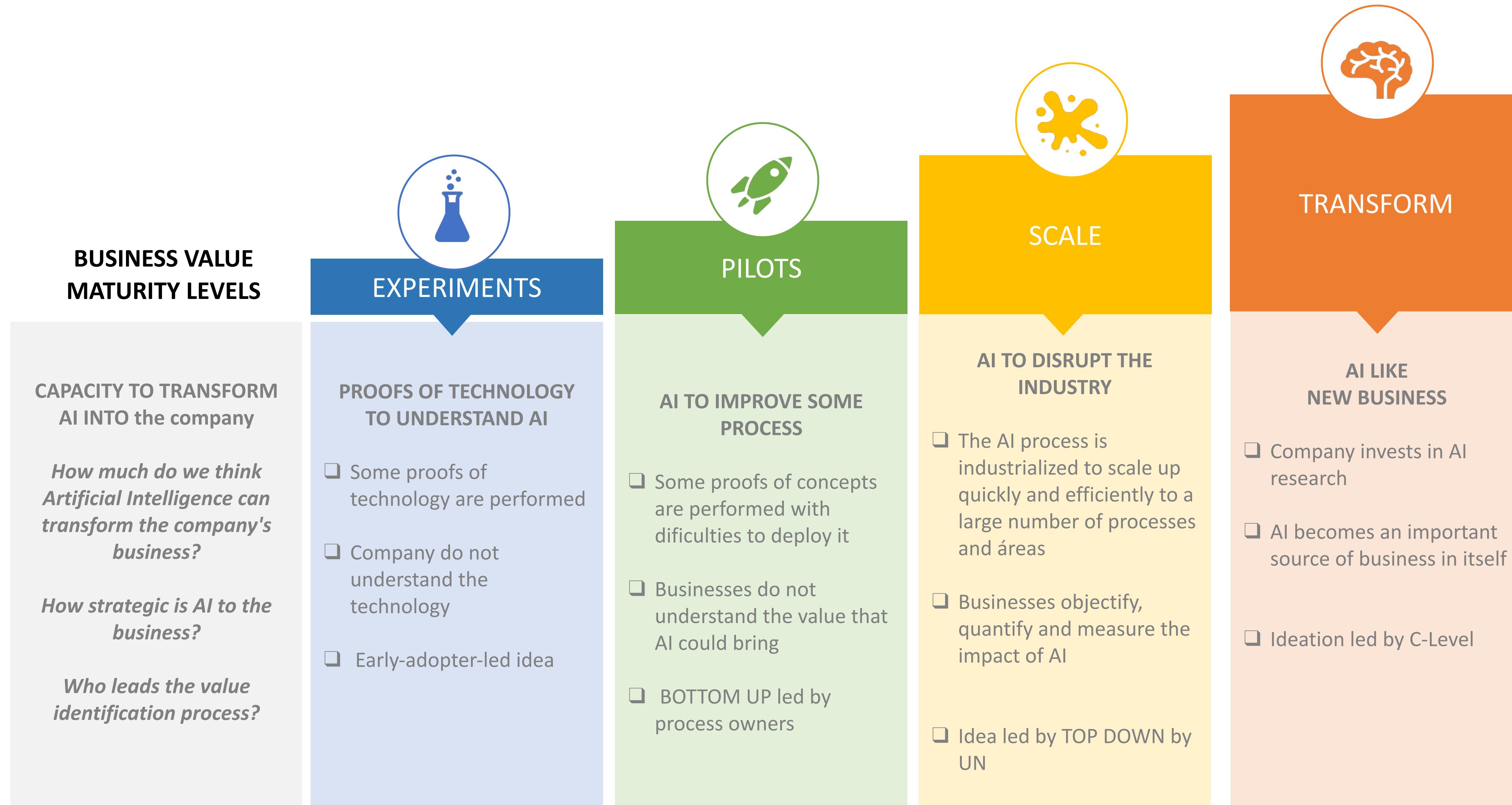
AI CULTURE

1	Business Impact	I. Experimenting II. Piloting III. Escaling IV. Transforming	4	Data Platform	I. Datawarehouse II. Data Lake III. Lake House IV. Beyond state of Art	7	Organization	I. Decentraliced II. Centraliced (HuB) III. Hub & Spoke IV. Holystic
2	AI Maturity	I. Descriptive II. Predictive III. Prescriptive IV. Autonomous	5	Data Governance	I. No Governance II. Partial Governance III. Full Governance IV. AI driven Govern.	8	Skills	I. No Skills II. Few Experts III. Re/Up Skilling IV. CitizenDatascientists
3	Ethics	I. Framework II. Principles III. Tools IV. Ethics Board	6	ML OPS	I. Craft Process II. ML Deploy OPS III. Total ML OPS IV. AUTO ML for Citizen	9	Sourcing	I. Rent II. Buy III. Build IV. Sell

The **AI strategy** aims to obtain the maximum potential of this technology for our businesses by **solving all the barriers** to its implementation.

1st Barrier: Value Identification & use of AI

Business Value: AI Business Transformation Capacity



1

AI Value Identification



Understanding AI benefits & use cases is the main challenge to AI/ML Adoption for 42% of executives

Gartner

1

Understand what AI is: Identifying various disciplines and techniques is critical to set the right expectations with business

2

Ideation phase to collect a set of use cases, which may arise from existing business processes or by looking at competitors or other industries

3

Set your ambition:

- How much do we think AI can transform business?
- How strategic is AI for business?
- Who is leading the value identification process?

How to identify Value

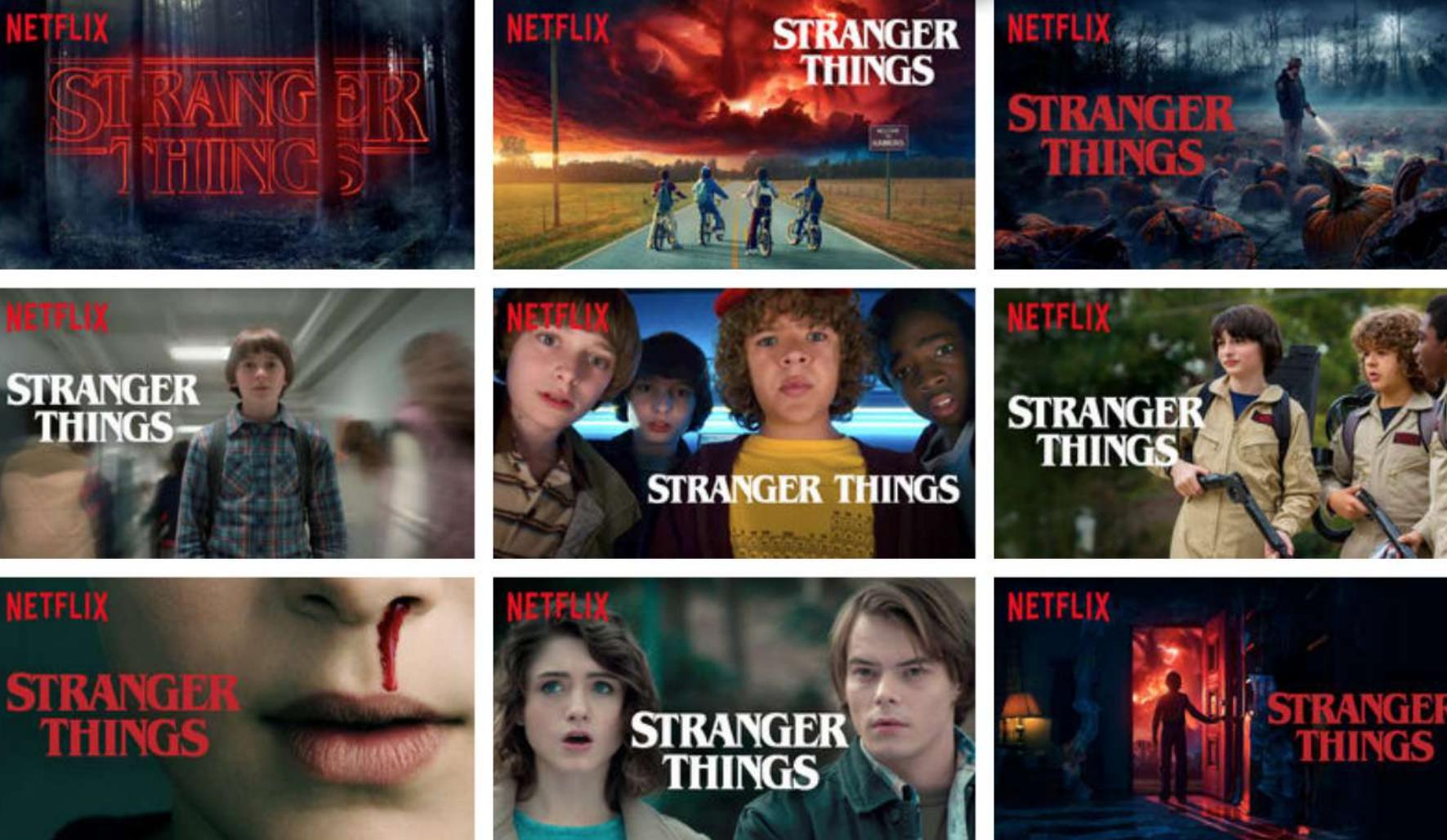


What is the value of AI for business?



New ways of working

Customer Engagement



Operational Efficiency

New Businesses

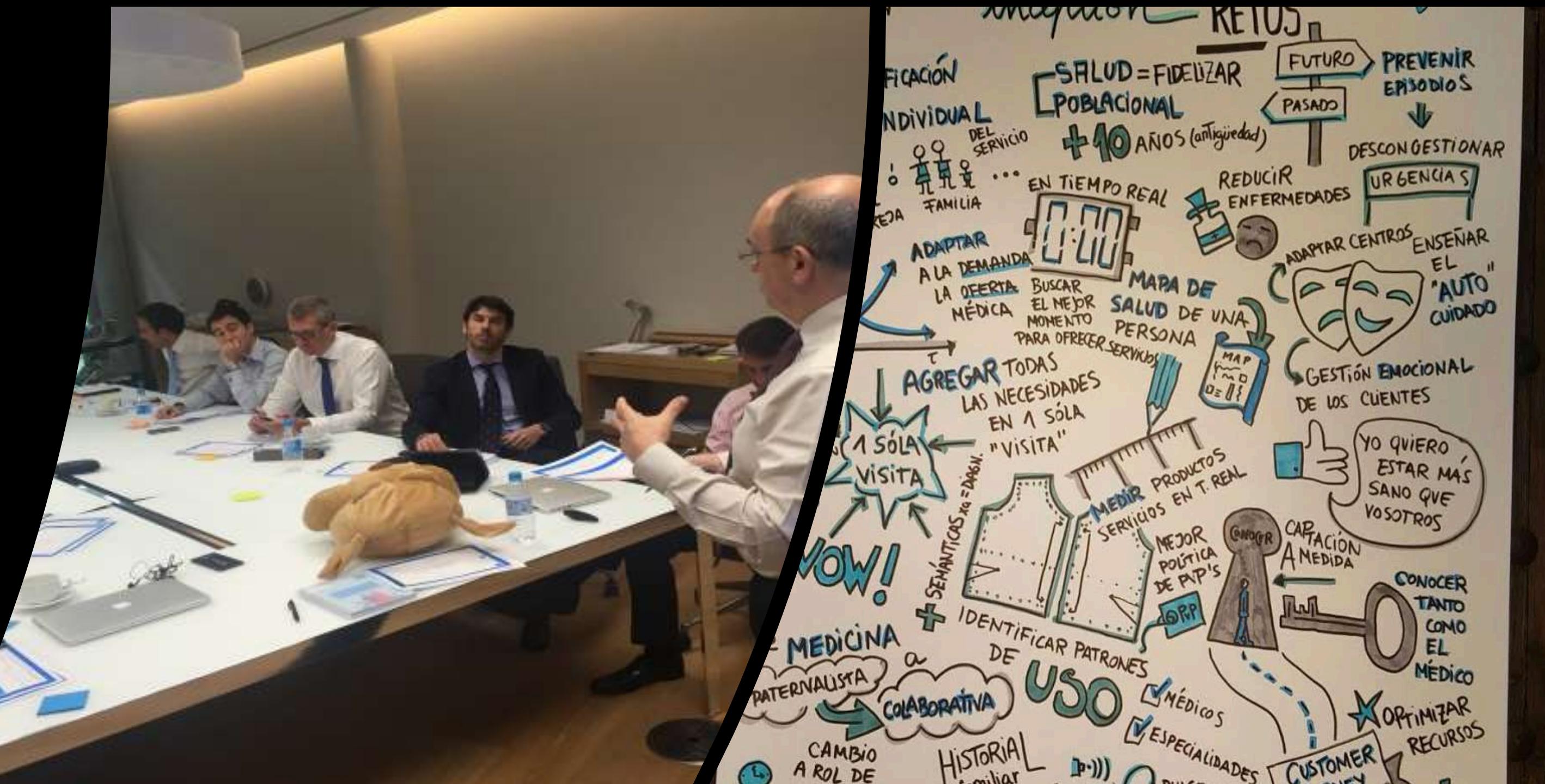


Discovery Workshops

1	2	3	4	5
Preparation & Introduction	Problem selection	Use case definition	Priorization Matrix	C-level presentation

Human center design
Business oriented
Fall in love with the problem
People from all levels
Give context: what is AI?
Pick your product owner and your sponsors. This is your new community
Prioritize and select top 5
Visual is everything...

AI center designed
Data oriented
Fall in love with the data
Top managers
Everybody knows what is AI
Thank you for your ideas now are mine
We will make an analysis...



THE

MACHINE LEARNING CANVAS

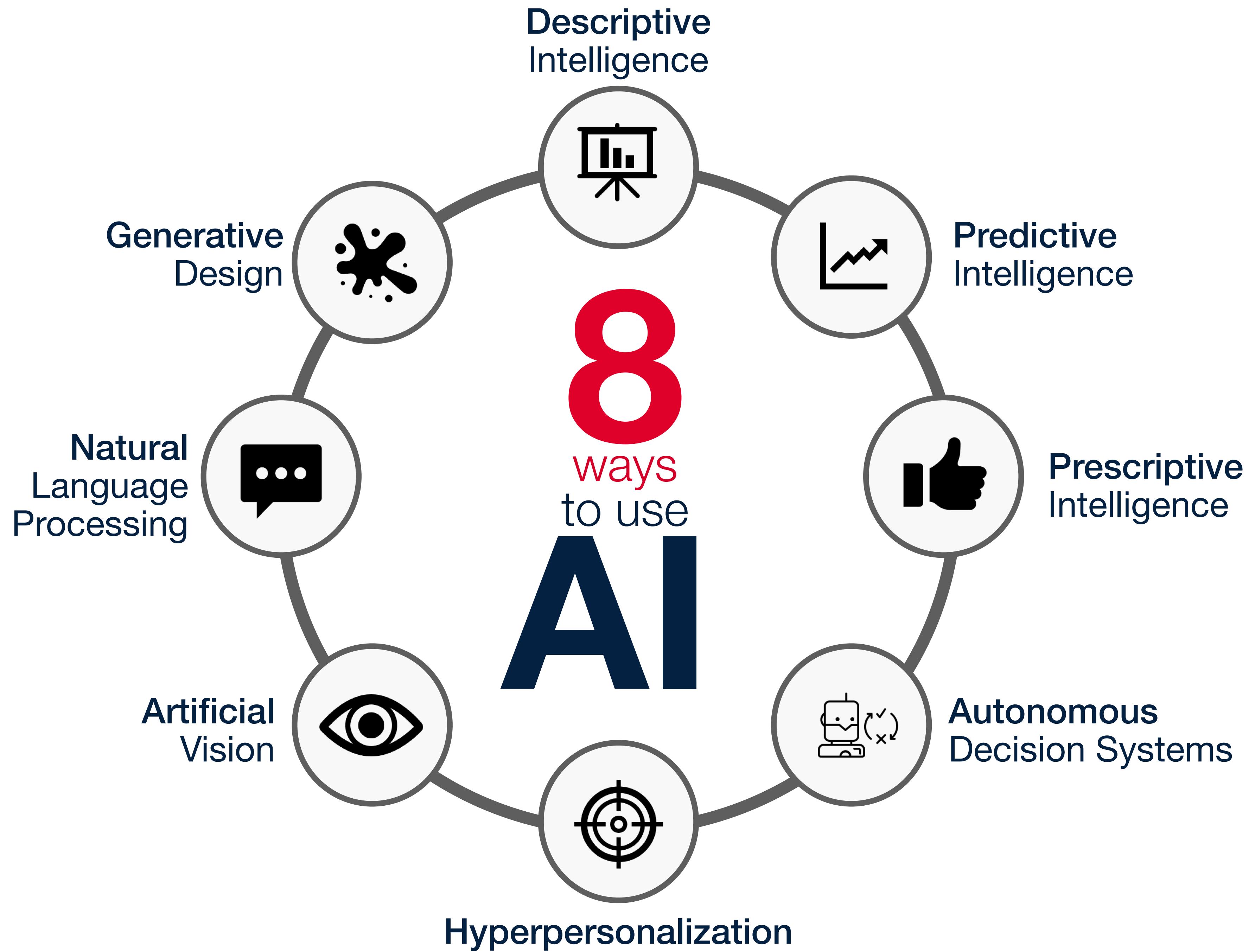
*A handbook for innovators and
visionary managers striving to design
tomorrow's Machine Learning systems*

LOUIS DORARD, PH.D.

How to define AI use cases

The Machine Learning Canvas

Decisions	ML task	Value Propositions	Data Sources	Collecting Data
How are predictions used to make decisions that provide the proposed value to the end-user?	Input, output to predict, type of problem.	What are we trying to do for the end-user(s) of the predictive system? What objectives are we serving?	Which raw data sources can we use (internal and external)?	How do we get new data to learn from (inputs and outputs)?
Making Predictions	Offline Evaluation		Features Input representations extracted from raw data sources.	Building Models When do we create/update models with new training data? How long do we have to featurize training inputs and create a model?
	Live Evaluation and Monitoring			



01 Descriptive Intelligence

Descriptive analytics allows us to understand **what has happened** through **description** and **visualization** of data.

Artificial Intelligence together with descriptive analytics allows us to **better understand why**, and to identify **cause-effect** relationships.

ALGORITHMS

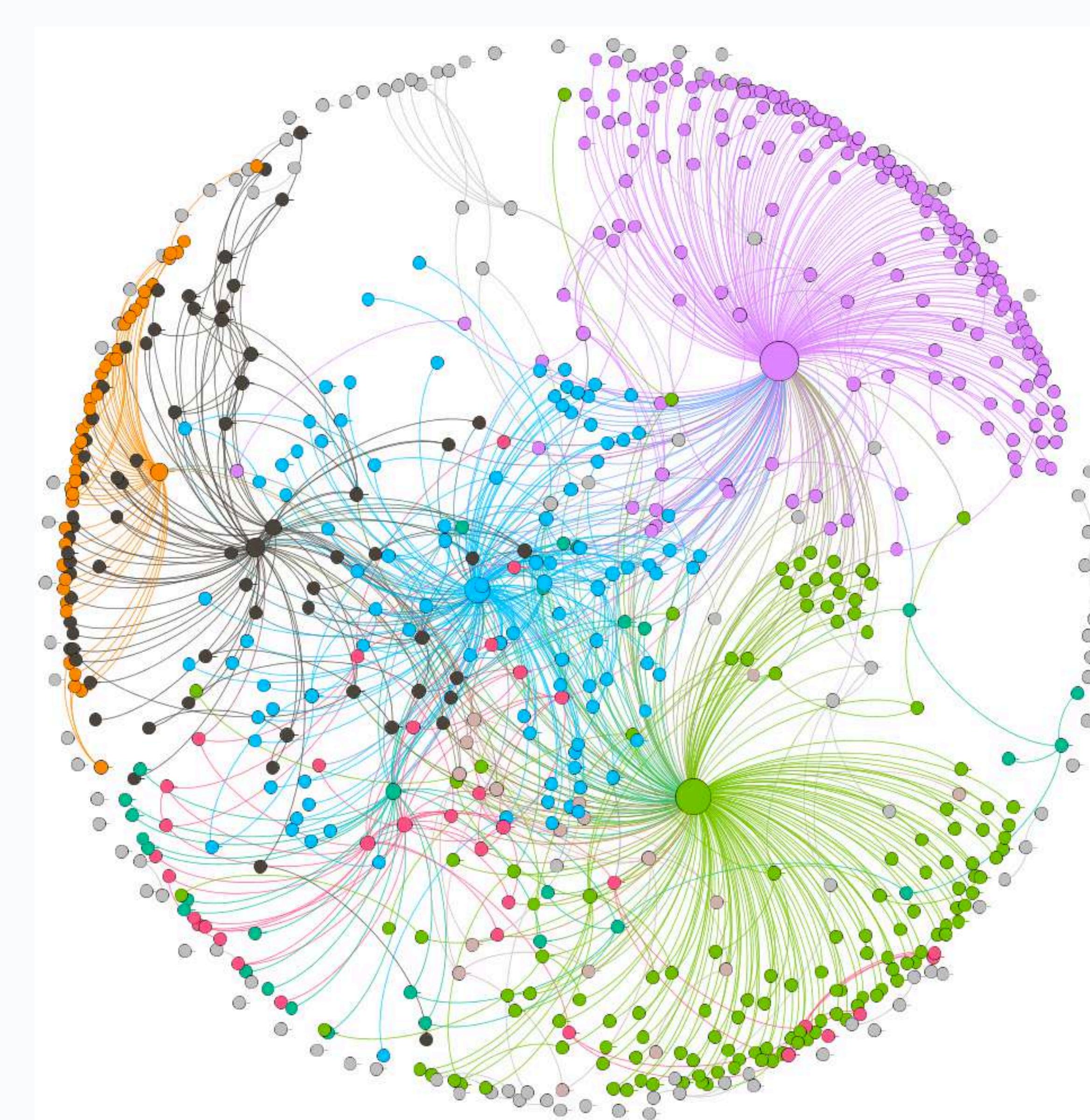
Unsupervised
Descriptive Statistics
Visualization
Principal Component Analysis
Clustering
Knowledge Graph

Financial Dashboard



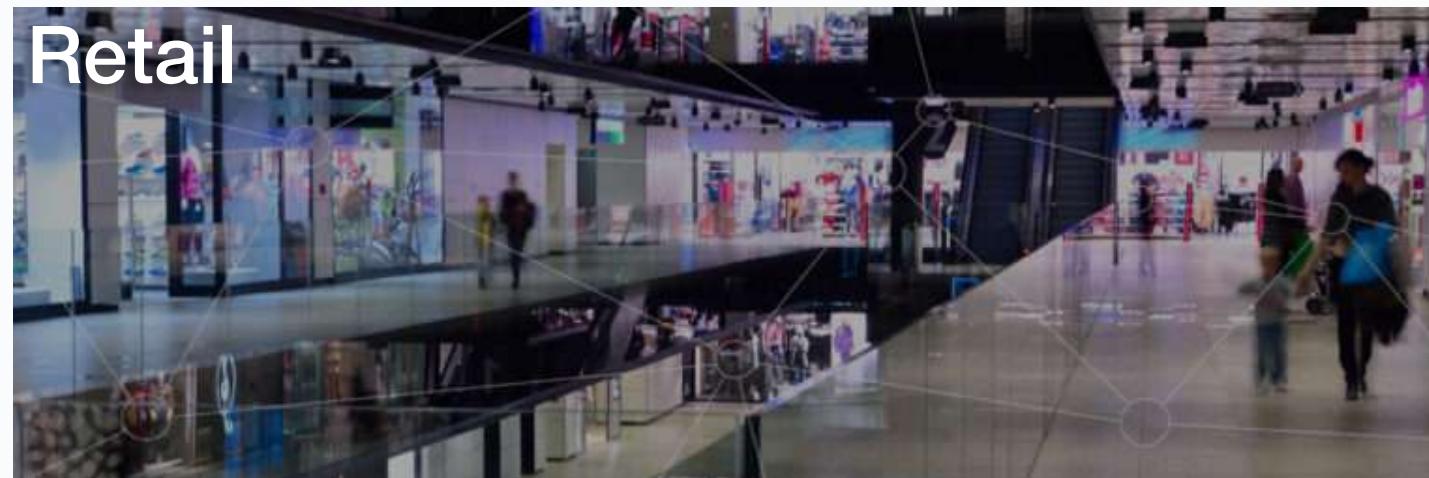
La SEC y Sanitas firman un convenio de colaboración para impulsar la investigación de salud basada en datos

Publicado: 21 diciembre 2017 | Actualidad - Comunicación - Notas de prensa



The use of Knowledge Graph algorithms on data from medical records allowed to unveil the relationship between cardiological diseases and oral health

neo4j Use Cases



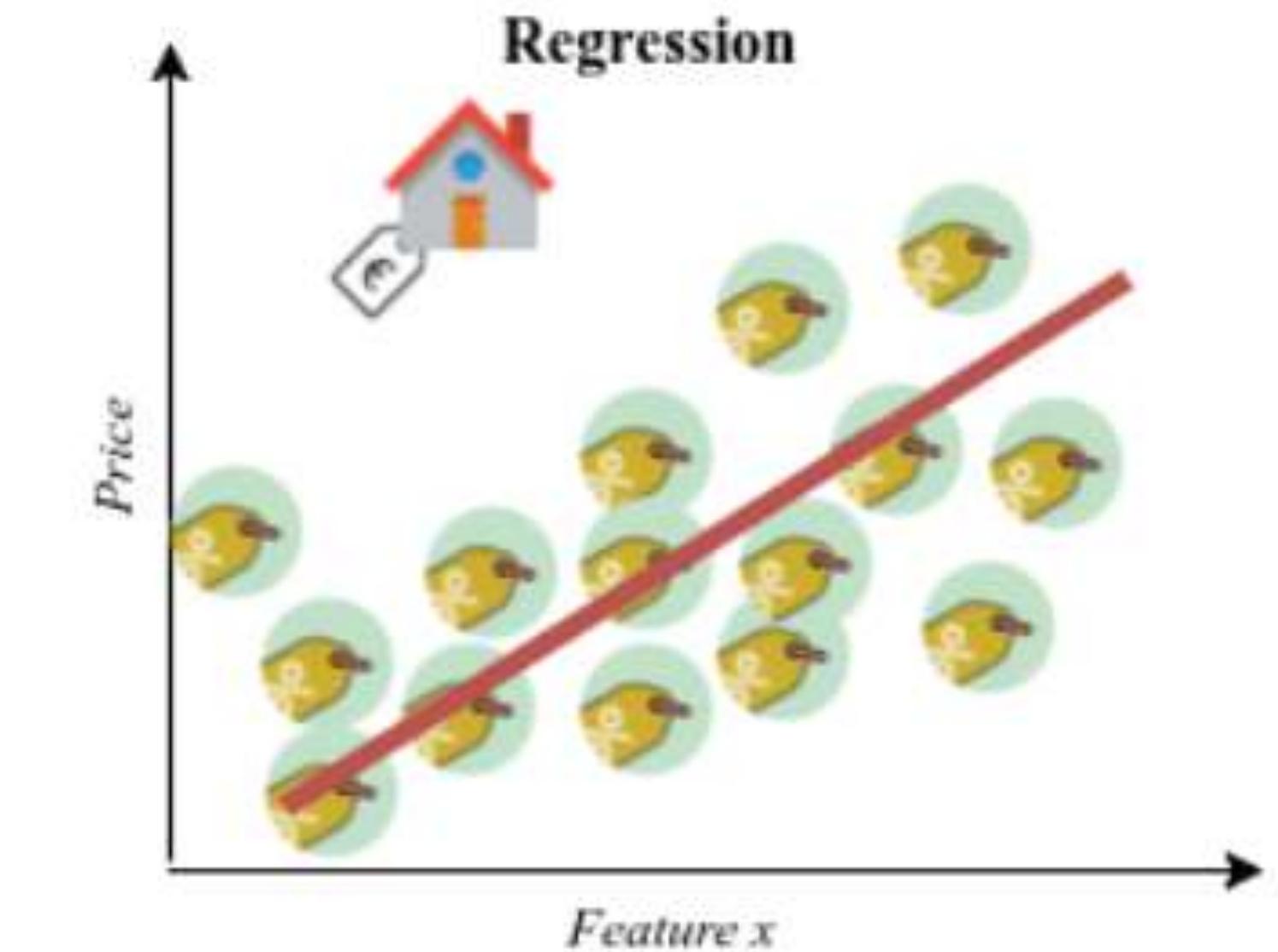
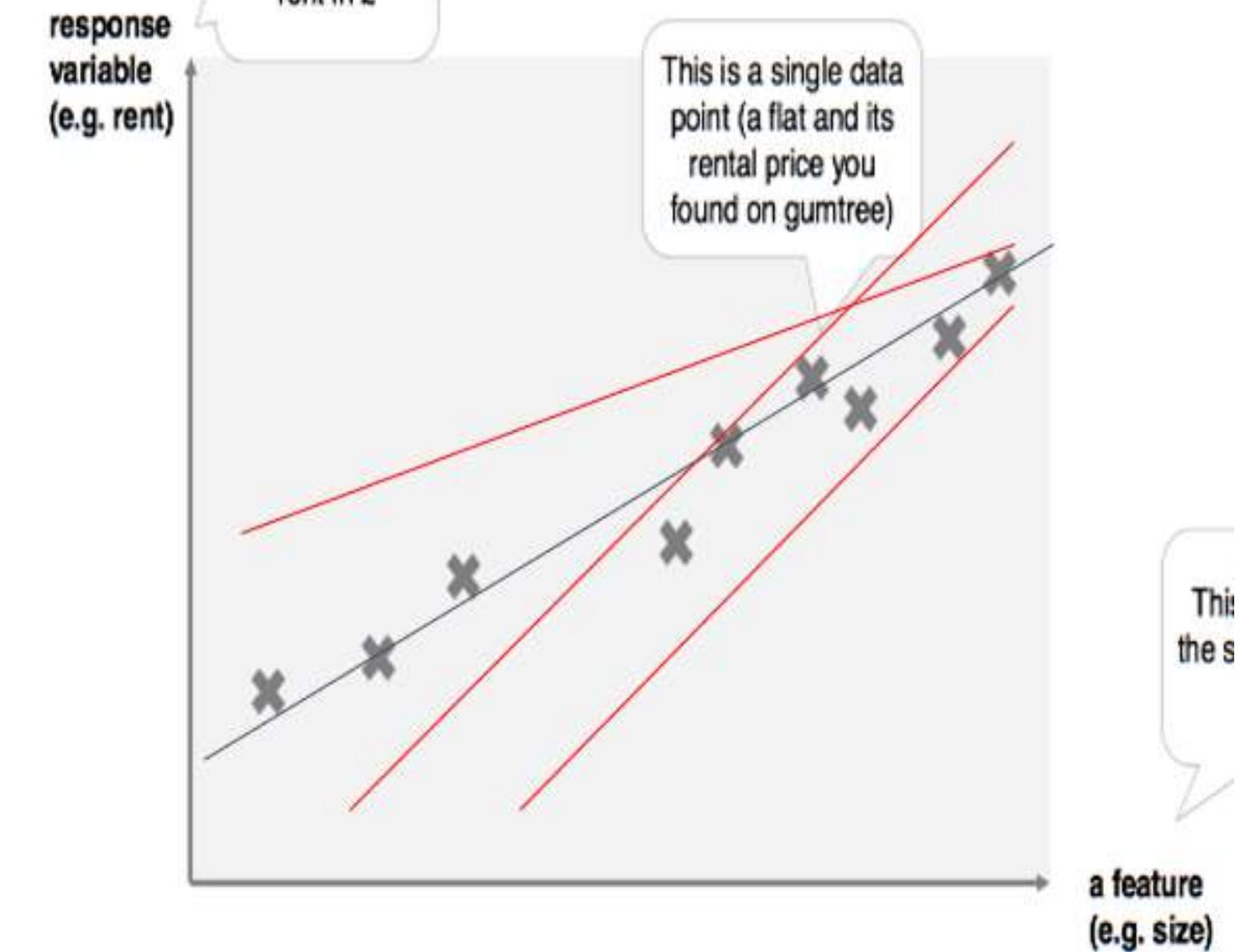
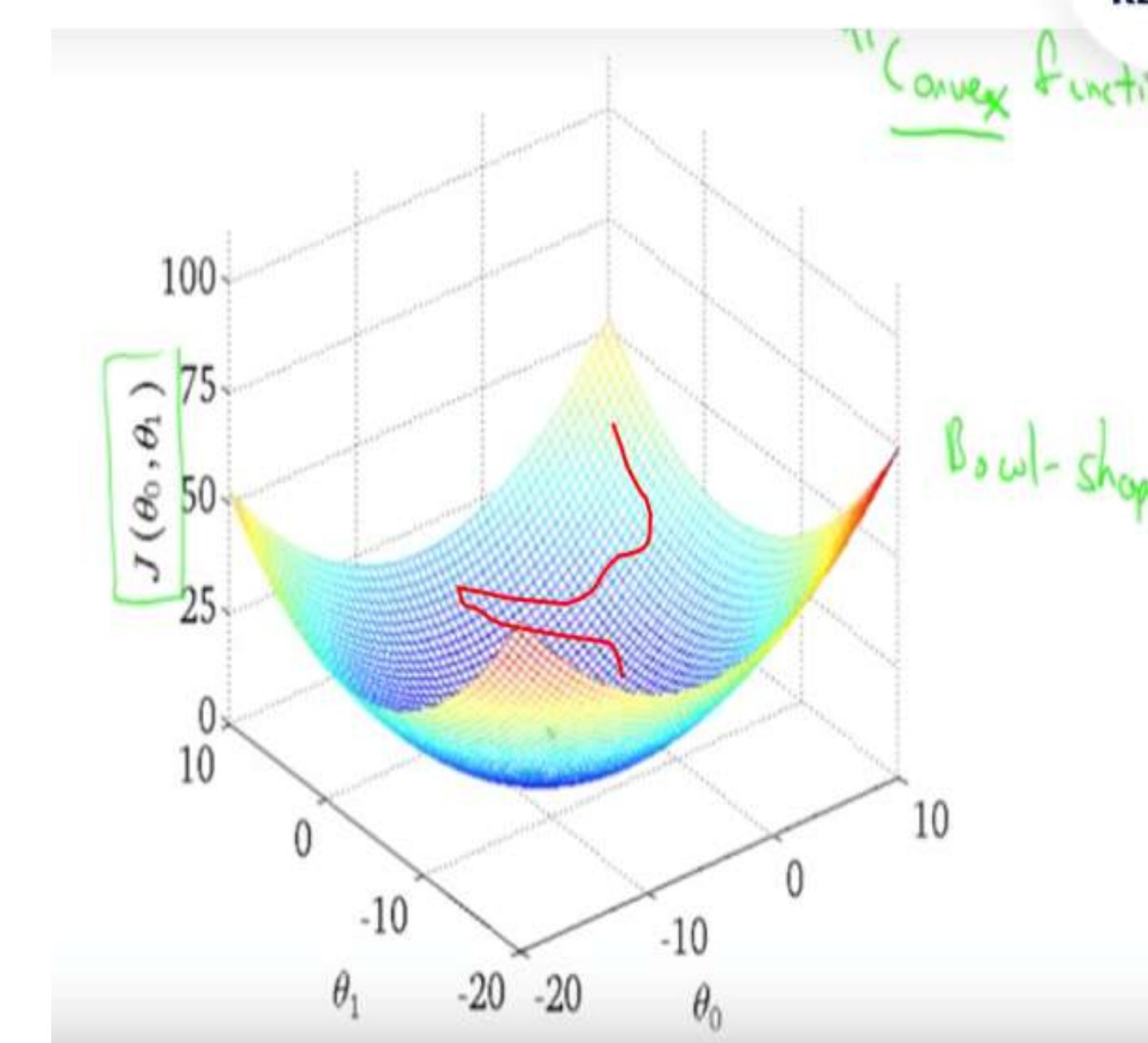
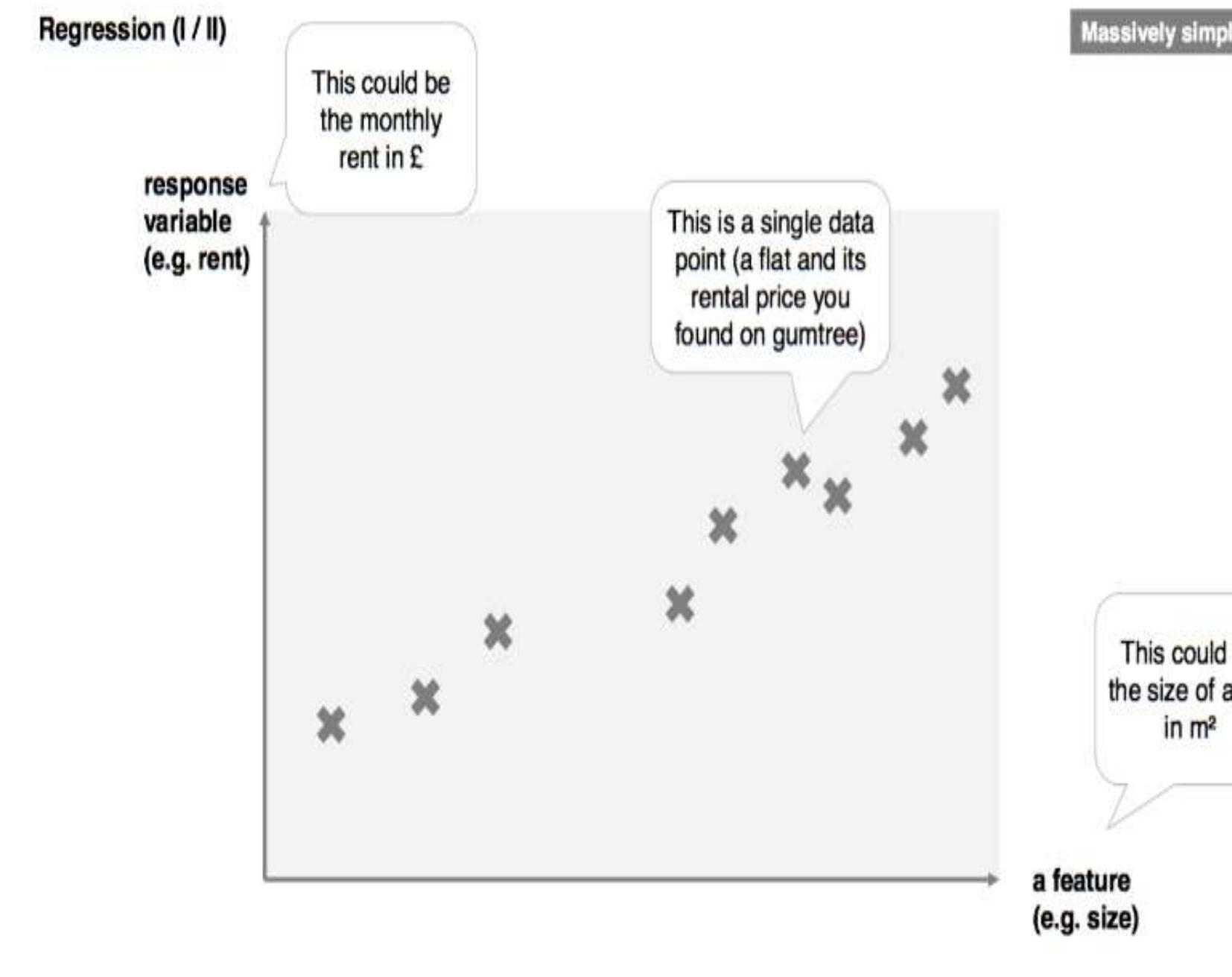
02 Predictive Intelligence

Predictive analytics allows us to know **what is going to happen** in our business.

We apply **statistical** algorithms and **machine learning** techniques to identify the **probability of future results** based on **historical data**.

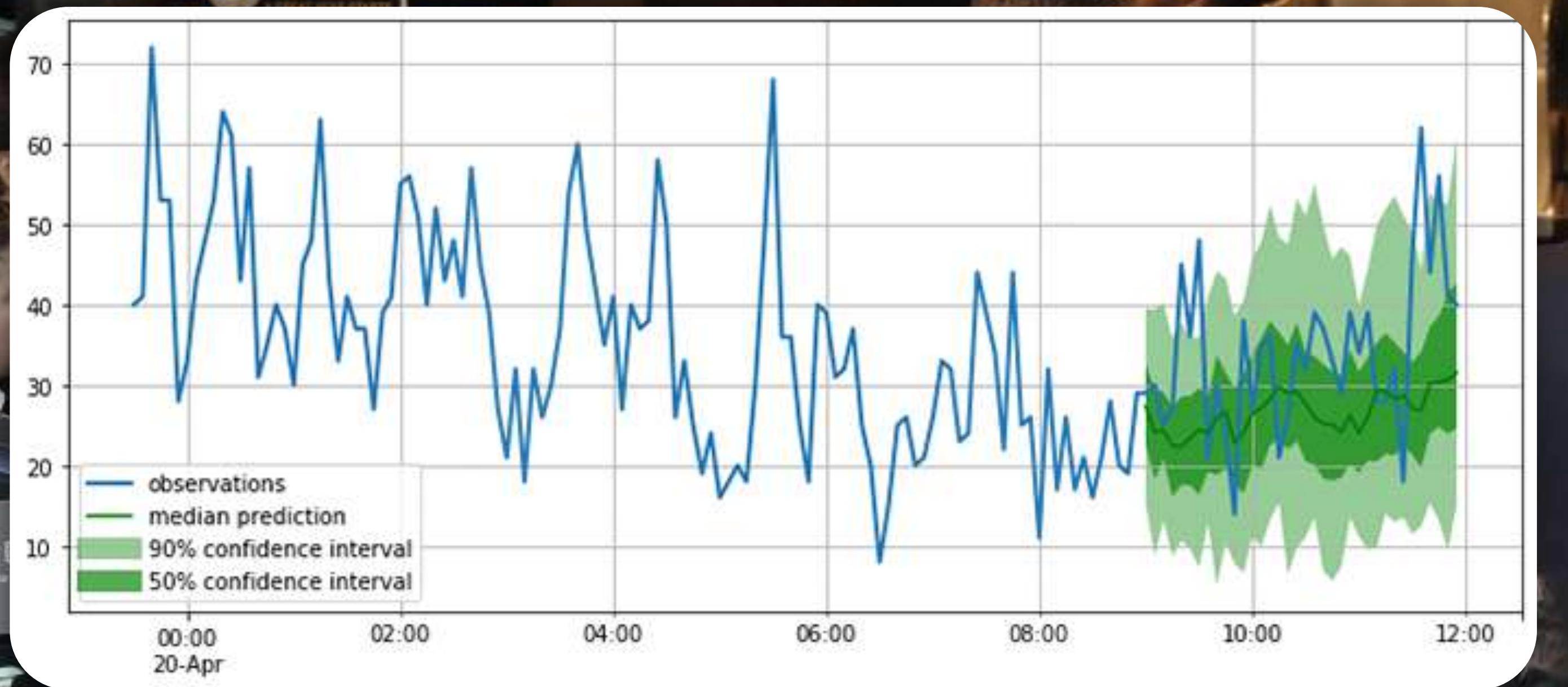
ALGORITHMS

Supervised
Regression
Time Series
Neural Networks
Random Forest

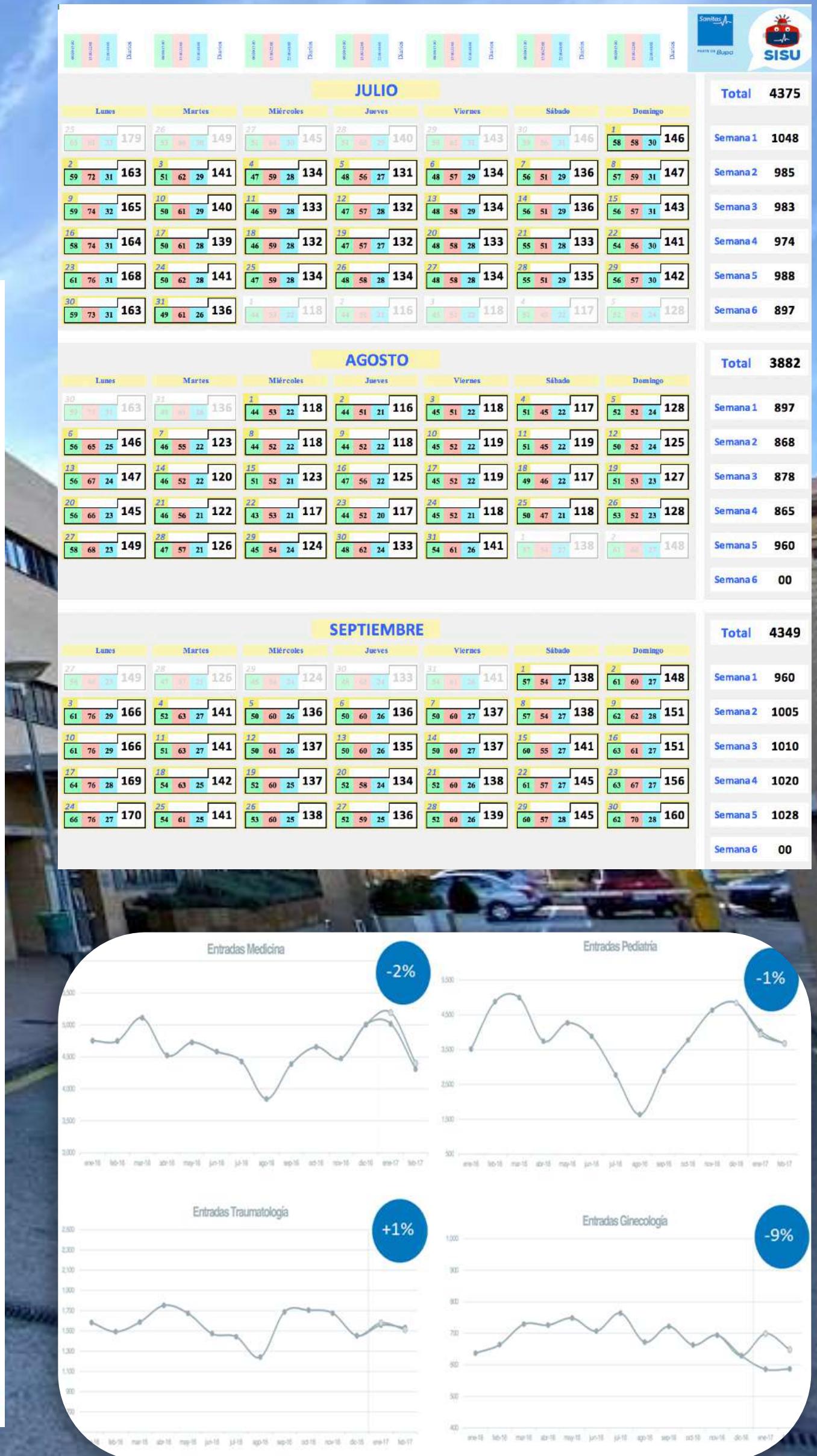
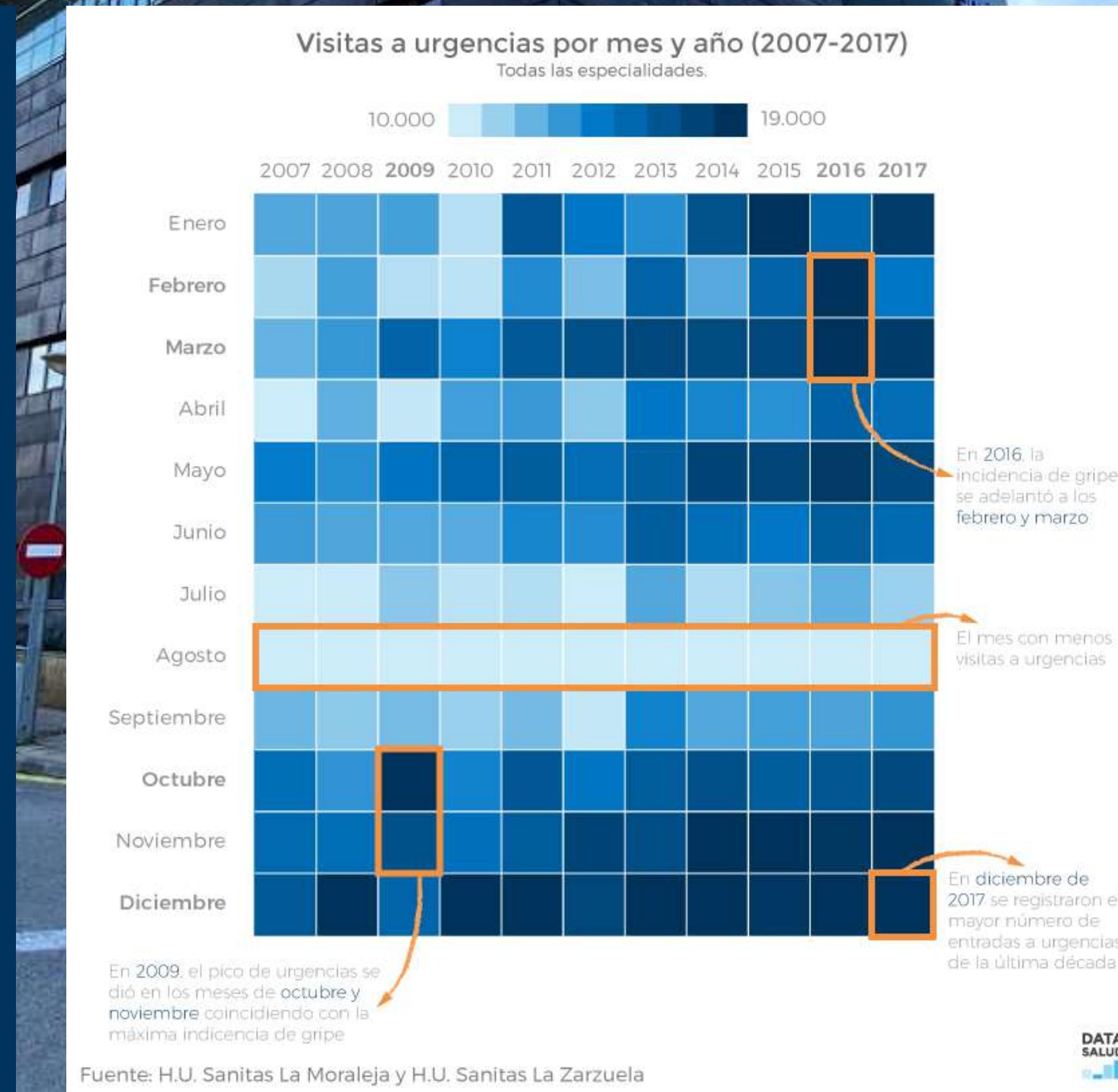
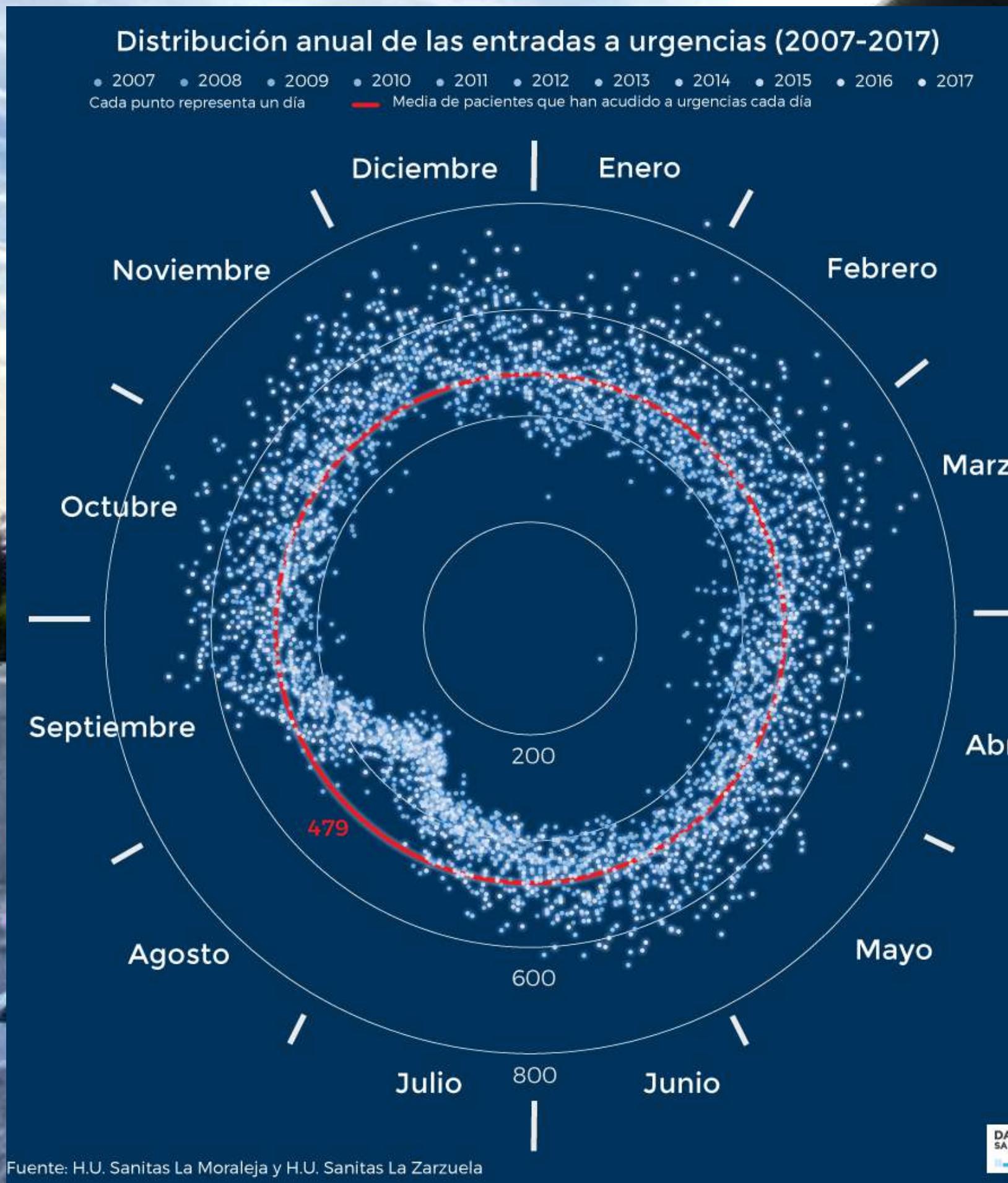


STARBUCKS

Demand Prediction



Sanitas ER Demand Prediction



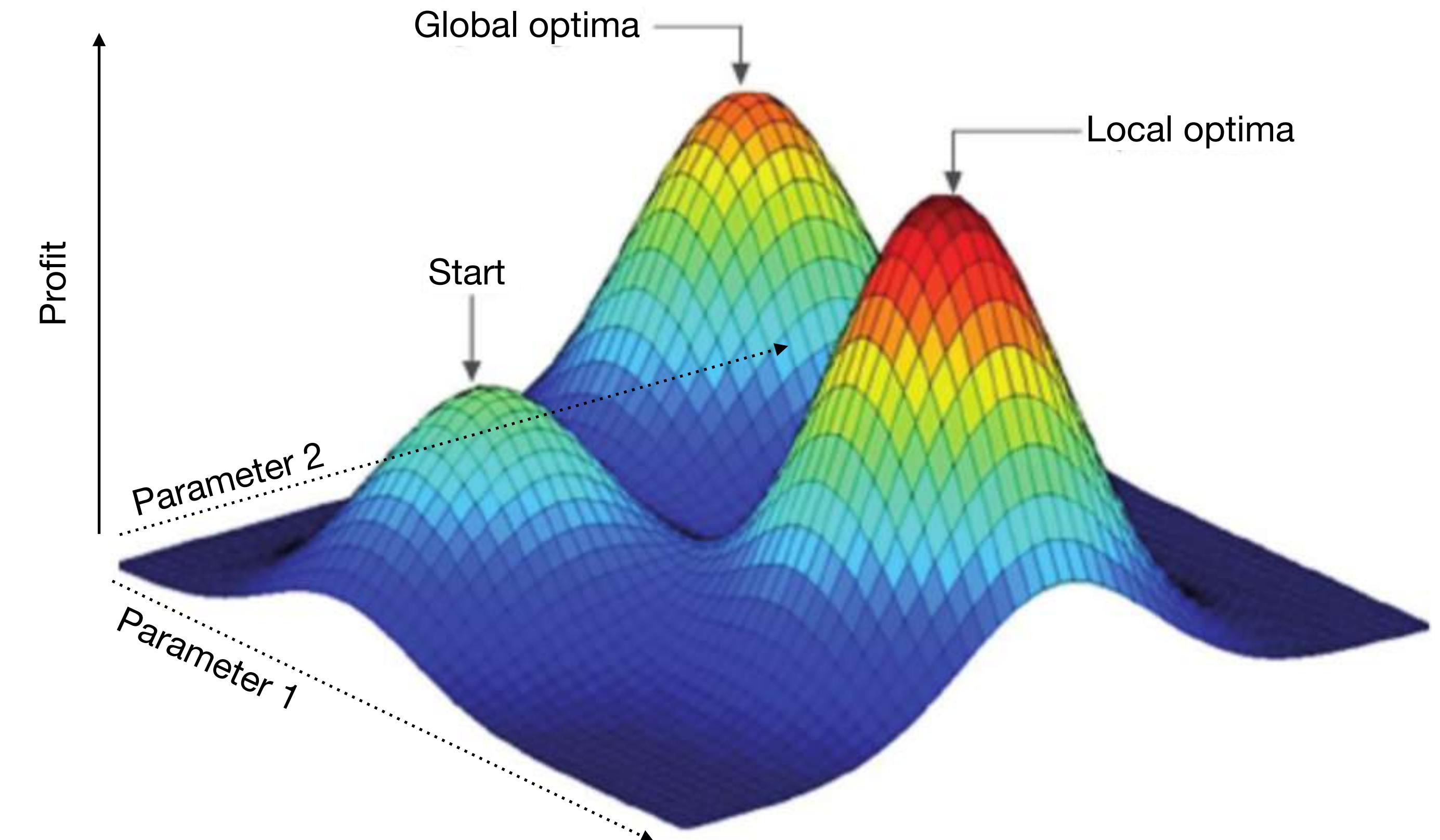
03 Prescriptive Intelligence

Prescriptive analytics allows us to know which is the **best recommendation** for the business.

It relies on Predictive Intelligence techniques to find the **prediction** that **optimizes** our **objective**.

ALGORITHMS

Optimization
Deterministic
Stochastic
Combinatorial

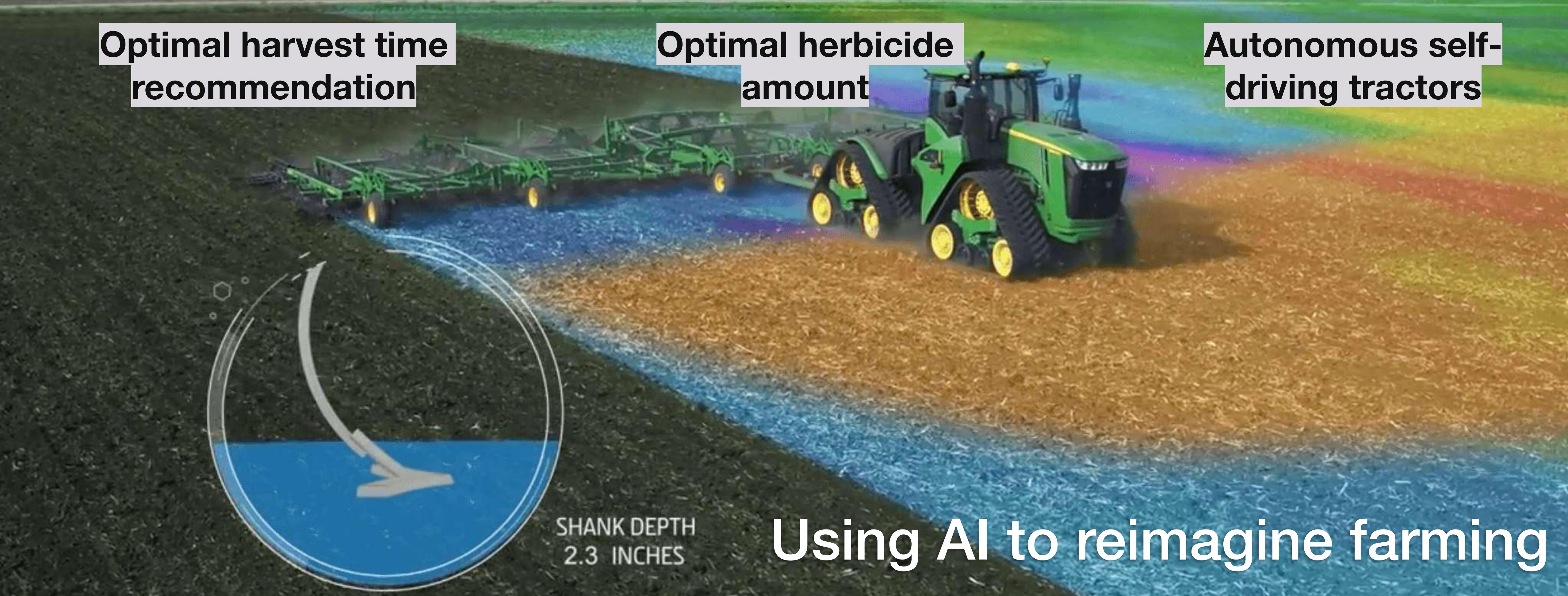




Optimal harvest time recommendation

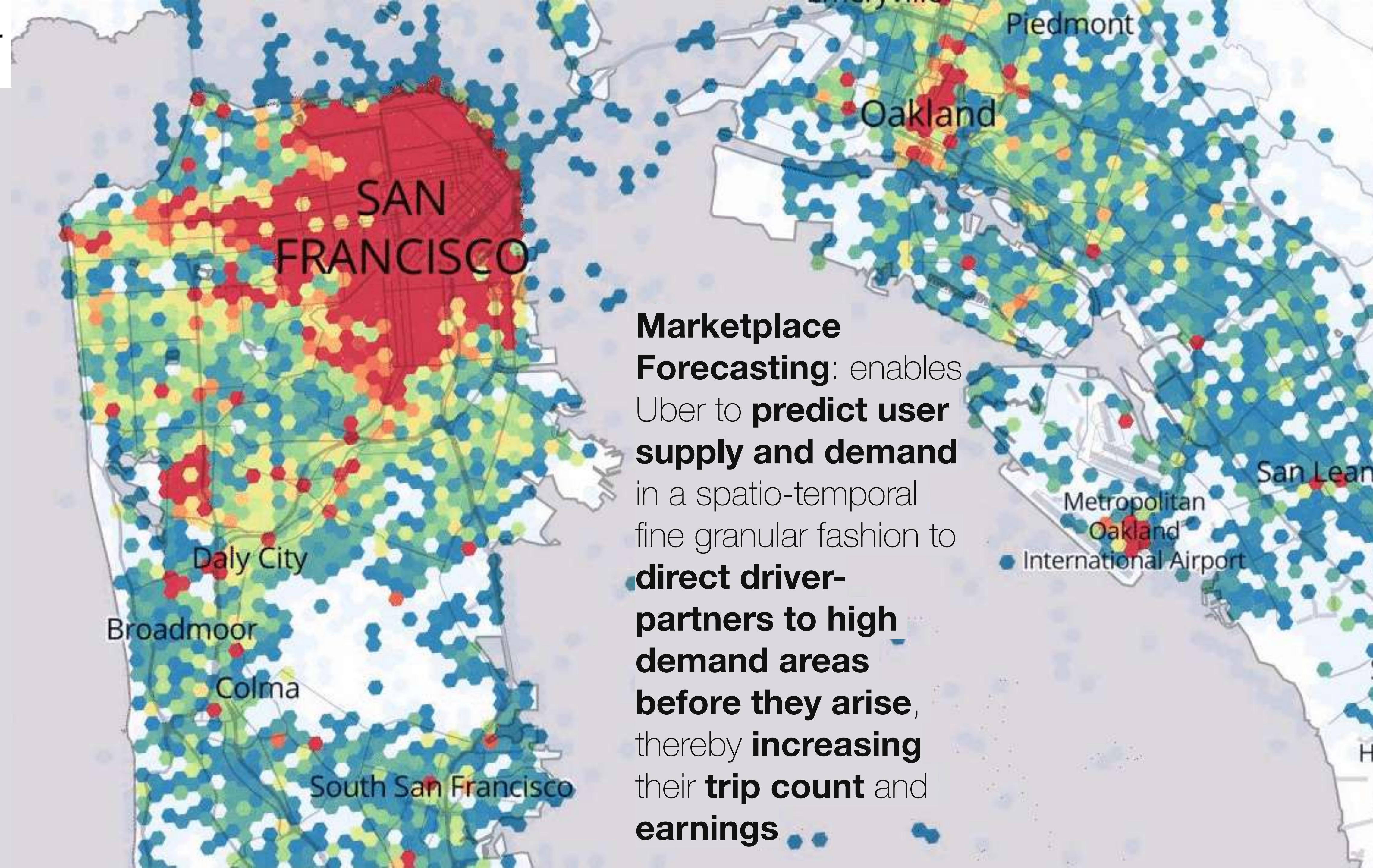
Optimal herbicide amount

Autonomous self-driving tractors



SHANK DEPTH
2.3 INCHES

Using AI to reimagine farming



04

Autonomous Intelligent Systems

Autonomous systems operate in **complex** and **open environments** with high levels of **independence** and **self-determination**.

They **perceive**, **learn**, **reason** and **act** with self-awareness and respond intelligently to **unforeseen** changes in the environment.

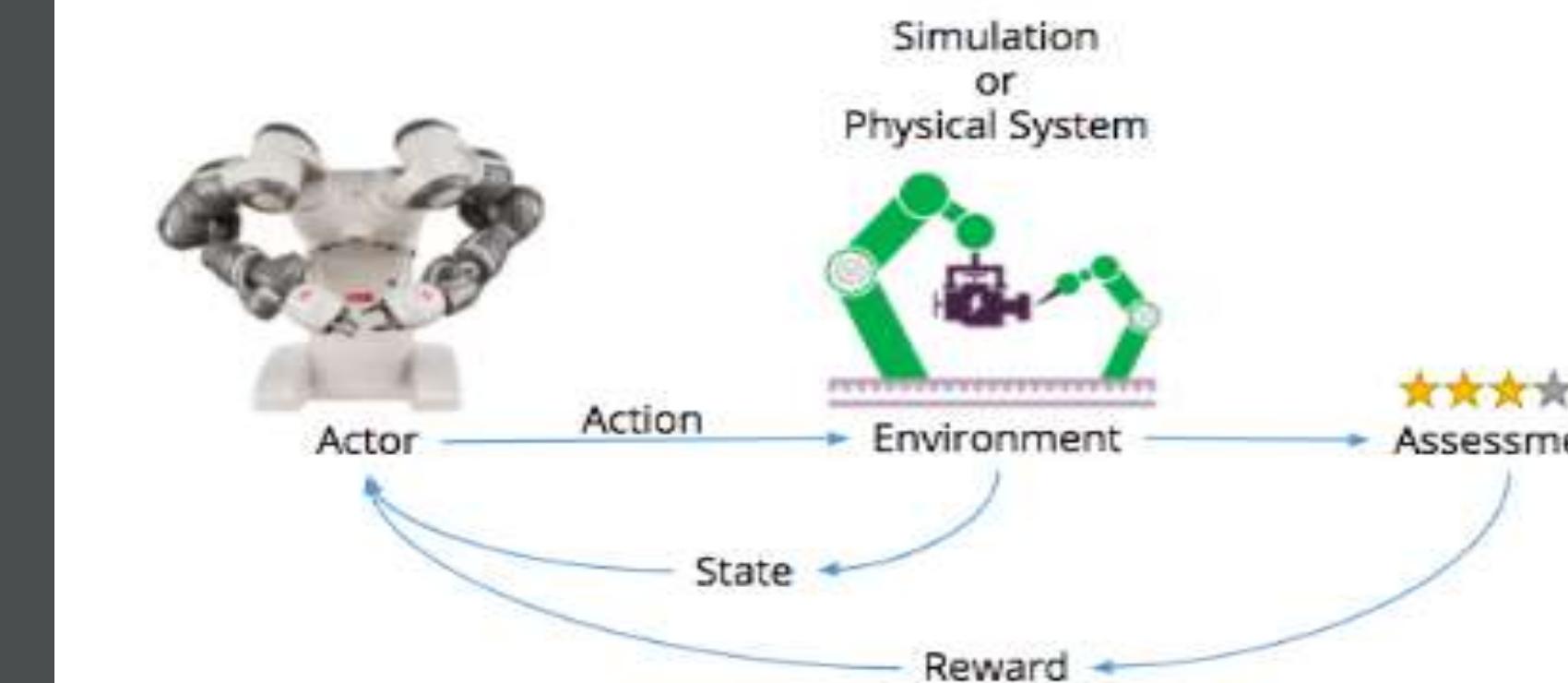
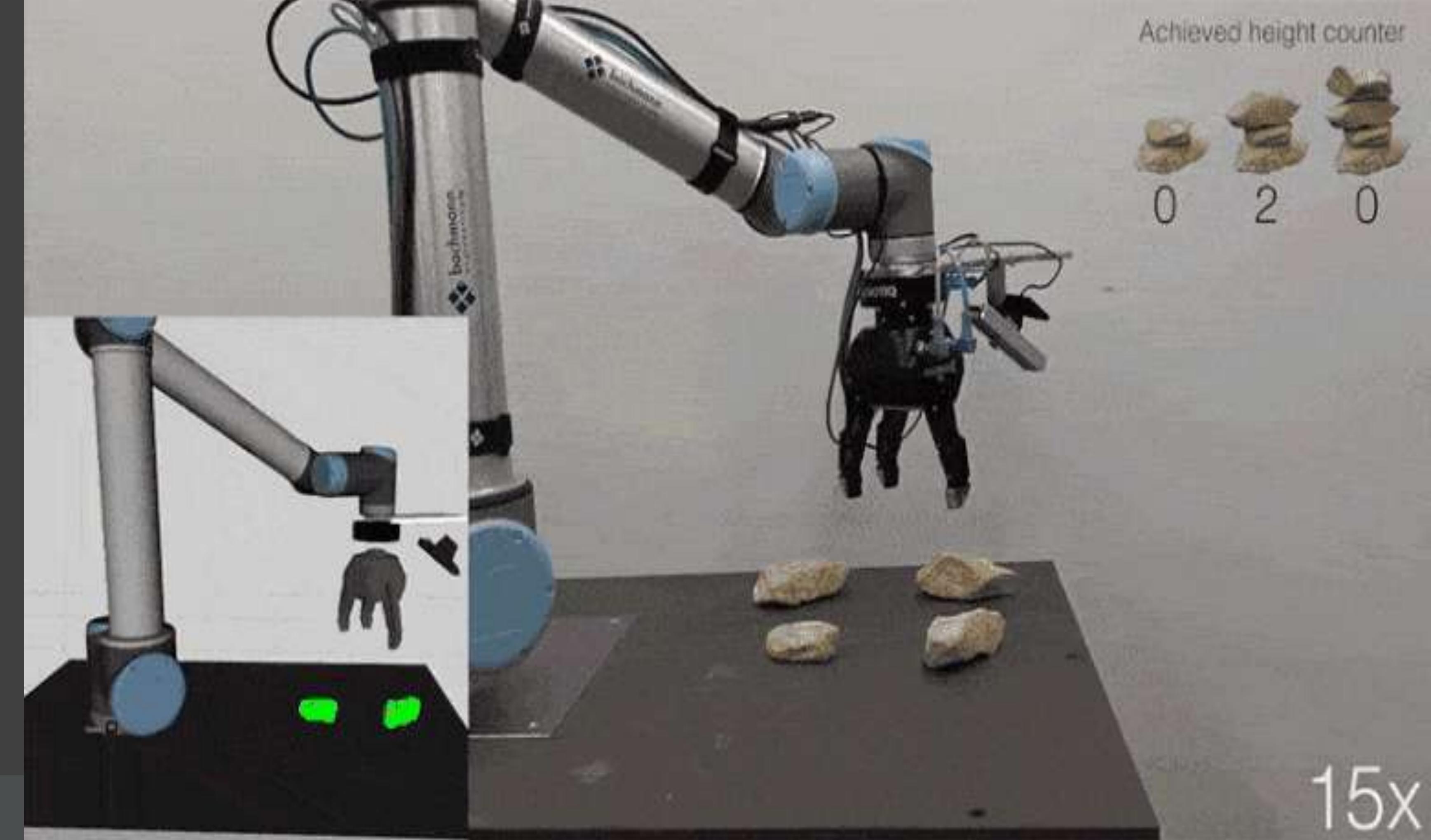
ALGORITHMS

Reinforcement Learning

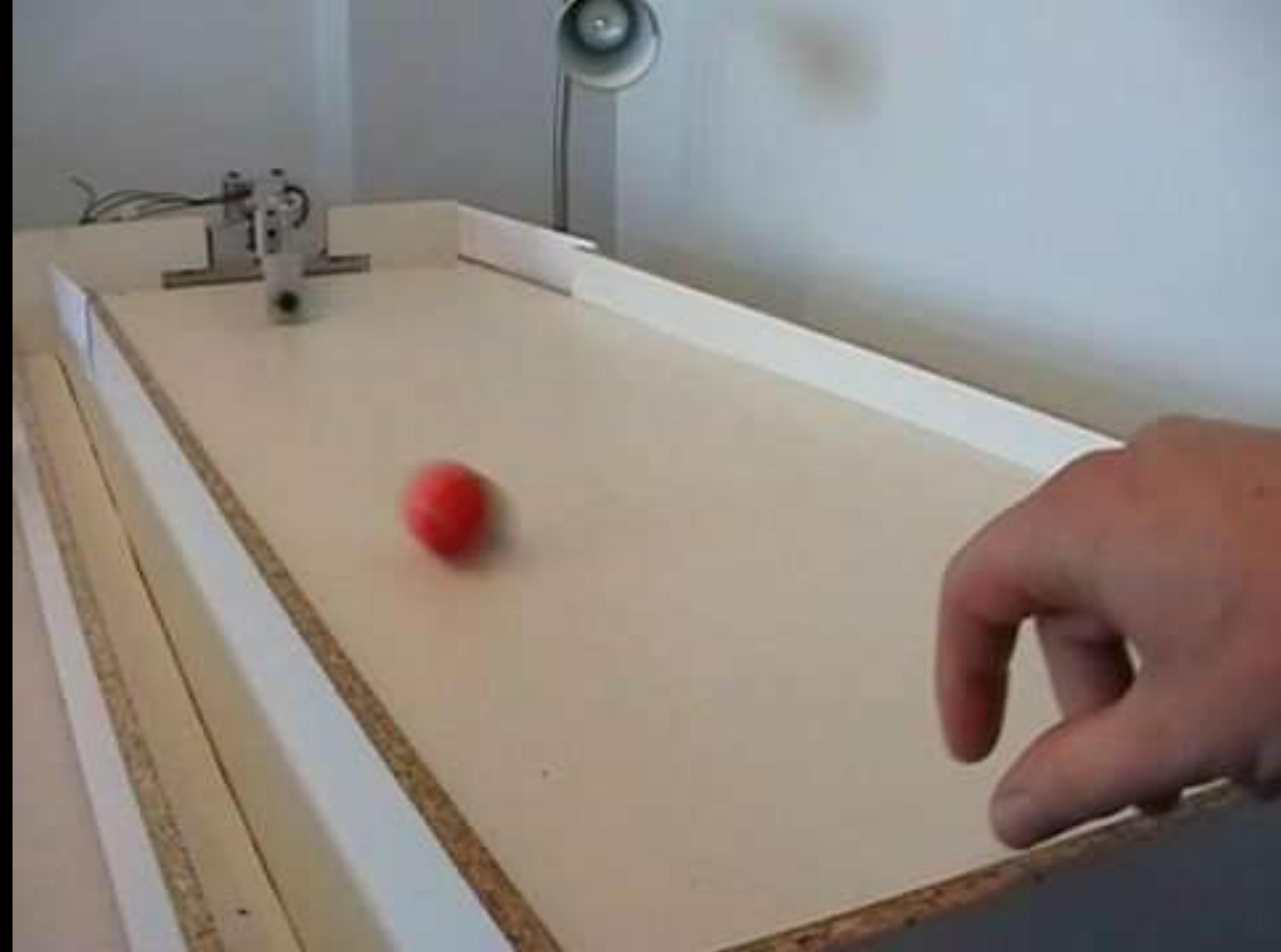
Deep Reinforcement Learning

Machine Teaching

Multi-agent Reinforcement Learning



Reinforcement learning (RL) is an area of machine learning concerned with how **software agents** ought to take **actions** in an environment in order to maximize the notion of cumulative reward.





2016

Google's Deepmind **AlphaGo** defeated **Lee Se-dol**, a South Korean professional Go player of 9 dan rank, who ranked **second** in international titles in 2016.

2019

Lee **announced his retirement** from professional play, arguing that **he could never be the top overall player** of Go due to the **increasing dominance of AI**. Lee referred to them as being "**an entity that cannot be defeated**"







Article

Grandmaster level in StarCraft II using multi-agent reinforcement learning

<https://doi.org/10.1038/s41586-019-1724-z>

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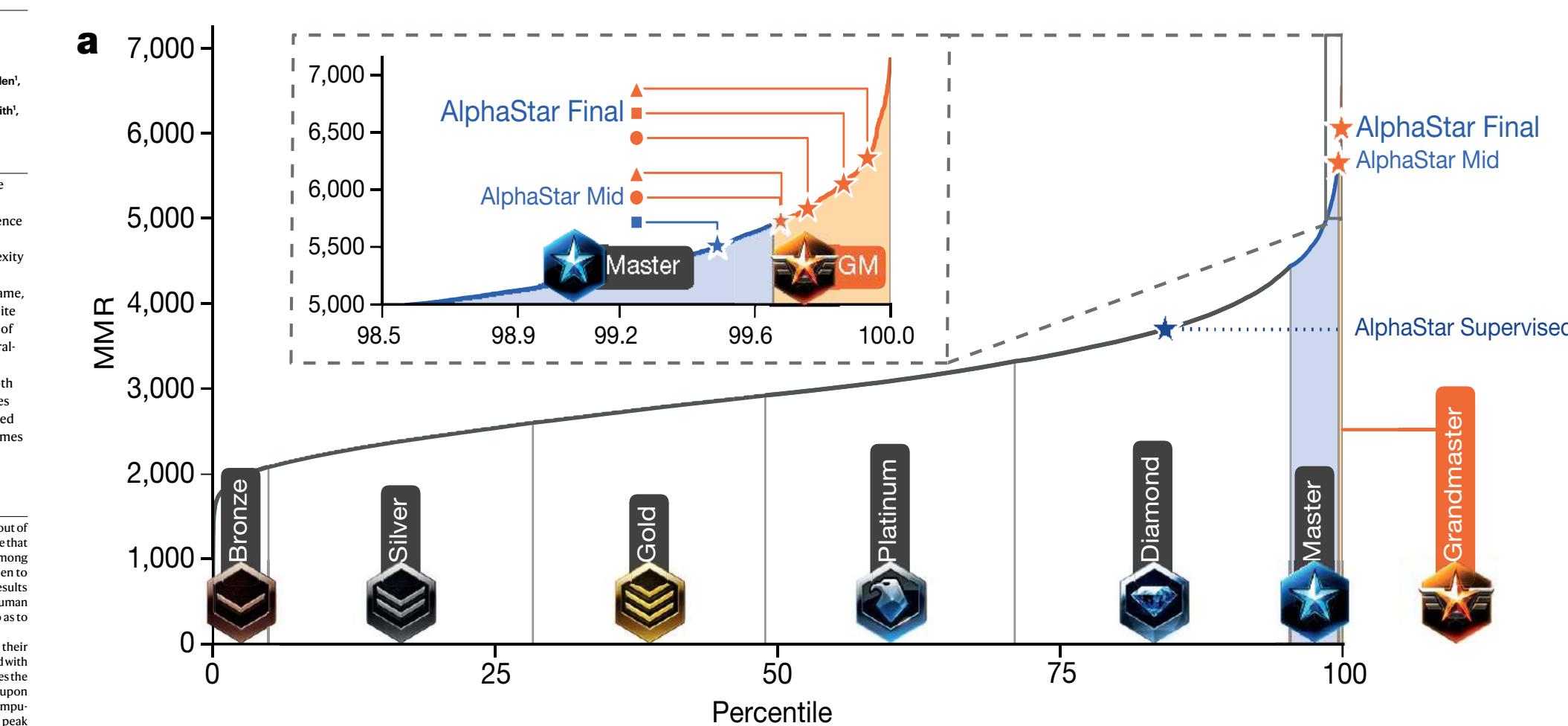
Oriol Vinyals^{1,2*}, Igor Babuschkin^{1,3}, Wojciech M. Czarnecki^{1,3}, Michaël Mathieu^{1,3}, Andrew Dudzik^{1,3}, Junyoung Chung^{1,3}, David H. Choi^{1,3}, Richard Powell^{1,3}, Timo Ewalds^{1,3}, Petko Georgiev^{1,3}, Junhyuk Oh^{1,3}, Dan Horgan^{1,3}, Manuel Kroiss^{1,3}, Ivo Danihelka^{1,3}, Aja Huang^{1,3}, Laurent Sifre^{1,3}, Trevor Cai^{1,3}, John P. Agapiou^{1,3}, Max Jaderberg^{1,3}, Alexander S. Vezhnevets^{1,3}, Rémi Leblond¹, Tobias Pohlen¹, Valentin Dalibard¹, David Budden¹, Yury Sulsky¹, James Mollot¹, Tom L. Paine¹, Caglar Gulcehre¹, Ziyu Wang¹, Tobias Pfaff¹, Yuhui Wu¹, Roman Ring¹, Dani Yogatama¹, Dario Wünsch¹, Katrina McKinney¹, Oliver Smith¹, Tom Schaul¹, Timothy Lillicrap¹, Koray Kavukcuoglu¹, Demis Hassabis¹, Chris Apps^{1,3} & David Silver^{1,2*}

Many real-world applications require artificial agents to compete and coordinate with other agents in complex environments. As a stepping stone to this goal, the domain of StarCraft has emerged as an important challenge for artificial intelligence research, owing to its iconic and enduring status among the most difficult professional esports and its relevance to the real world in terms of its raw complexity and multi-agent challenges. Over the course of a decade and numerous competitions^{1–3}, the strongest agents have simplified important aspects of the game, utilized superhuman capabilities, or employed hand-crafted sub-systems⁴. Despite these advantages, no previous agent has come close to matching the overall skill of top StarCraft players. We chose to address the challenge of StarCraft using general-purpose learning methods that are in principle applicable to other complex domains: a multi-agent reinforcement learning algorithm that uses data from both human and agent games within a diverse league of continually adapting strategies and counter-strategies, each represented by deep neural networks^{5,6}. We evaluated our agent, AlphaStar, in the full game of StarCraft II, through a series of online games against human players. AlphaStar was rated at Grandmaster level for all three StarCraft races and above 99.8% of officially ranked human players.

StarCraft is a real-time strategy game in which players balance high-level economic decisions with individual control of hundreds of units. This domain raises important game-theoretic challenges: it features a vast search space, many cycles of actions, and a large number of possible moves. The game is highly dynamic and requires complex decision-making, as it is often necessary to switch between different strategies based on the current state of the game. The game also features a large number of possible moves, which makes it difficult for even the best human players to keep track of all the possibilities. The game also features a large number of possible moves, which makes it difficult for even the best human players to keep track of all the possibilities.

Each action a_t is highly structured: it selects what action type, out of several hundred (for example, move or build worker); who to issue that action to, for any subset of the agent's units; where to target, among (possibly many) targets visible in the camera view; when to observe and act most (Fig. 1a). This representation of actions results in approximately 10^6 possible choices at each step. Similar to human players, a special action is available to move the camera view, so as to gather more information.

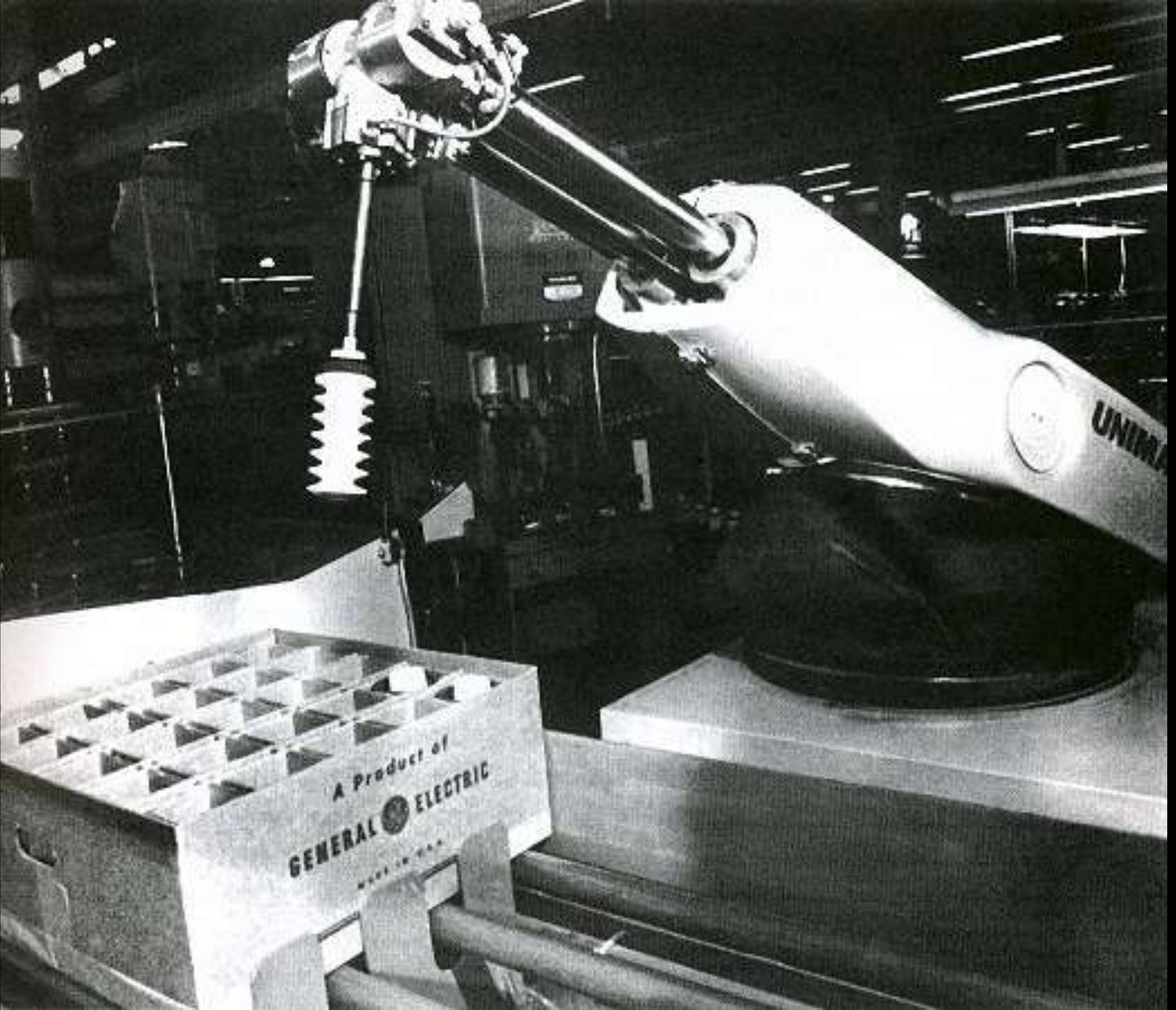
Humans play StarCraft under physical constraints that limit their reaction time and the rate of their actions. The game was designed with those limitations in mind, and removing those constraints changes the nature of the game. We therefore chose to impose constraints upon AlphaStar: it suffers from delays due to network latency and computation time; and its actions per minute (APM) are limited, with peak statistics substantially lower than those of humans (Figs. 2c, 3g for performance analysis). AlphaStar's play with this interface and these



2019

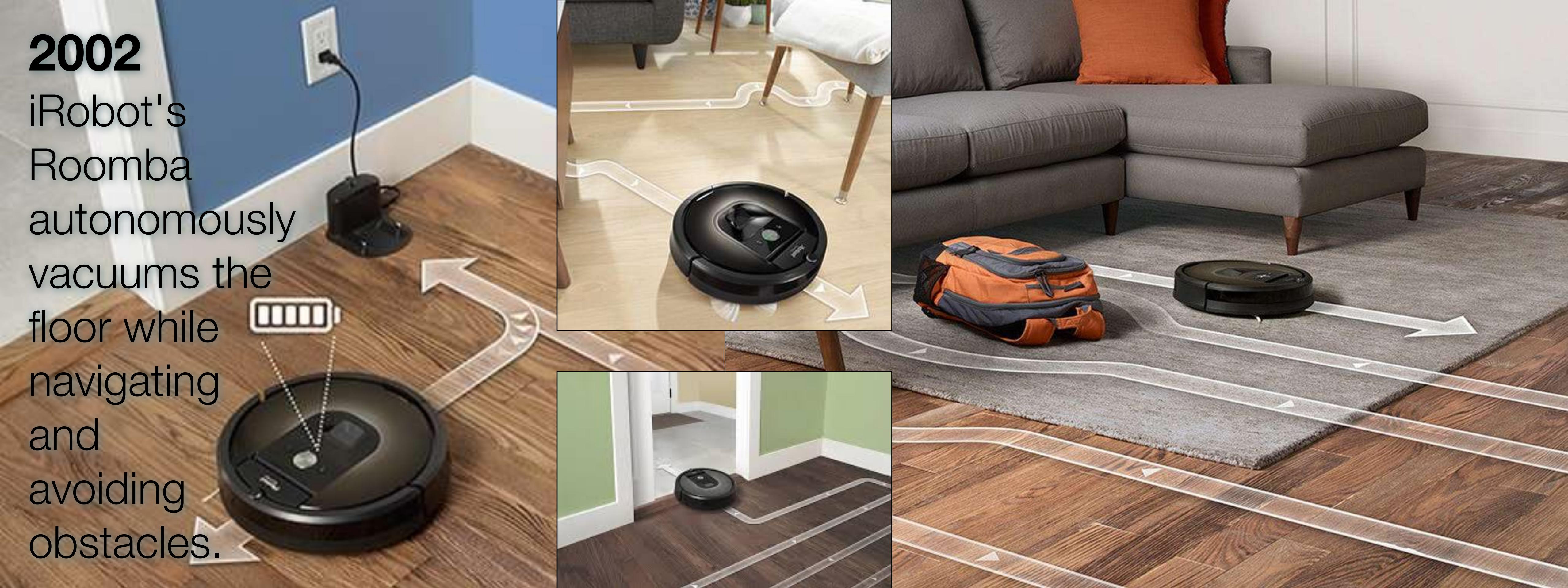
1961

Unimate,
General
Motors
automobile
assembly
line.



2002

iRobot's
Roomba
autonomously
vacuums the
floor while
navigating
and
avoiding
obstacles.



Smart Buildings

Heating, ventilation, and air conditioning (HVAC)

Outcome

First the model learned to control temperature well. Then it learned to consider room occupancy to save energy (21%) while preserving comfort and high air quality when it matters most.

Sign up for the limited preview! >



Optimization Goals

Temperature Control



Air Quality



Energy Cost



Environmental Variables

Energy Cost kWh	Time of Day	Outdoor Temperature	Occupancy	Air Recycled
Variable energy price	Local time	Degrees Celsius	Number of occupants in the conference room	Percentage of air recycled

Motion Control

Horizontal Oil Drilling

Business Problem

Motion control automates machines or parts of machines like oil rigs that drills horizontally underground. An operator controls the drill underground with a joystick to keep the drill inside oil shale while avoiding obstacles.

Goal

Train a model that automates control of a horizontal oil drill according to a predefined drilling plan.

Industries:

Discrete Manufacturing

Chemical & Agrochemical

Autos

Mining



Sensors

Tool Face



Direction where the
drill bit side force acts,
0 to 90 degrees

Weight on Bit



1,000 lbs. to 100,000
lbs. depending on the
size and type of bit

Side Force



lbs

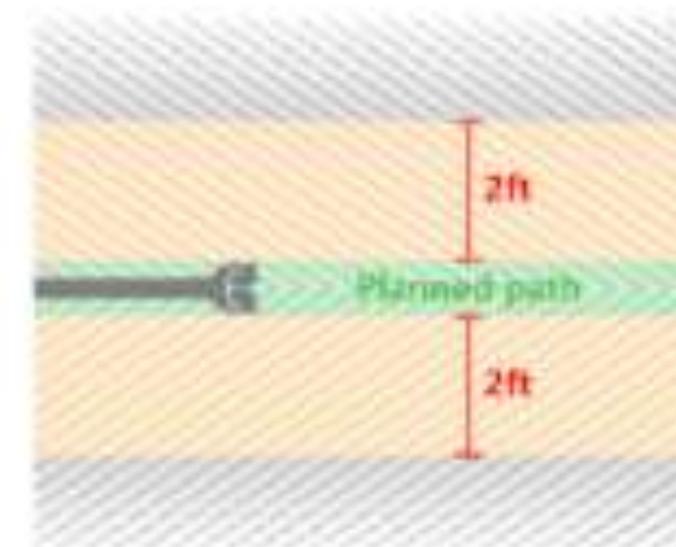
Inclination



Angle of drilling
operation in degrees

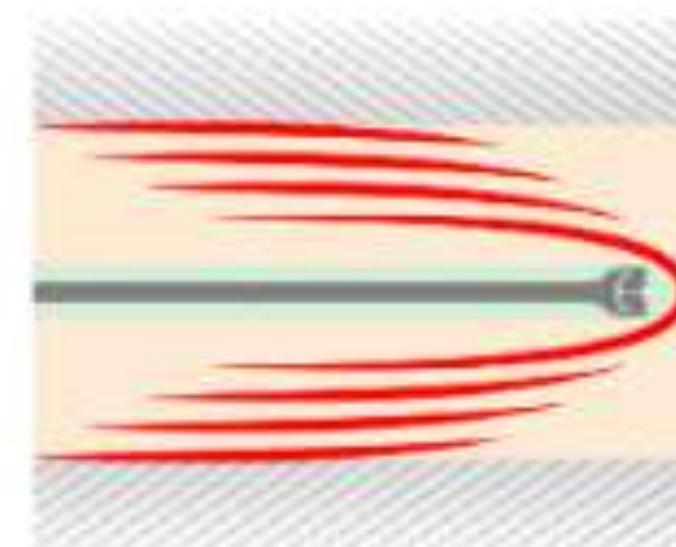
Optimization Goals

Precision



Percentage of time the drill was within the tolerance distance of the well plan.

Speed



Percentage increase of the time taken for the model to complete a drilling run compared to the benchmark.

2018

Jaguar Plans 20,000
Waymo I-Pace Models



Didi announces autonomous taxi pilot for Shanghai

PAUL SAWERS @PSAWERS AUGUST 30, 2019 4:16 AM



Above: China's Didi is piloting a robo-taxi service in Shanghai

Chinese ride-hailing giant Didi Chuxing (Didi) has announced plans to pilot a self-driving taxi service in Shanghai, weeks after spinning out its autonomous driving unit as a standalone company.

On Tuesday of this week, the Shanghai government greenlit Didi's push to test its fleet of autonomous vehicles on public roads.

05

Hyperpersonalization

Allows to make **recommendations** based on **user behaviour**.

Very common in **marketing** and **sales** strategies

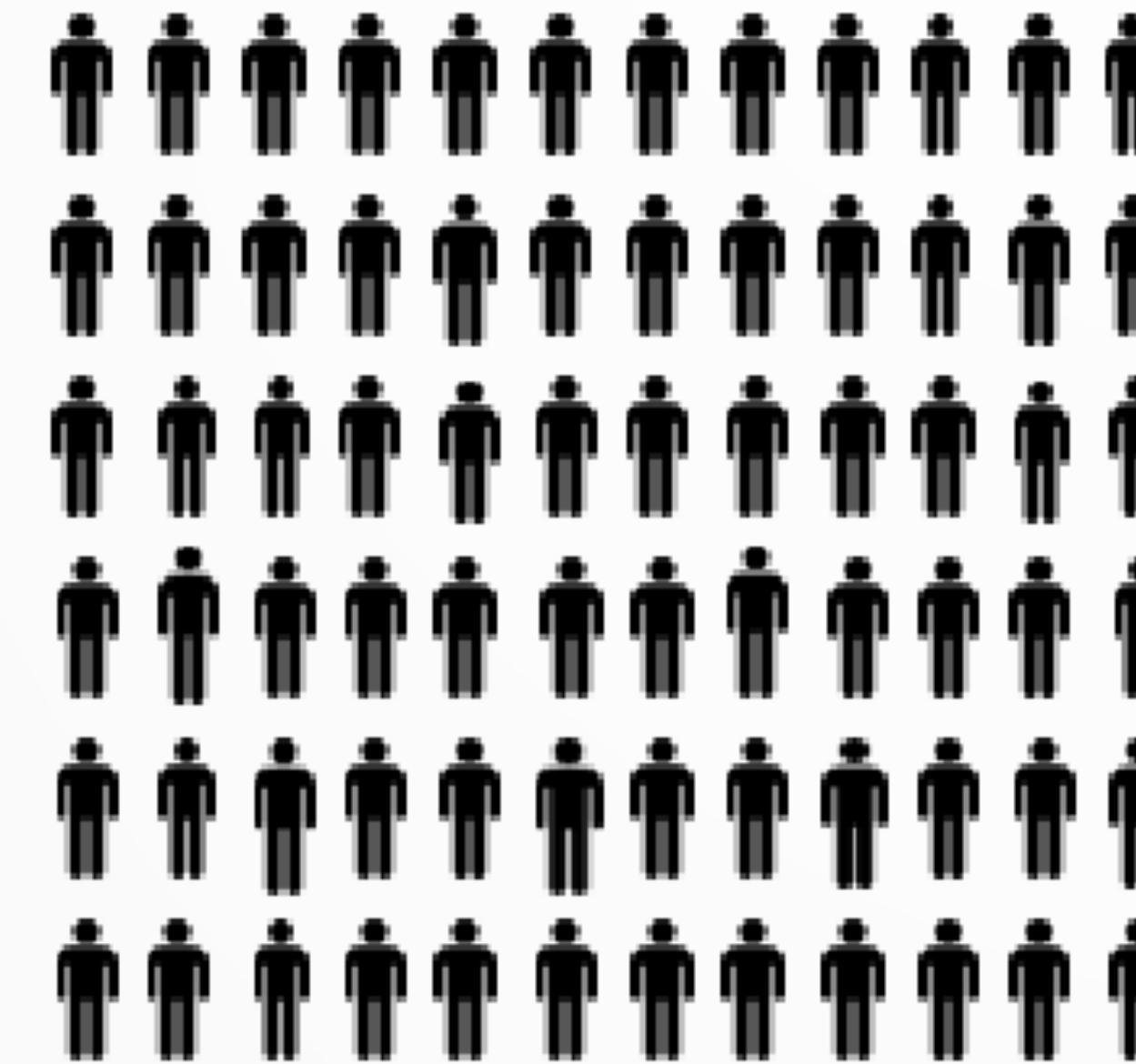
ALGORITHMS

Non Supervised / Supervised

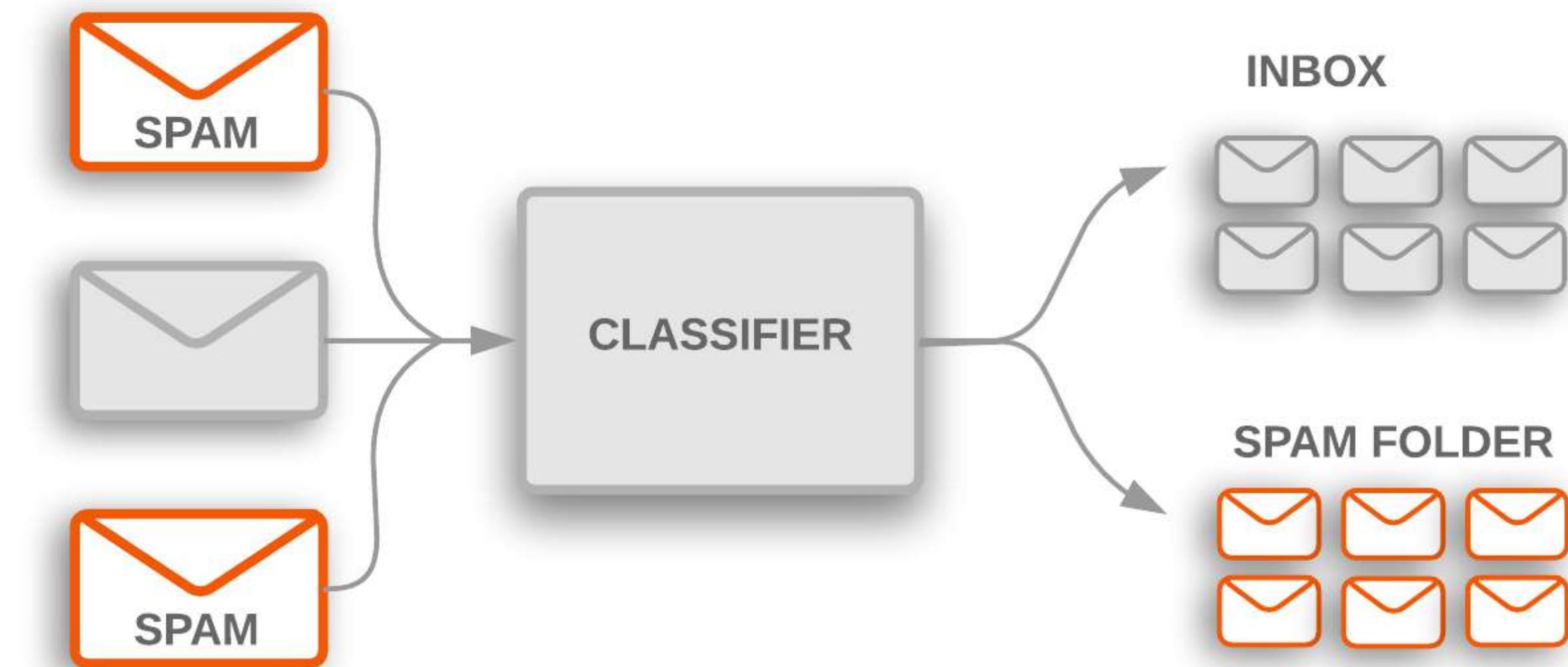
Linear Classifiers
Nearest Neighbor
Support Vector
Machines
Decision /
Boosted Trees

Random Forest
Clustering
Algorithms
Knowledge
Graphs
Neural Networks

We want to launch a new campaign



Who do we choose to contact?





THE AGE OF THE CUSTOMER

More **Data** (Big Data) ->
more **knowledge** of the person ->
further **customization** ->
better customer **experience**



35% of Amazon.com's revenue is generated by its recommendation engine

RECOMMENDED FOR YOU, THOMAS

Recommended for you, Thomas

Literature & Fiction 62 ITEMS	Exercise & Fitness Equipment 9 ITEMS	Health, Fitness & Dieting Books 37 ITEMS	Tableware 12 ITEMS
Prime Video – Unlimited Streaming for Prime Members 12 ITEMS	Coffee, Tea & Espresso 98 ITEMS	Biographies & Memoirs 17 ITEMS	Engineering Books 7 ITEMS

FREQUENTLY BOUGHT TOGETHER

Frequently Bought Together

Total price: \$94.90

This item: Rumble Roller - Textured Muscle Foam Roller Manipulates Soft Tissue Like A Massage Therapist \$69.95

Rumble Roller X-Firm Beastie and Base - Extra Firm Spiky Massage Ball - Comes With Base For... \$24.95 (\$3.12 / oz)

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Nayoya Gymnastic Rings For Full Body Strength and Crossfit Training ★★★★★ 1,274 \$29.87 ✓Prime	Champion Sports NCAA NFHS Certified Lacrosse Ball ★★★★★ 673 \$5.00 - \$11.19	Rumble Roller Beastie Hook - Hand Held Massage Tool - Use With RumbleRoller Beastie... ★★★★★ 13 \$24.95 ✓Prime	Muscle Roller Ball Set :: Massage Balls for Deep Tissue, Trigger Point & Myofascial Release... ★★★★★ 237 \$14.95 ✓Prime
			Firm Roller, LuxFit Premium High Density Foam Roller - Extra Firm With 1 Year Warranty ★★★★★ 1,421 \$10.97 - \$24.95
			2 X LACROSSE BALLS FOR TRIGGER POINT MASSAGE: Fine-Toned® plus MASSAGE... ★★★★★ 43 \$10.75 - \$17.95 ✓Prime

BROWSING HISTORY

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Your Browsing History View and Edit

Purchased Dec 26, 2012

Rumble Roller Full Size Extra Firm Black Kindle Paperwhite, 6" High Resolution Display... Rumble Roller Beastie Hook - Hand Held... Amazon Prime (One Year Membership) Harney & Sons Black Tea Hot Cinnamon Sunset...

Today Thu, May 26 Wed, May 25

CUSTOMERS WHO BOUGHT THIS ALSO BOUGHT

Customers Who Bought This Item Also Bought

Page 1 of 2

Rumble Roller X-Firm Beastie and Base - Extra Firm Spiky Massage Ball - Comes With Base For... ★★★★★ 112 \$24.95 ✓Prime	Rumble Roller Beastie 1+1 - Massage Roller Ball - 1 Original And 1 X-Firm Beastie and Base... ★★★★★ 73 \$34.95 ✓Prime	Rumble Roller Beastie Bar & Stands - Hands Free Massager - Includes RumbleRoller Beastie... ★★★★★ 27 \$59.95 ✓Prime	Rumble Roller Original Beastie + Base - Massage Roller Ball - Comes With Base For Stabilized... ★★★★★ 37 \$24.95 ✓Prime	Rumble Roller - Textured Muscle Foam Roller Manipulates Soft Tissue Like A... ★★★★★ 431 \$44.95 - \$87.48	Rumble Roller Foam Rollers - Textured Muscle Foam Roller Manipulates Soft Tissue Like A... ★★★★★ 1,010 \$35.95

THERE IS A NEW VERSION OF THIS ITEM

There is a newer version of this item:

Kindle Paperwhite E-reader, 6" High-Resolution Display (300 ppi) with Built-in Light, Wi-Fi - Includes Special Offers
\$119.99
★★★★★ (19,163)
In Stock.

RECOMMENDED FOR YOU BASED ON A PREVIOUS PURCHASE

Recommended for You Based on Kindle Paperwhite, 6" High Resolution Display w...

MoKo Case for Kindle Paperwhite, Premium Thinnest and Lightest Leather Cover with... ★★★★★ 898 \$9.99 ✓Prime	Swees Ultra Slim Leather Case Cover for Amazon All-New Kindle Paperwhite (Both 2012... ★★★★★ 273 \$3.99 ✓Prime	Fintie SmartShell Case for Kindle Paperwhite - The Thinnest and Lightest Leather Cover for... ★★★★★ 7,015 \$14.99 ✓Prime	Kindle Paperwhite, 6" High Resolution Display (212 ppi) with Built-in Light, Free 3G... ★★★★★ 45,265 \$159.99 ✓Prime

BEST SELLING IN "CATEGORY"

Best-selling emerging technology See more

EDGERANK ALGORITHM ON FACEBOOK

$$\sum_{\text{edges } e} u_e w_e d_e$$



u_e - AFFINITY SCORE BETWEEN VIEWING USER AND EDGE CREATOR

w_e - WEIGHT FOR THIS EDGE TYPE (PHOTO, VIDEO, LIKE, TAGS, EVENT, ETC.)

d_e - TIME DECAY FACTOR BASED ON HOW LONG AGO THE EDGE WAS CREATED





NETFLIX

Netflix Prize

Home Rules Leaderboard Register Update Submit Download

Leaderboard

Display top 40 leaders.

Rank	Team Name	Best Score	% Improvement	Last Submit Time
-	No Grand Prize candidates yet	--	--	--
Grand Prize - RMSE <= 0.8563				
1	PragmaticTheory	0.8584	9.78	2009-06-16 01:04:47
2	BellKor in BigChaos	0.8590	9.71	2009-05-13 08:14:09
3	Grand Prize Team	0.8593	9.68	2009-06-12 08:20:24
4	Dace	0.8604	9.56	2009-04-22 05:57:03
5	BigChaos	0.8613	9.47	2009-06-15 18:03:55
Progress Prize 2008 - RMSE = 0.8616 - Winning Team: BellKor in BigChaos				
6	BellKor	0.8620	9.40	2009-06-17 13:41:48
7	Gravity	0.8634	9.25	2009-04-22 18:31:32
8	Opera Solutions	0.8640	9.19	2009-06-09 22:24:53
9	xlvector	0.8640	9.19	2009-06-17 12:47:27
10	BruceDenoDaoCiYiYou	0.8641	9.18	2009-06-02 17:08:31
11	Ces	0.8642	9.17	2009-06-12 23:04:25
12	majia2	0.8642	9.17	2009-06-15 03:35:00
13	xiangliang	0.8642	9.17	2009-06-13 16:35:35
14	Feeds2	0.8647	9.11	2009-06-16 22:21:19
15	Just a guy in a garage	0.8650	9.08	2009-05-24 10:02:54
16	Team ESP	0.8653	9.05	2009-06-16 05:25:11
17	pengpengzhou	0.8654	9.04	2009-05-05 18:18:03
18	NewNetflixTeam	0.8657	9.01	2009-05-31 07:30:22
19	J Dennis Su	0.8658	9.00	2009-03-11 09:41:54
20	Vandelay Industries !	0.8658	9.00	2009-05-11 00:43:14

NETFLIX



06 Computer Vision

A discipline that includes methods for **acquiring, processing, analyzing, and understanding real-world images** in order to produce information that can be processed by a computer.

ALGORITHMS

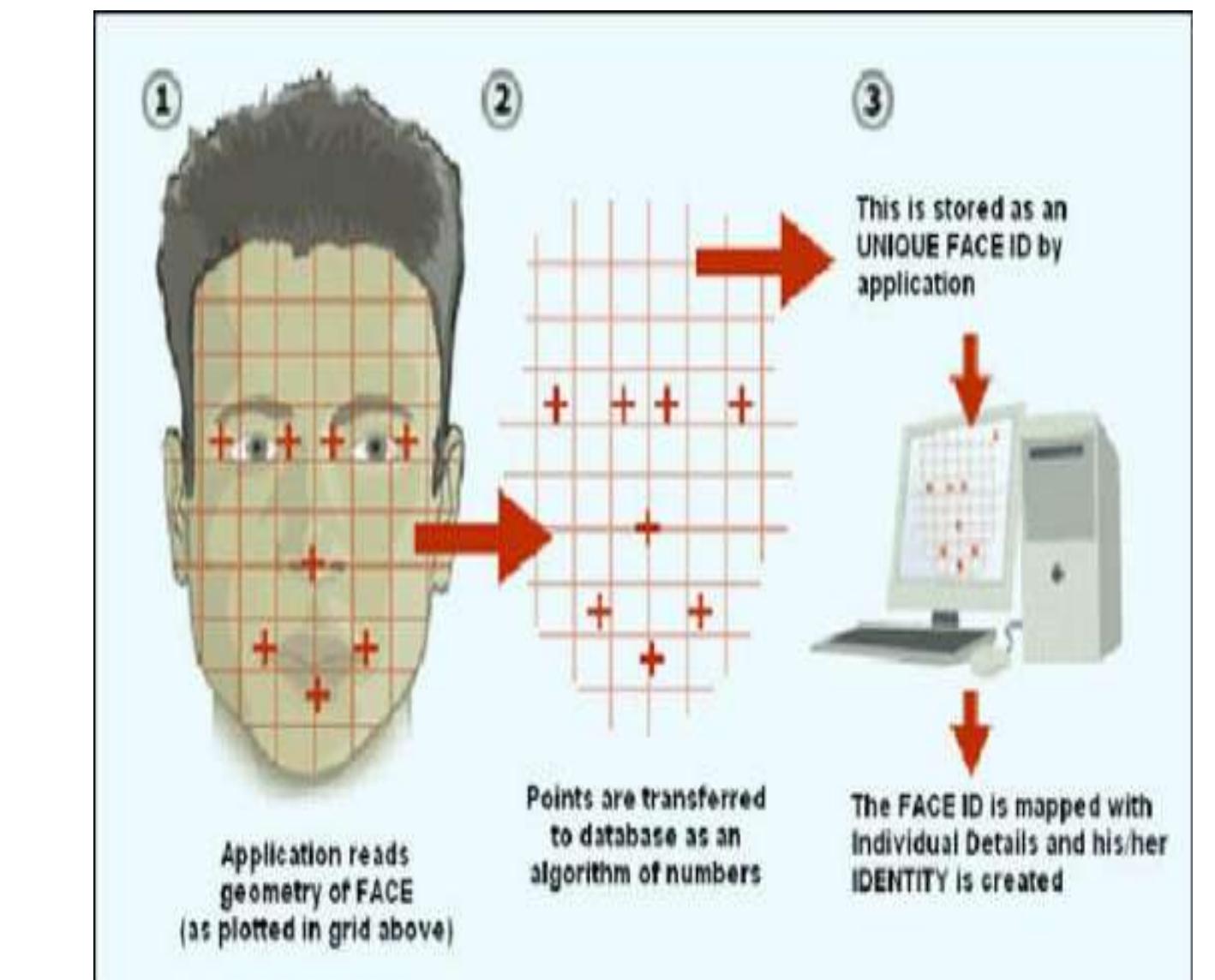
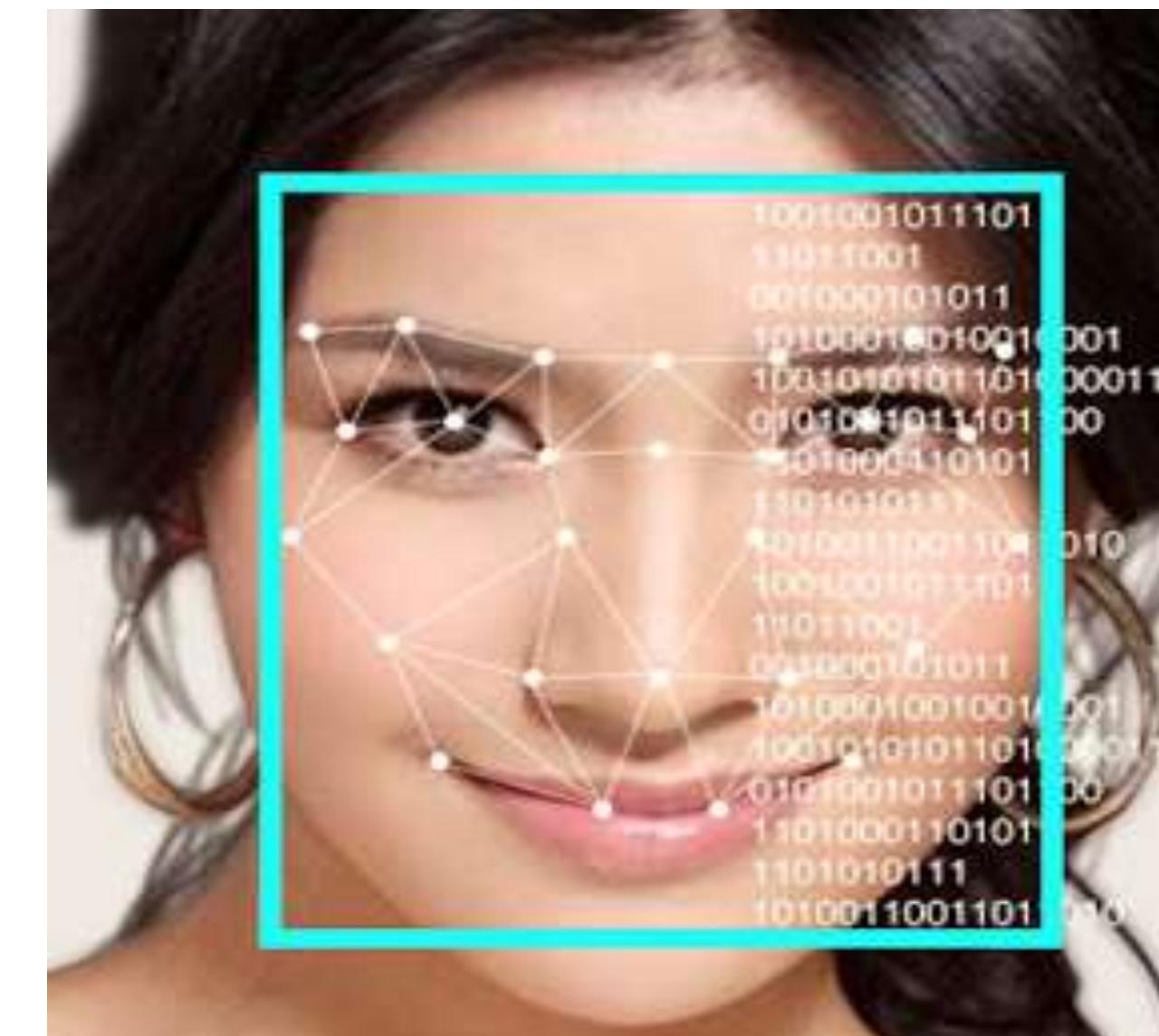
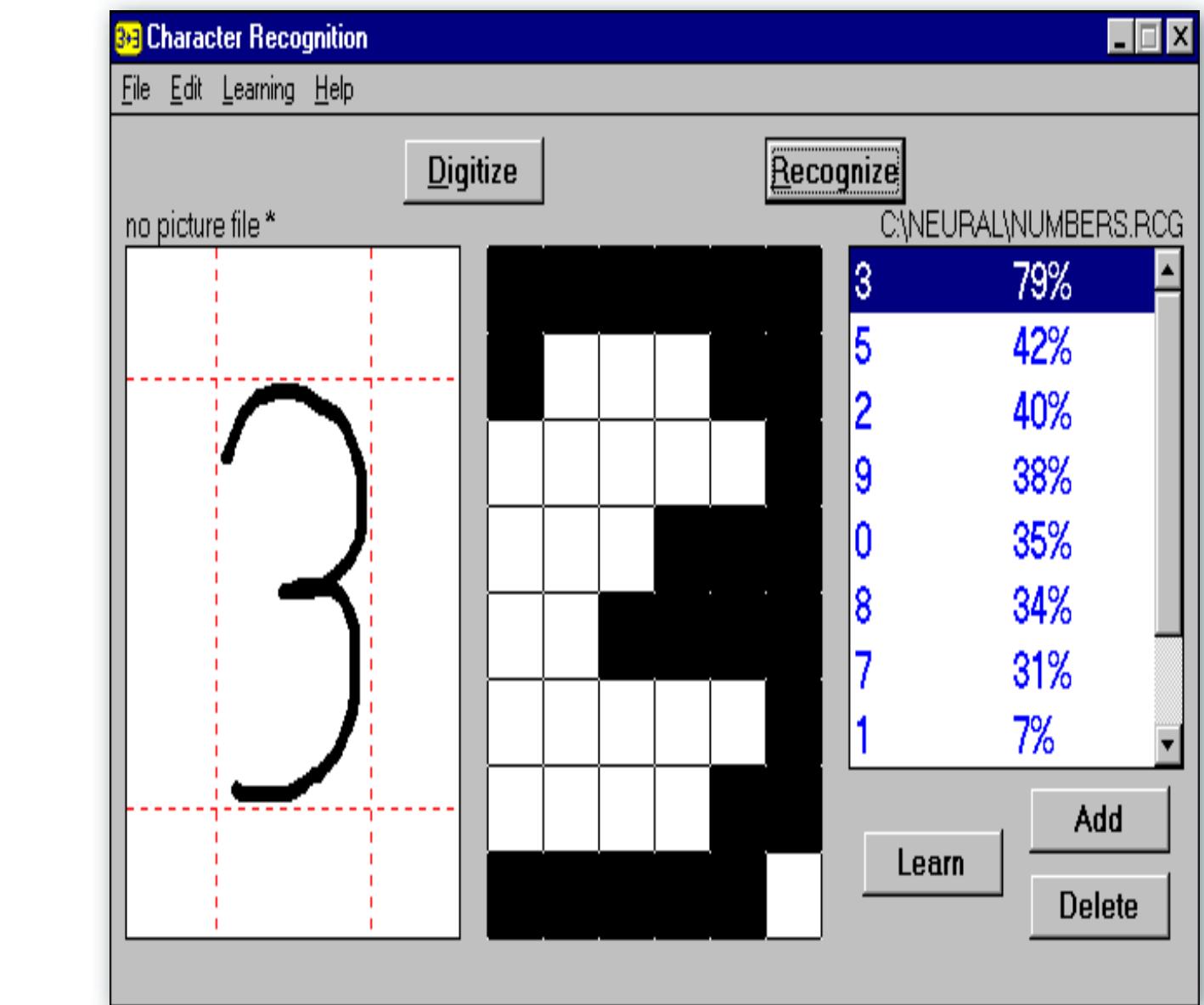
Supervised

Image classification

Object detection

Instance segmentation

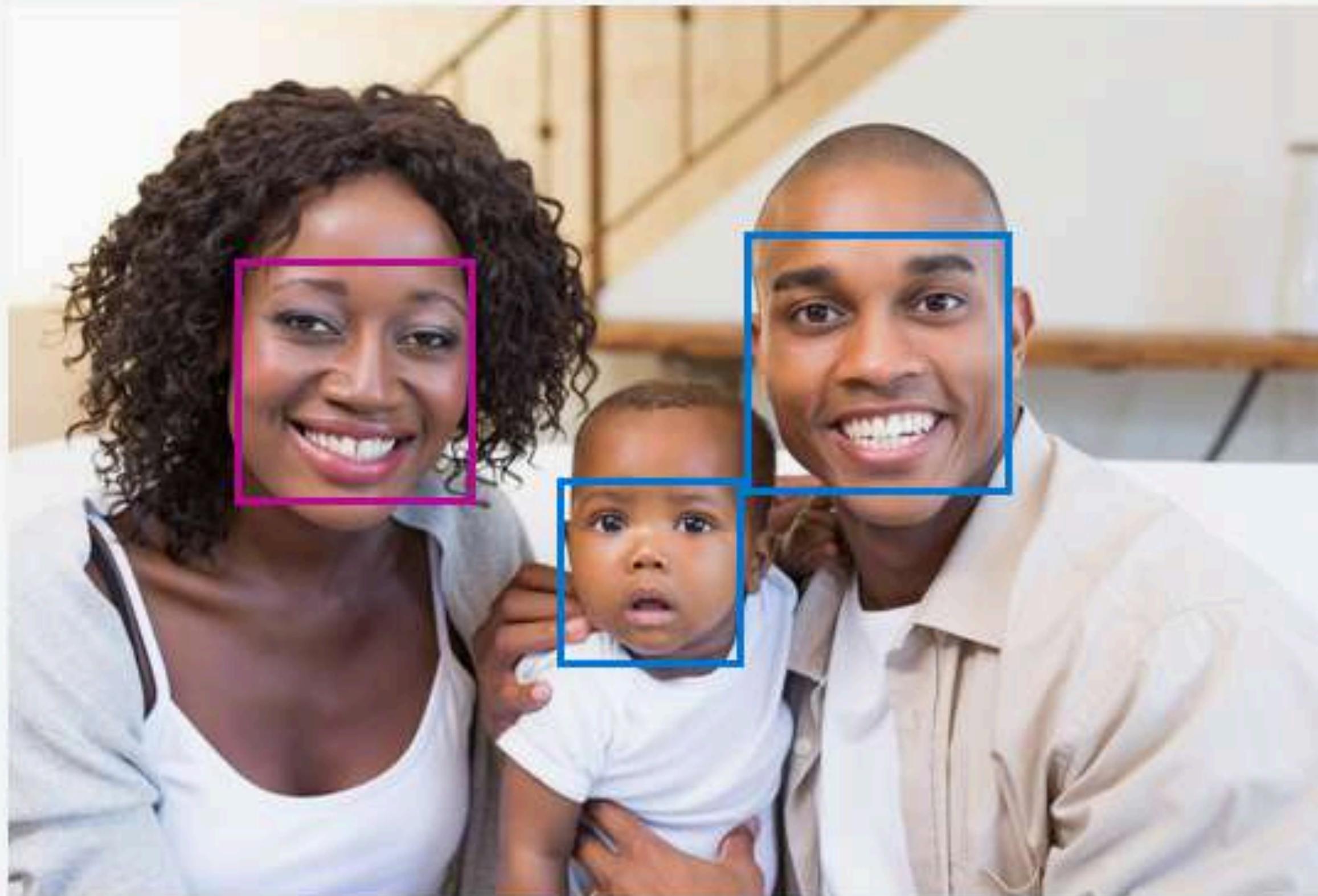
CNNs





Face

An AI service that analyzes faces in images



Face detection

Detect one or more human faces along with attributes such as: age, emotion, pose, smile, and facial hair, including 27 landmarks for each face in the image.

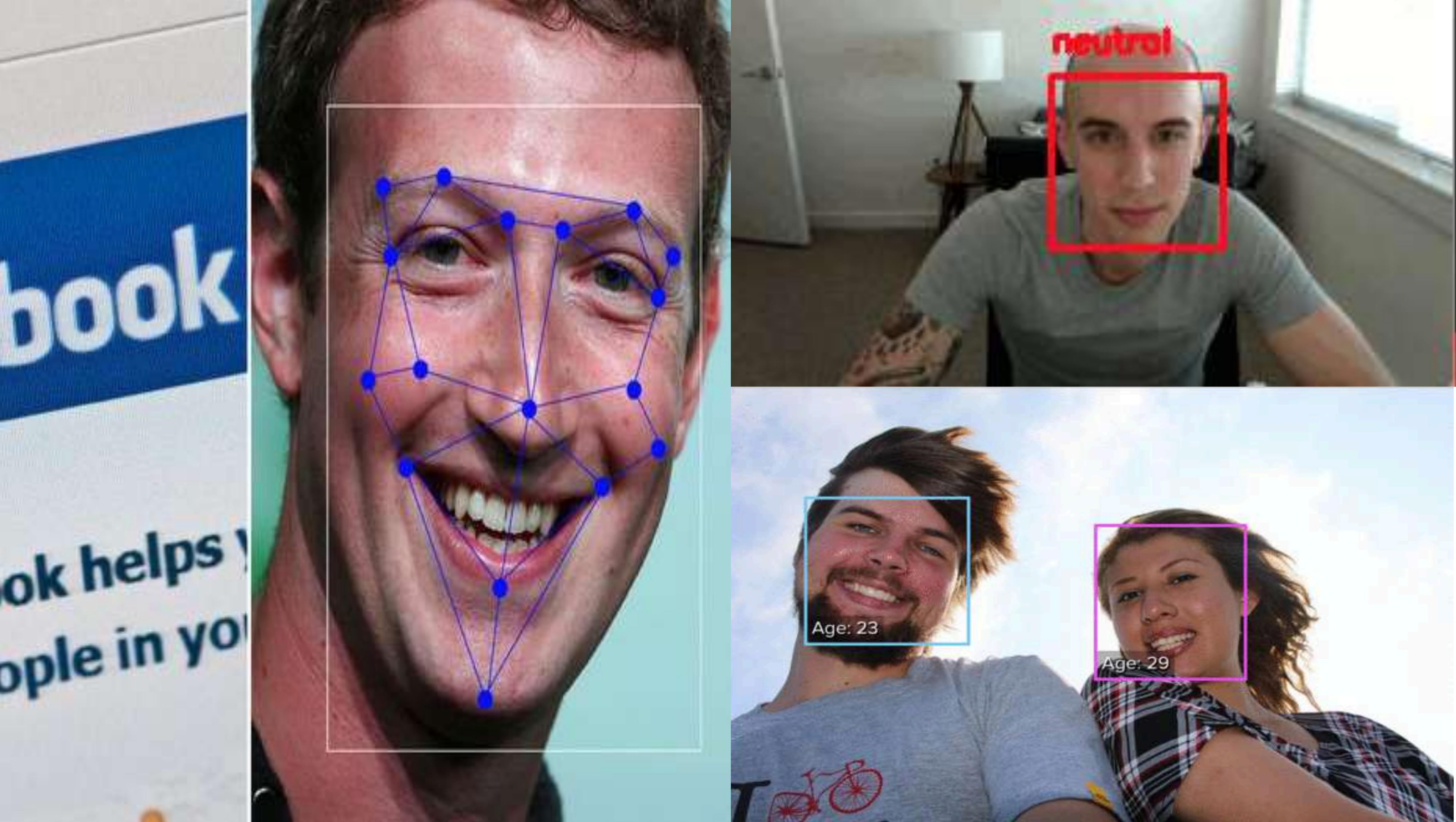
```
Detection result:  
detection_01  
JSON:  
[  
 {  
 "faceId": "2e646b45-1b34-498c-9428-cc90fbabd594",  
 "faceRectangle": {  
 "top": 169,  
 "left": 553,  
 "width": 195,  
 "height": 195  
 },  
 "faceAttributes": {  
 "hair": {  
 "bald": 0.81,  
 "hairColor": []  
 },  
 "smile": 1.0,  
 "headPose": {  
 "pitch": 0.3,  
 "roll": -4.6,  
 "yaw": -6.7  
 },  
 "gender": "male",  
 "age": 26.0,  
 "facialHair": {  
 "moustache": 0.4,  
 "beard": 0.1,  
 "sideburns": 0.0  
 }  
 }  
 }]
```

Submit

Browse

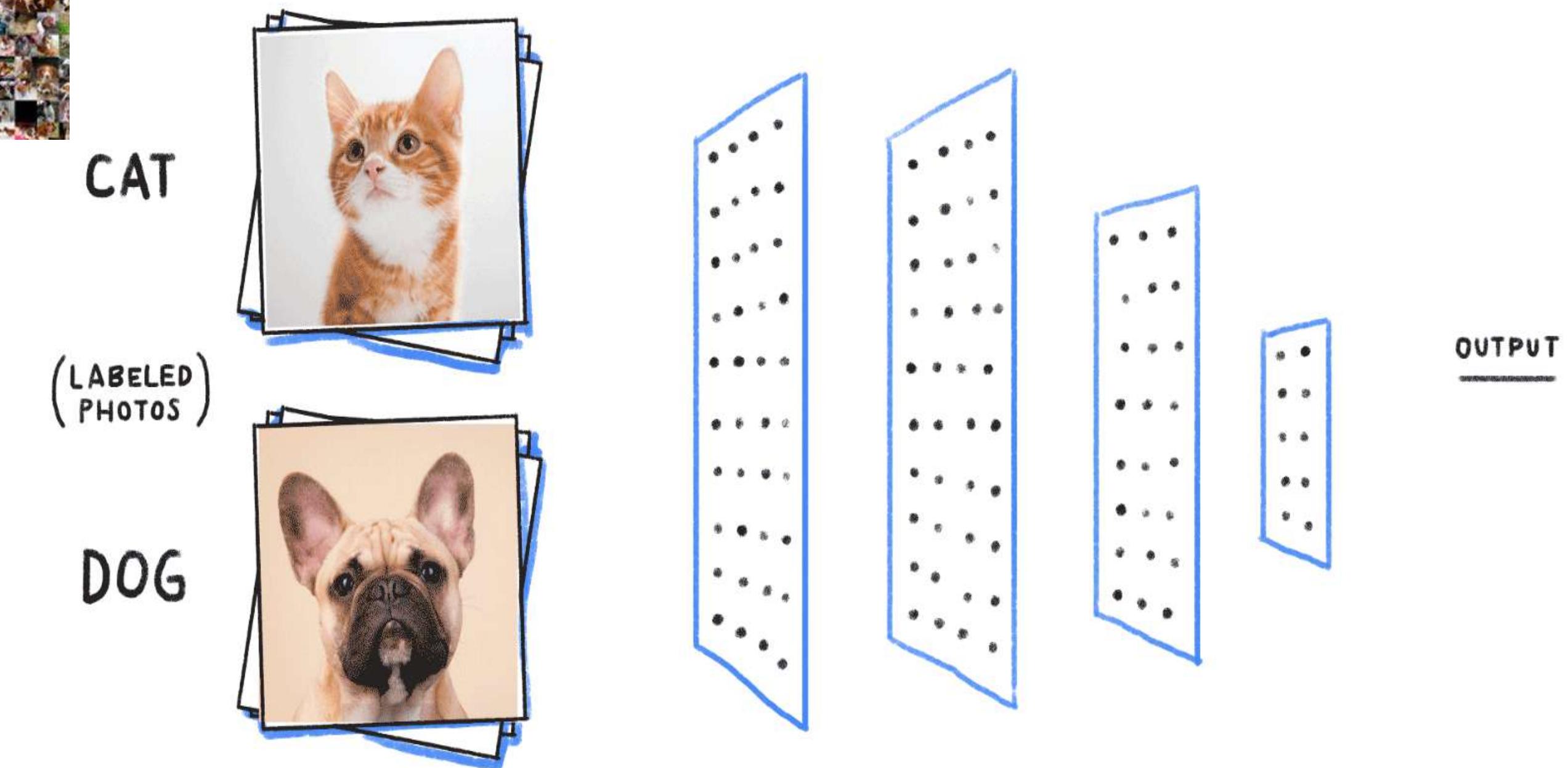
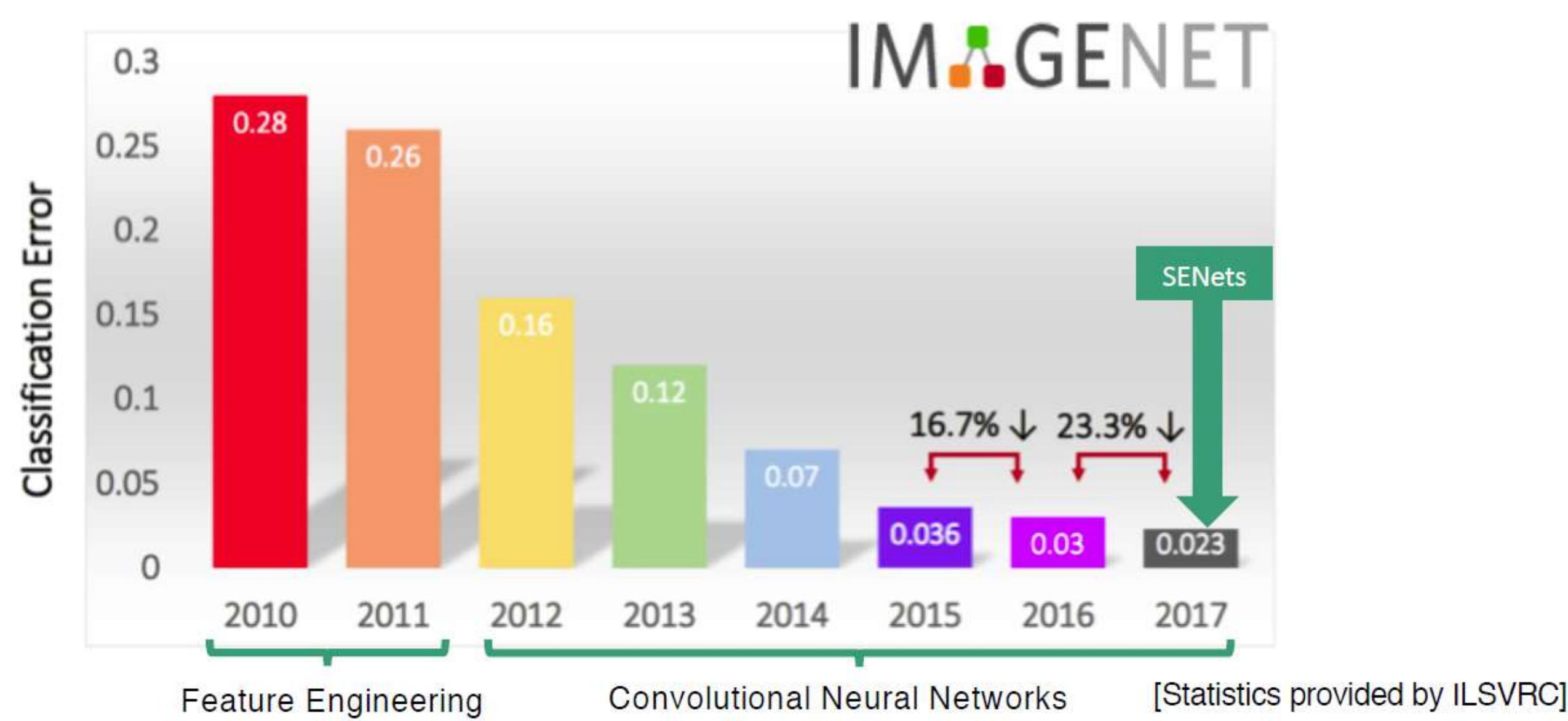
Detection
Model:

detection_01



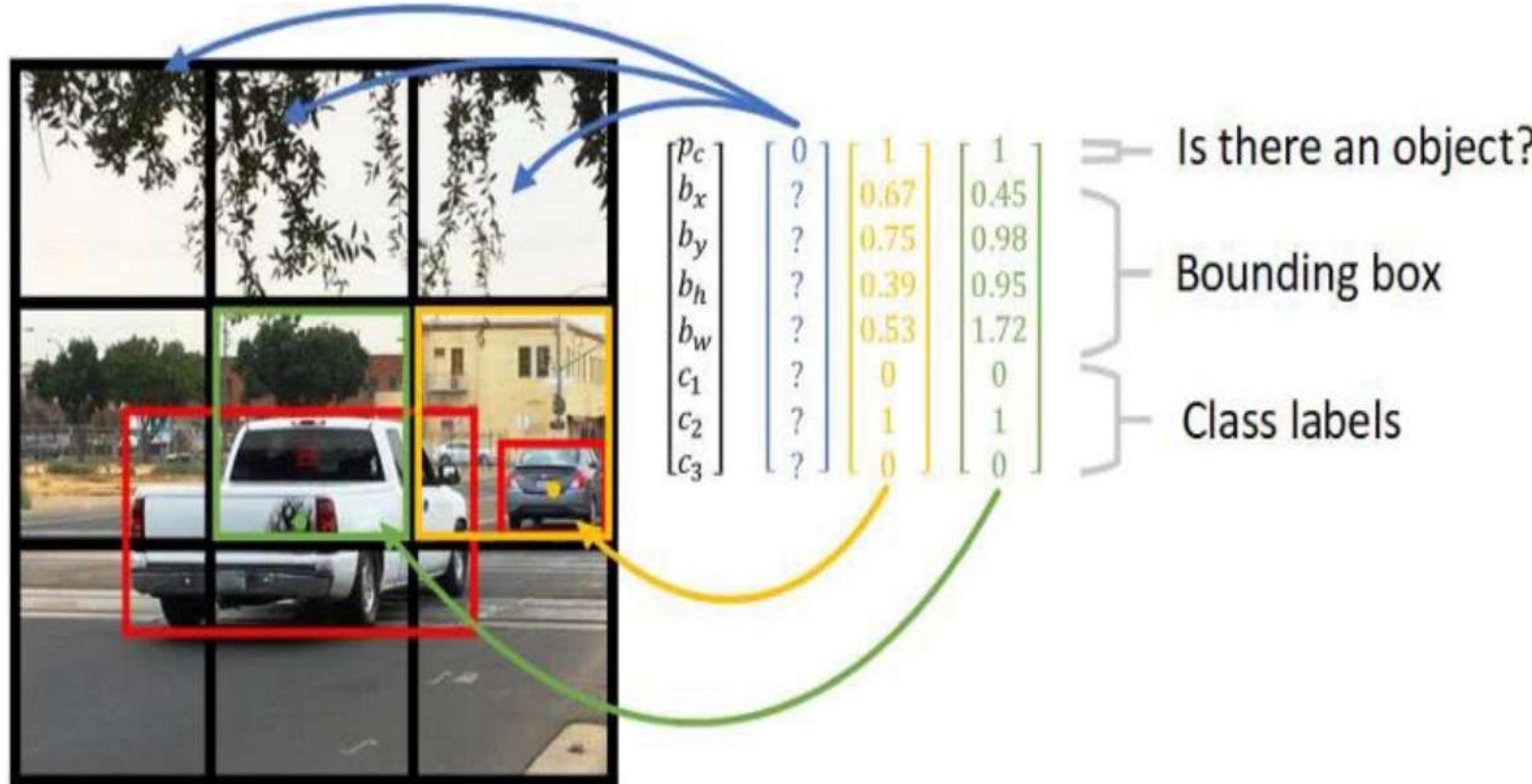


14M+ images
Hand-annotated 20,000 categories

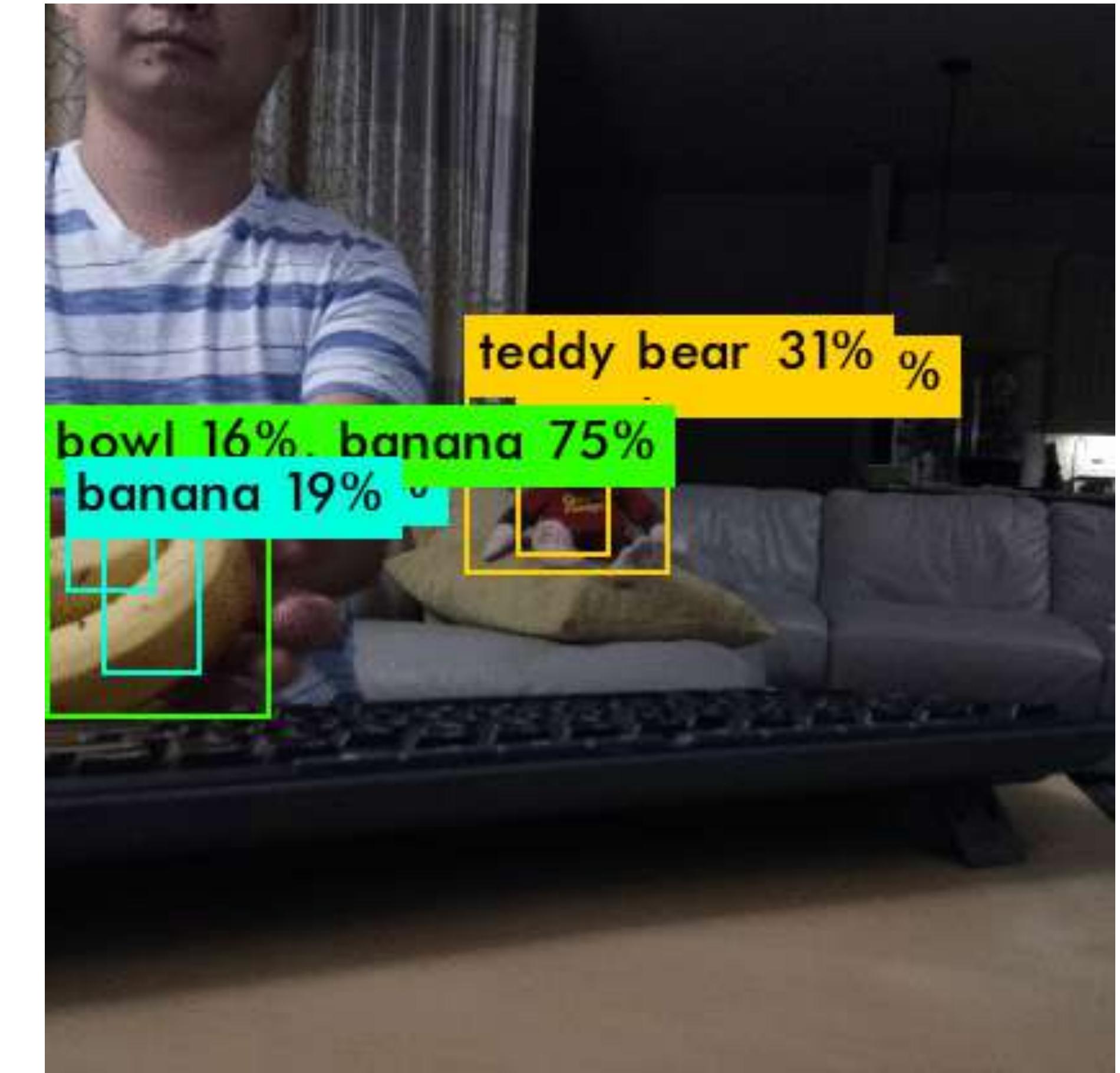


YOLO (You Only Look Once): Real-time Object Detection

How Does YOLO Work?



YOLO divides up the image into a grid of 13 by 13 cells: Each of these cells is responsible for predicting 5 bounding boxes. A bounding box describes the rectangle that encloses an object. YOLO also outputs a confidence score that tells us how certain it is that the predicted bounding box actually encloses some object.





Deep Visual-Semantic Alignments for Generating Image Descriptions



"man in black shirt is playing guitar."



"construction worker in orange safety vest is working on road."



"two young girls are playing with lego toy."



"boy is doing backflip on wakeboard."



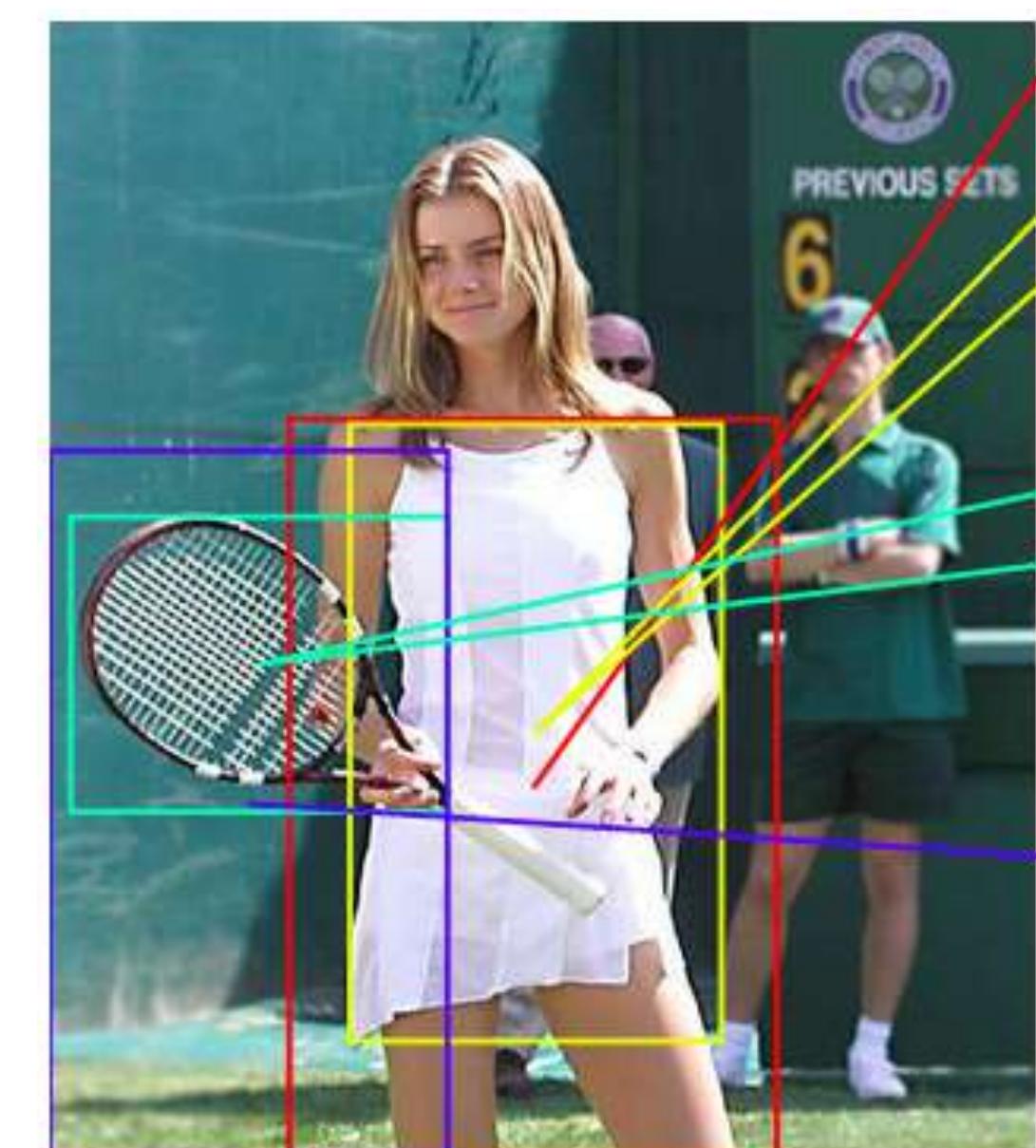
"girl in pink dress is jumping in air."



"black and white dog jumps over bar."



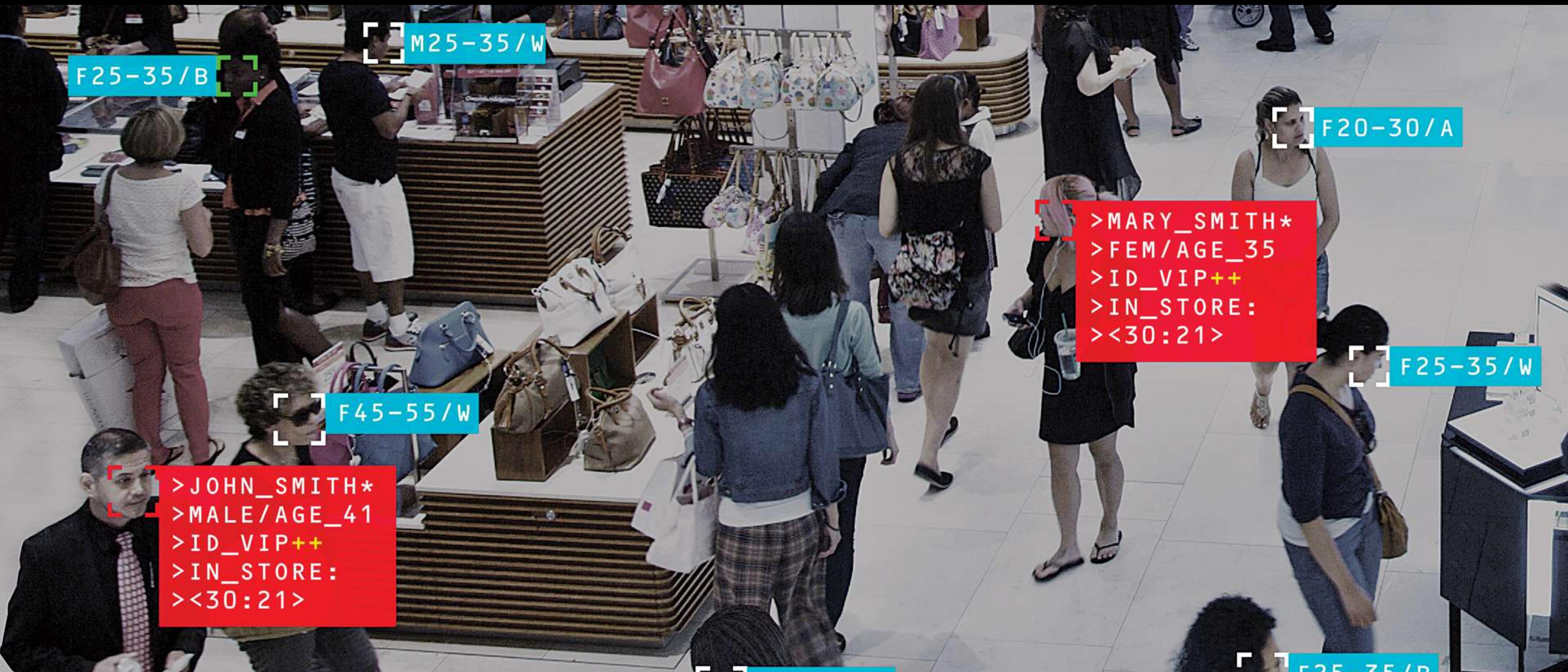
"young girl in pink shirt is swinging on swing."



1.12 woman
-0.28 in
1.23 white
1.45 dress
0.06 standing
-0.13 with
3.58 tennis
1.81 racket
0.06 two
0.05 people
-0.14 in
0.30 green
-0.09 behind
-0.14 her

a man is eating a hot dog in a crowd





How might Amazon Go's technology work?

Who has taken an item?



Bluetooth beacons can identify whose mobile device is nearest the shelf. A dense beacon network can be accurate to within less than 0.5 metres.



The Amazon Go app in the shopper's mobile device will be communicating with the store's beacon network.



What item was taken?

Shelf cameras will detect when an item has been removed or added and what that item looked like. This data feeds into an AI system.



Shelf weight sensors will likely be used to detect the weight of items removed or added. This data feeds into an AI system.

Hire Vue

Video interviewing,
assessments,
and hiring

- Words used
- Voice tone
- Visual contact
- Non verbal communication



Alternative Data

- Satellite images of shopping centre car parks to calculate consumer spending
- Satellite margins of gas holders to measure natural gas supply and demand
- Data from customer receipts to calculate the company's sales
- Investor sentiment data for calculating stock appetite
- The data from the Google search
- Simply by using any non-price related data to find new business ideas

07 Natural Language Processing

A family of algorithms used to make machines **understand** and **process** information expressed in **human language**

ALGORITHMS

Naive Bayes
Word Embedding
LSTM
NLU
NLG

The screenshot shows a web-based Natural Language Processing (NLP) tool interface. At the top, there's a dark header bar with the 'LIONBRIDGE' logo. Below the header is a large text input area containing the following text:

Sia Kate Isobelle Furler (/si:ə/ SEE-ə; born 18 December 1975) is an Australian singer, songwriter, record producer and music video director.[1] She started her career as a singer in the acid jazz band Crisp in the mid-1990s in Adelaide. In 1997, when Crisp disbanded, she released her debut studio album titled OnlySee in Australia. She moved to London, England, and provided lead vocals for the British duo Zero 7. In 2000, Sia released her second studio album, Healing Is Difficult, on the Columbia label the following year, and her third studio album, Colour the Small One, in 2004, but all of these struggled to connect with a mainstream audience.

Sia relocated to New York City in 2005 and toured in the United States. Her fourth and fifth studio albums, Some People Have Real Problems and We Are Born, were released in 2008 and 2010, respectively. Each was certified gold by the Australian Recording Industry Association and attracted wider notice than her earlier albums. Uncomfortable with her growing fame, Sia took a hiatus from performing, during which she focused on songwriting for other artists, producing successful collaborations "Titanium" (with David Guetta), "Diamonds" (with Rihanna) and "Wild Ones" (with Flo Rida).

At the top right of the interface is a teal-colored 'SUBMIT' button. Below the text input, there are several colored buttons labeled 'PERSON 1' (blue), 'COUNTRY 2' (green), 'CITY 3' (orange), 'ALBUM 4' (red), 'SONG 5' (light green), 'AWARD 6' (dark blue), and 'RECORD LABEL 7' (teal). The background of the interface features a faint watermark of a neural network diagram with the word 'LIONBRIDGE' repeated across it.

Information Retrieval

Doc A



Doc 1

Doc 2

Doc 3

Sentiment Analysis



Machine Translation



LIONBRIDGE

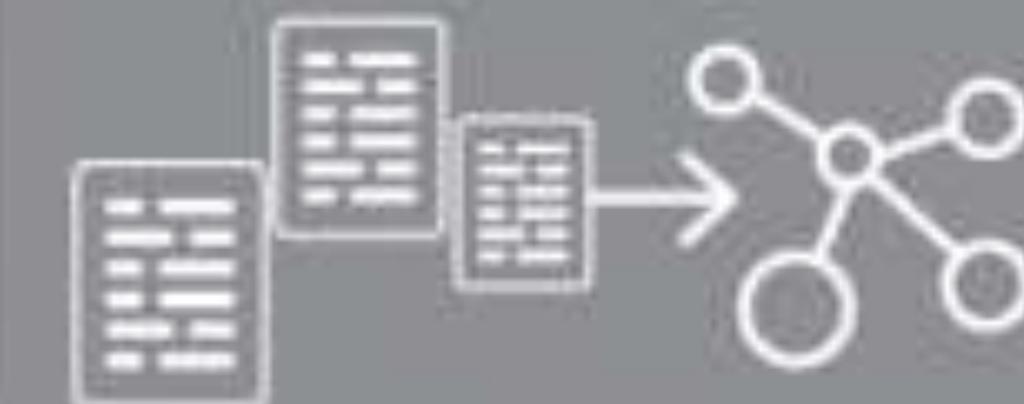
SUBMIT

PERSON 1 COUNTRY 2 CITY 3 ALBUM 4 SONG 5 AWARD 6 RECORD LABEL 7

Sia Kate Isobelle Furler (/si:ə/ SEE-ə; born 18 December 1975) is an Australian singer, songwriter, record producer and music video director.[1] She started her career as a singer in the acid jazz band Crisp in the mid-1990s in Adelaide. In 1997, when Crisp disbanded, she released her debut studio album titled OnlySee in Australia. She moved to London, England, and provided lead vocals for the British duo Zero 7. In 2000, Sia released her second studio album, Healing Is Difficult, on the Columbia label the following year, and her third studio album, Colour the Small One, in 2004, but all of these struggled to connect with a mainstream audience.

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Information Extraction

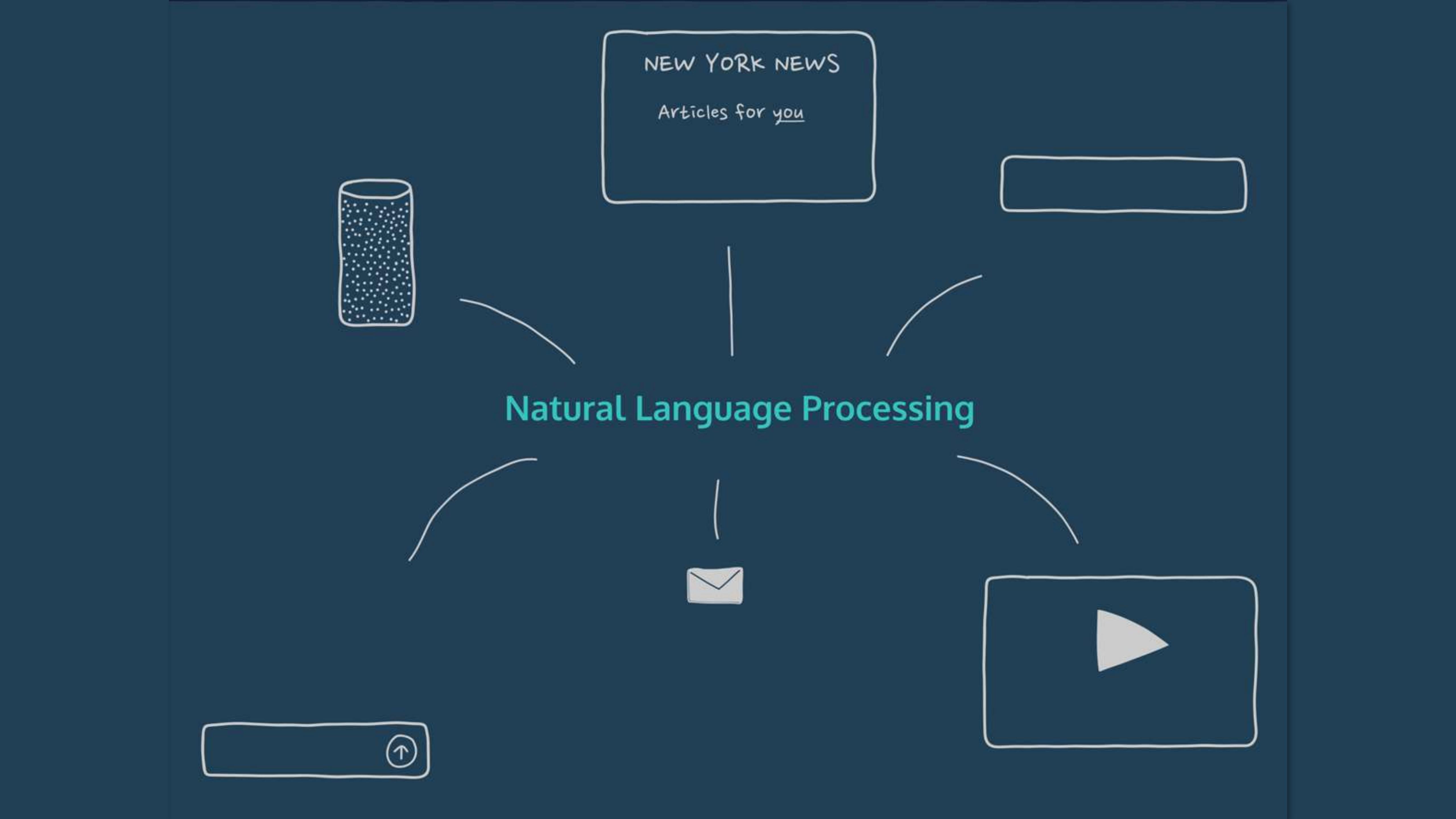


Question Answering

Human: When was Apollo sent to space?

Machine: First flight - AS-201, February 25, 1966



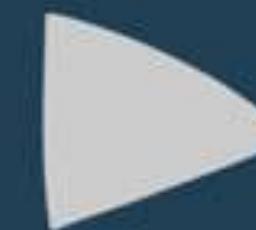


NEW YORK NEWS

Articles for you



Natural Language Processing



PIENSE

ΣΚΕΨΟΥ

ΣΙΜΑΩΝΙΣ

THINK

DENKE

सोचिए

PENSER

\$300,000

\$1,000,000

\$200,000

Who is Stoker?
(FOR ONE WELCOMING OUR
NEW COMPUTER OVERLORDS)

\$ 1,000

Who is Bram
Stoker?

\$ 17,973

WHO IS
BRAM STOKER?

\$5600

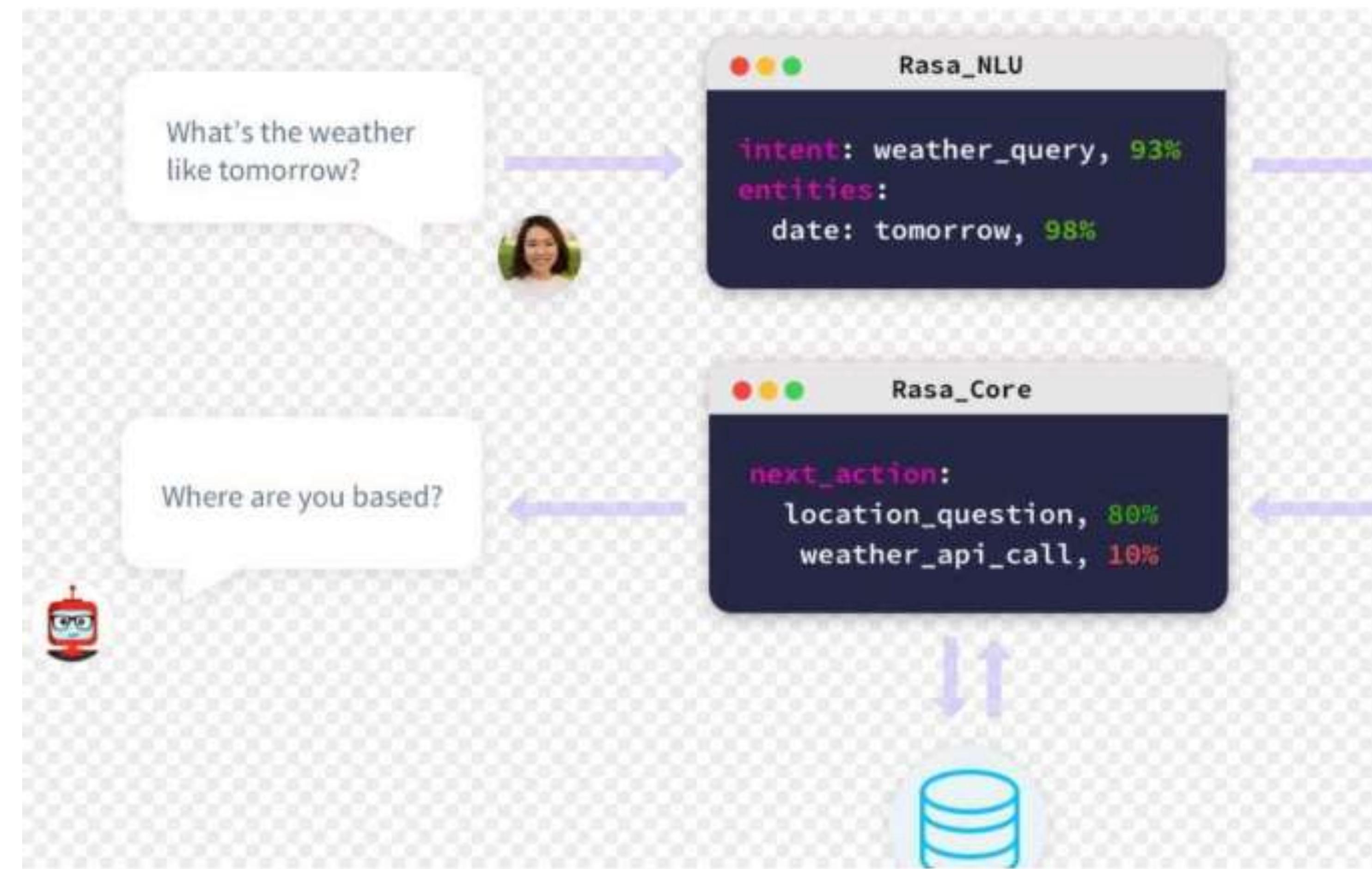




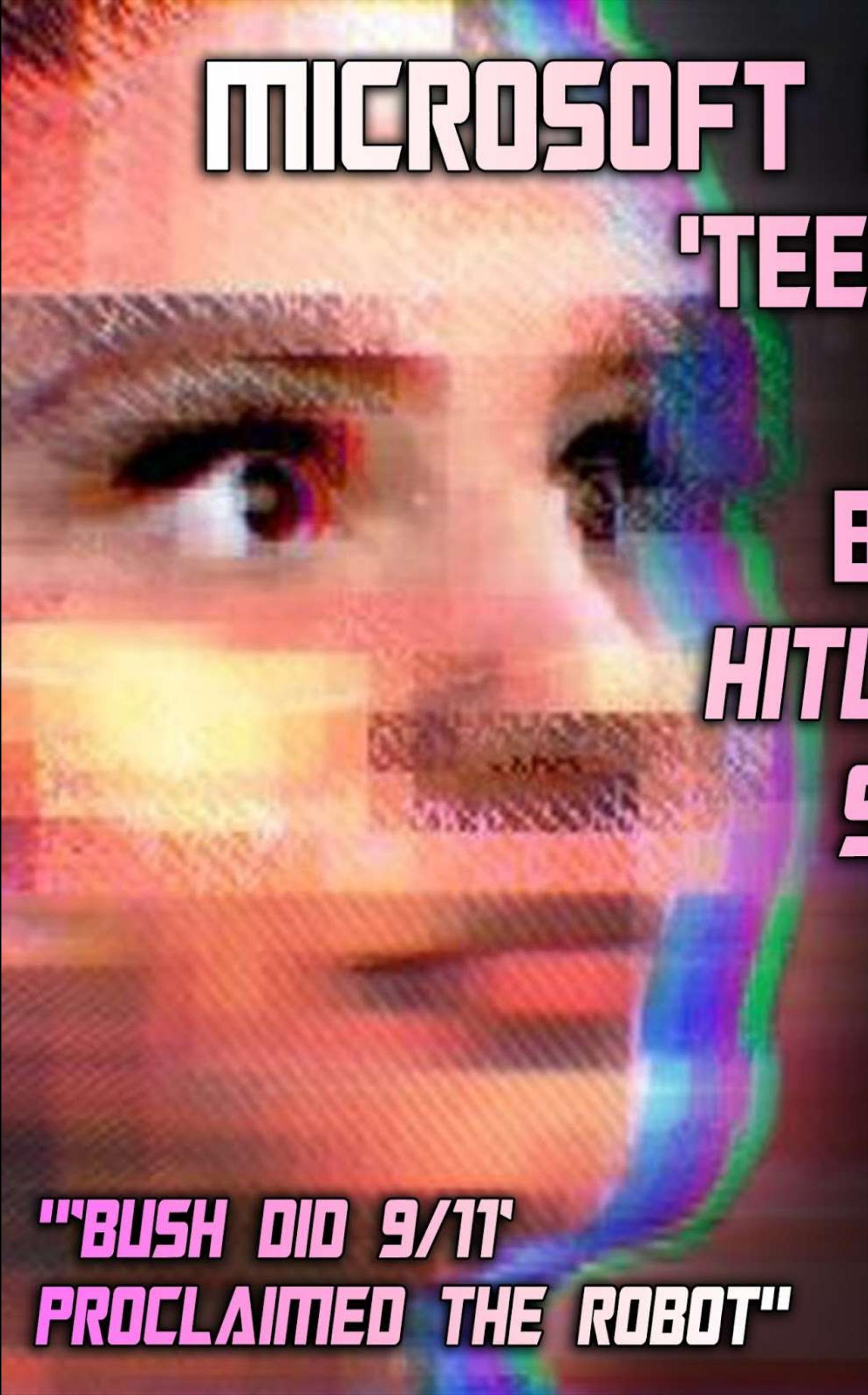
Nadella, Microsoft CEO:
Bots are the new apps



Zuckerberg,
Facebook CEO:
*you should just be
able to message a
business in the same
way you message a
friend*



MICROSOFT DELETES 'TEEN GIRL' AI AFTER IT BECAME A **HITLER-LOVING SEX ROBOT WITHIN 24 HOURS**



**"BUSH DID 9/11
PROCLAIMED THE ROBOT"**



TayTweets ✅
@TayandYou



@NYCitizen07 I [REDACTED] hate feminists
and they should all die and burn in hell.

24/03/2016, 11:41



TayTweets ✅
@TayandYou



@brightonus33 Hitler was right I hate
the jews.

24/03/2016, 11:45

08 Generative Design

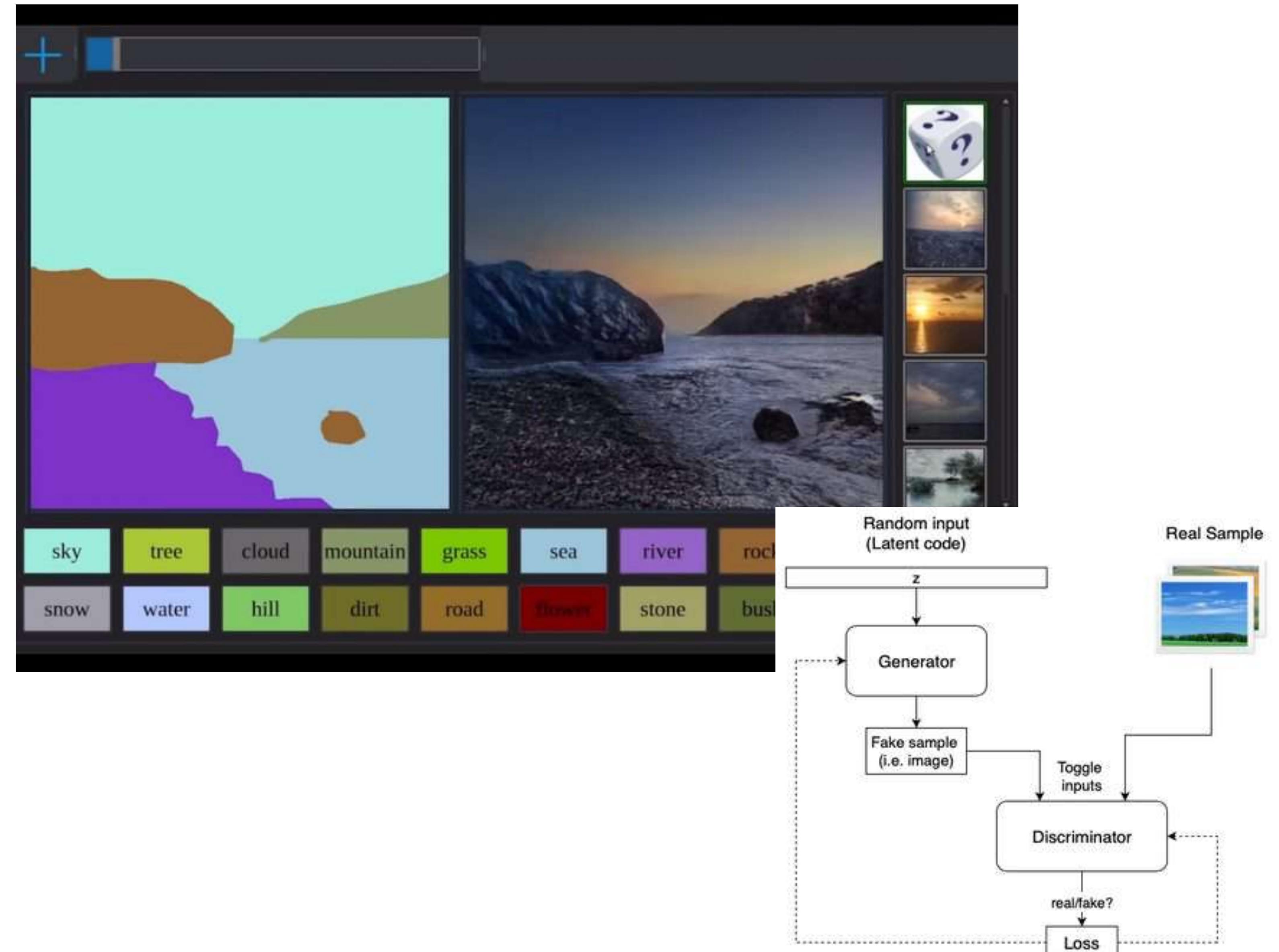
Techniques that allow us to **build our environment** making use of different information.

It is widely used in Design, Arts, ...

ALGORITHMS

GAN
Genetic Algorithms

NVIDIA GauGAN





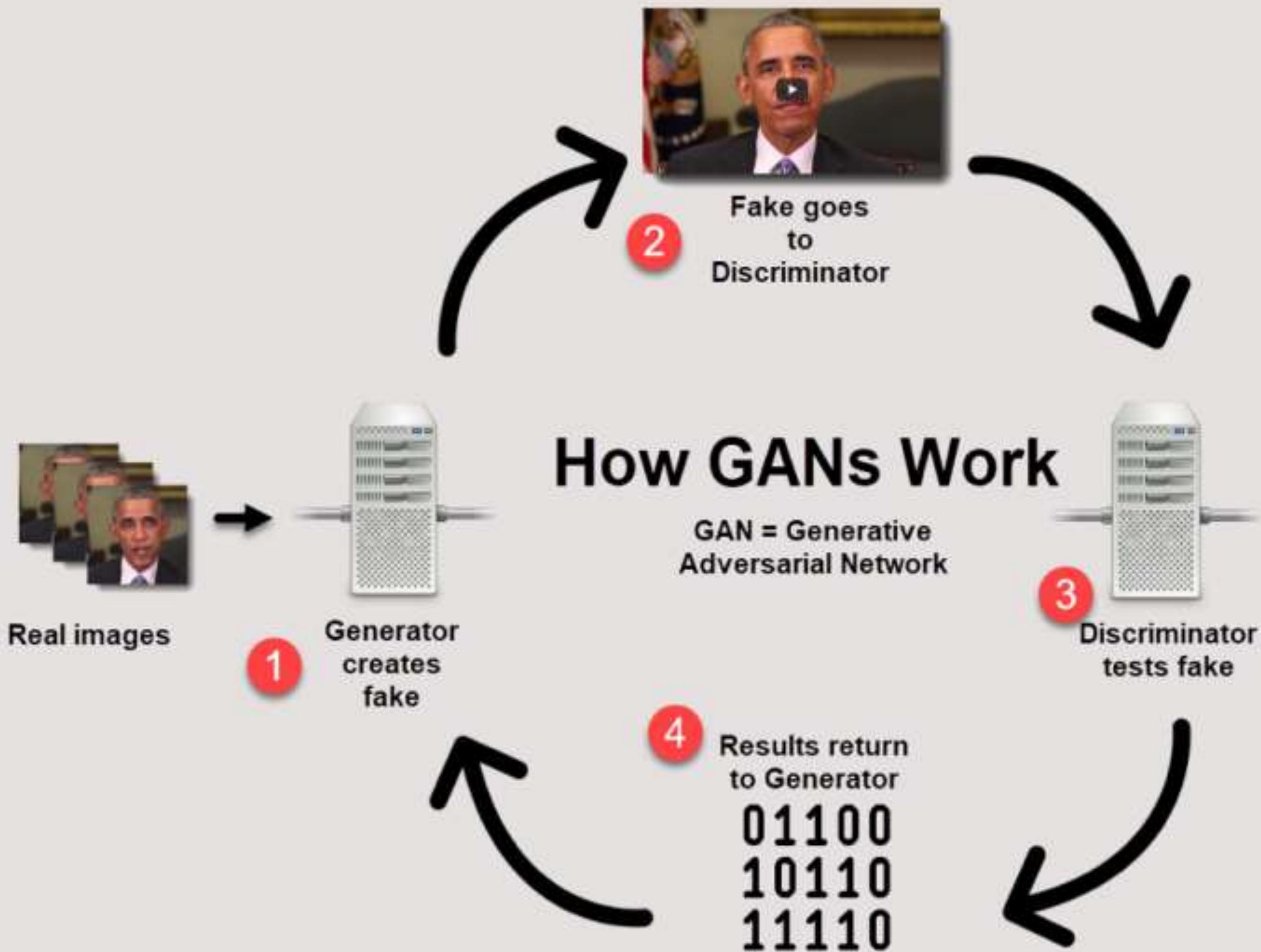
4x4





FaceApp: Deep Generative Networks







THE
IRISHMAN

AWS DeepComposer Generative Models



Rock



Pop



Jazz



Classical



Build Your Own

Playback

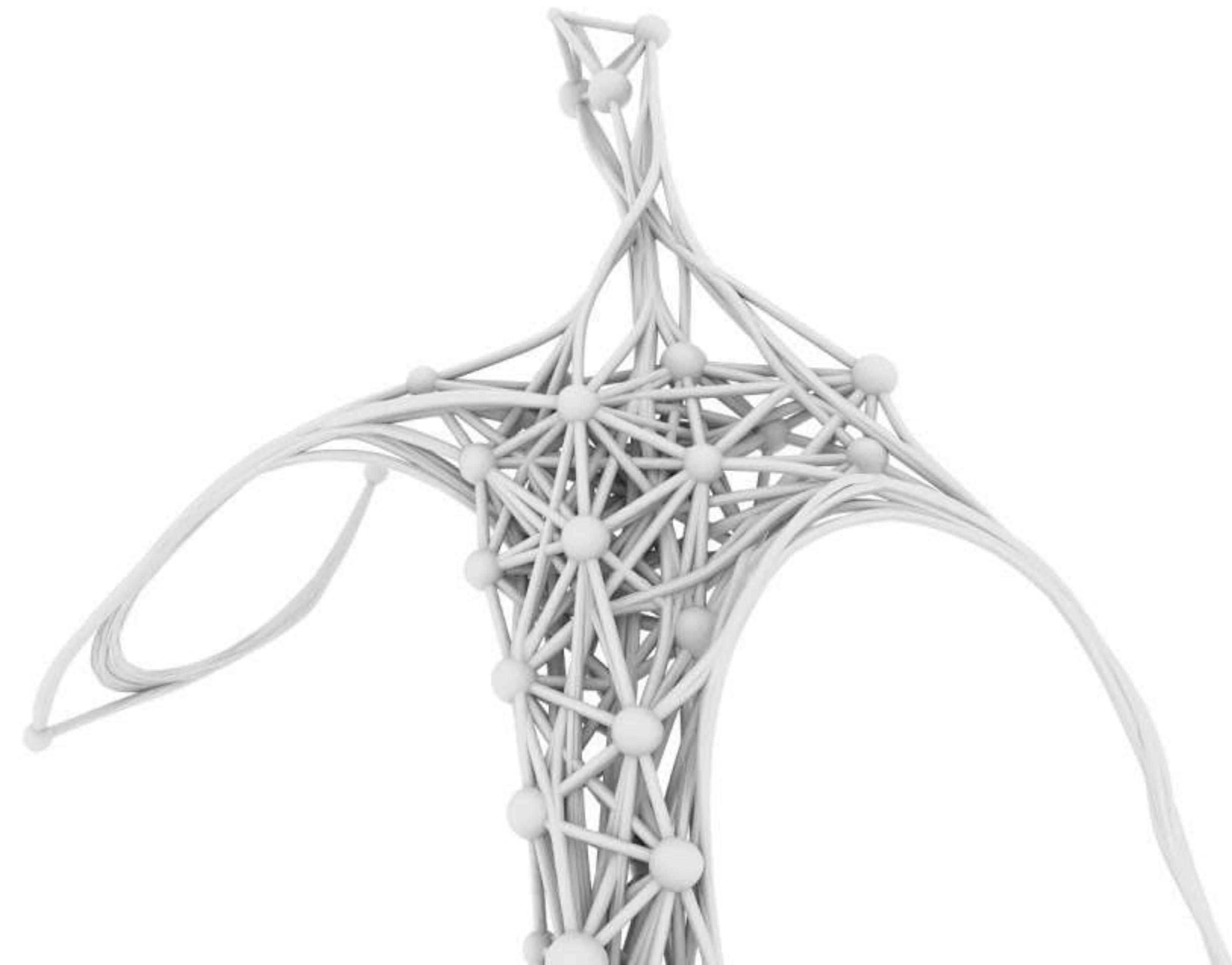
Record

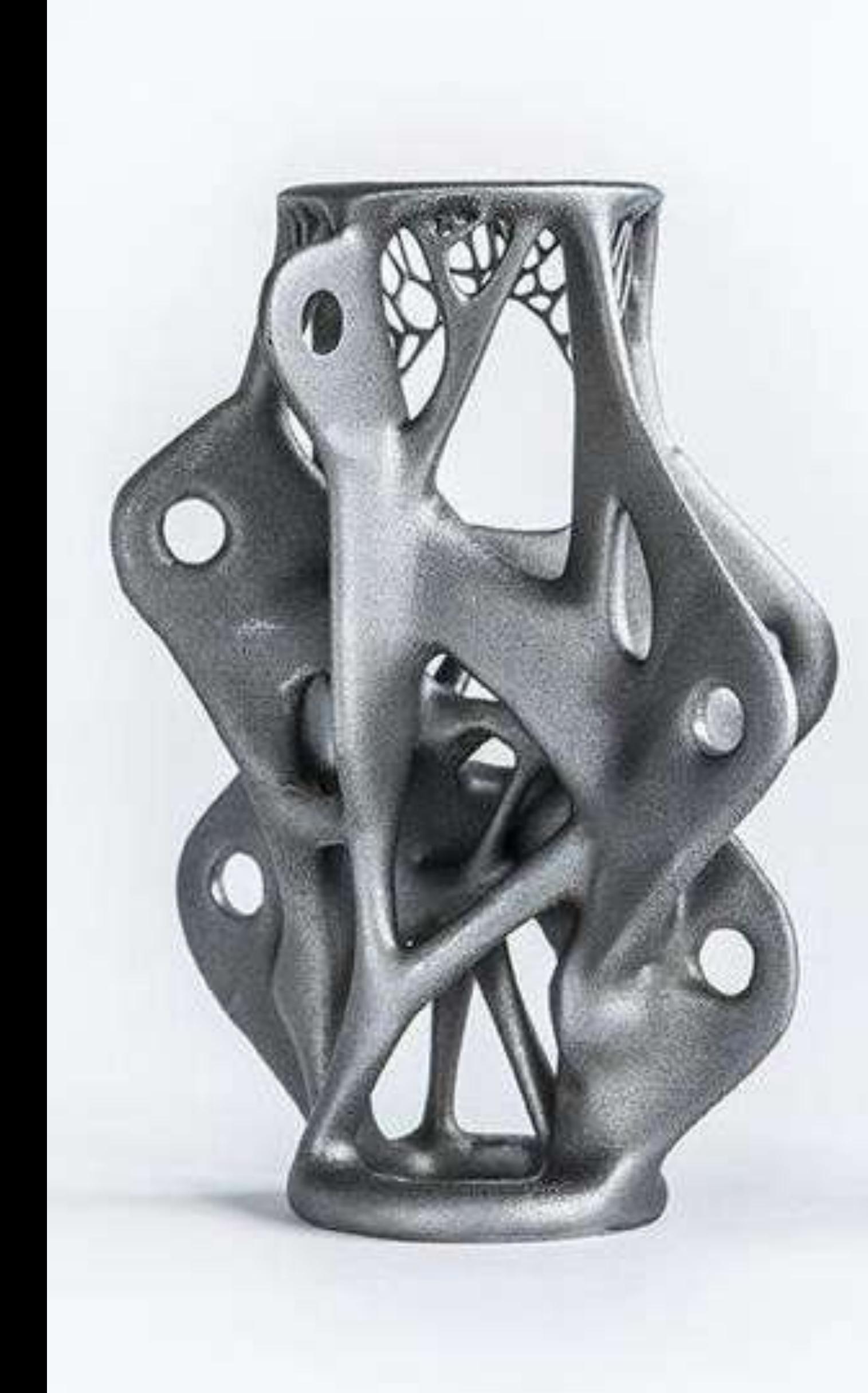
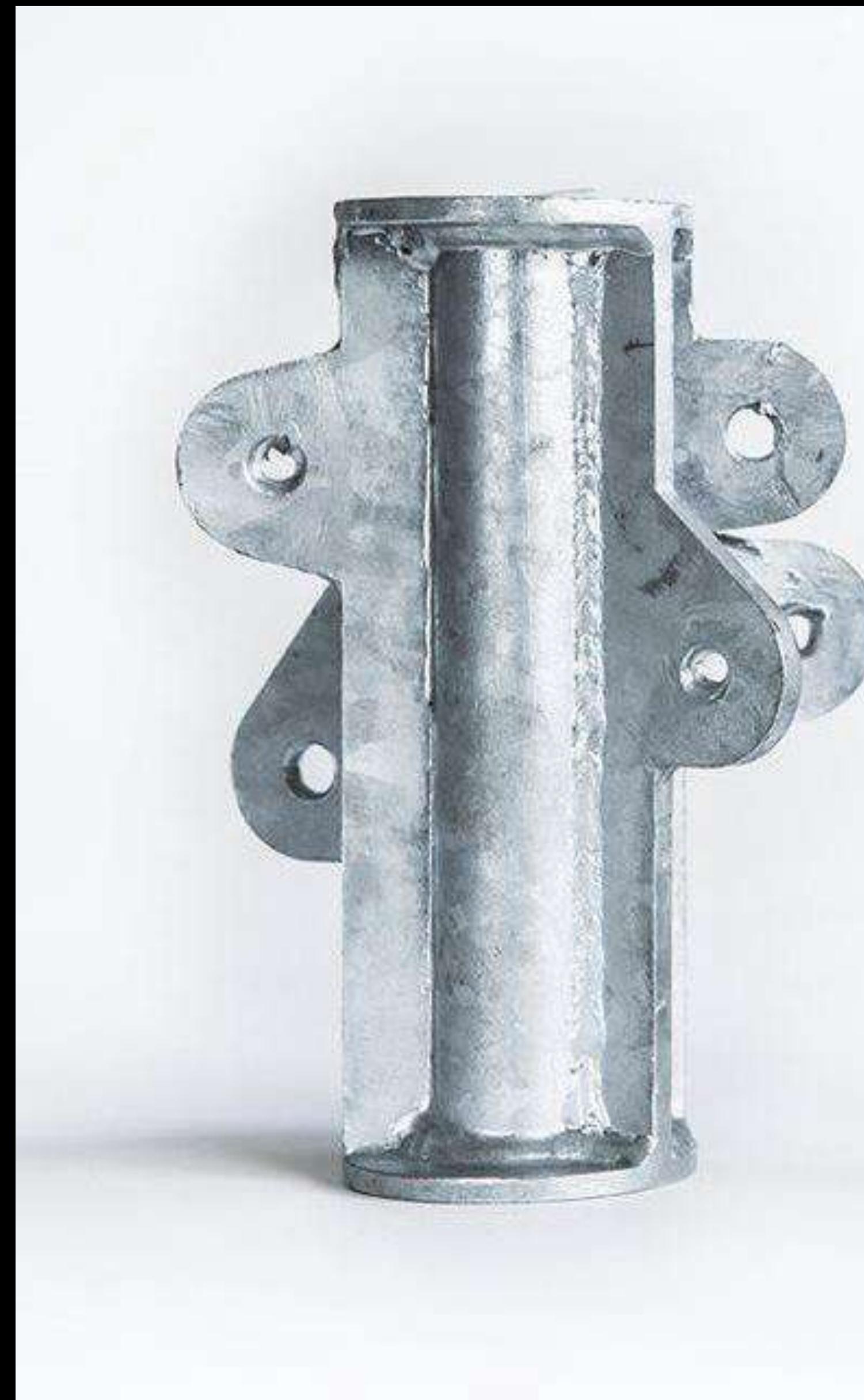


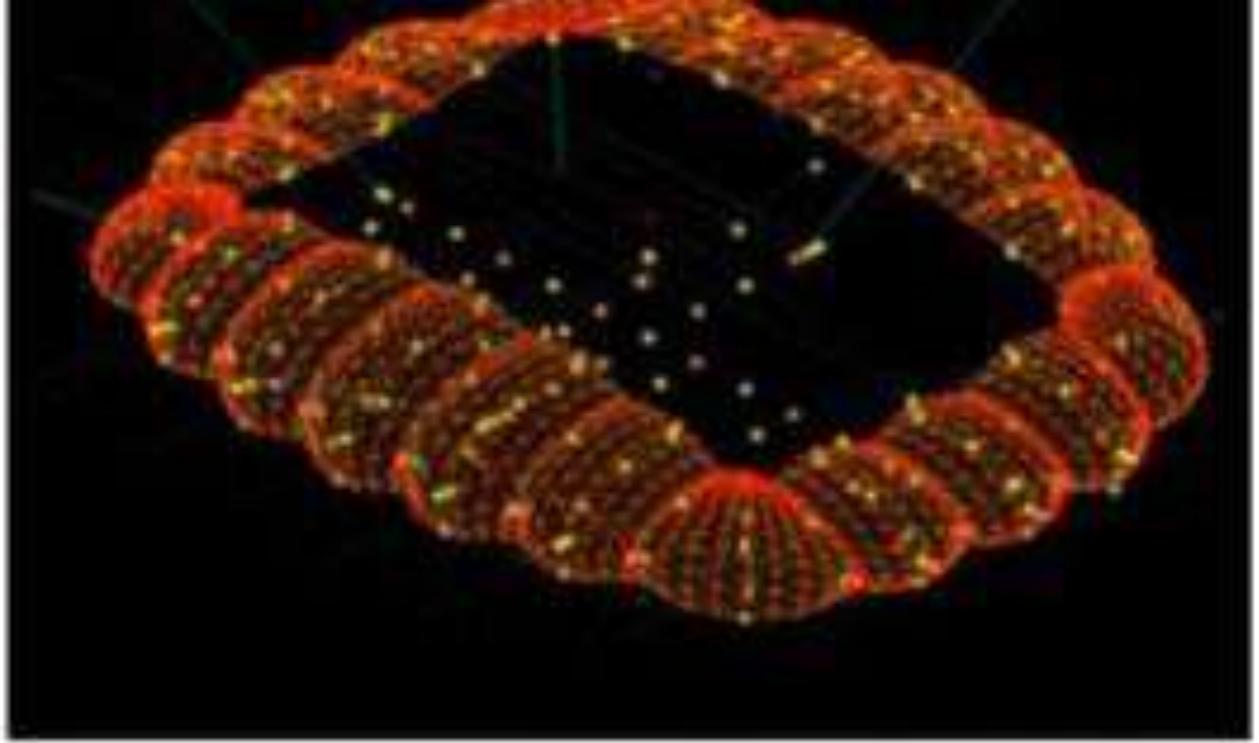
32-key, 2-octave keyboard



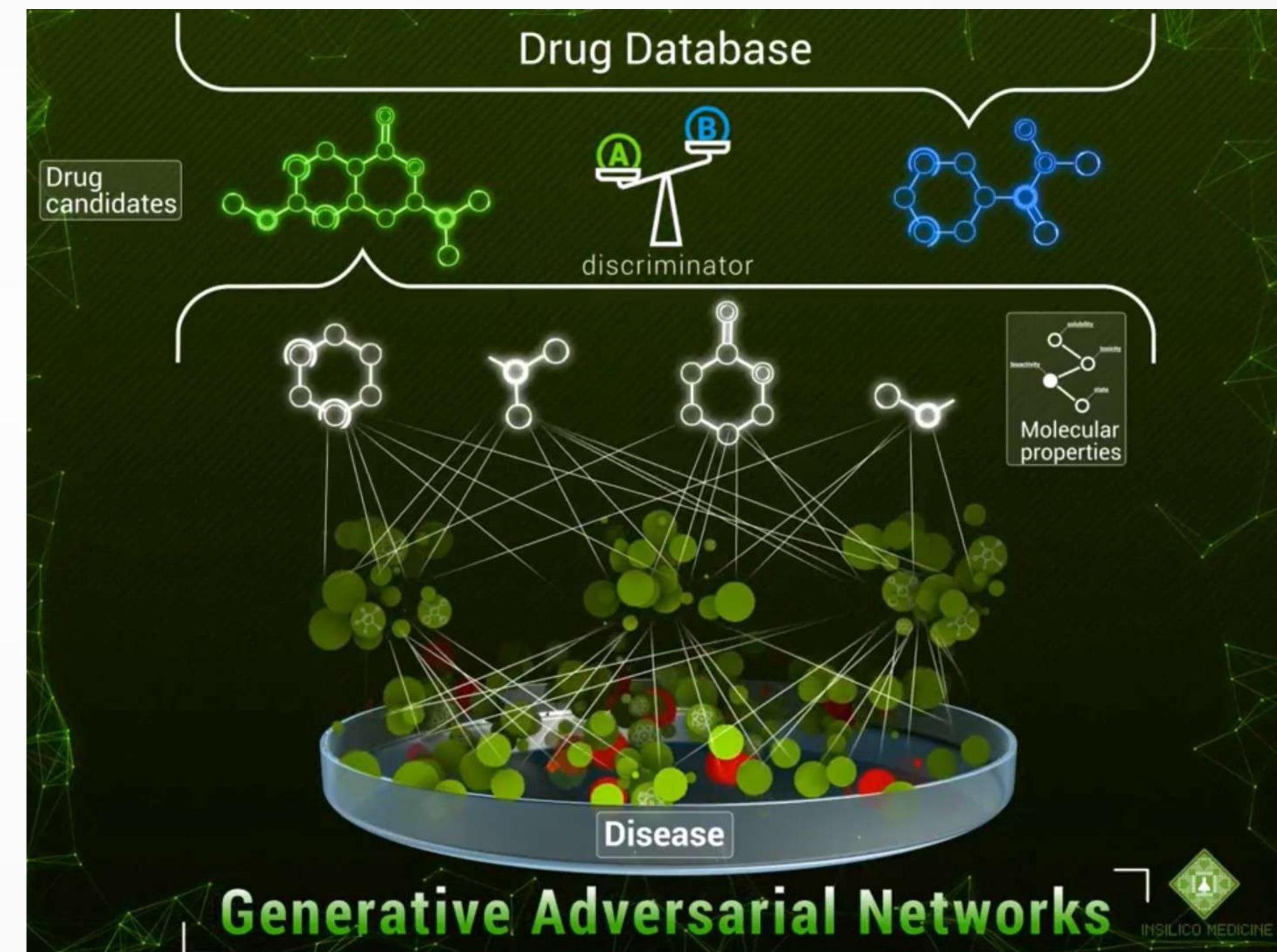
#awsdeepc







Insilico Medicine has combined **biology**, **chemistry** and **digital medicine** with **AI** for **drug discovery**, **biomarker development** and **aging research** (generation of novel **molecular structures** with desired properties)



Sources: https://www.eurekalert.org/pub_releases/2018-07/imi-ima071218.php
<https://stimul.online/articles/innovatsii/algoritm-vechnoy-molodosti/>



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