

Desarrollo de aplicaciones para la visualización de datos

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Sobre David Martín-Corral

- Artista, ingeniero, científico, emprendedor en serie, profesor, escritor y poeta. 15 años de experiencia modelizando la realidad con datos y ha puesto en producción cientos de modelos de ML / AI.
- Cofundador de **StressTech**, desarrolla tecnologías de IA para monitorizar y mitigar los niveles de estrés.
- CEO de **Zensei** dedicada a la salud respiratoria y cofundador de **Politibot**. Previamente trabajó para **IBM**, **CaixaBank**, **Bankinter**, **BBVA**, **Smartvel** y **Sanitas** en las primeras plataformas de Big Data de España y como data scientist.
- **Lleva trabajando en salud desde el 2014**, en Sanitas, en Zensei y con su doctorado en epidemiología computacional, comportamiento humano y sistemas complejos.
- Es autor de múltiples libros.
- **Ingeniero Eléctrico** por la UCLM, **Ingeniero Industrial** por la UPM, **Máster en Investigación Operativa** por la Universidad de Strathclyde (UK), **Doctor en Ingeniería Matemática** por la UC3M y estudió varios cursos de la licenciatura de **Filosofía**.
- Imparte o ha impartido clases en **Instituto de Empresa**, **Universidad Complutense de Madrid**, **The Valley**, **ThePowerMBA**, **Universidad Carlos III de Madrid** y **Universidad de Alcalá**. David ha publicado en revistas científicas de alto nivel como **Nature** y **PNAS** y ha sido investigador invitado en el laboratorio de dinámica humana del **MIT Media Lab** (USA).

Agenda

1. Introducción asignatura
2. Introducción a los datos y su analítica
3. Arquitecturas de procesamiento de datos
4. Datos y modelos matemáticos
5. Introducción al aprendizaje automático
6. Introducción al aprendizaje profundo
7. Casos de uso en la realidad
8. Productos basados en datos

Programa asignatura

1. Introducción a python
2. Desarrollo de aplicaciones para visualización de datos
3. Despliegue de aplicaciones

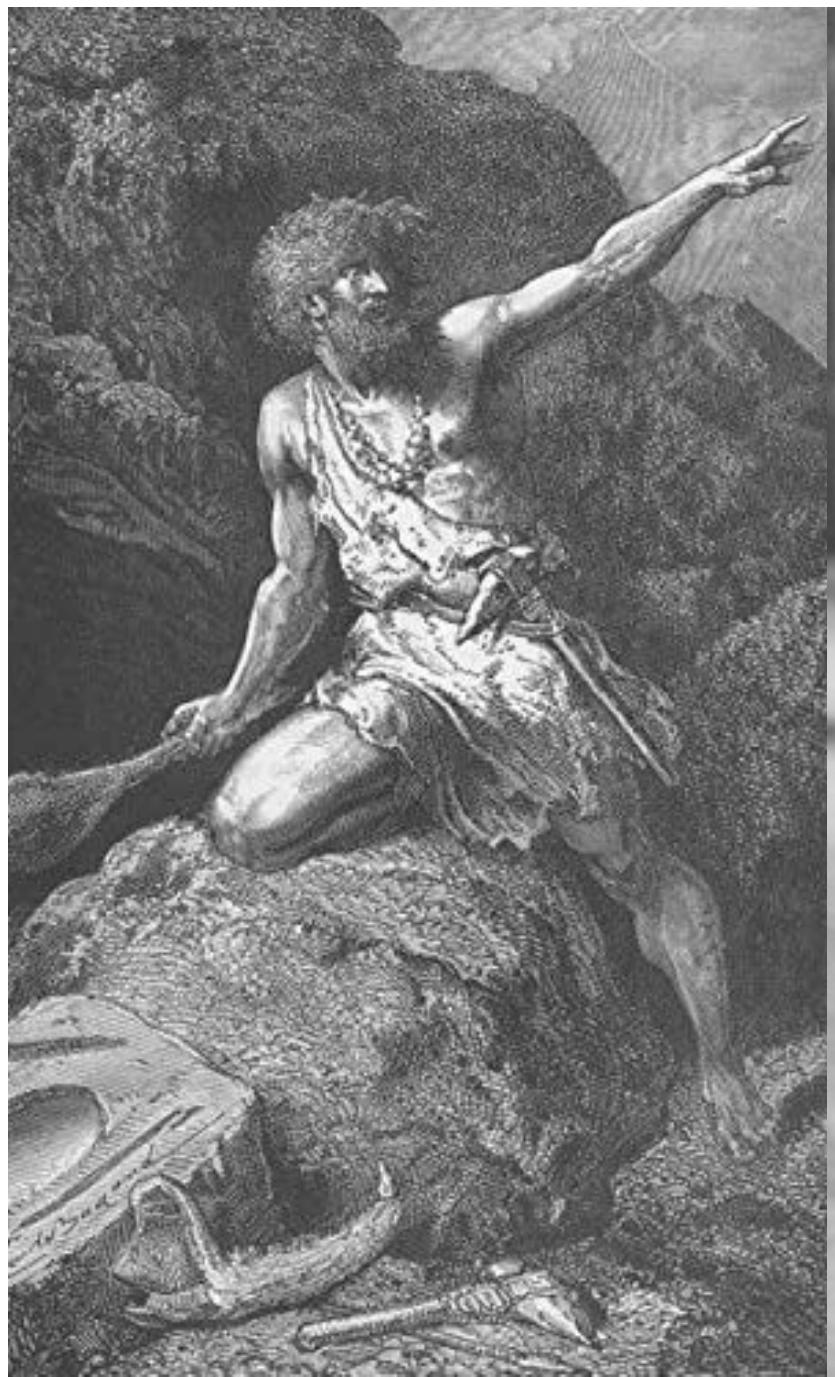
Evaluación asignatura

1. Propuesta de idea (10%)
2. Prueba intertrimestral (10%)
3. Desarrollo aplicación de datos y presentación (50%)
4. Examen final (30%)

Fecha	Clase
4 de septiembre 2025	Presentación
11 de septiembre 2025	Estructuras básicas + Funciones y clases + Ejercicios
18 de septiembre 2025	Lectura de datos (Pandas) + Ejercicios
25 de septiembre 2025	Modelos de machine learning + Ejercicios
29 de septiembre 2025	Visualizaciones + Ejercicios / Entrega propuesta
9 de octubre 2025	Ejercicios de repaso
16 de octubre 2025	Prueba intertrimestral
23 de octubre 2025	Visualizaciones interactivas + Trabajo app
30 de octubre 2025	Dash + Trabajo app
6 de noviembre 2025	Dash Producción + API + Trabajo app
13 de noviembre 2025	Trabajo app
20 de noviembre 2025	Repaso para examen final + Trabajo app
27 de noviembre 2025	Presentación app (12)
4 de diciembre 2025	Presentación app (12) + Entrega final app
TBD	Exámen final

* Sujeto a cambios

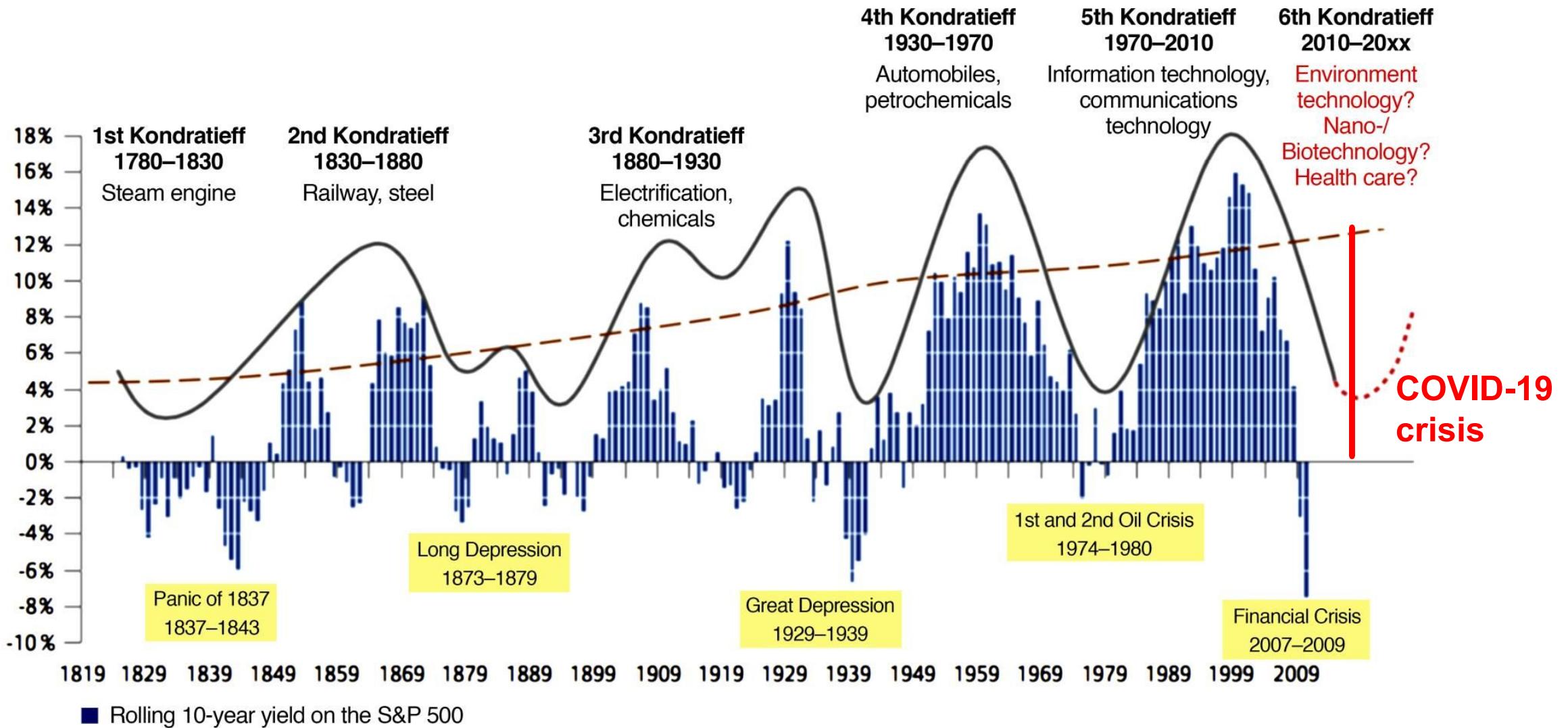
Introducción a los datos y su analítica



Situación de los datos y social

	Datos	Conexión social
 Neolítico	No existían	Muy baja
 Principios s. XX	Escasos	Media alta
 Principios s. XXI	Exponencial	Hiperconectados

Estamos en el inicio de la sexta Kondratieff (ola de innovación), donde existen oportunidades de grandes retornos en salud y clima. Pero tenemos que cambiar.

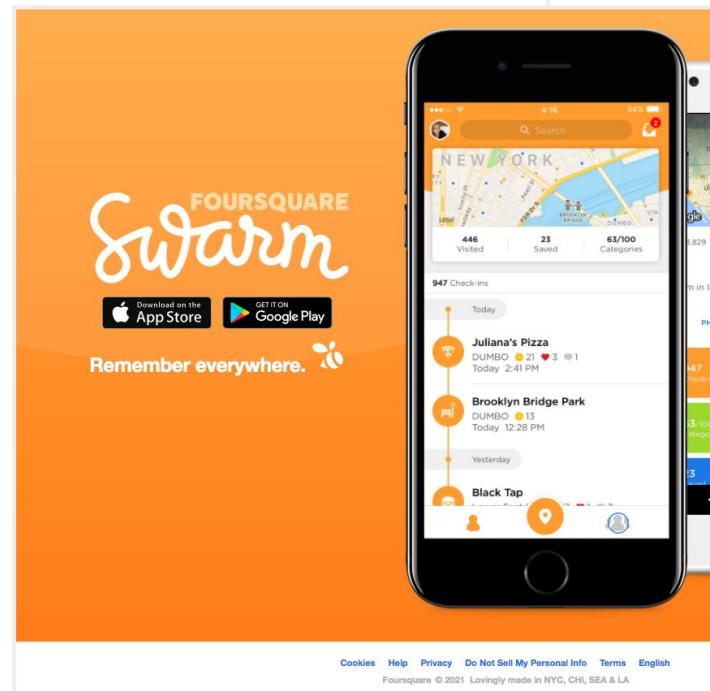


Fuente: [The ownership paradox: nurturing continuity and change for the future ASCI. 2019. Marr](#)



¿De donde podemos extraer los datos?

- Fuentes de datos propias
 - Bases de datos
 - Datos de comportamiento
 - Sensores
- Proveedores de datos
- Datos abiertos
- Scrapeado de internet



Google

Google Search I'm Feeling Lucky

Google offered in: español català galego euskara

FOURSQUARE Products & Solutions Resources Partners Company Log In Contact Us

If it tells you where, it's probably built on Foursquare

[recent articles and news]

Learn more about Foursquare

Contact Sales Our Story

With uncompromising accuracy, accessibility, scale, and respect for consumer data privacy, Foursquare is the location technology platform the world trusts.

A composite image showing Google search results for "Foursquare" and the official Foursquare website. The Google search results page shows the classic multi-colored Google logo, a search bar, and links for "Google Search" and "I'm Feeling Lucky". Below the search bar, it says "Google offered in: español català galego euskara". The Foursquare website page features the word "Foursquare" in large letters, followed by a navigation menu with links for "Products & Solutions", "Resources", "Partners", and "Company". There are also "Log In" and "Contact Us" buttons. A prominent headline on the site reads "If it tells you where, it's probably built on Foursquare". Below this, there is a section for "[recent articles and news]" and a link to "Learn more about Foursquare". At the bottom of the website page, there are "Contact Sales" and "Our Story" buttons. The text "With uncompromising accuracy, accessibility, scale, and respect for consumer data privacy, Foursquare is the location technology platform the world trusts." is displayed. This block illustrates how data can be extracted from the Foursquare platform itself.

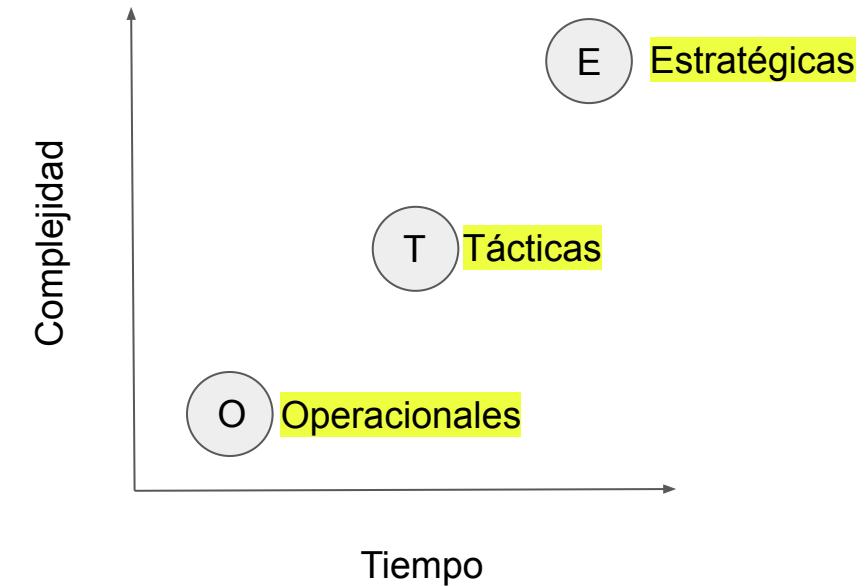
¿Para qué podemos utilizar los datos?

Toma de decisiones

- ▶ Operacionales
- ▶ Tácticas
- ▶ Estratégicas

	Operativa	Táctica	Estratégica
Opciones	Binarias o Bajas	Múltiples	Miles o millones
Incertidumbre	Baja	Media	Alta
Automatización	Alta	Media	Baja

En términos de escala temporal y complejidad podemos dividirlas en:



Análisis que podemos realizar sobre los datos

Analítica

- Descriptiva

¿Qué sucedió?

- Diagnóstica

¿Por qué sucedió?

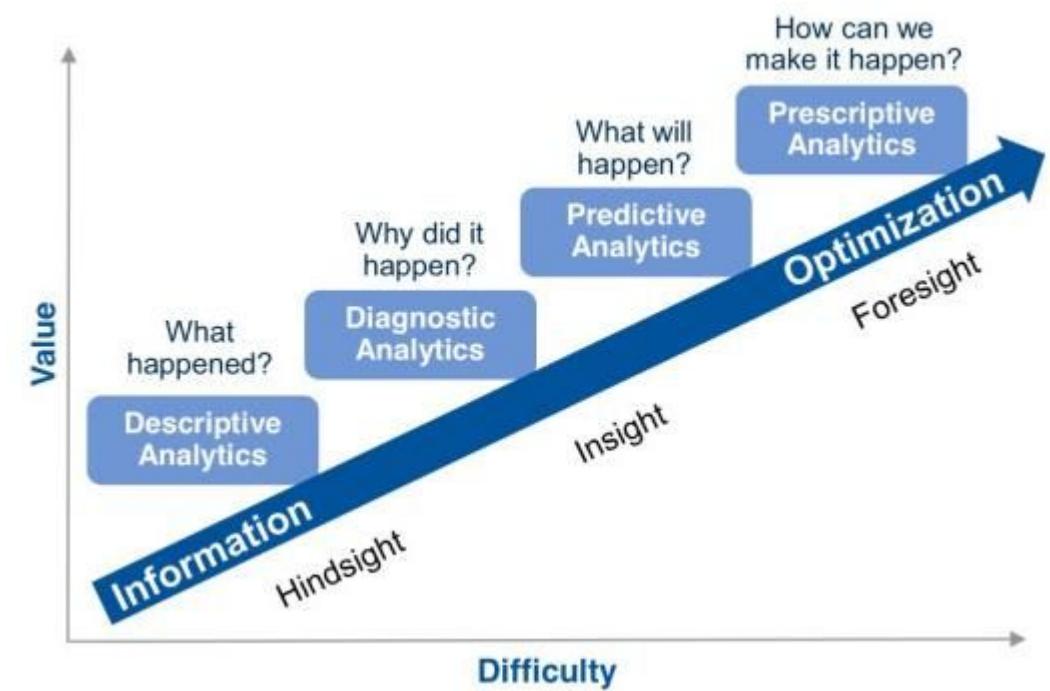
- Predictiva

¿Qué sucederá?

- Prescriptiva

¿Cómo hacemos que suceda?

En términos de valor y dificultad podemos dividirlas en:



Tipos de datos

► Estructurados

Tabulares (csv, excel,...)

Diccionarios (json, xml,...)

► No estructurados

Texto

Imágenes

Sonido

Vídeo

	Period	Sexo	A	B	C	D	E	F	G	H	I	J	K
1	2014M12	Varones	18381.0	318.0	5781.0	78.0	561.0	559.0	861.0	5100.0	2239.0		
2	2014M11	Varones	16508.0	259.0	5524.0	56.0	413.0	516.0	779.0	4486.0	1945.0		
3	2014M10	Varones	16393.0	270.0	5842.0	75.0	382.0	523.0	729.0	4253.0	1778.0		
4	2014M09	Varones	14870.0	272.0	5329.0	59.0	388.0	440.0	680.0	3727.0	1571.0		
5	2014M08	Varones	15545.0	268.0	5570.0	60.0	396.0	505.0	689.0	3820.0	1679.0		
6	2014M07	Varones	15720.0	264.0	5467.0	69.0	450.0	501.0	623.0	4104.0	1723.0		
7	2014M06	Varones	15724.0	239.0	5471.0	58.0	393.0	518.0	735.0	3986.0	1782.0		
8	2014M05	Varones	16297.0	263.0	5642.0	56.0	416.0	520.0	685.0	4397.0	1855.0		
9	2014M04	Varones	16157.0	238.0	5351.0	60.0	446.0	510.0	715.0	4327.0	2014.0		
10	2014M03	Varones	17853.0	267.0	5694.0	57.0	476.0	592.0	774.0	4923.0	2413.0		
11	2014M02	Varones	17763.0	281.0	5546.0	67.0	502.0	554.0	791.0	4835.0	2678.0		
12	2014M01	Varones	20360.0	324.0	6081.0	86.0	608.0	605.0	858.0	5623.0	3229.0		
13	2013M12	Varones	18786.0	310.0	5584.0	64.0	511.0	573.0	802.0	5371.0	2420.0		
14	2013M11	Varones	16467.0	264.0	5632.0	57.0	423.0	457.0	707.0	4430.0	1922.0		
15	2013M10	Varones	15895.0	232.0	5795.0	51.0	391.0	462.0	674.0	3989.0	1744.0		
16	2013M09	Varones	14770.0	222.0	5240.0	41.0	366.0	439.0	568.0	3886.0	1538.0		
17	2013M08	Varones	15211.0	268.0	5599.0	58.0	357.0	440.0	685.0	3754.0	1568.0		
18	2013M07	Varones	16260.0	254.0	5694.0	54.0	415.0	515.0	737.0	4087.0	1802.0		
19	2013M06	Varones	15684.0	249.0	5501.0	55.0	378.0	488.0	599.0	4171.0	1750.0		
20	2013M05	Varones	16241.0	261.0	5770.0	61.0	409.0	451.0	620.0	4342.0	1861.0		
21	2013M04	Varones	16039.0	257.0	5486.0	63.0	362.0	428.0	678.0	4273.0	1962.0		
22	2013M03	Varones	18299.0	308.0	5893.0	62.0	477.0	497.0	761.0	5007.0	2628.0		
23	2013M02	Varones	17284.0	258.0	5330.0	54.0	459.0	502.0	750.0	4892.0	2460.0		
24	2013M01	Varones	18898.0	284.0	5957.0	68.0	515.0	520.0	779.0	5303.0	2650.0		
25	2012M12	Varones	17861.0	282.0	5858.0	57.0	428.0	524.0	747.0	4981.0	2196.0		
26	2012M11	Varones	16359.0	234.0	5670.0	62.0	364.0	474.0	687.0	4464.0	1828.0		
27	2012M10	Varones	15759.0	249.0	5694.0	40.0	361.0	397.0	625.0	4126.0	1754.0		
28	2012M09	Varones	14735.0	253.0	5492.0	34.0	311.0	413.0	604.0	3704.0	1428.0		
29	2012M08	Varones	15778.0	267.0	5656.0	48.0	417.0	474.0	689.0	3910.0	1680.0		
30	2012M07	Varones	15238.0	259.0	5398.0	44.0	390.0	409.0	627.0	3941.0	1604.0		
31	2012M06	Varones	15230.0	258.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
32	2012M05	Varones	16695.0	299.0	5670.0	69.0	436.0	505.0	648.0	4353.0	2182.0		
33	2012M04	Varones	16897.0	279.0	5561.0	62.0	455.0	448.0	602.0	4684.0	2208.0		
34	2012M03	Varones	19719.0	279.0	5898.0	58.0	562.0	542.0	843.0	5373.0	3209.0		
35	2012M02	Varones	14339.0	201.0	5398.0	44.0	390.0	409.0	627.0	3941.0	1604.0		
36	2012M01	Varones	14340.0	202.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
37	2012M00	Varones	14341.0	203.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
38	2011M12	Varones	14342.0	204.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
39	2011M11	Varones	14343.0	205.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
40	2011M10	Varones	14344.0	206.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
41	2011M09	Varones	14345.0	207.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
42	2011M08	Varones	14346.0	208.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
43	2011M07	Varones	14347.0	209.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
44	2011M06	Varones	14348.0	210.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
45	2011M05	Varones	14349.0	211.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
46	2011M04	Varones	14350.0	212.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
47	2011M03	Varones	14351.0	213.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
48	2011M02	Varones	14352.0	214.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
49	2011M01	Varones	14353.0	215.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
50	2011M00	Varones	14354.0	216.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
51	2010M12	Varones	14355.0	217.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
52	2010M11	Varones	14356.0	218.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
53	2010M10	Varones	14357.0	219.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
54	2010M09	Varones	14358.0	220.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
55	2010M08	Varones	14359.0	221.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
56	2010M07	Varones	14360.0	222.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
57	2010M06	Varones	14361.0	223.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
58	2010M05	Varones	14362.0	224.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
59	2010M04	Varones	14363.0	225.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
60	2010M03	Varones	14364.0	226.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
61	2010M02	Varones	14365.0	227.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
62	2010M01	Varones	14366.0	228.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
63	2010M00	Varones	14367.0	229.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
64	2009M12	Varones	14368.0	230.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
65	2009M11	Varones	14369.0	231.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
66	2009M10	Varones	14370.0	232.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
67	2009M09	Varones	14371.0	233.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
68	2009M08	Varones	14372.0	234.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
69	2009M07	Varones	14373.0	235.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
70	2009M06	Varones	14374.0	236.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
71	2009M05	Varones	14375.0	237.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
72	2009M04	Varones	14376.0	238.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
73	2009M03	Varones	14377.0	239.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
74	2009M02	Varones	14378.0	240.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
75	2009M01	Varones	14379.0	241.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
76	2009M00	Varones	14380.0	242.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
77	2008M12	Varones	14381.0	243.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
78	2008M11	Varones	14382.0	244.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
79	2008M10	Varones	14383.0	245.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
80	2008M09	Varones	14384.0	246.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
81	2008M08	Varones	14385.0	247.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
82	2008M07	Varones	14386.0	248.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
83	2008M06	Varones	14387.0	249.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
84	2008M05	Varones	14388.0	250.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
85	2008M04	Varones	14389.0	251.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
86	2008M03	Varones	14390.0	252.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
87	2008M02	Varones	14391.0	253.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
88	2008M01	Varones	14392.0	254.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
89	2008M00	Varones	14393.0	255.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
90	2007M12	Varones	14394.0	256.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		
91	2007M11	Varones	14395.0	257.0	5420.0	47.0	378.0	387.0	630.0	3882.0	1762.0		

```
untitled

1 <?xml version="1.0" encoding="utf-8"?>
2
3 <root_element>
4
5     <child_element_1>
6         <child_element_2>Content</child_element_2>
7     </child_element_1>
8
9     <child_element_1>
10        <child_element_2>Content</child_element_2>
11    </child_element_1>
12
13    <child_element_1>
14        <child_element_2>Content</child_element_2>
15        <child_element_2>Content</child_element_2>
16    </child_element_1>
17
18 </root_element>
```

Tipos de datos

► Estructurados

Tabulares (csv, excel,...)

Diccionarios (json, xml,...)

► No estructurados

Texto

Imágenes

Sonido

Vídeo

Cualitativas (No numéricos)

Cuantitativos (Numéricos)

Nombre	Color de pelo	Estatura
Pedro	Rubio	1,86m
Ana	Morena	1,76m
Cualitativo	Cualitativo	Cuantitativo

Tipos de datos

► Estructurados

Tabulares (csv, excel,...)

Diccionarios (json, xml)

► No estructurados

Texto

Imágenes

Sonido

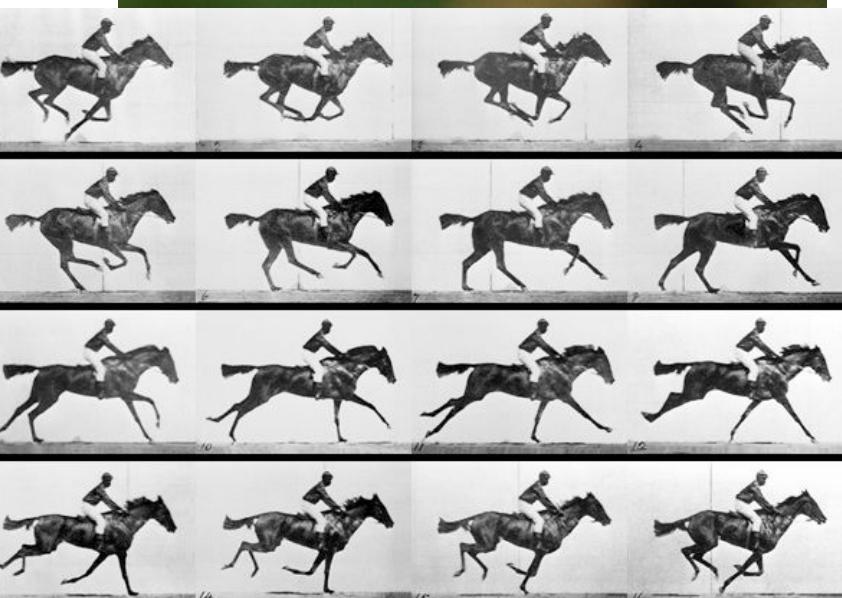
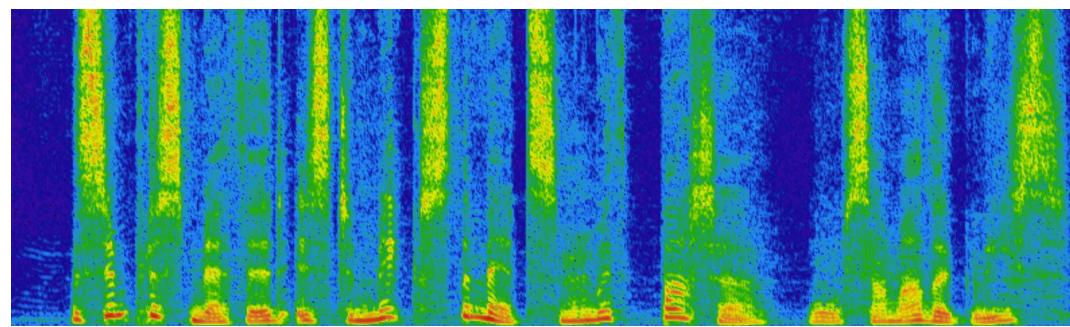
Vídeo



David Perell @david_perell · 1m

Talented kids are more capable than we think:

- Leonardo da Vinci was an apprentice to Verrocchio at 14
- Andrew Carnegie finished schooling at 12. At 13, he became a office boy. By 16, he earned most of the family income.



Tipos de variables

► Contenido

1. Texto
 - a. Cadenas de caracteres
 - b. Mensajes
2. Categóricas
 - a. Color, marca, producto, ranking
3. Numérica

► Origen

1. Dummy
2. Latente o sintética

► Función

1. Independientes
 - a. Precio
 - b. Marketing
 - c. Leads
2. Dependientes
 - a. Ventas

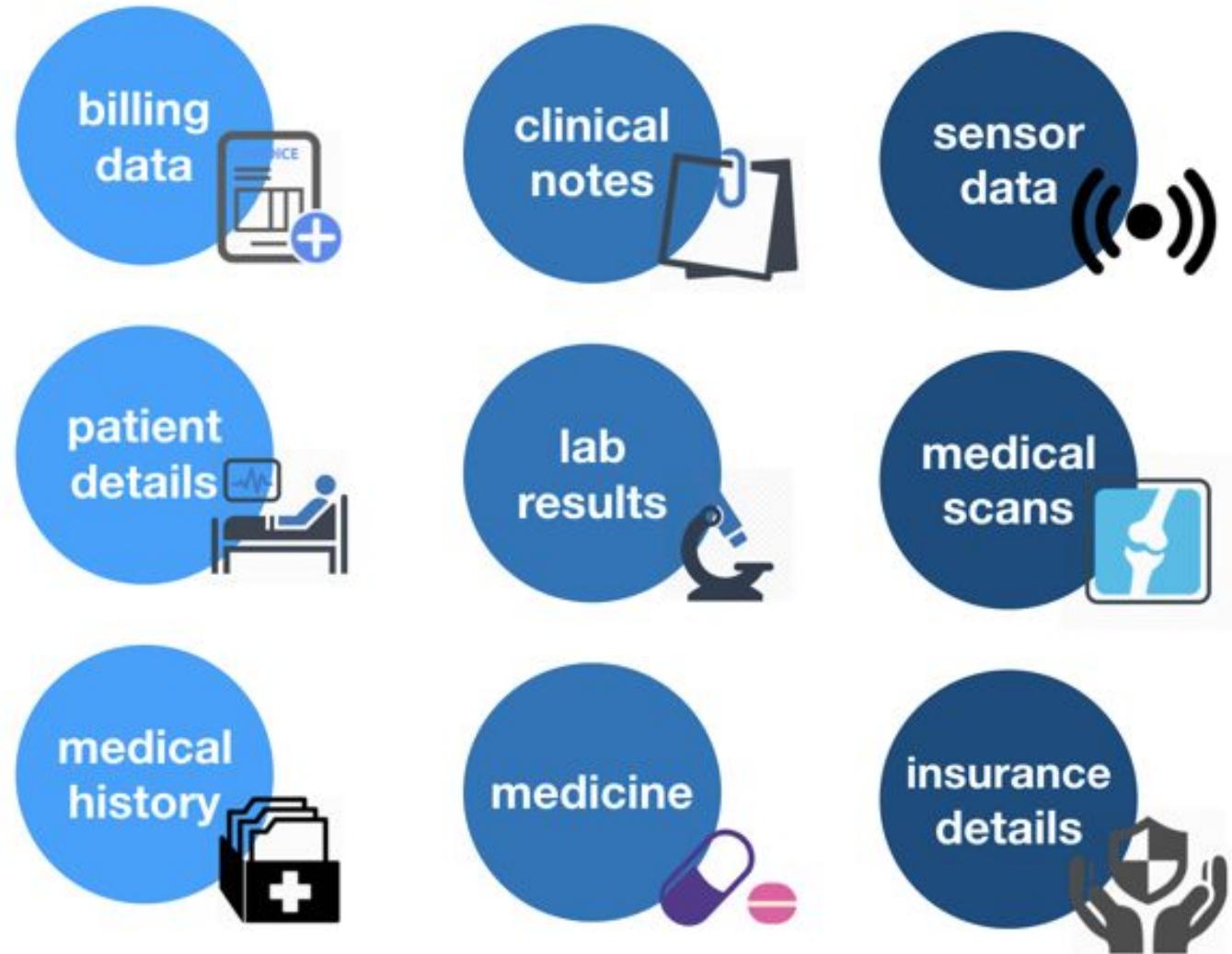
¿Cómo podemos trabajar con datos?

- ▶ No estructurados
 1. Técnicas de procesamiento del...
 - a. Lenguaje
 - b. Visión
 - c. Sonidos
- ▶ Estructurados
 1. Técnicas estadísticas y matemáticas
- ▶ Plataformas de procesamiento Big Data

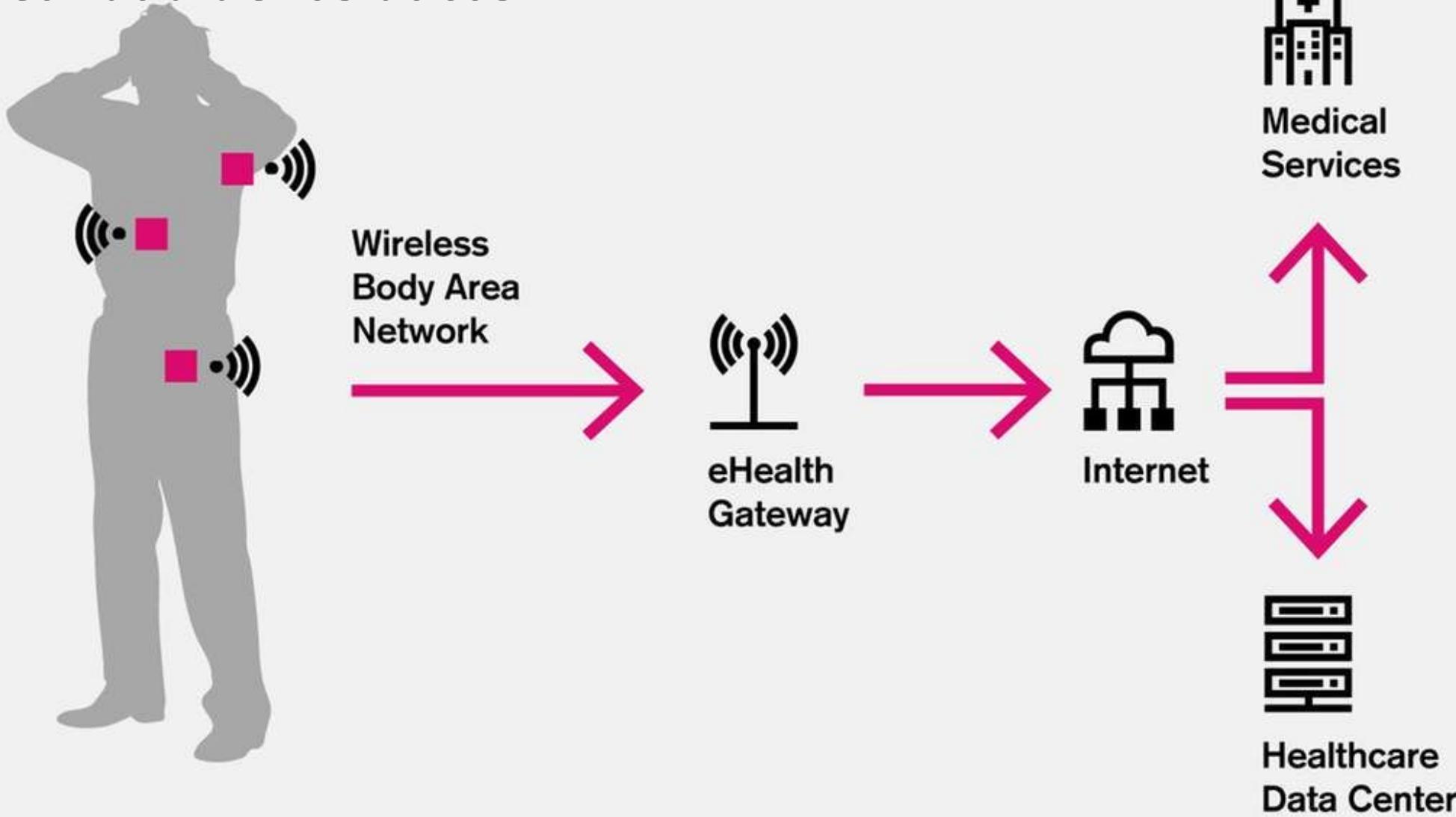
La realidad de los datos



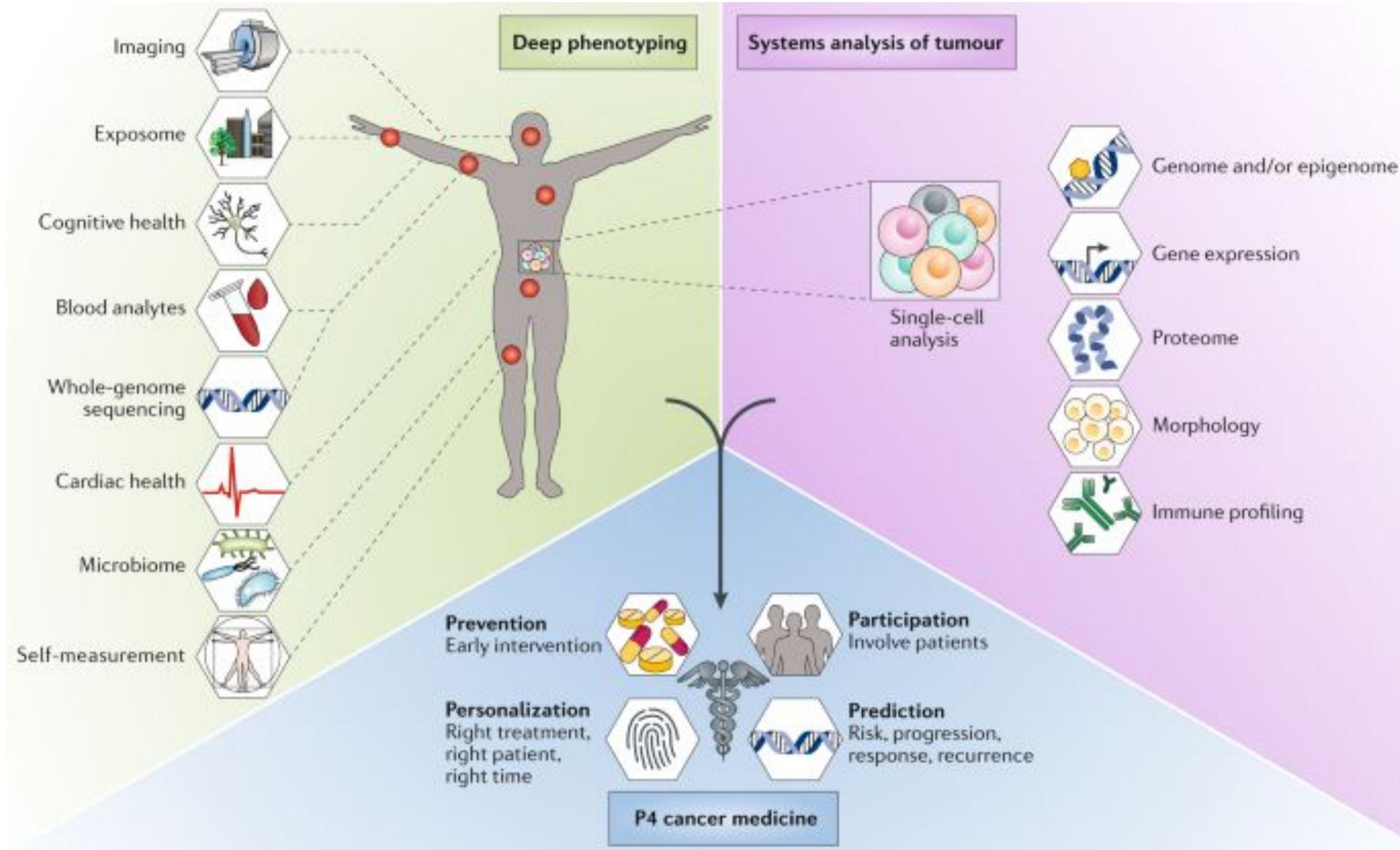
EHR



La realidad de los datos



La realidad de los datos



Arquitecturas de procesamiento de datos

Tipos de tareas de una plataforma de Big data

- ▶ Procesamiento batch
- ▶ Procesamiento en tiempo real
- ▶ Exploración interactiva de datos
- ▶ Analítica

Qué es el famoso data lake

- *Es una base de datos distribuida donde todas las fuentes de datos de una organización están integradas y en su formato original para posteriores procesamientos . Permitiendo eliminar silos de información.*

Tipos de arquitecturas

- ▶ Tradicional

- ▶ Lambda

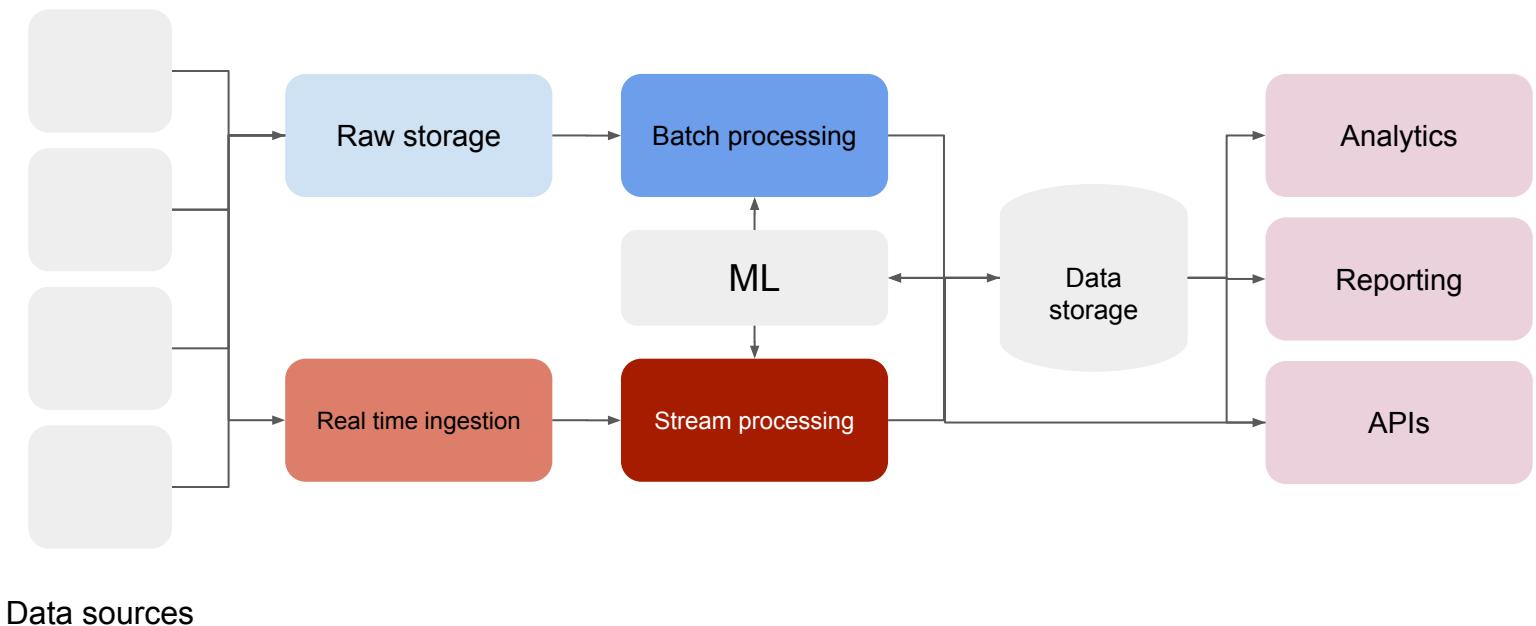
- ▶ Kappa

Tipos de arquitecturas

► Tradicional

► Lambda

► Kappa

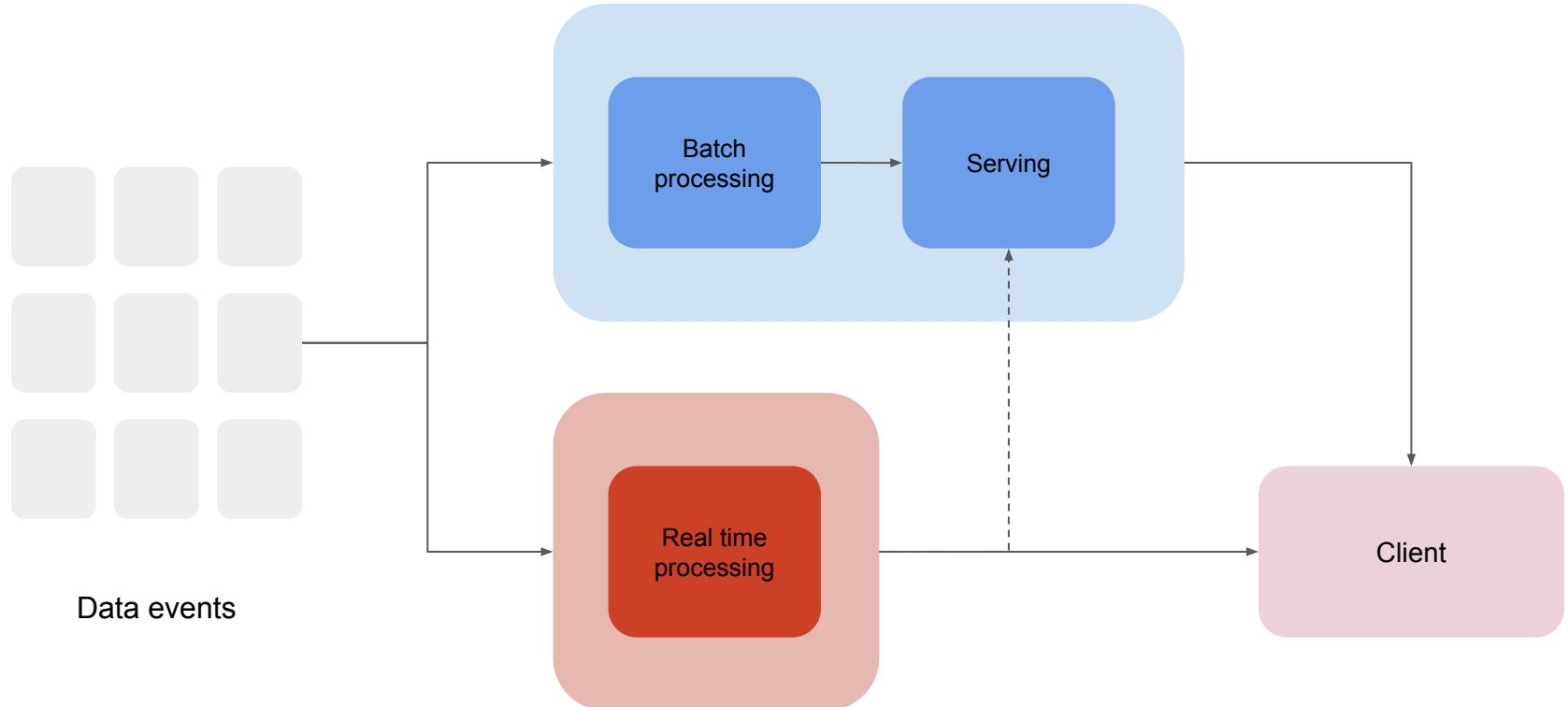


Tipos de arquitecturas

- Tradicional

- Lambda

- Kappa

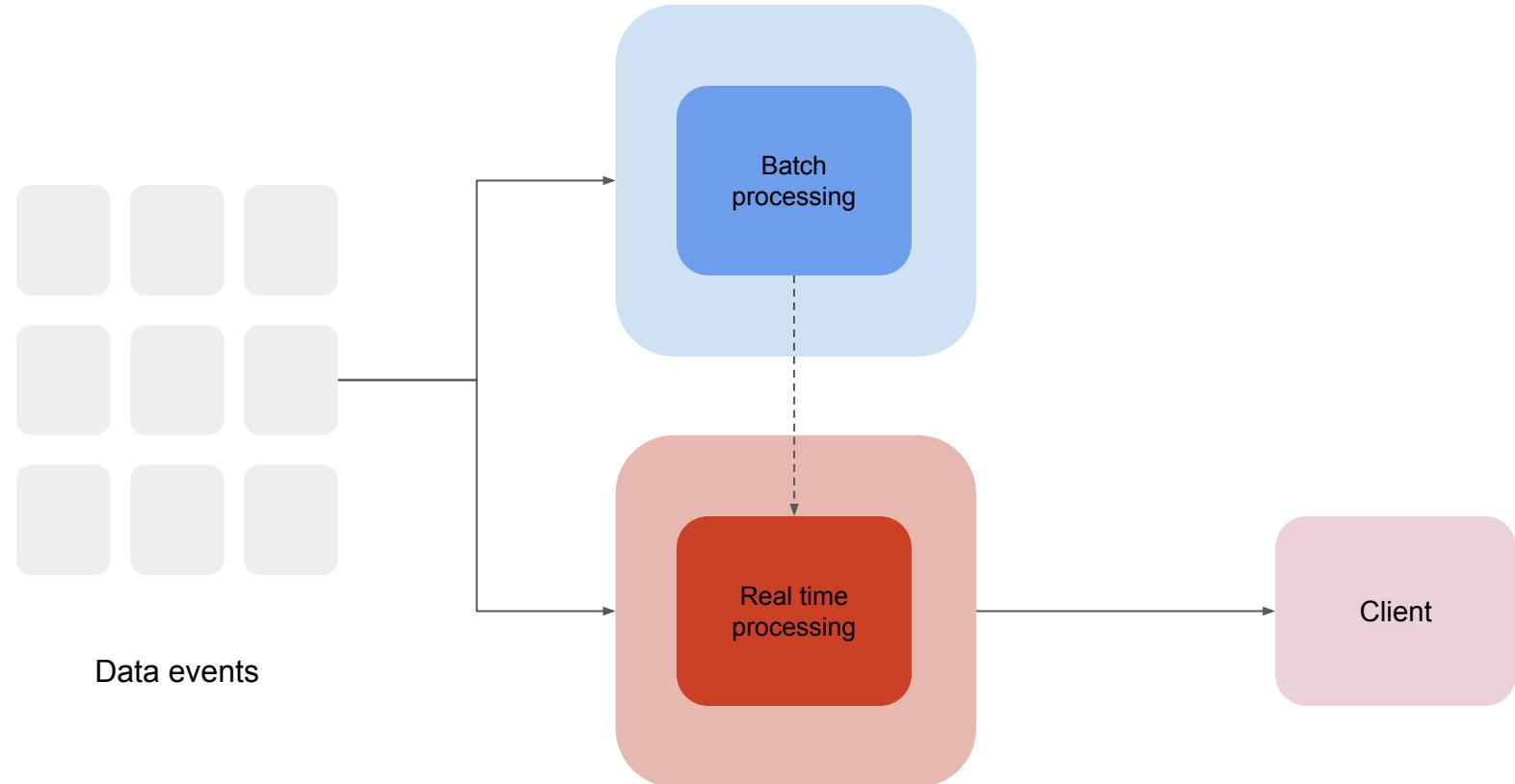


Tipos de arquitecturas

- Tradicional

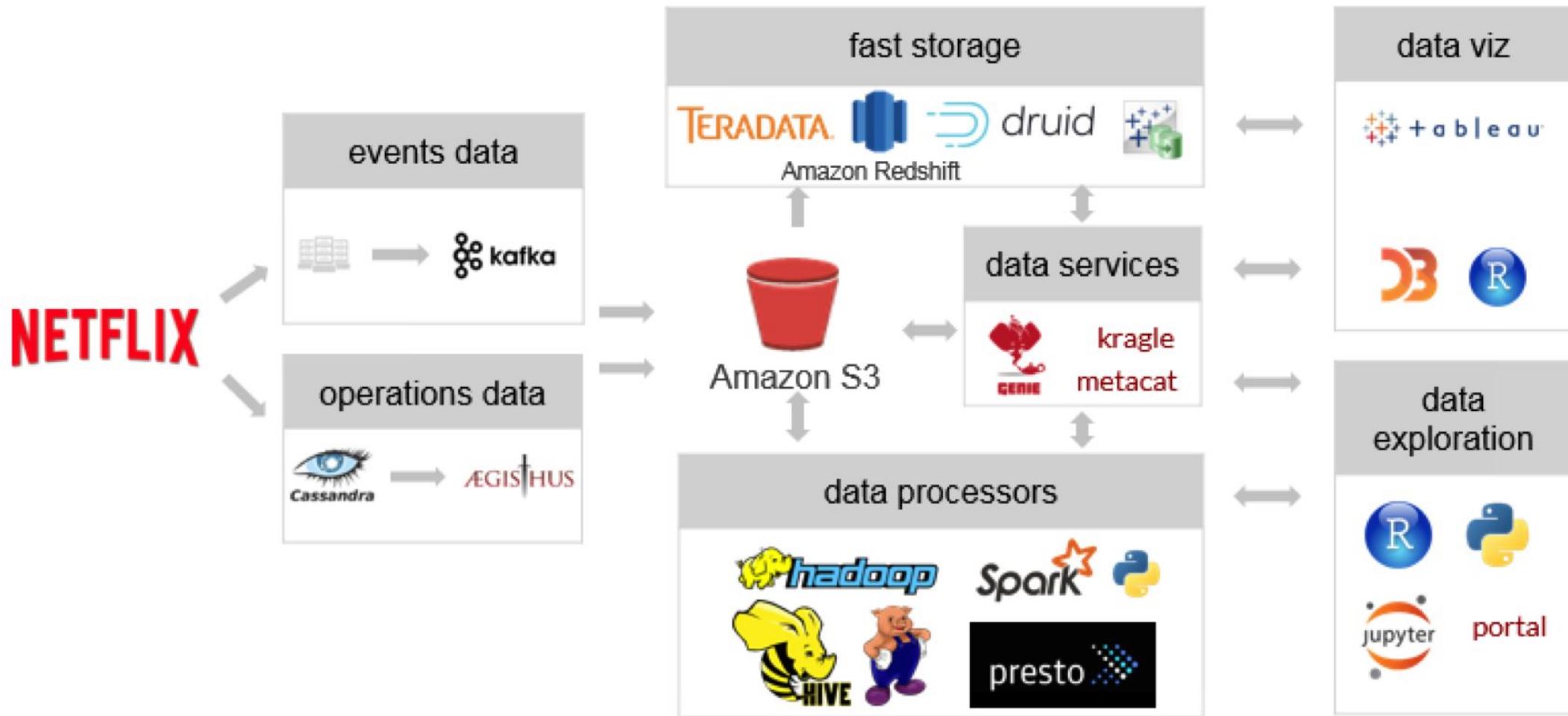
- Lambda

- Kappa



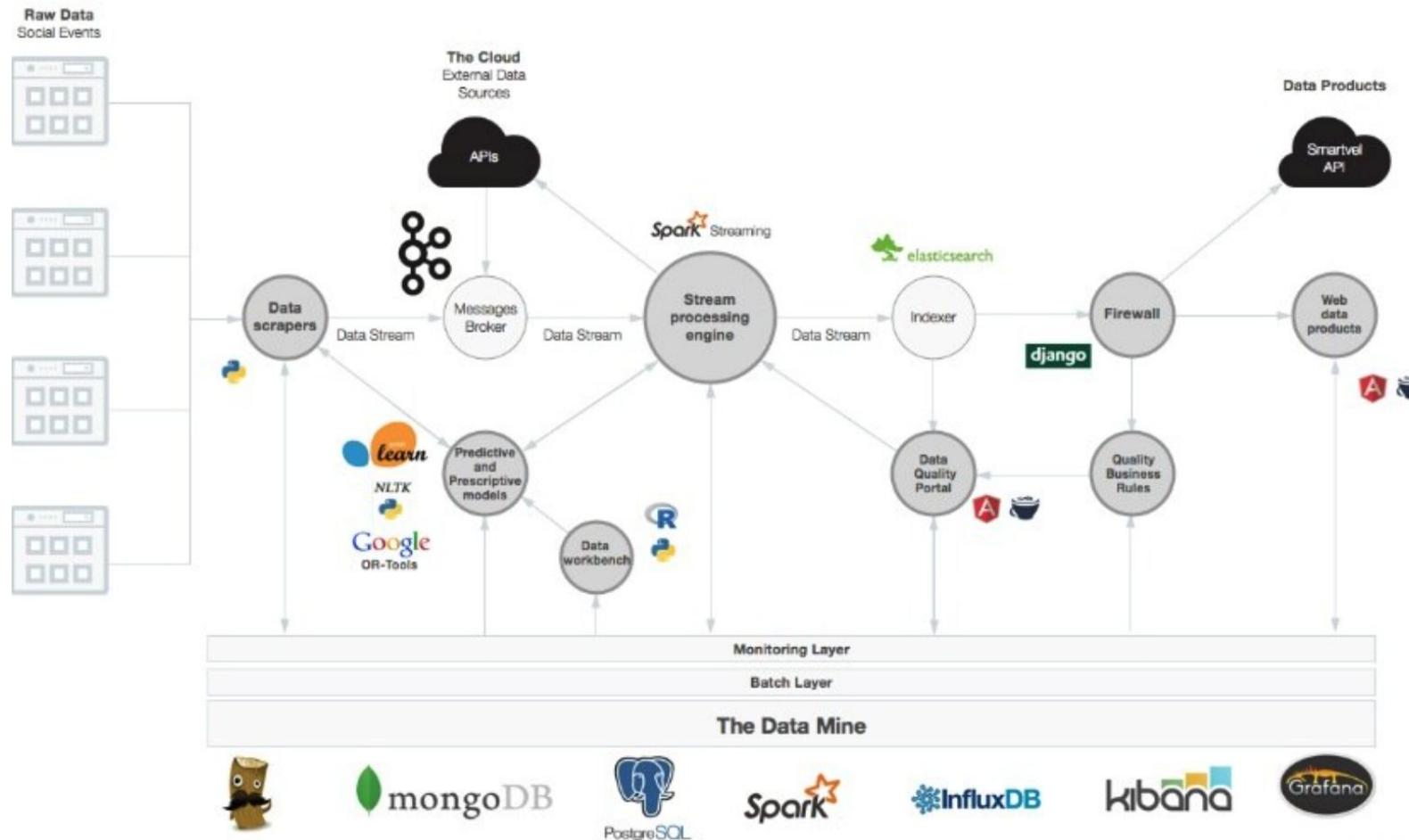
Tipos de arquitecturas

► Arquitectura de microservicios de Netflix



Tipos de arquitecturas

► Arquitectura de microservicios (Otro ejemplo)



Trabajo previo a la implantación

- ▶ Casos de uso y de negocio
- ▶ Análisis de fuentes de datos

Problema - Qué problemas tiene el negocio.

Solución - Qué solución tiene impacto.

Tecnología - Cómo podemos implementarla.

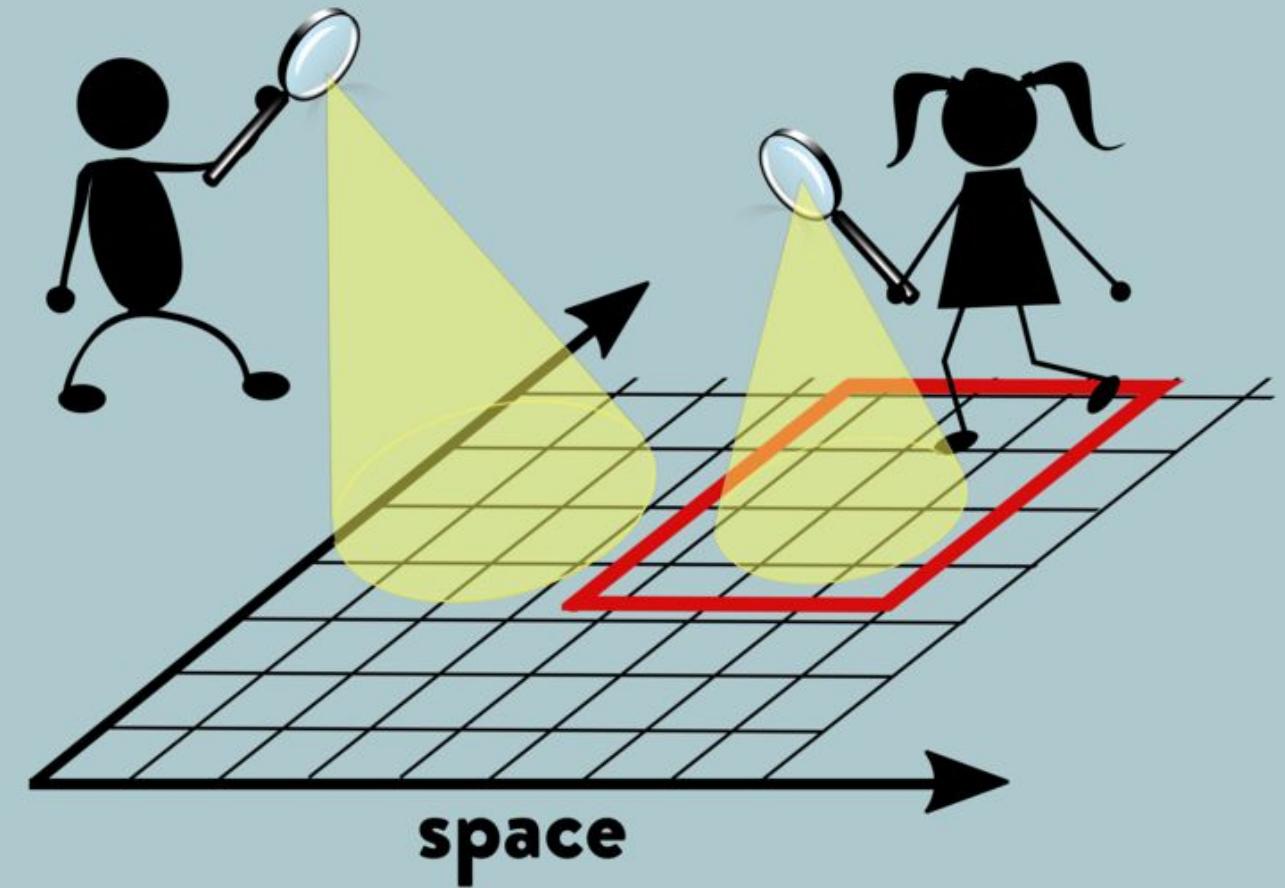
Cuidado con los arcos de iglesia y las culturas de técnicos tiranos.

Datos y modelos matemáticos

Datos

Espacio

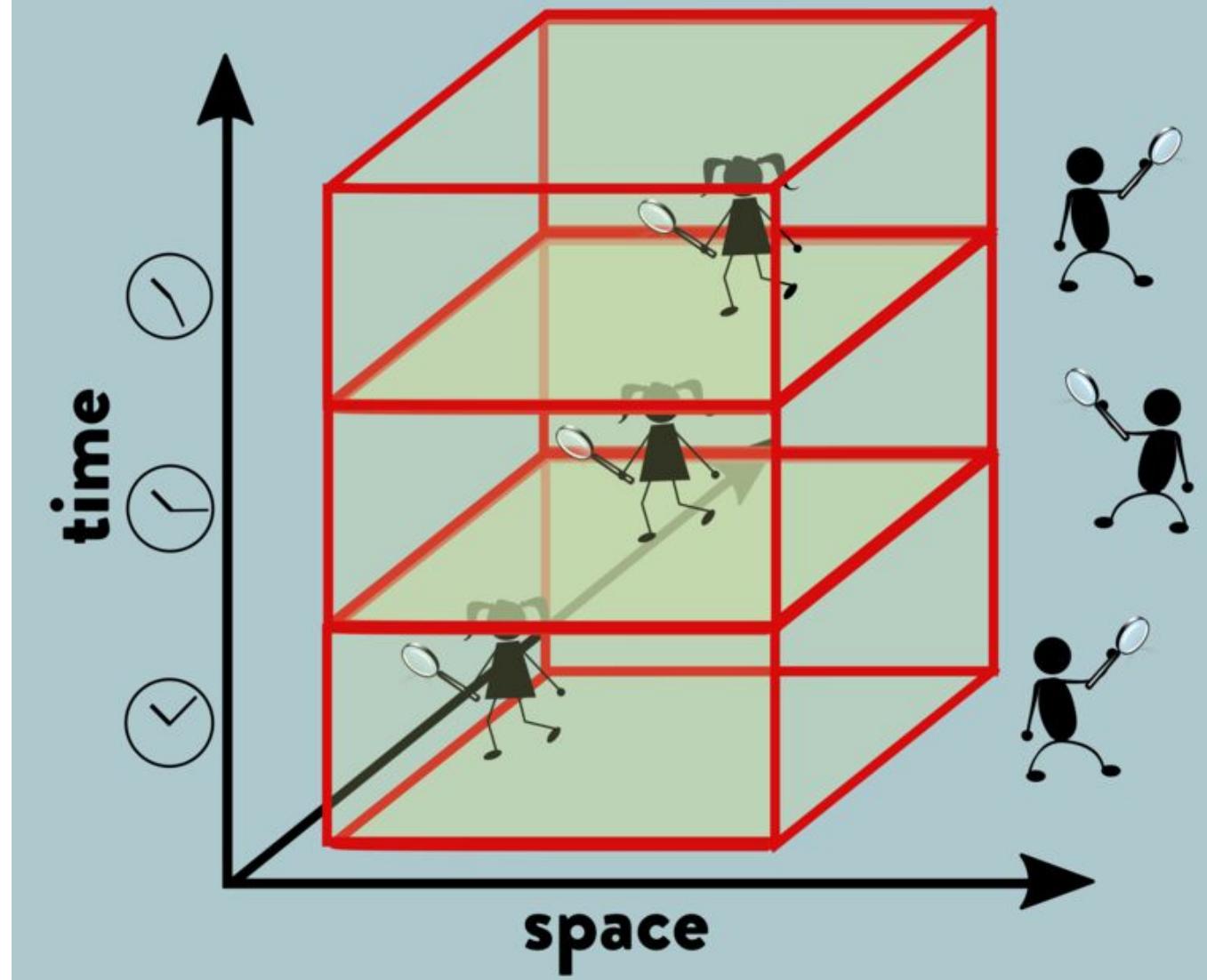
Area law in space



Datos

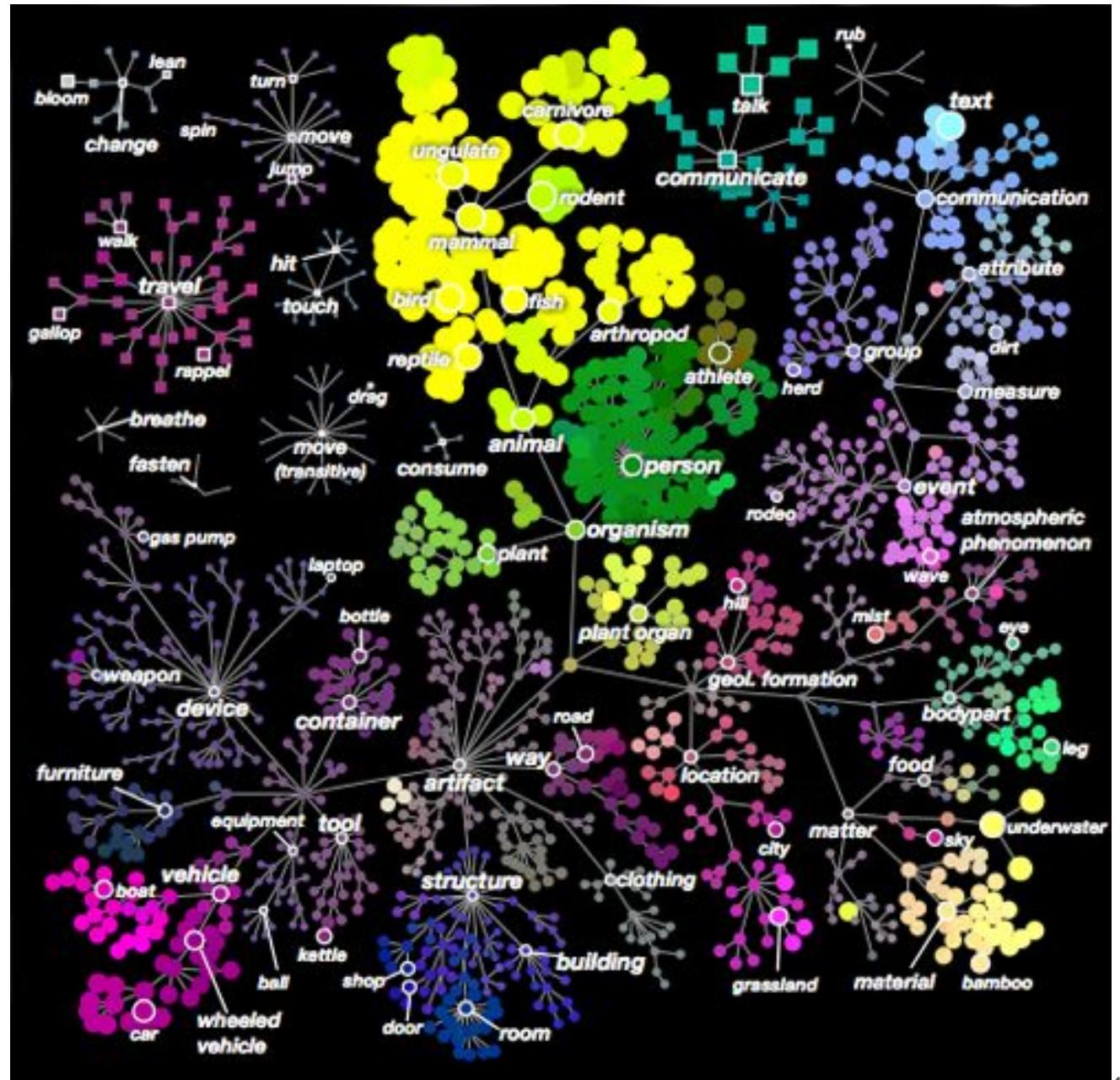
Espacio-tiempo

Area law in spacetime



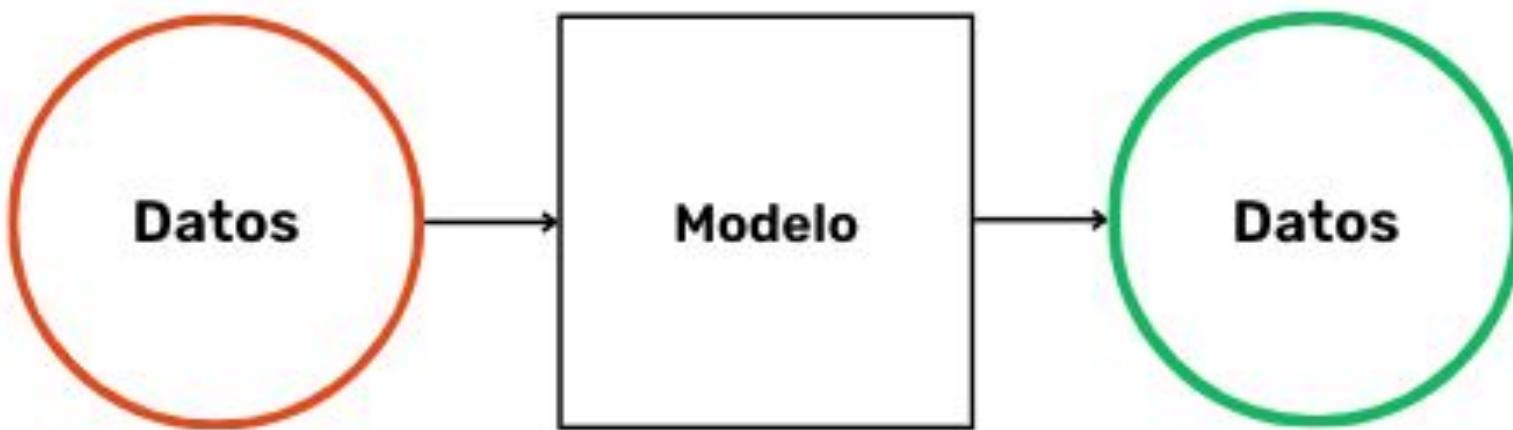
Datos

Representación simbólica,
fonológica, semántica y
gramatical = Lenguaje



Modelos

Datos + Modelo = Datos

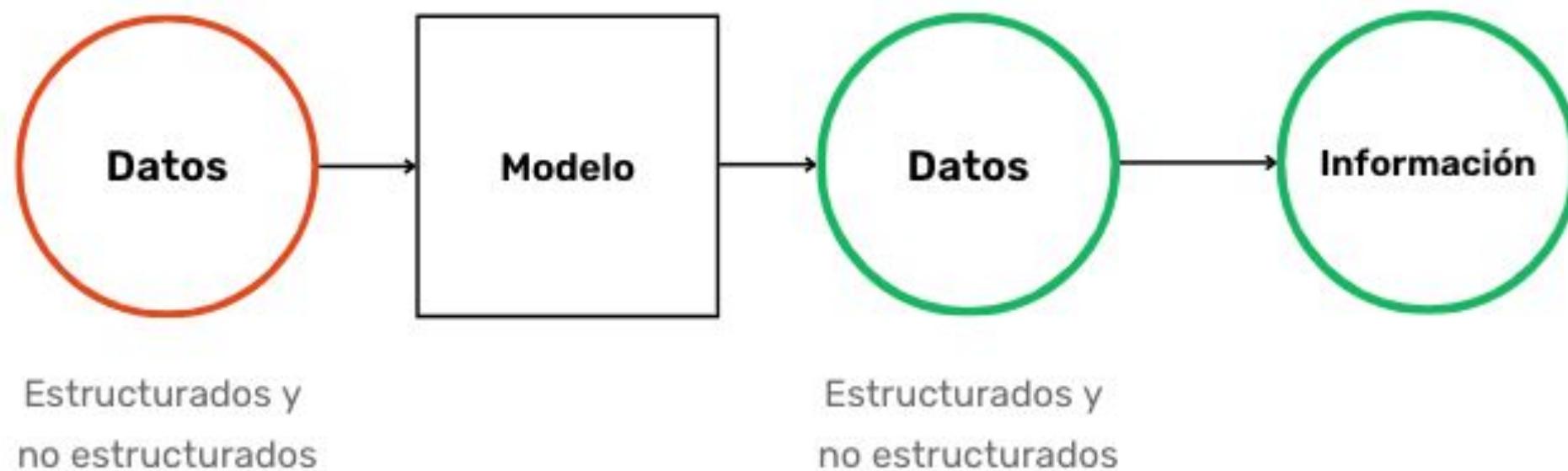


Estructurados y
no estructurados

Estructurados y
no estructurados

Modelos

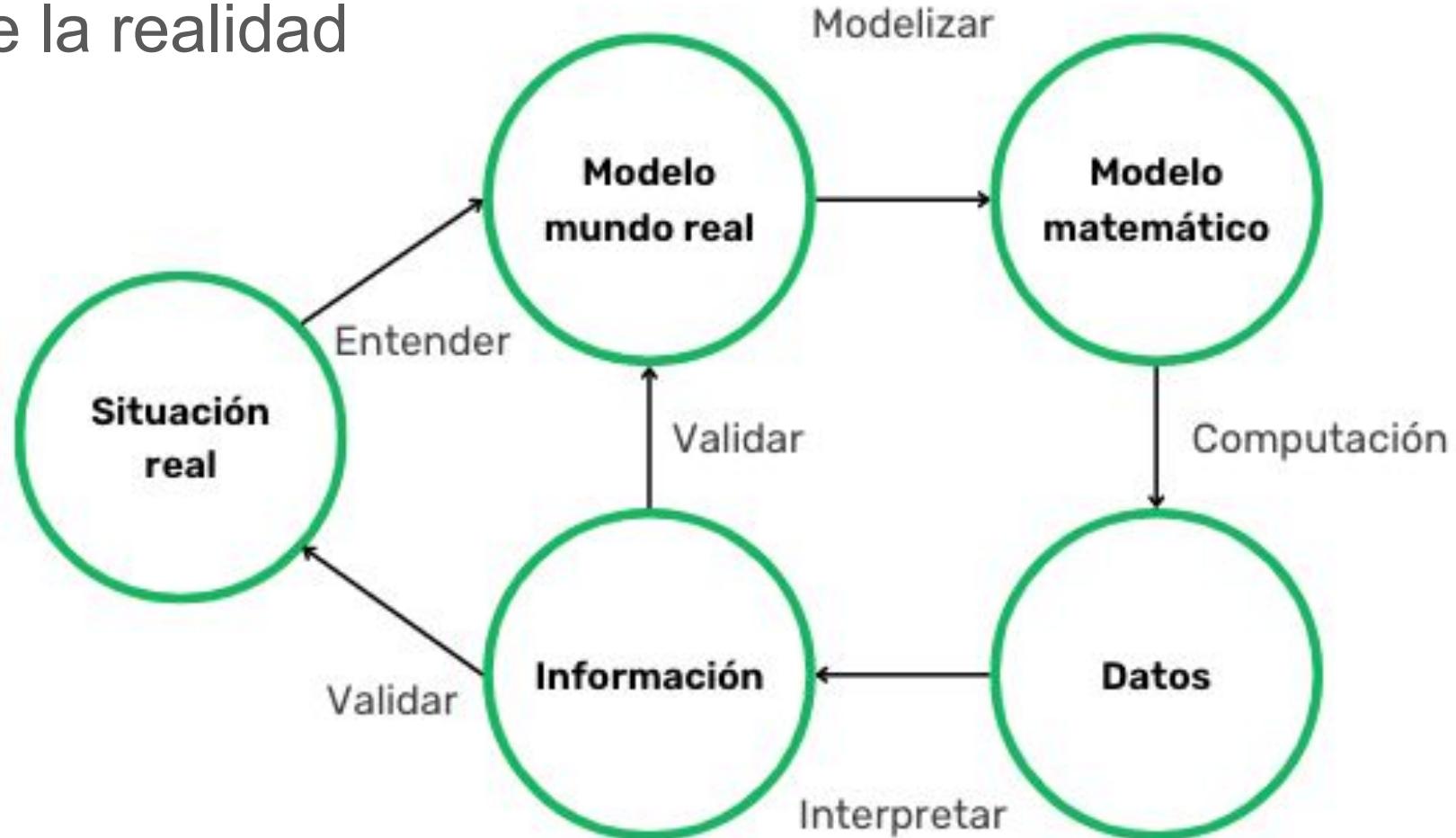
Datos + Modelo = Datos



Modelos

¿Qué es un modelo?

Una representación de la realidad



Introducción al aprendizaje automático

Cognición

"Proceso mental que incluye el pensamiento, el aprendizaje, la memorización, la conciencia del entorno y el sentido de realidad o juicio."

Cognición

Nos creemos dioses y queremos crear inteligencias artificiales que sean capaces de ...

- ▶ Percibir = Sensores = Datos
- ▶ Aprender = Representación de la información de los datos
- ▶ Memorizar = Recordar en el corto y largo plazo
- ▶ Razonar = Lógica, asociación, inducción, deducción
- ▶ Sentir emociones
- ▶ Ser conscientes

Aprendizaje

El aprendizaje es el proceso de adquirir nuevos conocimientos, comportamientos, habilidades, valores, actitudes y preferencias.

- ▶ Supervisado
- ▶ Semi supervisado
- ▶ No supervisado
- ▶ Refuerzo

Aprendizaje

Supervised Learning

Data: (x, y)

x is data, y is label

Goal: Learn function to map

$$x \rightarrow y$$

Examples: Classification,
regression, object detection,
semantic segmentation, etc.



Unsupervised Learning

Data: x

x is data, no labels!

Goal: Learn some *hidden* or
underlying structure of the data

Examples: Clustering, feature or
dimensionality reduction, etc.

Modelos matemáticos para resolver problemas

- ▶ Regresión = Variable numérica
- ▶ Clasificación = Variable categórica
- ▶ Clusterización = Similitud
- ▶ Series temporales = Variables temporales
- ▶ Análisis de redes = Interdependencia
- ▶ Reducción de la dimensionalidad = Condensación de la información
- ▶ Optimización = Resolución óptima o factible de problemas
- ▶ Simulaciones = Solo tenemos datos de distribuciones estadísticas
- ▶ Agentes = Toma de acciones en mundos virtuales
- ▶ Recomendadores = Busca elementos similares

TIPOS DE APRENDIZAJE

Tareas

Supervisado

No supervisado

Semi supervisado

Contar

Reconocer imagen

Reconocer a un cliente

Preguntas y respuestas

Categorizar contenido

Clasificar Regresión
Calcular

Reconocer audio
Reconocer imagen

Describir imagen

Traducción del lenguaje

Detección de objetos

Crear video

Crear contenido

Crear audio

Crear

Reducción de la dimensionalidad

Asociación

Modelos del lenguaje

Introducción al aprendizaje profundo

El despertar de la inteligencia artificial

'Deep Voice' Software Can Clone Anyone's Voice With Just 3.7 Seconds of Audio

Using snippets of voices, Baidu's 'Deep Voice' can generate new speech, accents, and tones.



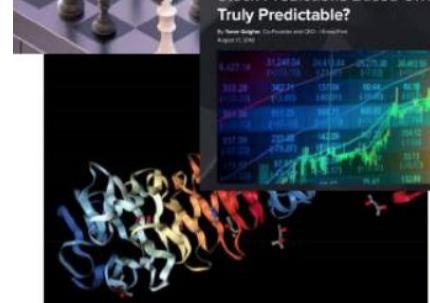
'Creative' AlphaZero leads way for chess computers and, maybe, science

Former chess world champion Garry Kasparov likes what he sees of computer that could be used to find cures for diseases



How an A.I. 'Cat-and-Mouse Game' Generates Believable Fake Photos

By CADIE RETZ and KEITH COLLINS - JAN 2, 2018



Complex of bacteria-infecting viral proteins modeled in CASP 13. The complex.com that were modeled individually. PICTON DATA BANK

Google's DeepMind aces protein folding

By Robert F. Service | Dec. 6, 2018, 12:05 PM

Let There Be Sight: How Deep Learning Is Helping the Blind 'See'



DEEPMIND I
STARCRAFT
TRIUMPH FO



Neural networks everywhere
New chip reduces neural networks' power consumption by up to 95 percent, making them practical for battery-powered devices.

Wed, 03/07/2018 - 10:00am | 1 Comment | by Kenny Walter - Digital Reporter - @KennyWalter



Researchers introduce a deep learning method that converts mono audio recordings into 3D sounds using video scenes



These faces show how far AI image generation has advanced in just four years

Sample on the right aren't real; they're the product of machine learning



Automation And Algorithms: De-Risking Manufacturing With Artificial Intelligence

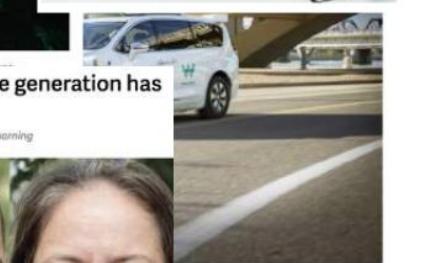
Sarah Goehrke contributor
Manufacturing
I focus on the industrialization of additive manufacturing.

TWEET THIS

The two key applications of AI in manufacturing are pricing and manufacturability feedback

AI Can Help In Predicting Cryptocurrency Value

By Ariane Sherine | last updated Jan 21, 2018



ARTIFICIAL INTELLIGENCE

Any technique that enables computers to mimic human behavior



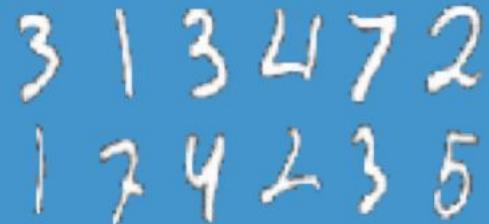
MACHINE LEARNING

Ability to learn without explicitly being programmed



DEEP LEARNING

Extract patterns from data using neural networks

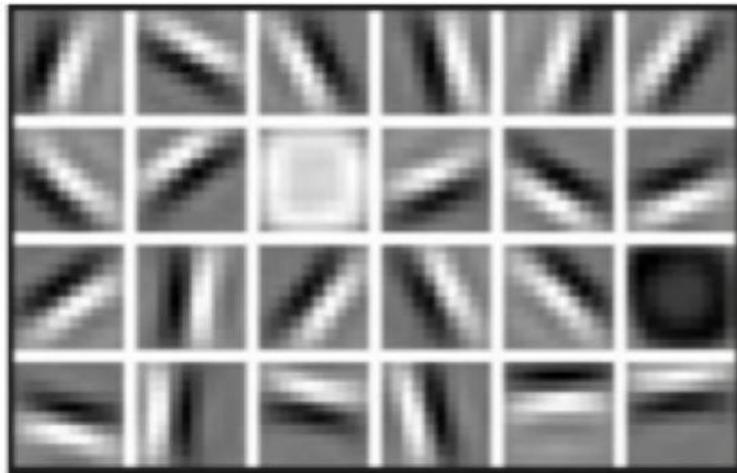


Por qué el aprendizaje profundo

Hand engineered features are time consuming, brittle and not scalable in practice

Can we learn the **underlying features** directly from data?

Low Level Features



Lines & Edges

Mid Level Features



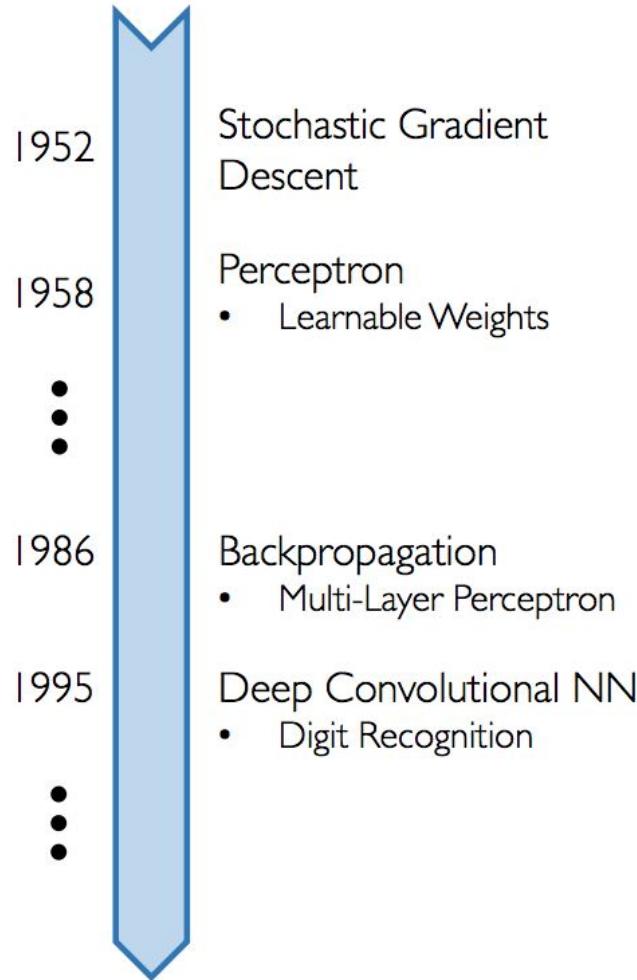
Eyes & Nose & Ears

High Level Features



Facial Structure

Por qué ahora



Neural Networks date back decades, so why the resurgence?

I. Big Data

- Larger Datasets
- Easier Collection & Storage

IMAGENET



2. Hardware

- Graphics Processing Units (GPUs)
- Massively Parallelizable



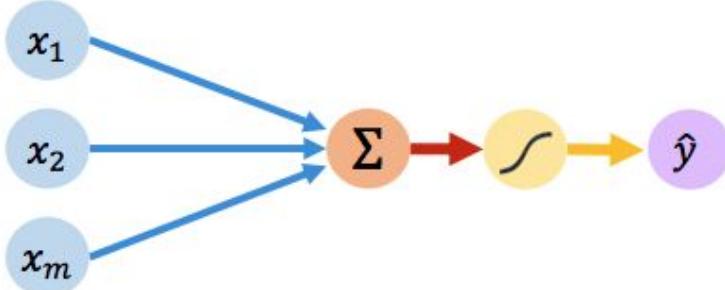
3. Software

- Improved Techniques
- New Models
- Toolboxes



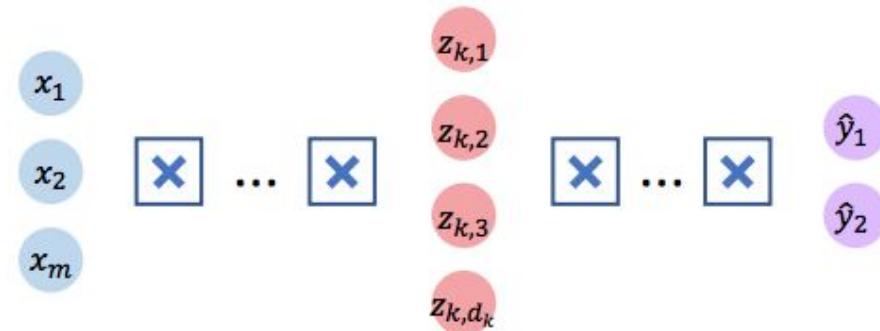
The Perceptron

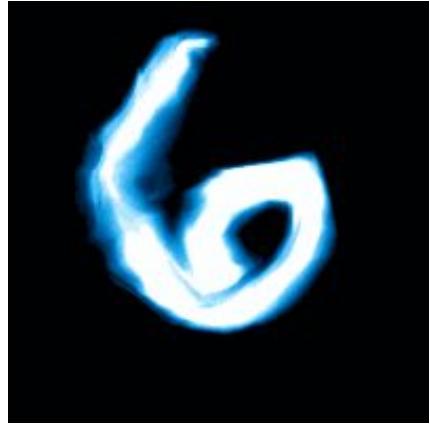
- Structural building blocks
- Nonlinear activation functions



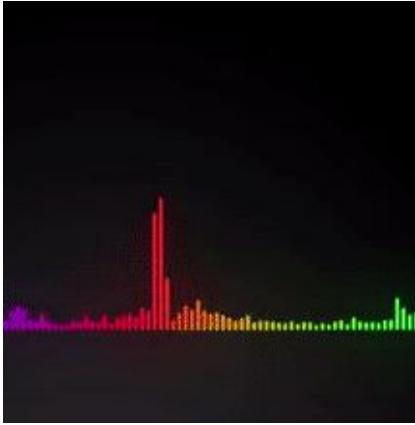
Neural Networks

- Stacking Perceptrons to form neural networks
- Optimization through backpropagation





Vision



Secuencias



Generativa



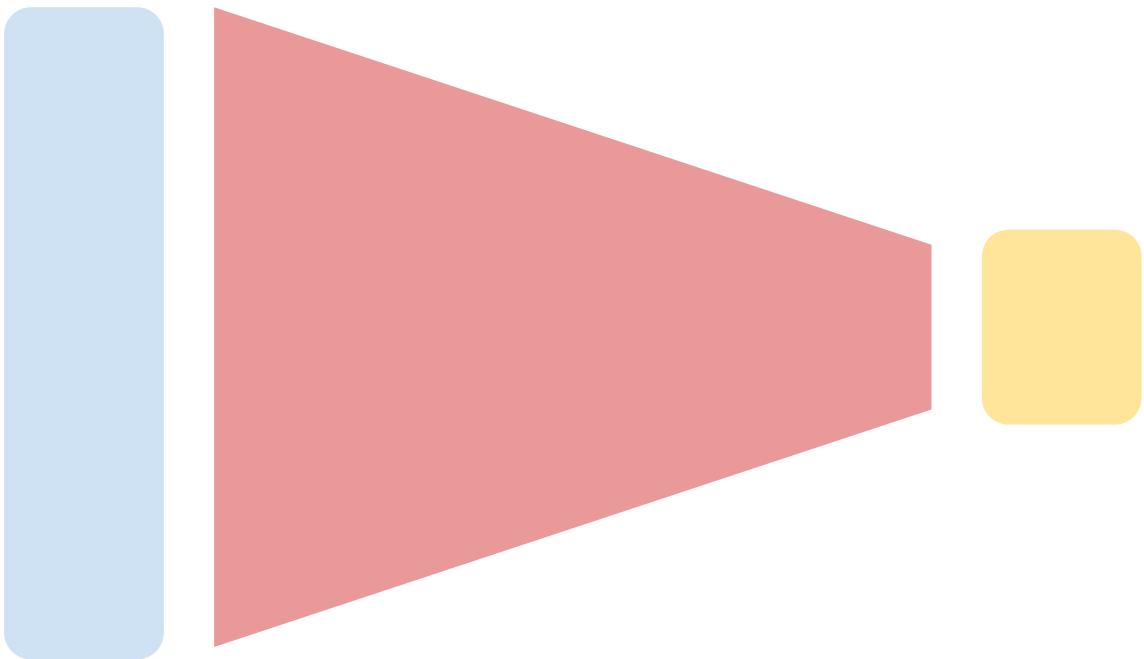
Refuerzo

Convolución

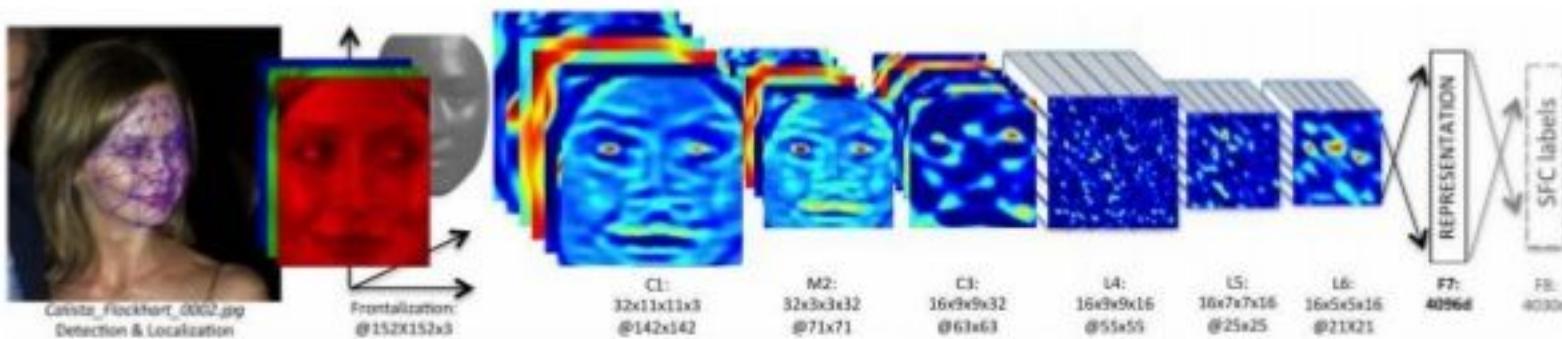
Entrada
X

Aprende
patrones

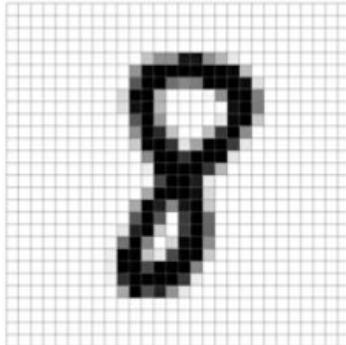
Predicción
y



DeepFace Architecture



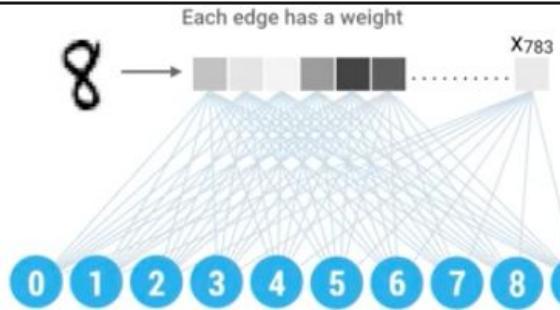
Yaniv Taigman, etc (Facebook) . [DeepFace: Closing the Gap to Human-Level Performance in Face Verification](#), CVPR
2014



28 x 28 pixels → 784 pixels

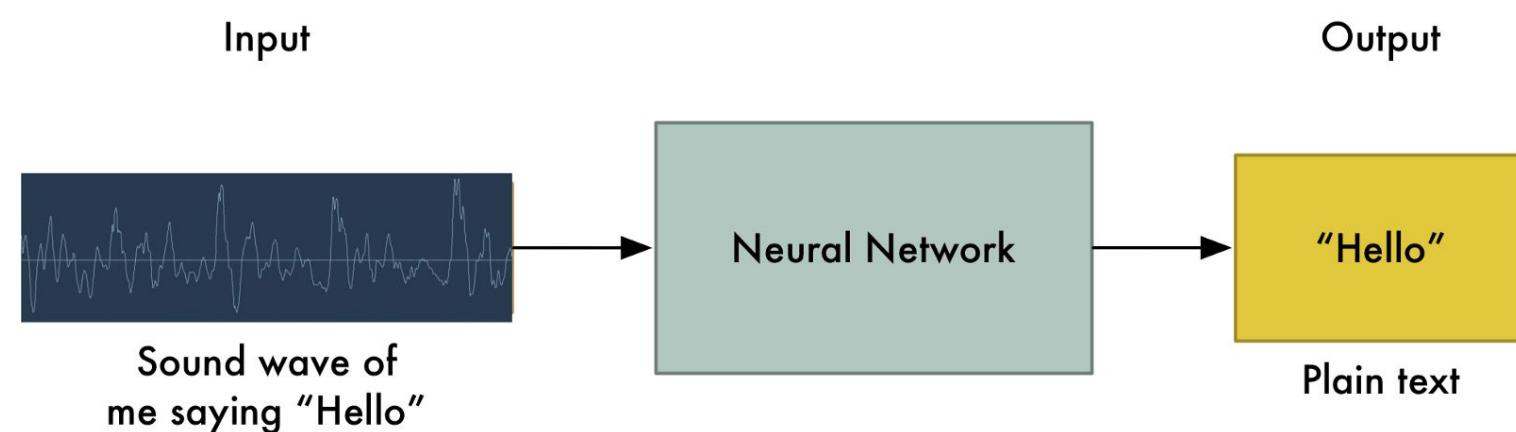
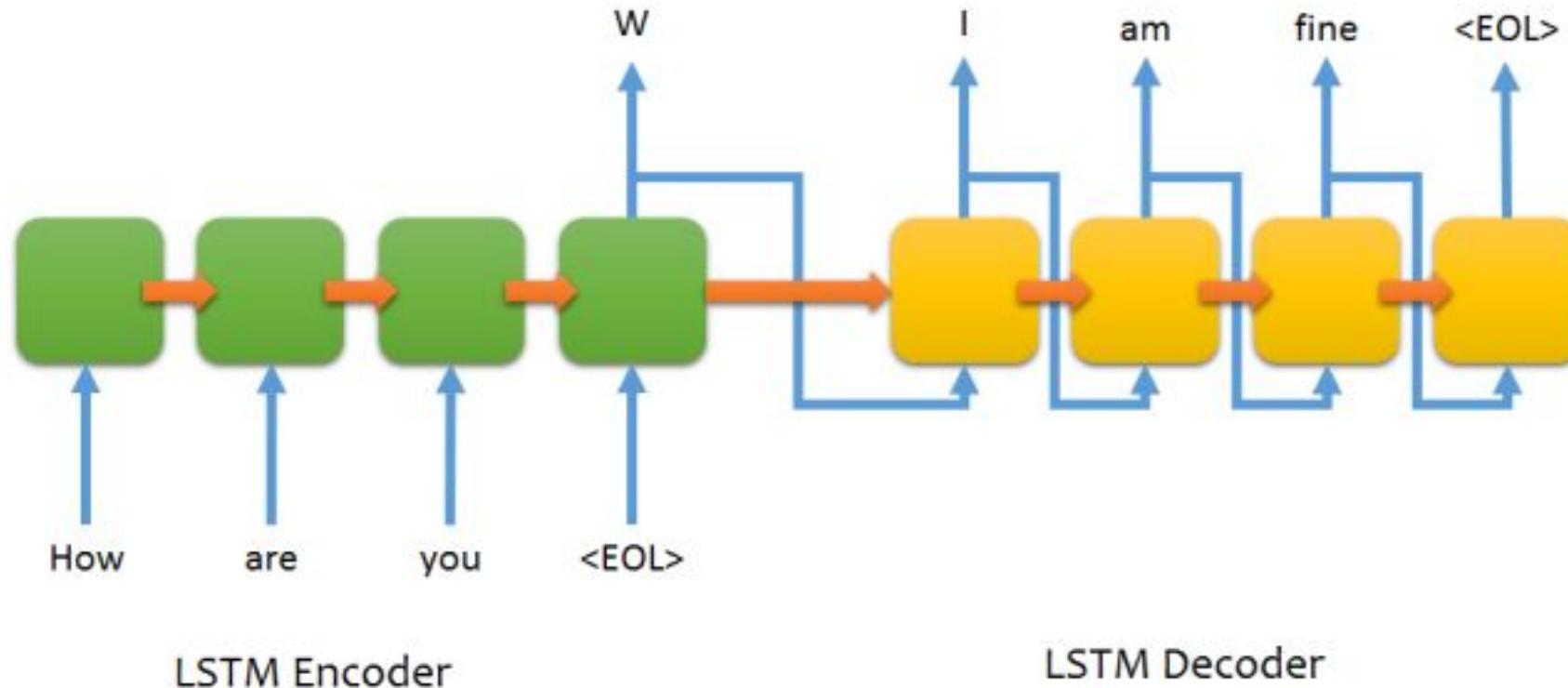
8 → x₀ x₁ x₂ x₃ x₄ x₅ ... x₇₈₃

0 1 2 3 4 5 6 7 8 9
y₀ y₁ y₂ y₃ y₄ y₅ y₆ y₇ y₈ y₉



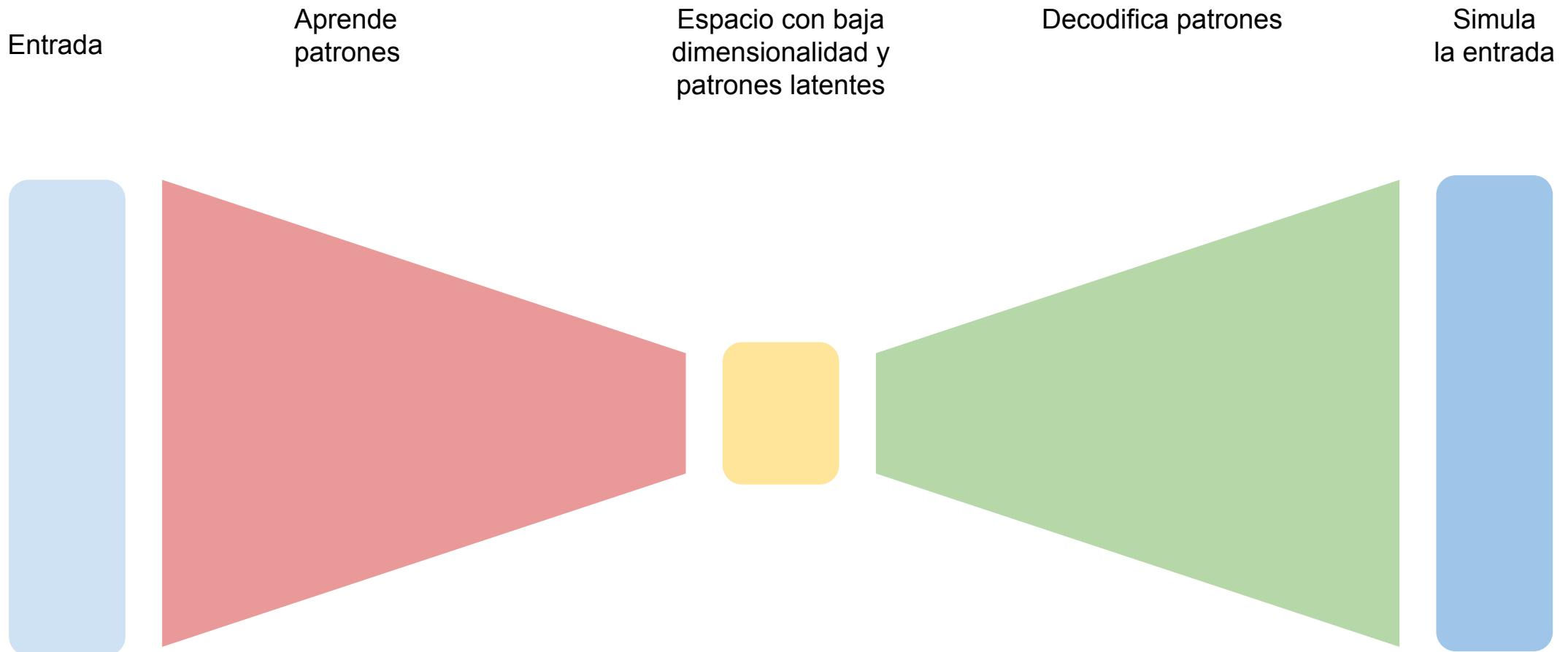
8 → 0 1 2 3 4 5 6 7 8 9

$$\text{evidence } y_i = \sum_j W_{i,j} x_j$$

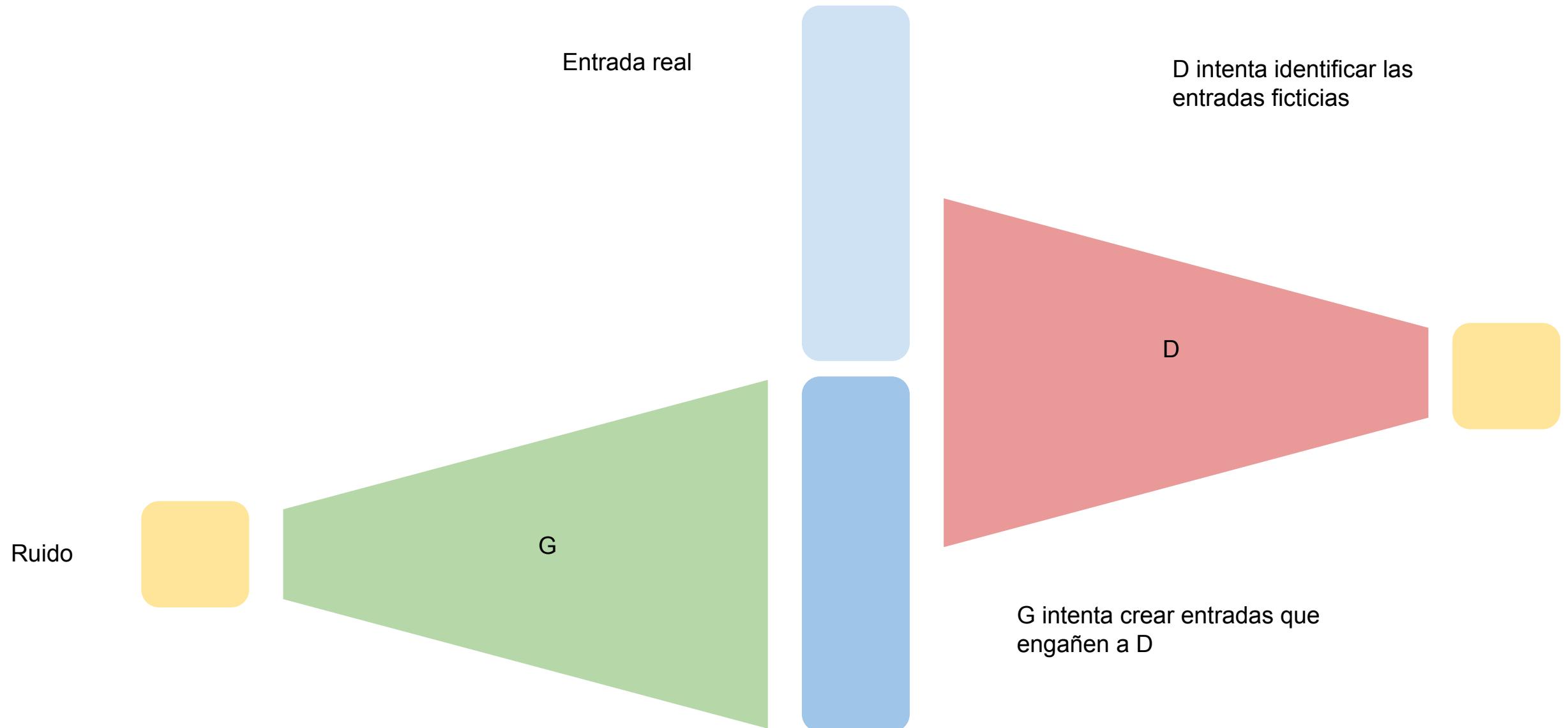


Autoencoders

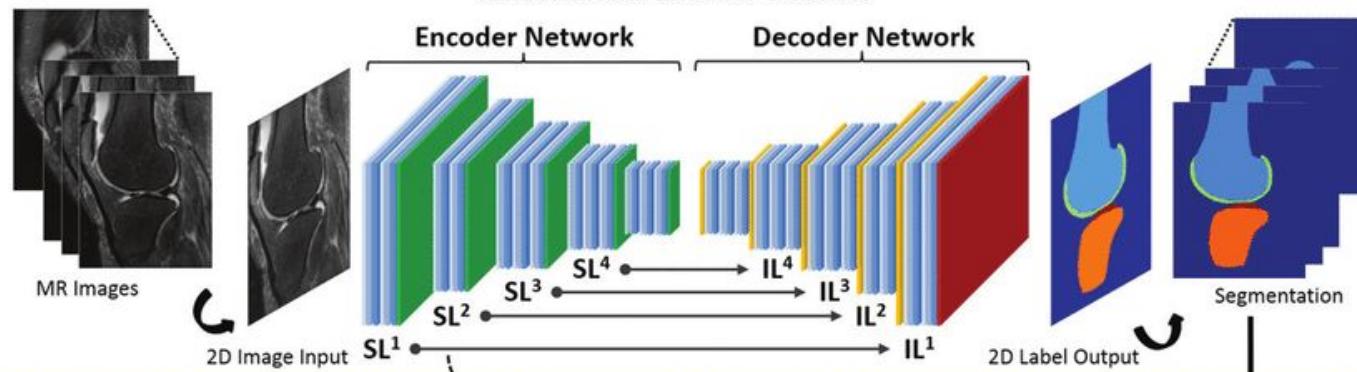
Permite reconstruir datos originales, es como una comprensión de los datos.



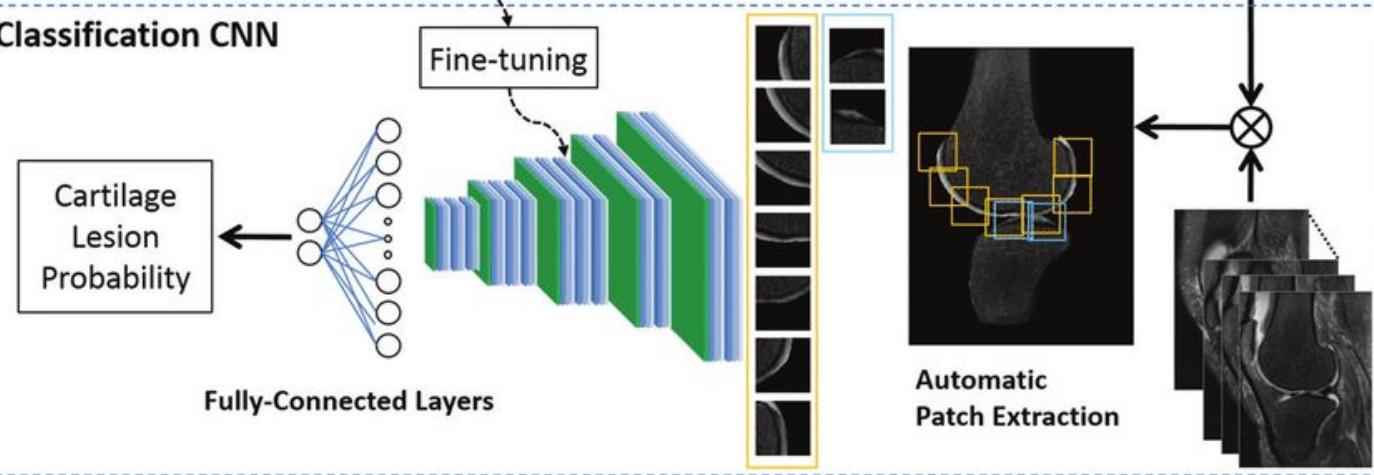
Generative Adversarial Networks



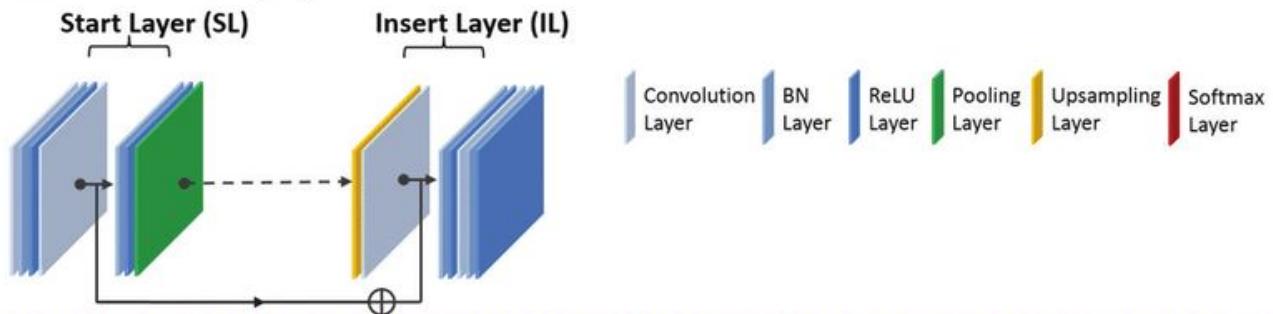
Segmentation CNN



Classification CNN



Shortcut Connection (SC)



Monet ↪ Photos



Monet → photo

Zebras ↪ Horses



zebra → horse

Summer ↪ Winter



summer → winter



photo → Monet



horse → zebra



winter → summer



Monet



Van Gogh



Cezanne

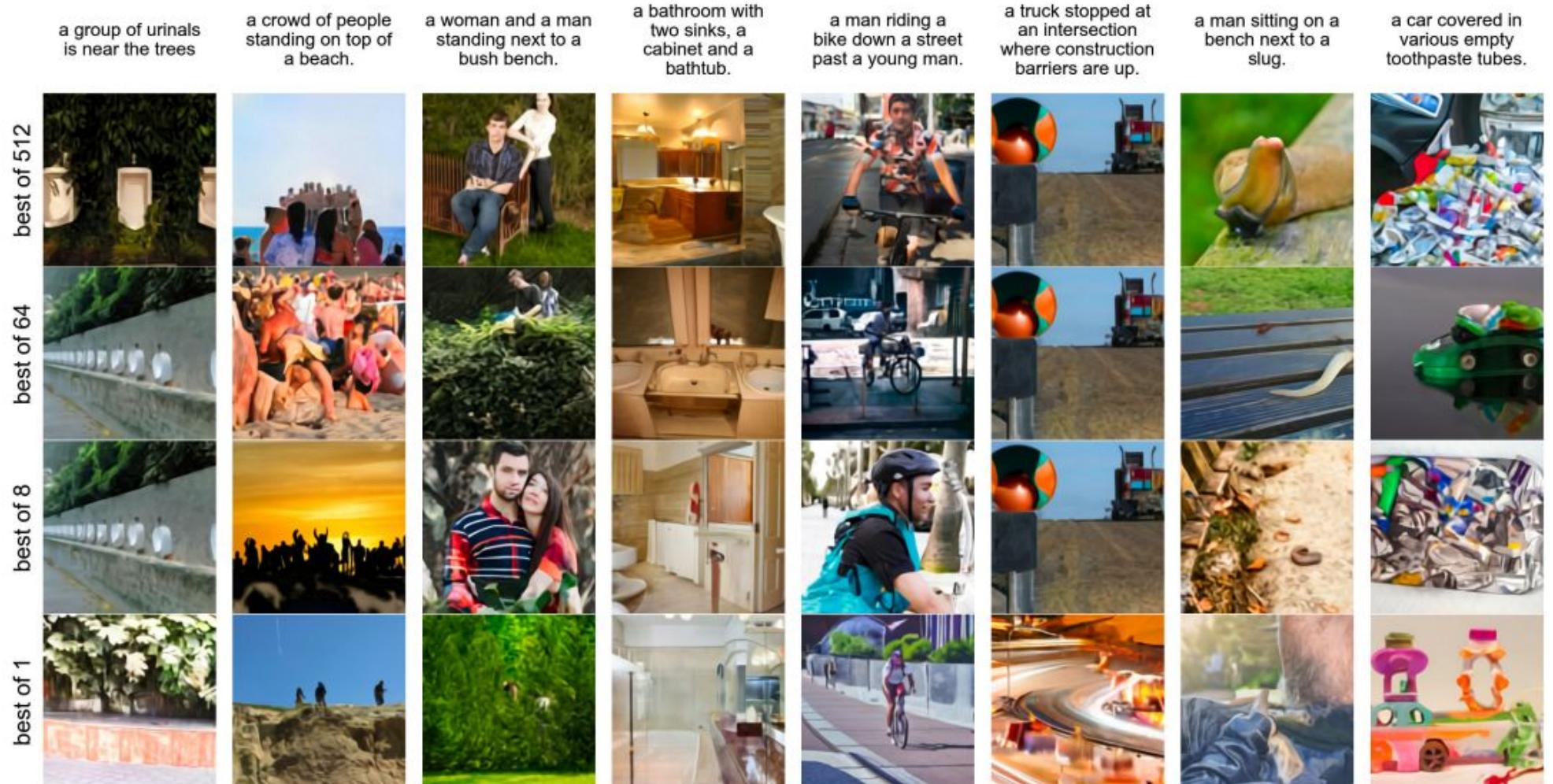


Ukiyo-e

Photograph

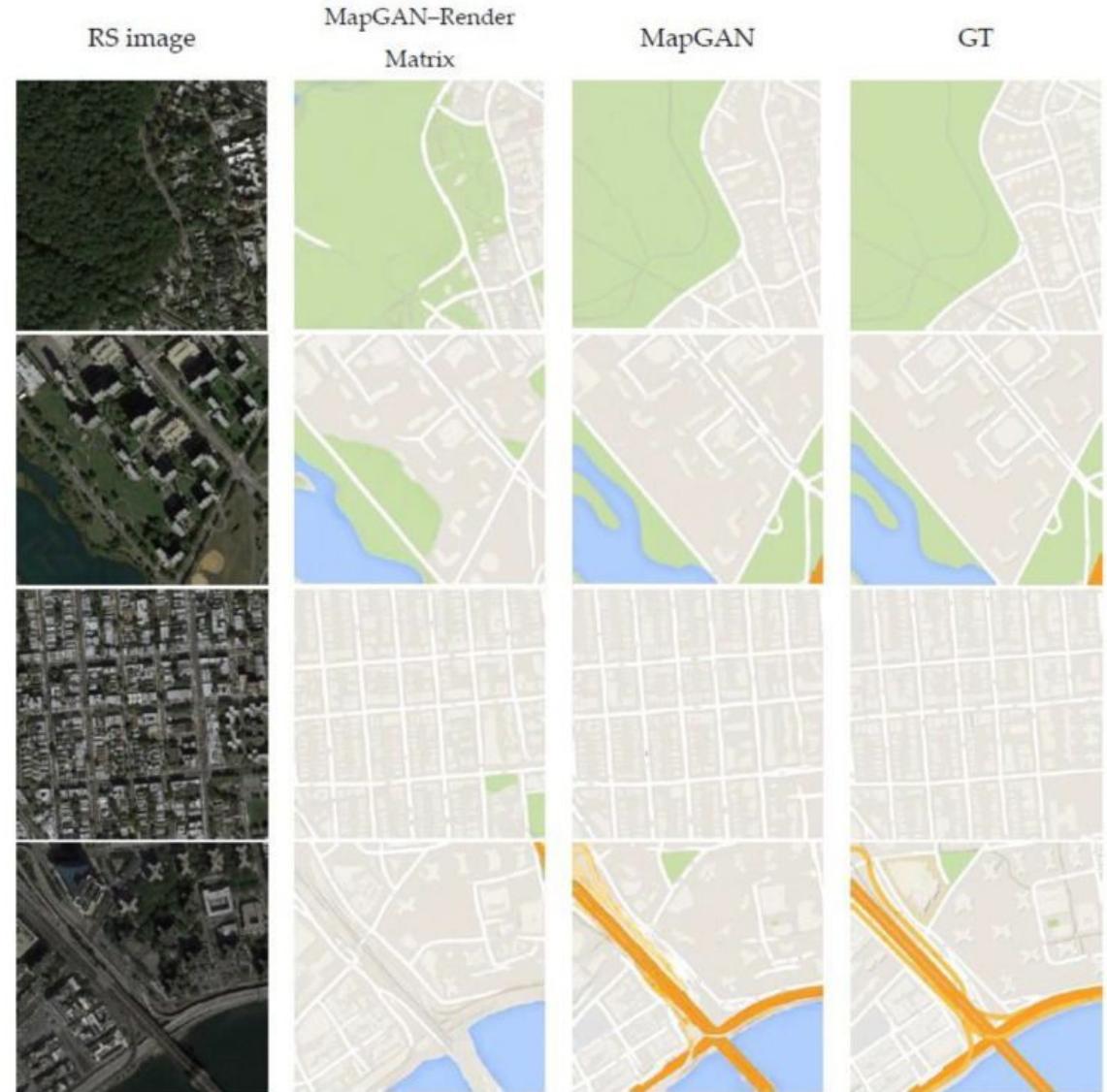
Texto to image

Unpaired Image-to-Image Translation
using Cycle-Consistent Adversarial Network

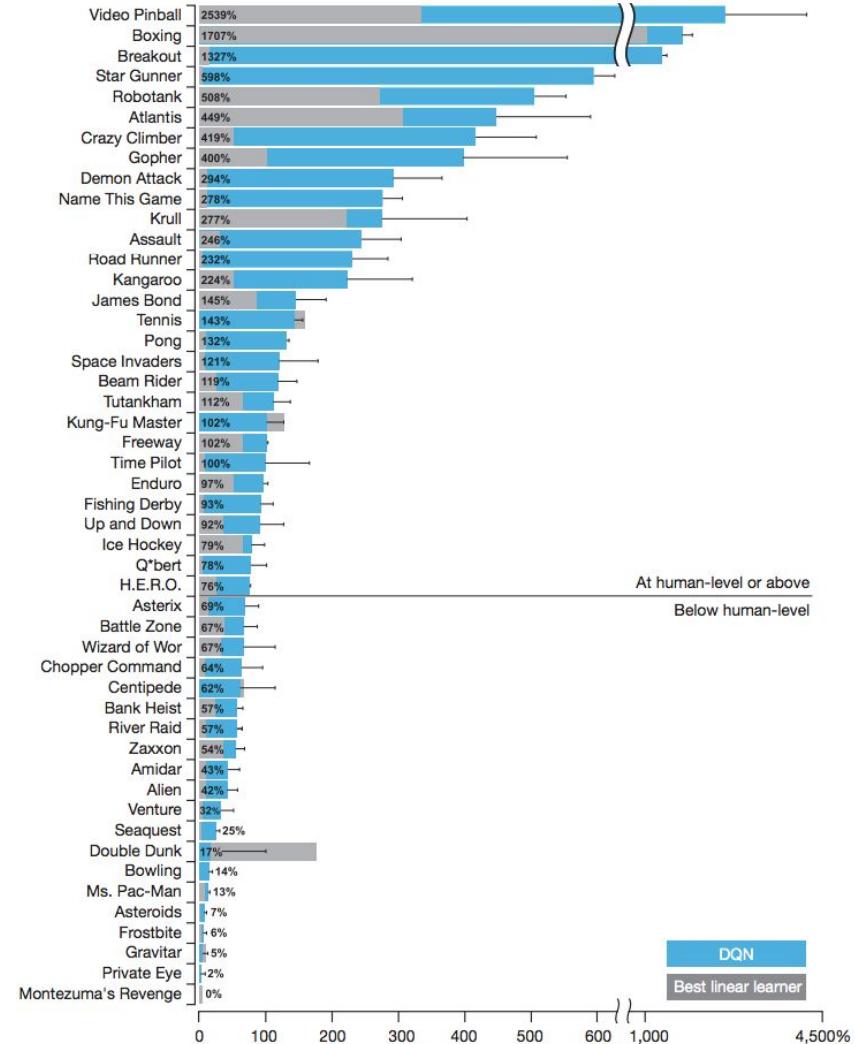
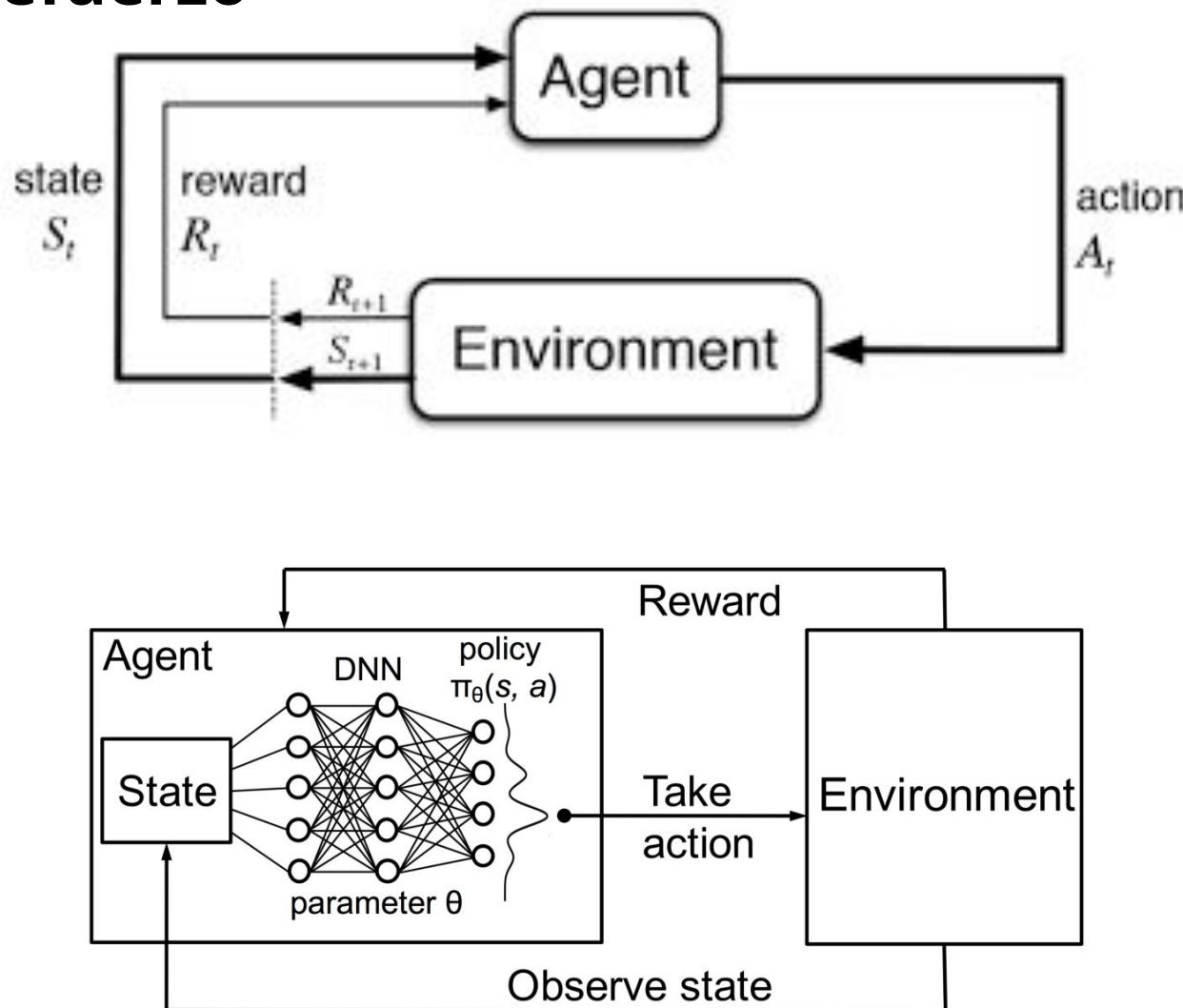


Creación de mapas

MapGAN: An Intelligent Generation Model for Network Tile Maps



Refuerzo



Atención

Efecto de realizar algunos patrones de los datos de entrada y permite transferir información entre redes neuronales

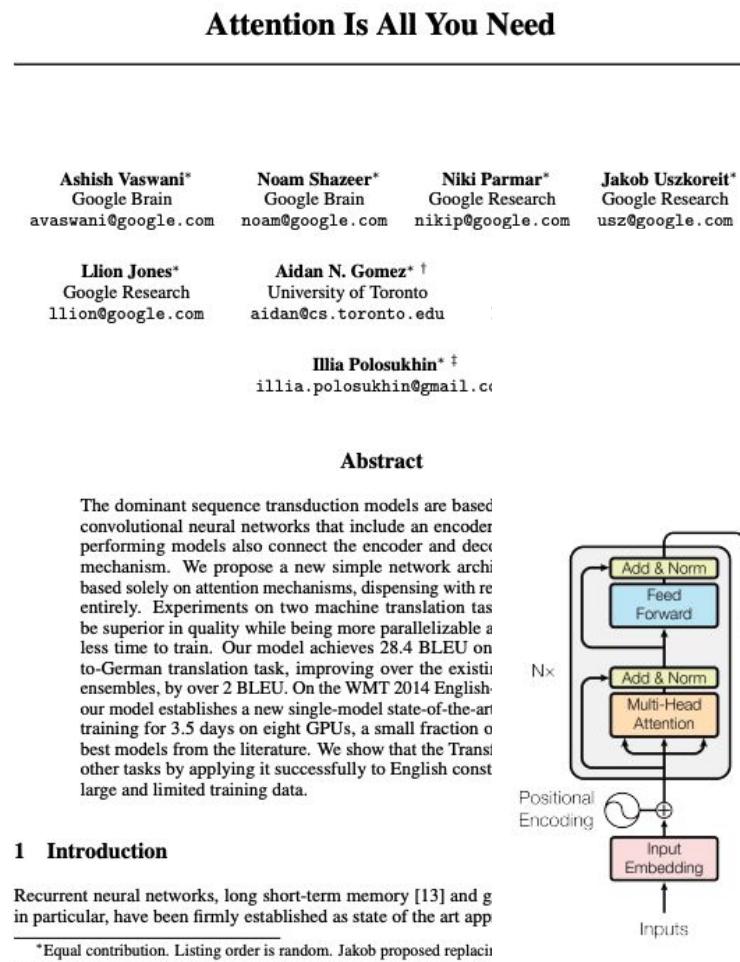
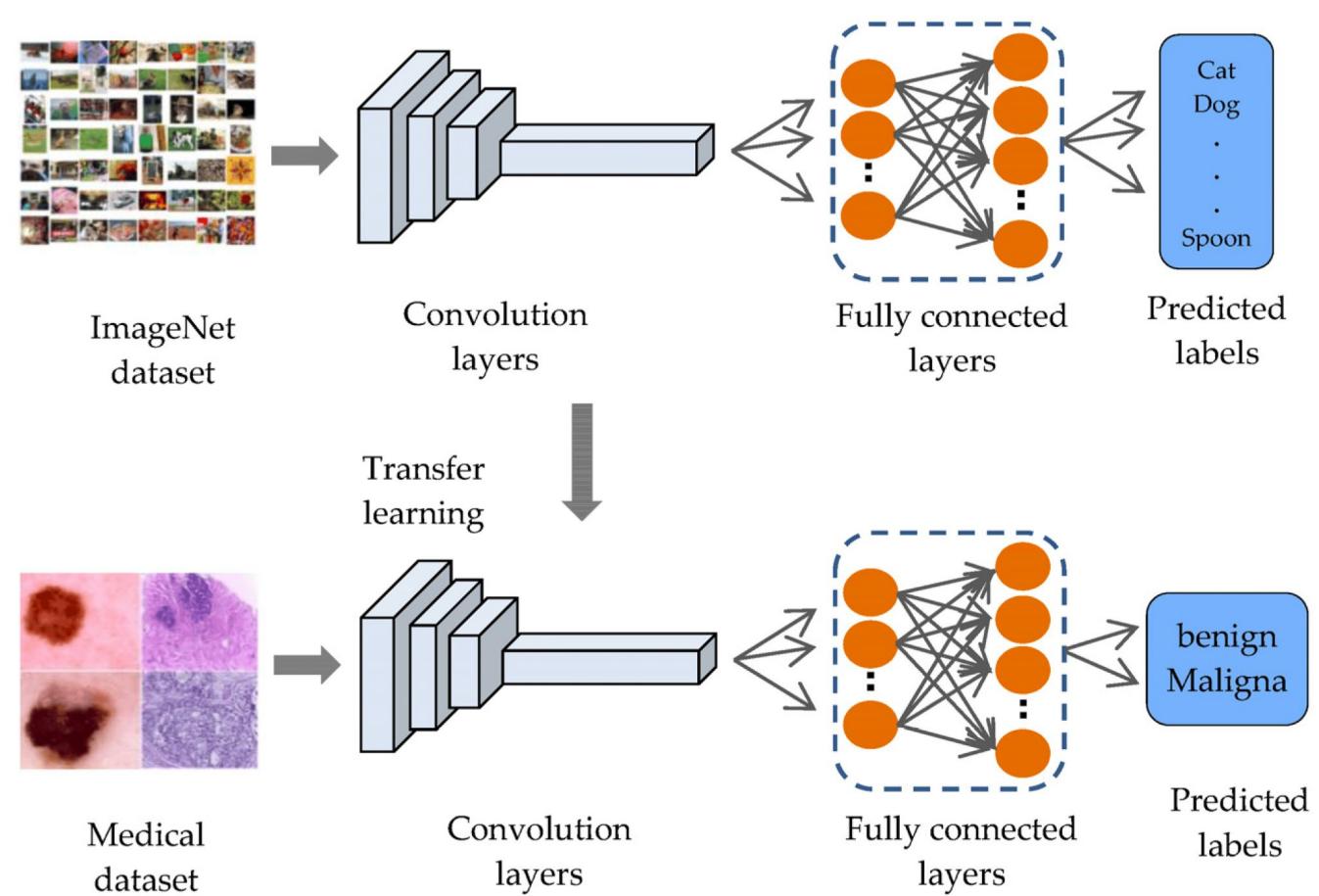
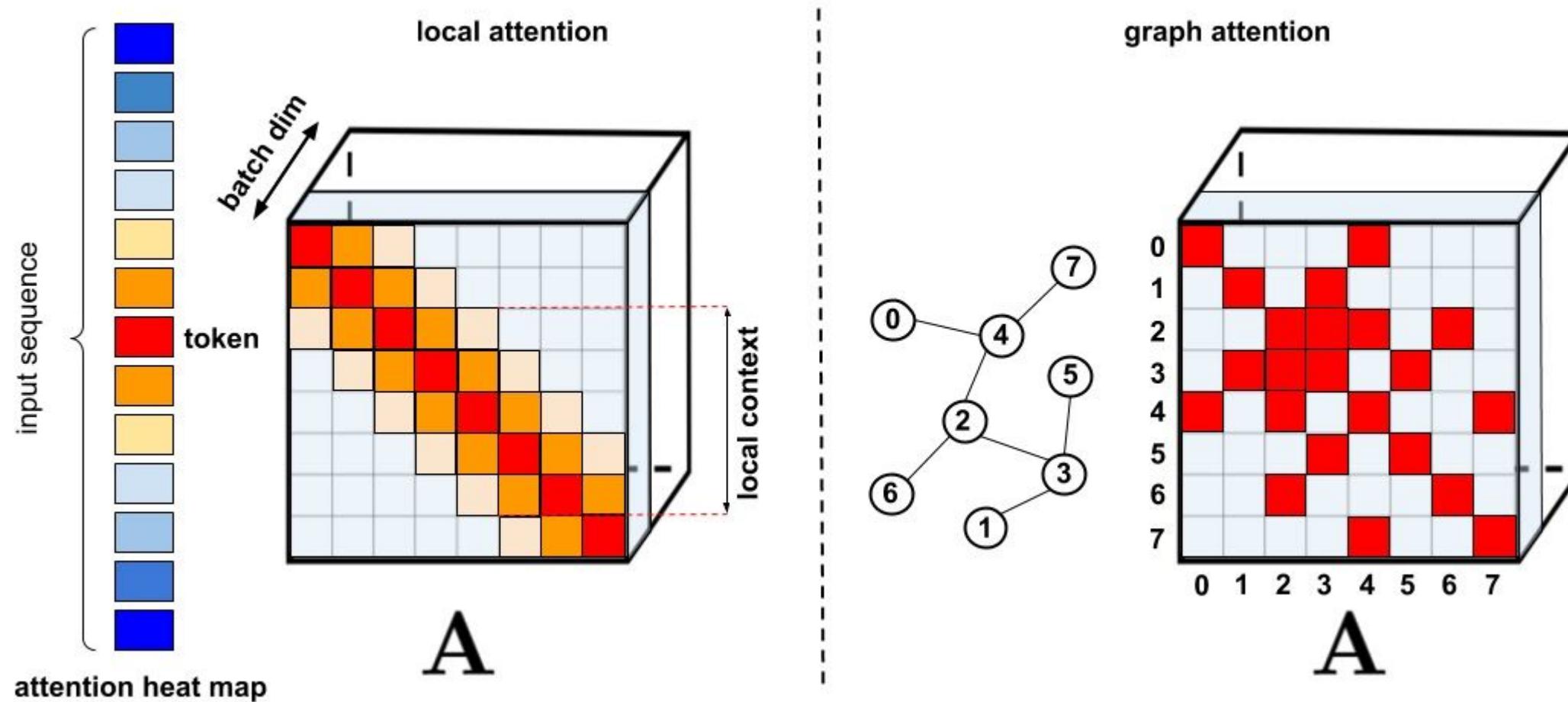


Figure 1: The Transformer - model architecture.



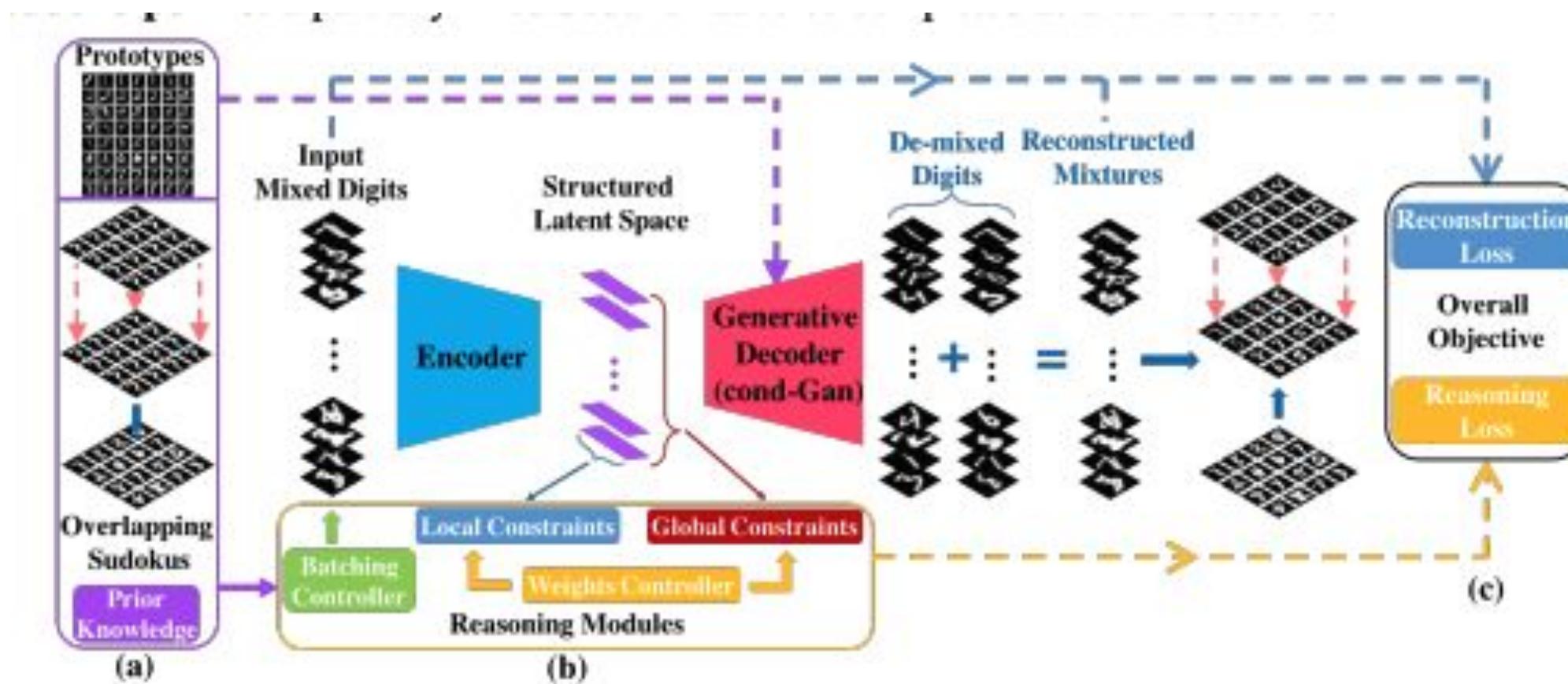
Atención

Efecto de realizar algunos patrones de los datos de entrada y permite transferir información entre redes neuronales



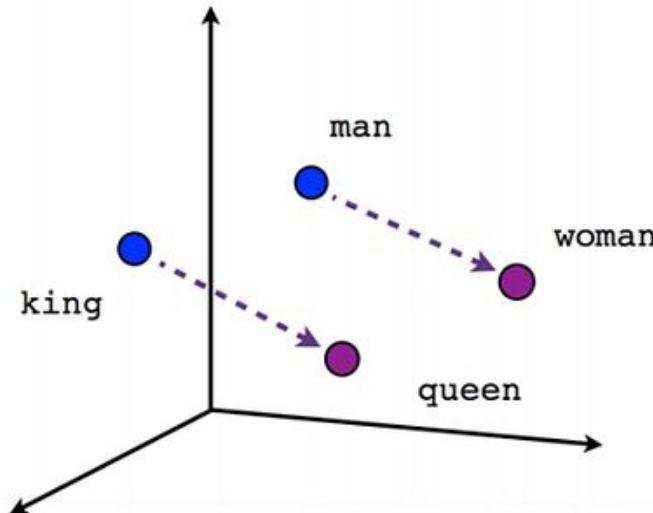
Razonamiento

Capacidad de resolver problemas complejos mediante lógica, inducción o deducción.

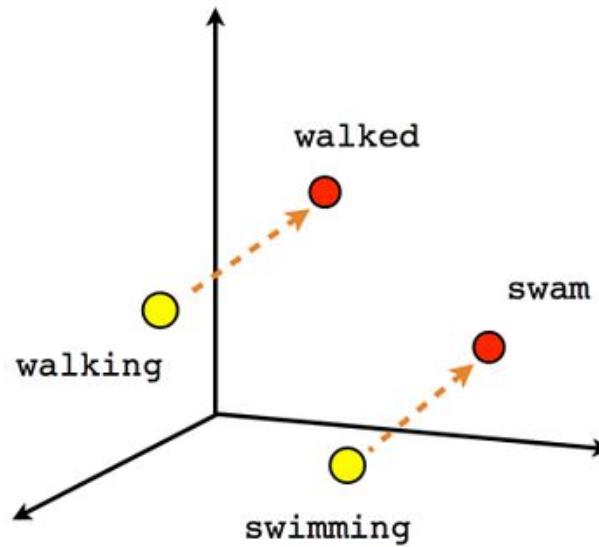


Razonamiento

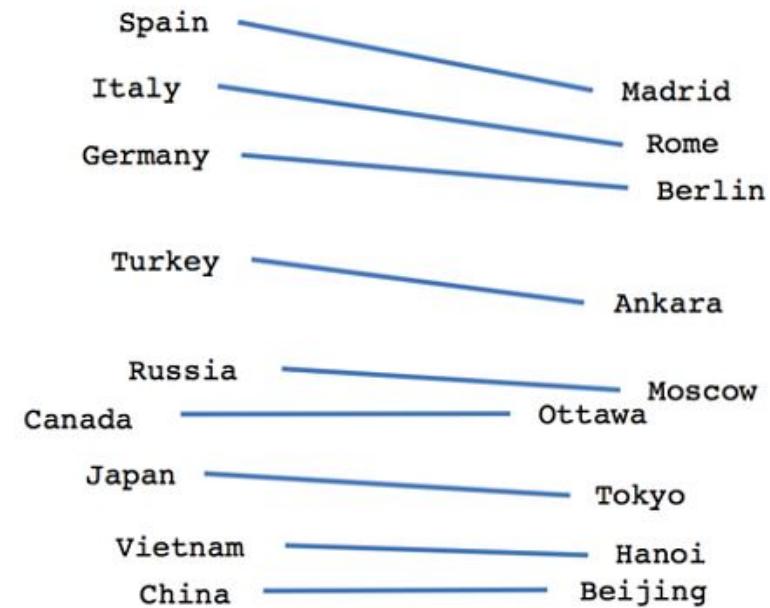
Capacidad de resolver problemas complejos mediante lógica, inducción o deducción.



Male-Female



Verb tense

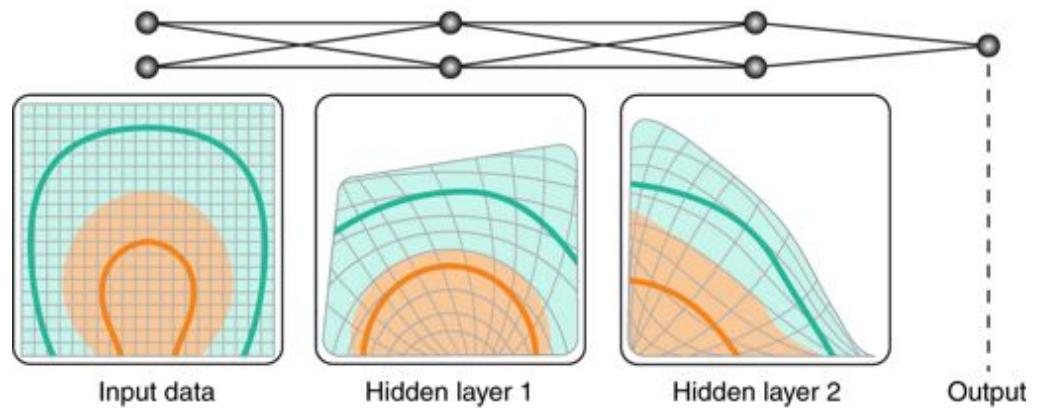


Country-Capital

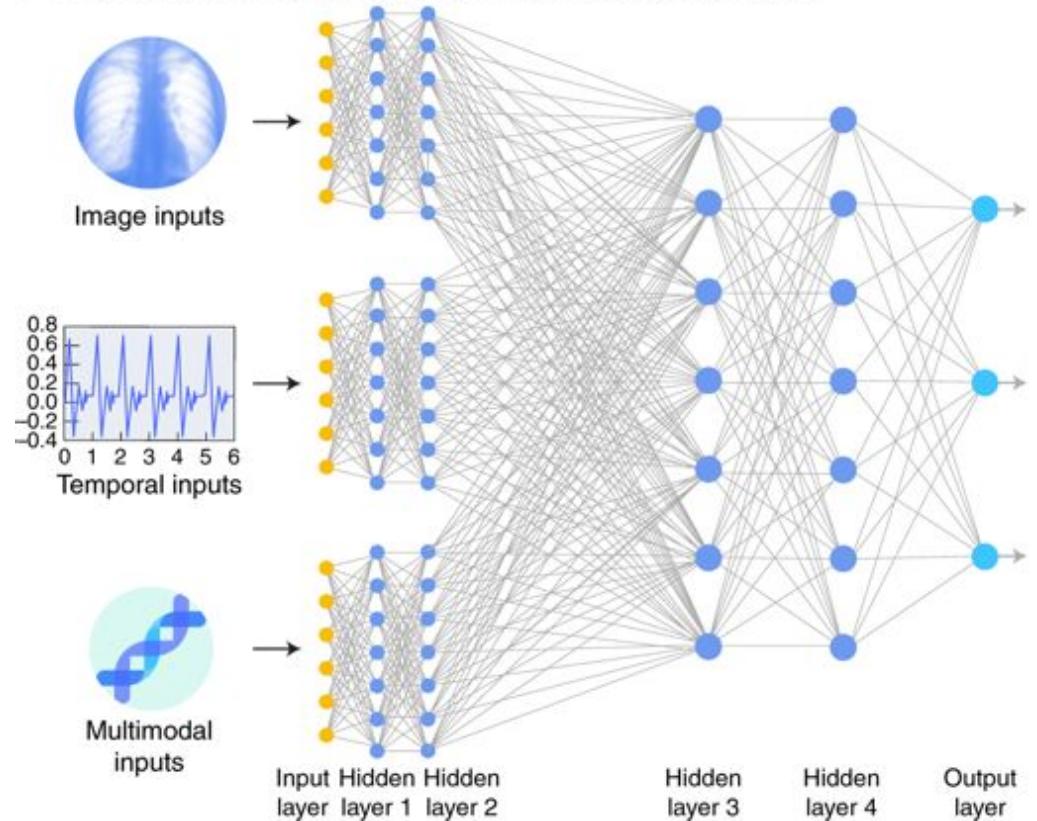
Explicatividad vs predictibilidad

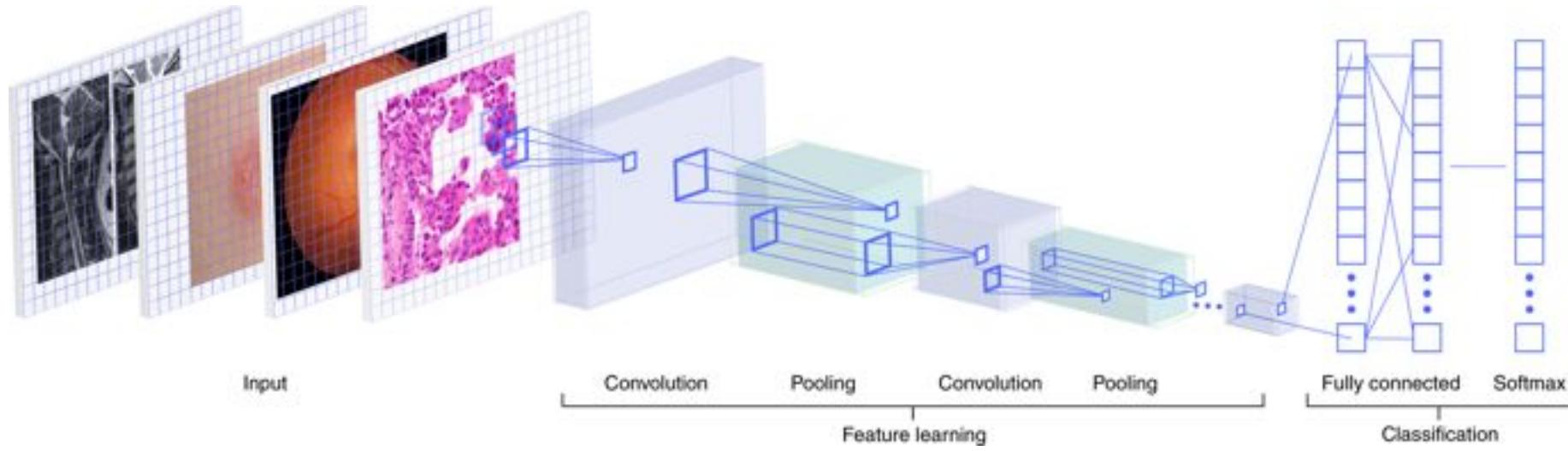
Casos de uso en salud

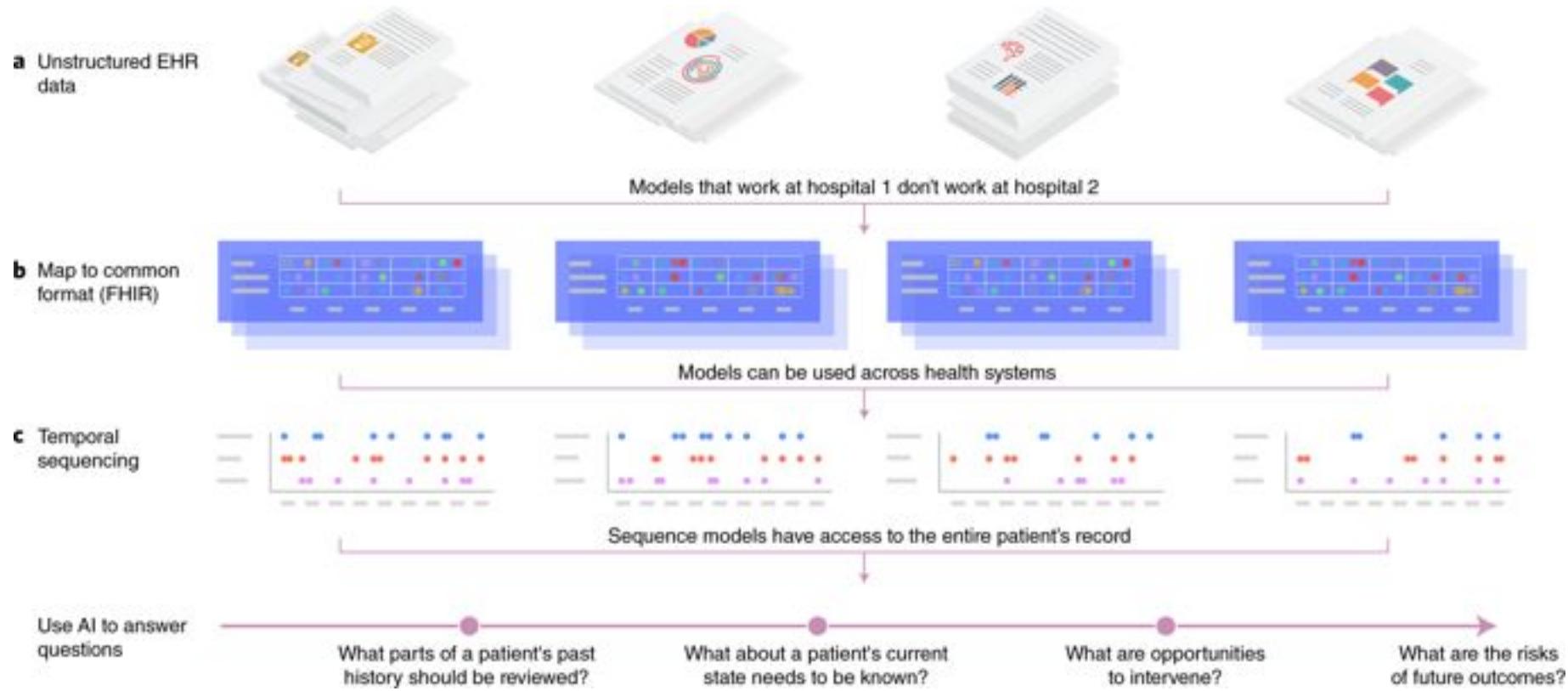
a Neural network layers make data linearly separable

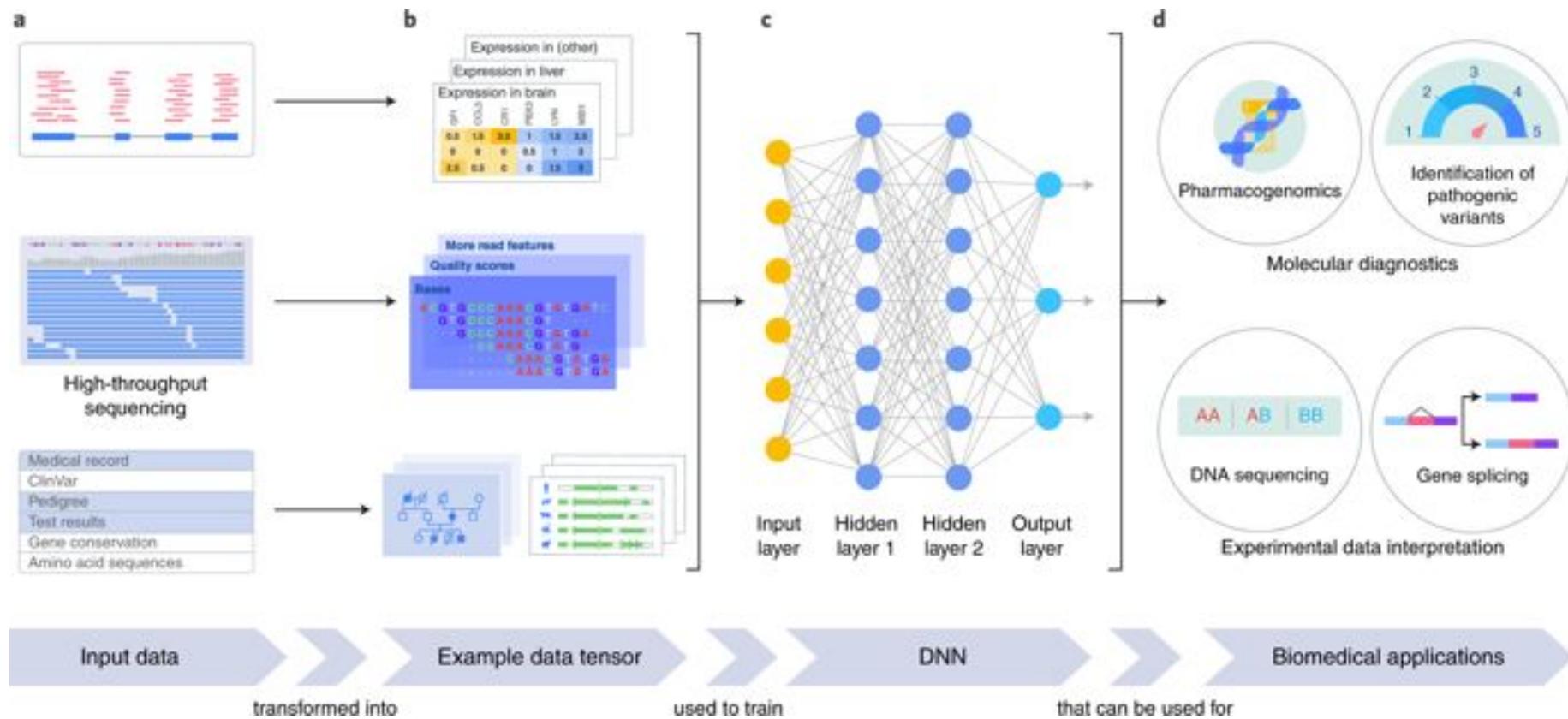


b Deep learning can featurize and learn from a variety of data types

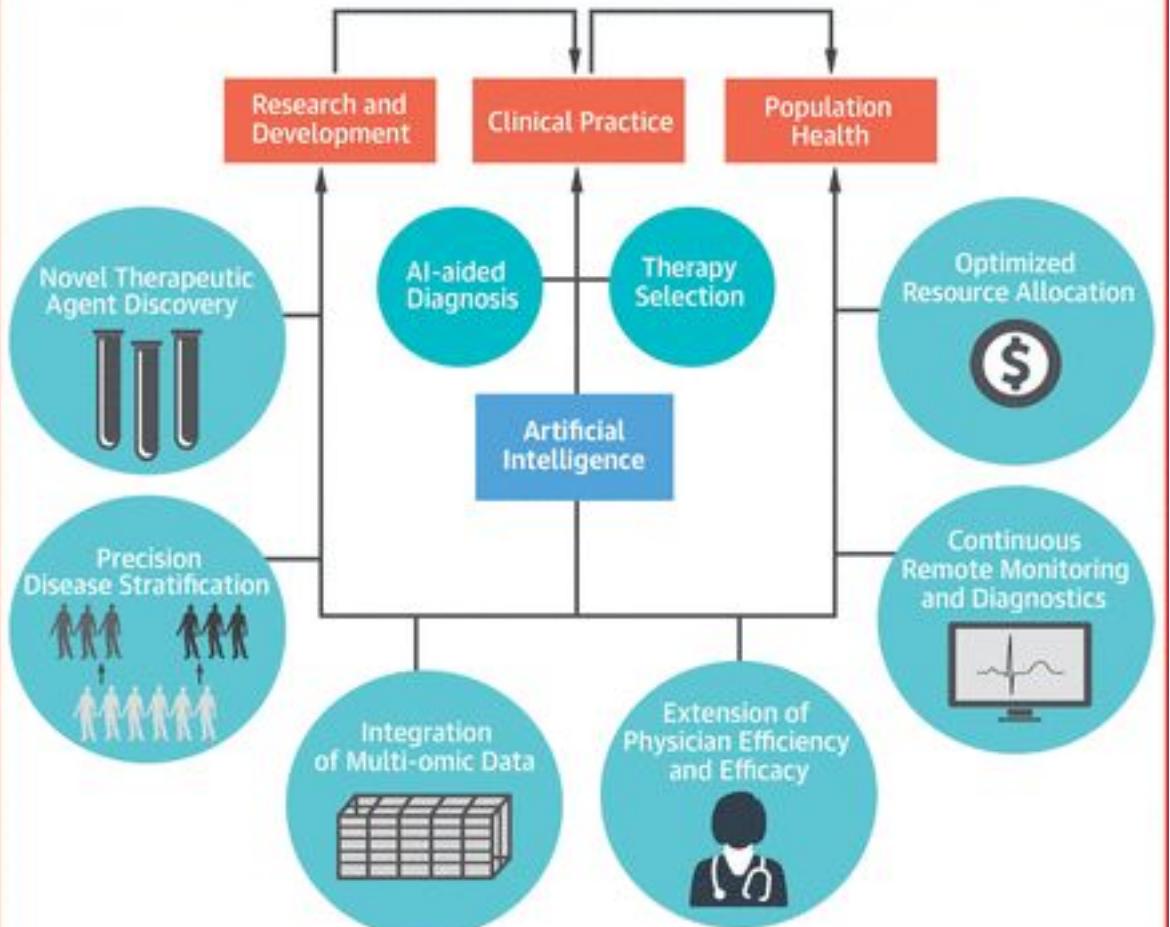




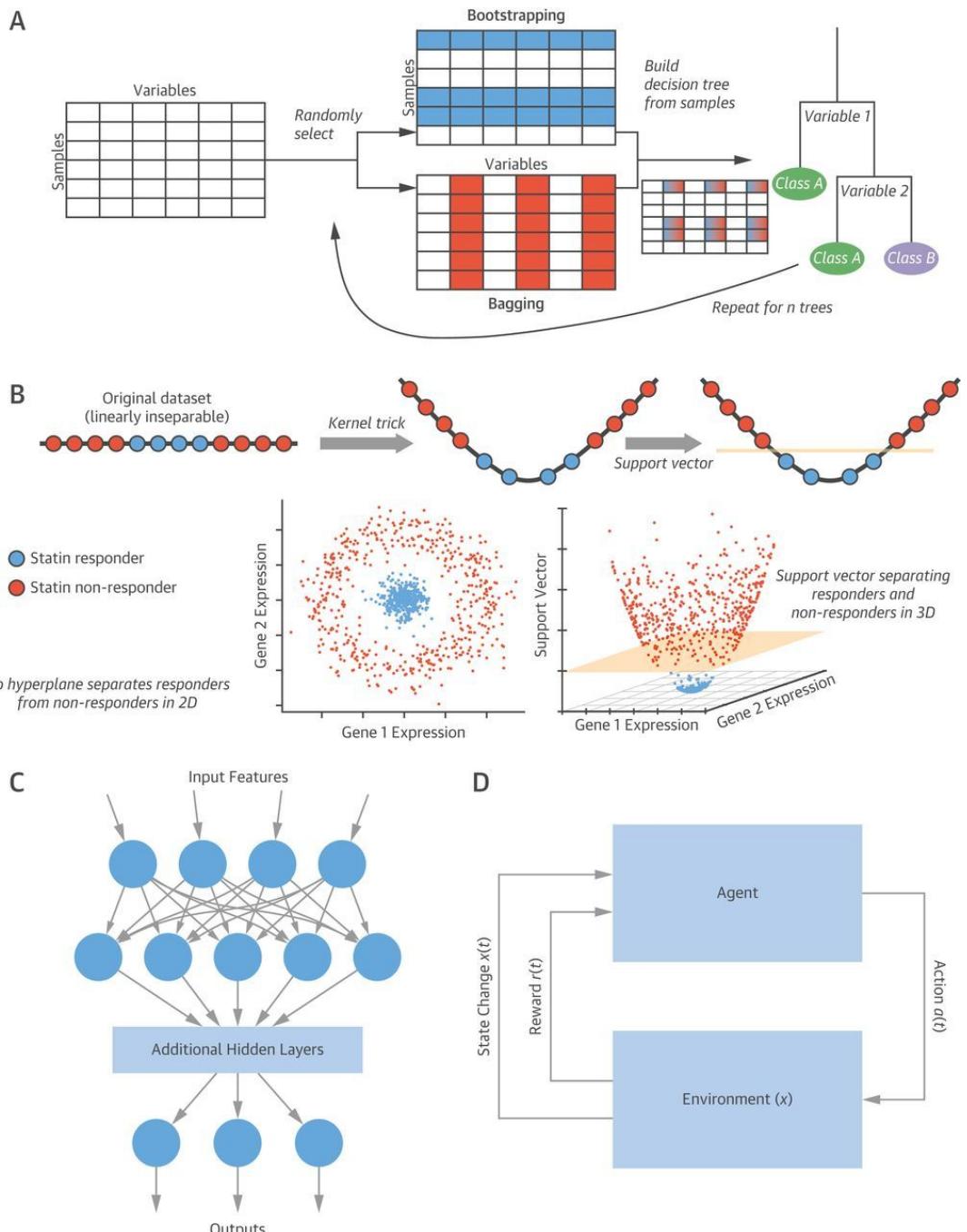


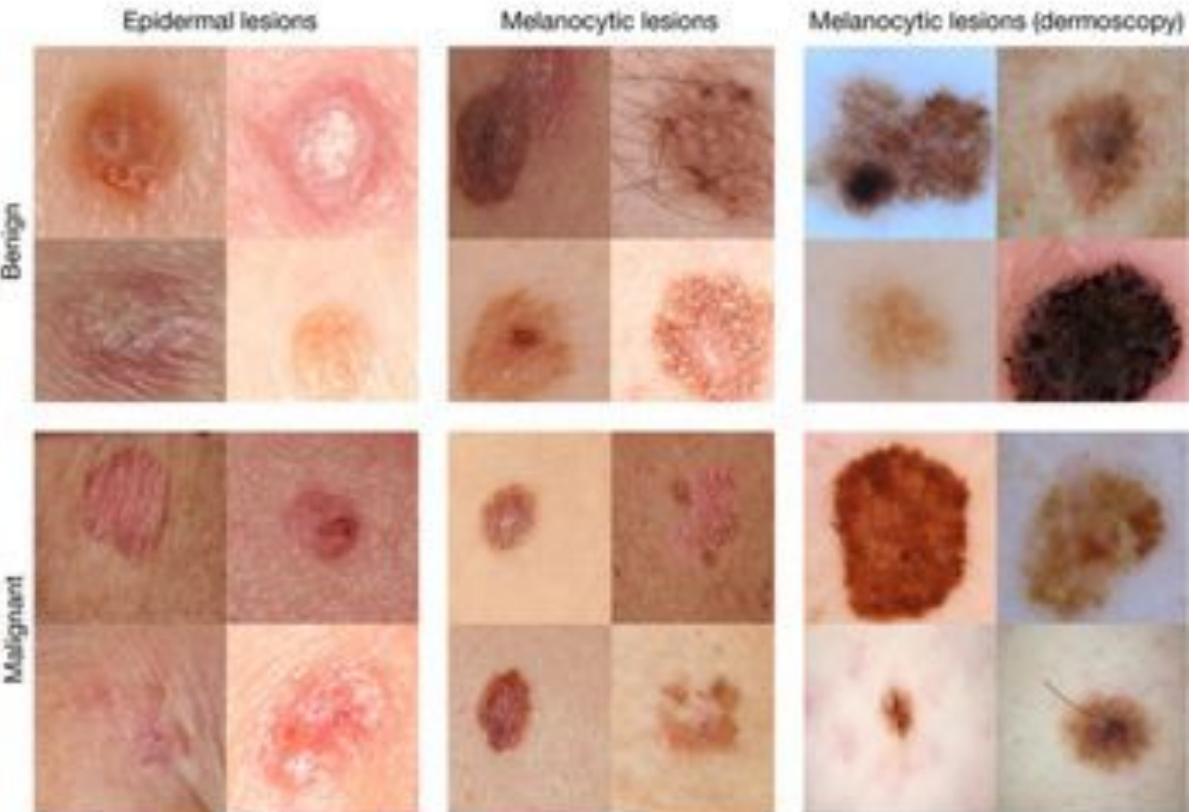


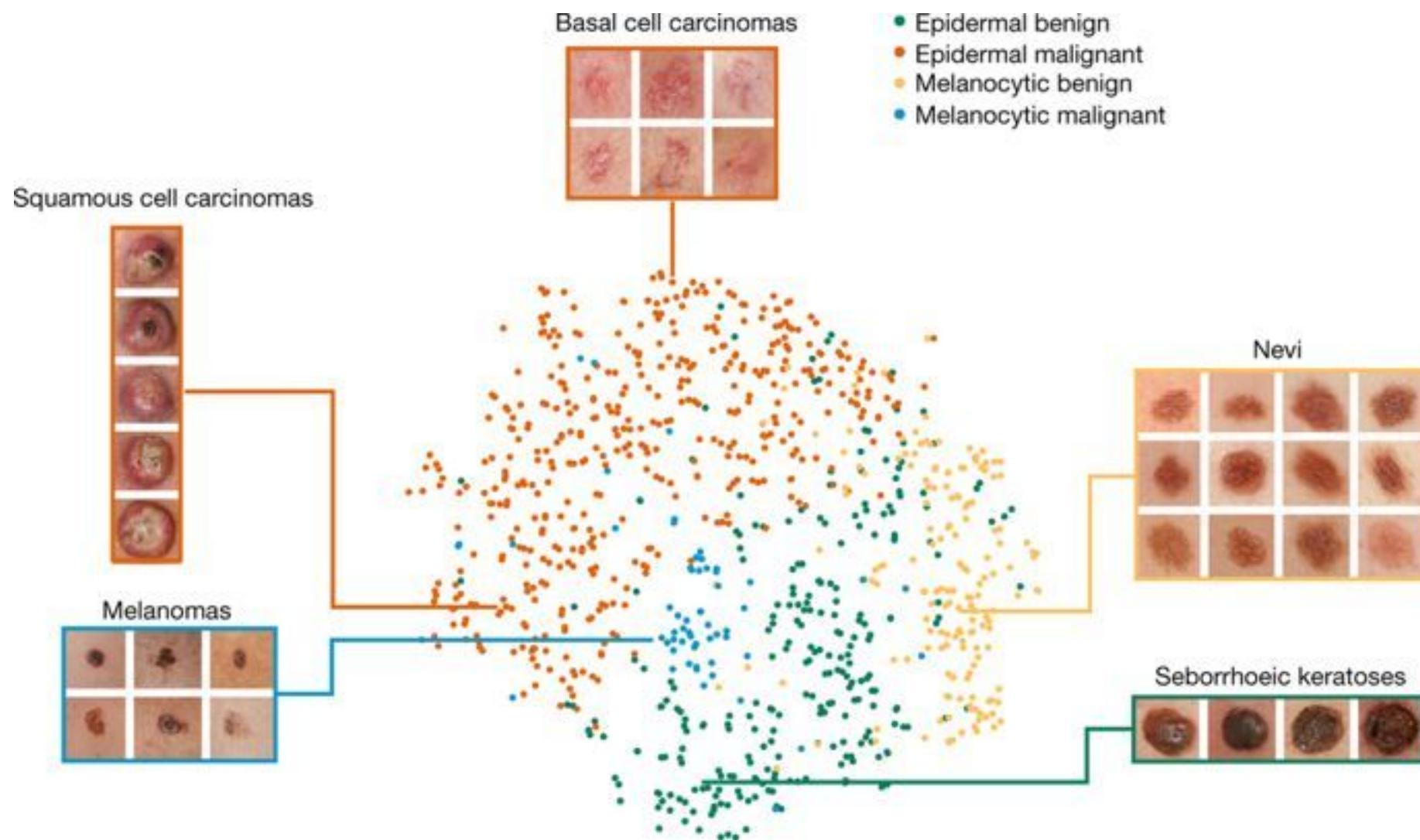
CENTRAL ILLUSTRATION: Role of Artificial Intelligence in Cardiovascular Medicine

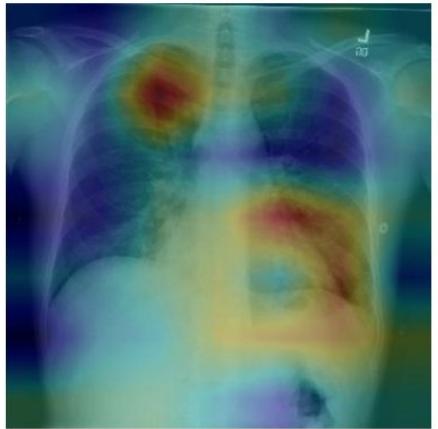


Johnson, K.W. et al. J Am Coll Cardiol. 2018;71(23):2668-79.

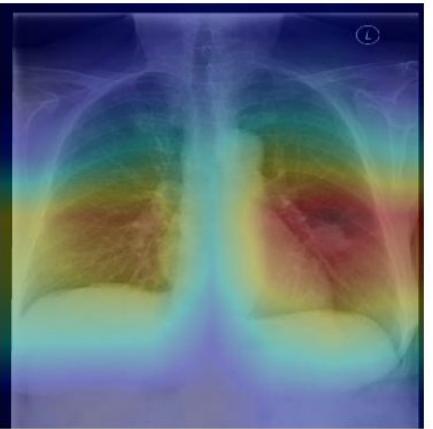


a**b**





(a) Patient with multifocal community acquired pneumonia. The model correctly detects the airspace disease in the left lower and right upper lobes to arrive at the pneumonia diagnosis.



(b) Patient with a left lung nodule. The model identifies the left lower lobe lung nodule and correctly classifies the pathology.



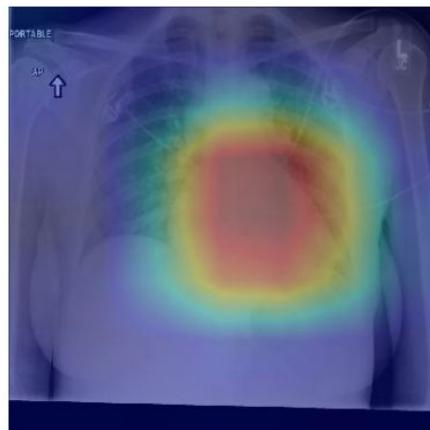
(c) Patient with primary lung malignancy and two large masses, one in the left lower lobe and one in the right upper lobe adjacent to the mediastinum. The model correctly identifies both masses in the X-ray.



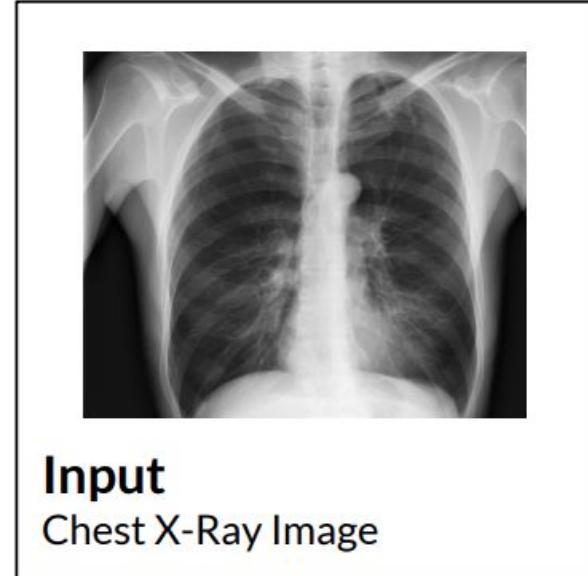
(d) Patient with a right-sided pneumothorax and chest tube. The model detects the abnormal lung to correctly predict the presence of pneumothorax (collapsed lung).



(e) Patient with a large right pleural effusion (fluid in the pleural space). The model correctly labels the effusion and focuses on the right lower chest.



(f) Patient with congestive heart failure and cardiomegaly (enlarged heart). The model correctly identifies the enlarged cardiac silhouette.



Input
Chest X-Ray Image

CheXNet
121-layer CNN

Output
Pneumonia Positive (85%)



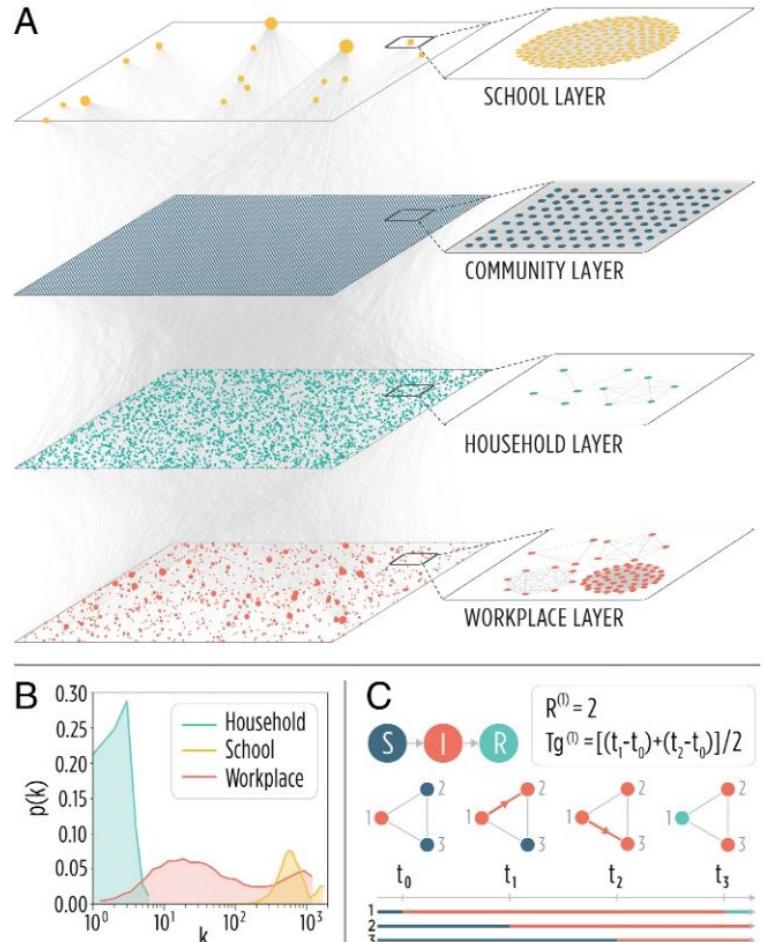


Fig. 1. Model structure. (A) Visualization of the multiplex network representing a subsample of 10,000 individuals of the synthetic population. Note that the community layer is a complete graph, although not all edges are visible for the sake of readability of the illustration. (B) Degree distributions in the school, household, and workplace layers. (C) Schematic representation of the infection transmission model along with examples of the computation of individual reproduction number and generation time for the simulated transmission chains. I, infectious; R, removed; S, susceptible.

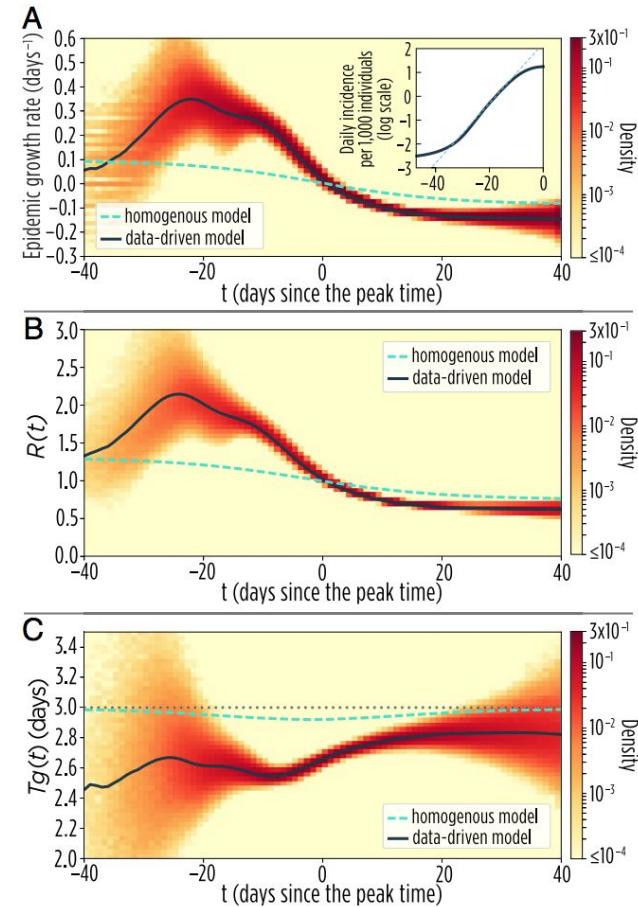
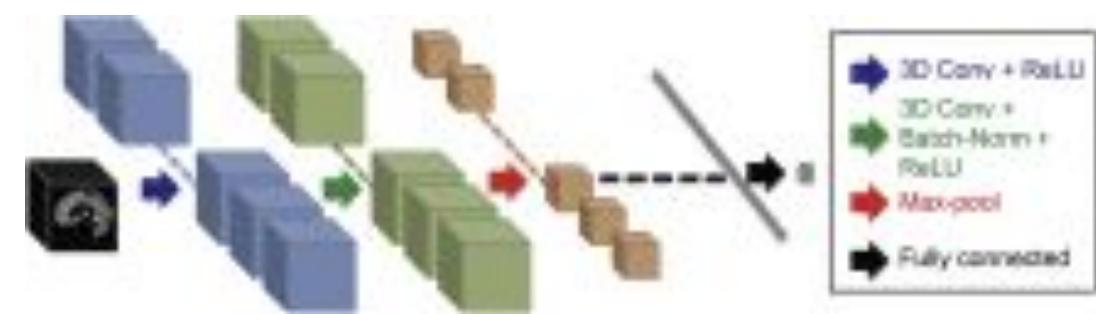
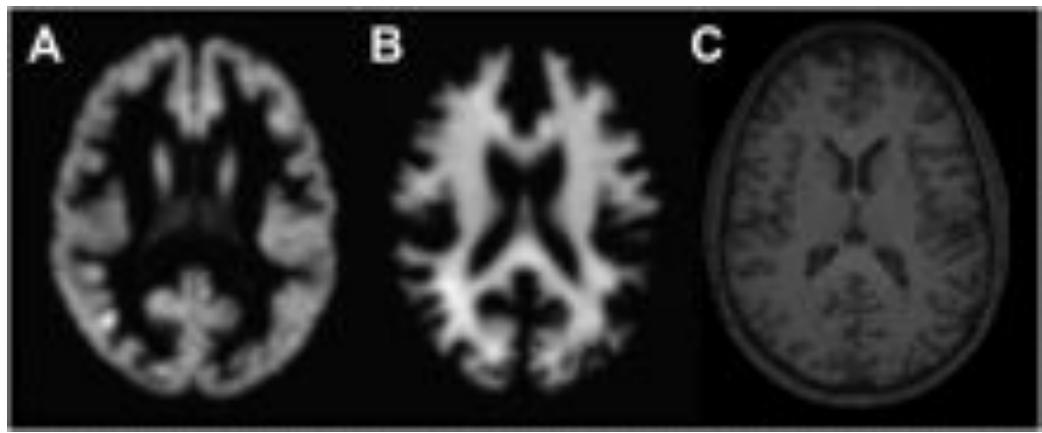
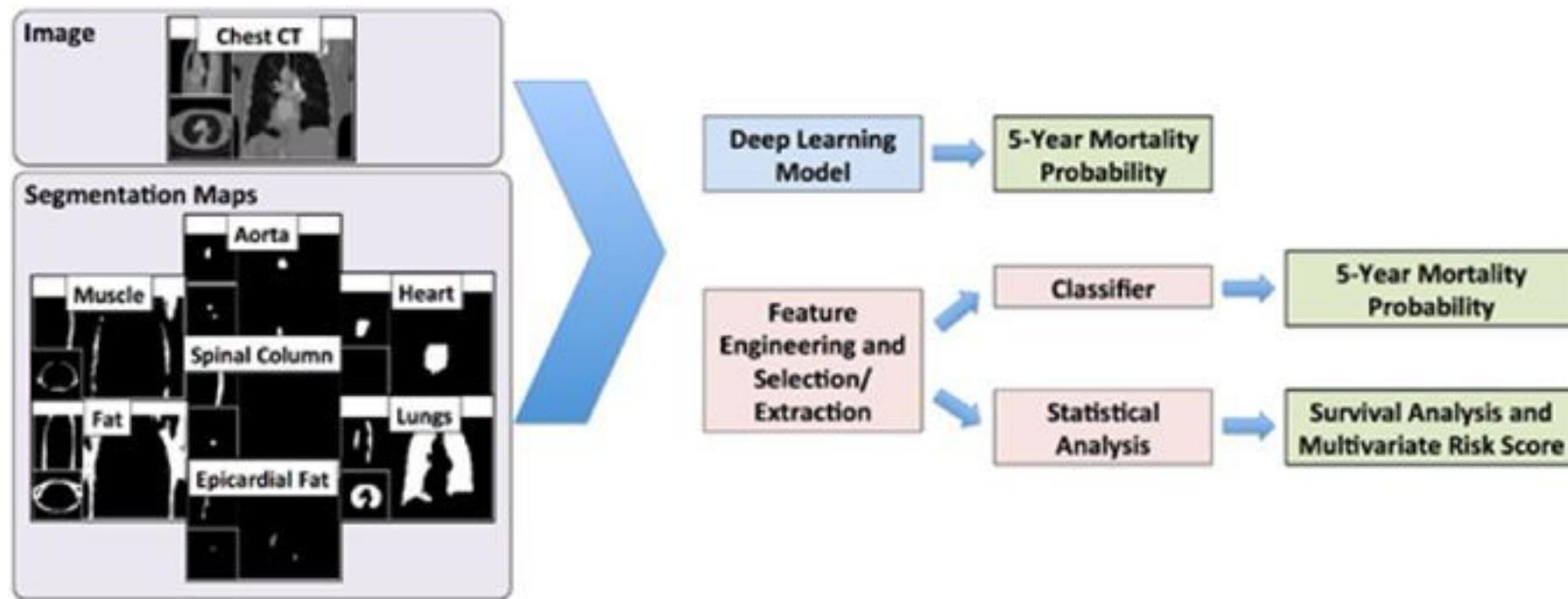


Fig. 2. Fundamental epidemiological indicators. (A) Mean daily exponential epidemic growth rate, r , over time of the data-driven and homogeneous models. The colored area shows the density distribution of $r(t)$ values obtained in the single realizations of the data-driven model. Results are based on 50,000 realizations of each model. Results are aligned at the epidemic peak, which corresponds to time $t = 0$. Inset shows the logarithm of the mean daily incidence of new influenza infections over time, which does not follow a linear trend. (B) Mean $R(t)$ of data-driven and homogeneous models. The colored area shows the density distribution of $R(t)$ values obtained in the single realizations of the data-driven model. (C) The three lines represent the mean $Tg(t)$ of data-driven and homogeneous models. The colored area shows the density distribution of $Tg(t)$ values obtained in the single realizations of the data-driven model. The horizontal dotted



- 3D Conv + ReLU
- 3D Conv +
- Batch-Norm + ReLU
- Max-pool
- Fully connected



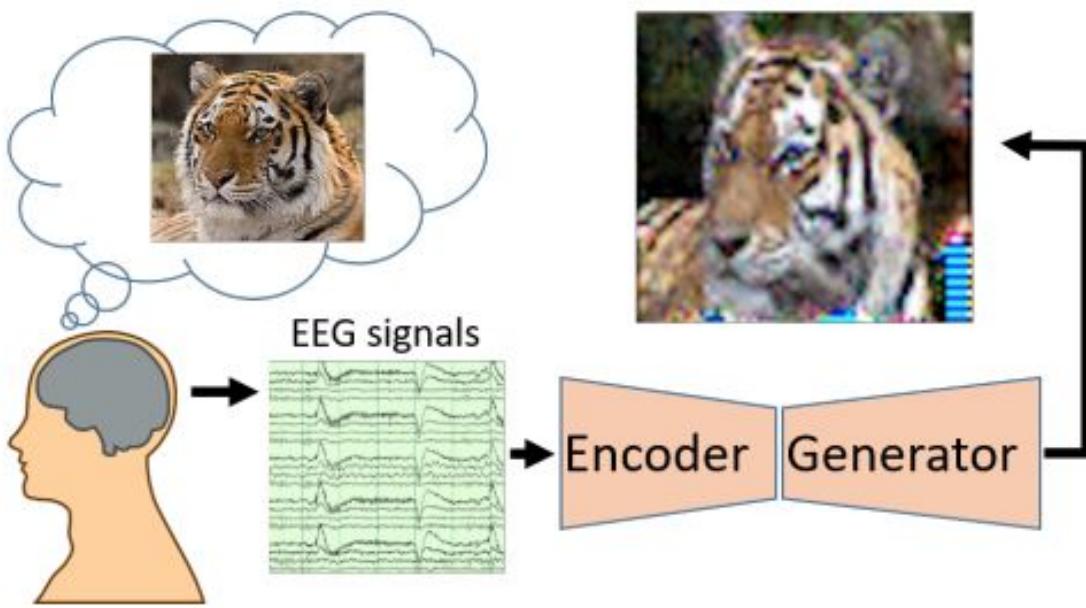
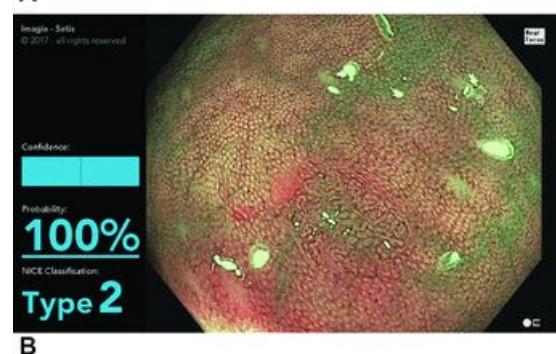
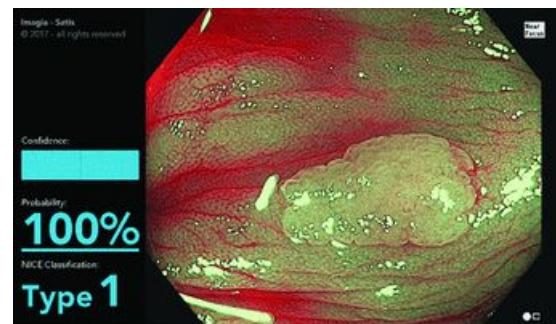
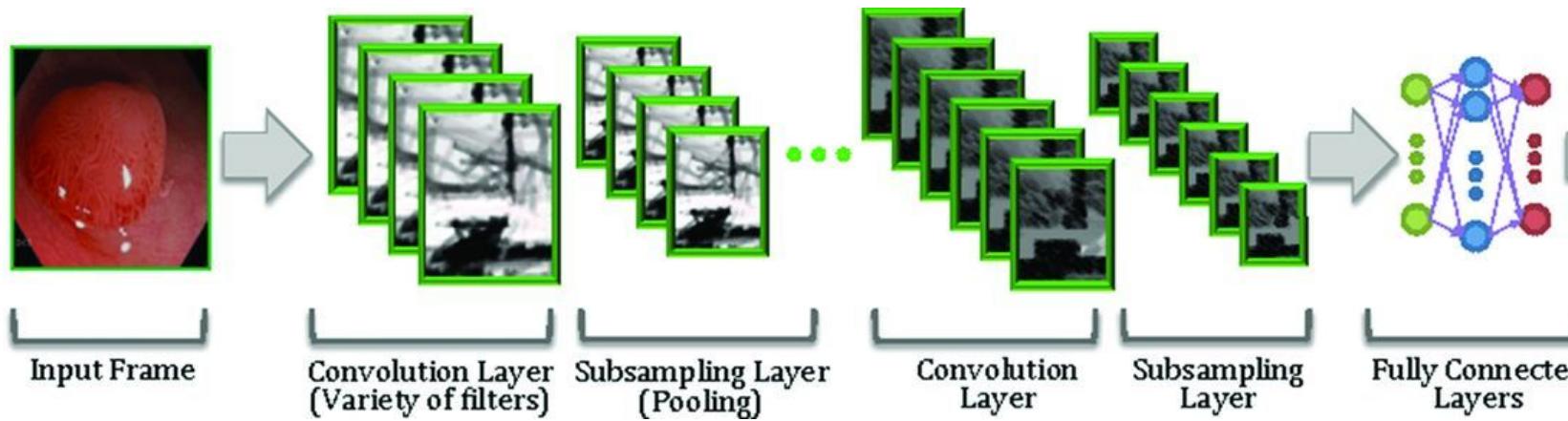


Figure 1: Overview of our proposed method where an EEG signal from brain is sent to the encoder and the encoded signal is used to generate a visualization corresponding to the captured EEG signal.

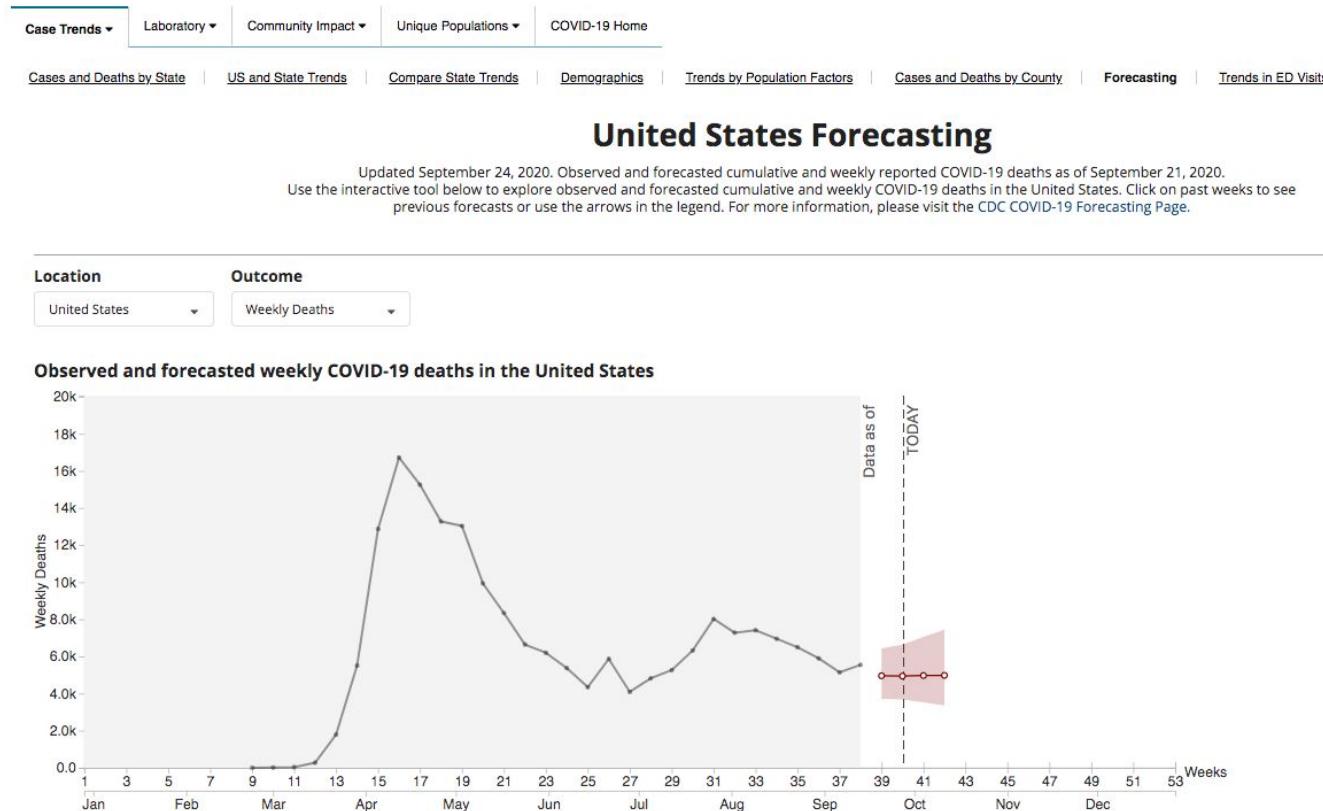




El CDC tiene una predicción ensamblada de todos los modelos que se han construido. Un gestor nunca puede confiar en el resultado de un solo modelo.

CDC COVID Data Tracker

Maps, charts, and data provided by the CDC

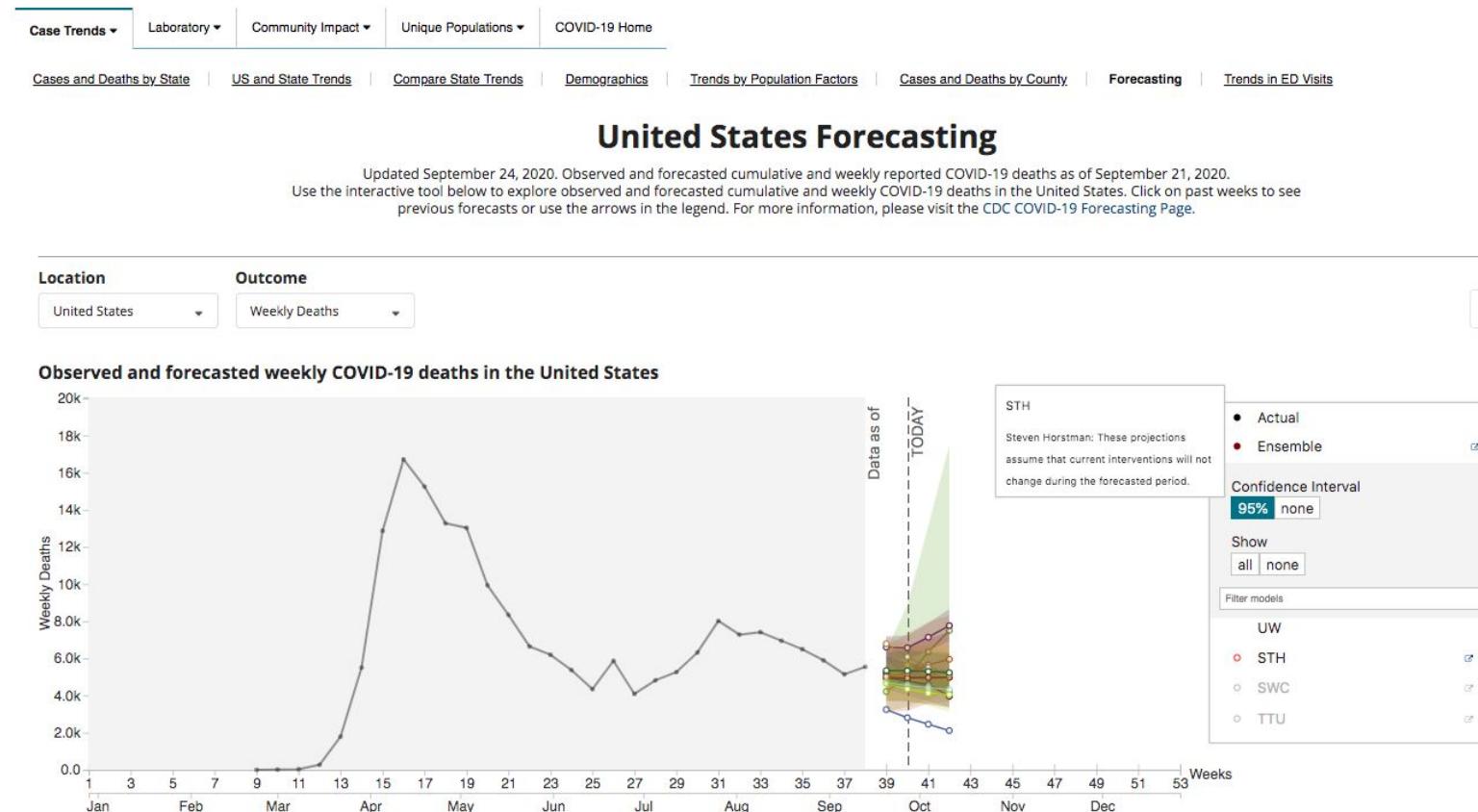


Fuente: [CDC COVID Data Tracker](#)

Por eso el CDC ha recopilado todas las predicciones colaborando con terceros.

CDC COVID Data Tracker

Maps, charts, and data provided by the CDC



Fuente: [CDC COVID Data Tracker](#)

Productos basados en datos y
modelos de negocio

¿Productos basados en datos?

Son aquellos en los que el core del negocio son los datos que manejan y permiten.

- ▶ Tomar decisiones
- ▶ Reducción de la incertidumbre.
- ▶ Automatizar o optimizar un proceso

¿Productos basados en datos?

Ibai @IbaiLlanos · 19h
Alguien me explica qué ha sido esto

0:01

1,394 3,194 56.2K 3.4M

Push notifications
Never miss what's happening on Twitter by enabling push notifications

Turn on notifications

NEAR Protocol @NEARProtocol
200M in total transactions on #NEAR. Probably nothing.

Follow us!

NEAR Protocol @NEARProtocol

NEAR is the Blockchain Operating System.

<https://t.co/RUXPdKERJf>



	↑ 26° ↓ 13°	↑ 30° ↓ 16°	↑ 32° ↓ 19°	↑ 29° ↓ 19°	↑ 27° ↓ 16°	↑ 29° ↓ 15°	↑ 31° ↓ 17°
08:00	14° 14°	17° 17°	19° 19°	19° 19°	16° 16°	16° 16°	17° 17°
14:00	26° 26°	30° 30°	32° 32°	29° 29°	27° 27°	29° 29°	31° 31°
20:00	26° 26°	30° 30°	30° 30°	27° 27°	25° 25°	28° 28°	30° 30°
Lluvias	0 mm						
Viento	↙ 15 km/h	↙ 13 km/h	↗ 19 km/h	→ 17 km/h	↓ 11 km/h	↗ 9 km/h	↗ 9 km/h
	06:46	06:46	06:47	06:47	06:48	06:48	06:49
	21:49	21:49	21:49	21:49	21:49	21:49	21:49

13:06 ↗

Tu ubicación Parque de El Retiro

22 min 34 min 1 h 3 22 min

Evitando peajes

⚠ Se requiere mascarilla en algunos espacios públicos debido al COVID-19 Ver más

22 min (6,4 km) P Difícil

Actualmente es la mejor ruta debido a las condiciones del tráfico

Pasos Iniciar Fijar

Tráfico

86

¿Productos basados en datos?



¿Productos basados en datos?



zebra

Reset search SEARCH

http://searchapp.zebra-med.com/?s

STUDY PARAMETERS

Modality: CT - Computed Tomography

Body part: Chest

Male (94,251) Female (94,226)

Age: 35 - 110

FINDINGS

- Abdominal Aortic Aneurysm: 7,127
- Aortic Stentgraft: 6,422
- Appendicitis: 30
- Benign appearing Nodules: 565

My Tab

Volume Referencing Flip Selection

AI1

Robin Bates Mar 3, 2010

Lung Nodules
No lung nodule has been detected.

Not Detected Detected

Copy To Clipboard

Current MEDICAL SYSTEMS Discovery STE 38% Pixel DFOV 146.6 x 60.1 cm

ROBIN BATES F:923472412 Pos:-195.00 mm SI:1 Acc#: ZEBRA Patient Pos: HFS Study Desc: PET-CT SCAN Series Desc: Plain Chest 2.5mm Inspiration <2-1>

Viewer 10 cm

C 50 W 500 Link 1

Current MEDICAL SYSTEMS Discovery STE 120kV, 13mA 82% Pixel DFOV 86.3 x 36.1 cm

ROBIN BATES F:923472412 Pos:-195.60 mm SI:100 Acc#: ZEBRA Patient Pos: HFS Study Desc: PET-CT SCAN

SW 2.50 mm Viewed 10 cm

C -500 W 1500

Current GE MEDICAL SYSTEMS Discovery STE 120kV, 30mA SC:500.00 mm

186,221 studies CREATE DATASET

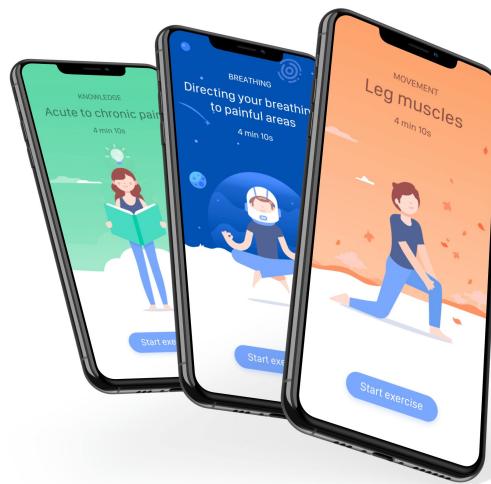
PROJECTS DATA SEARCH

Docs Hello Tom Goldberg

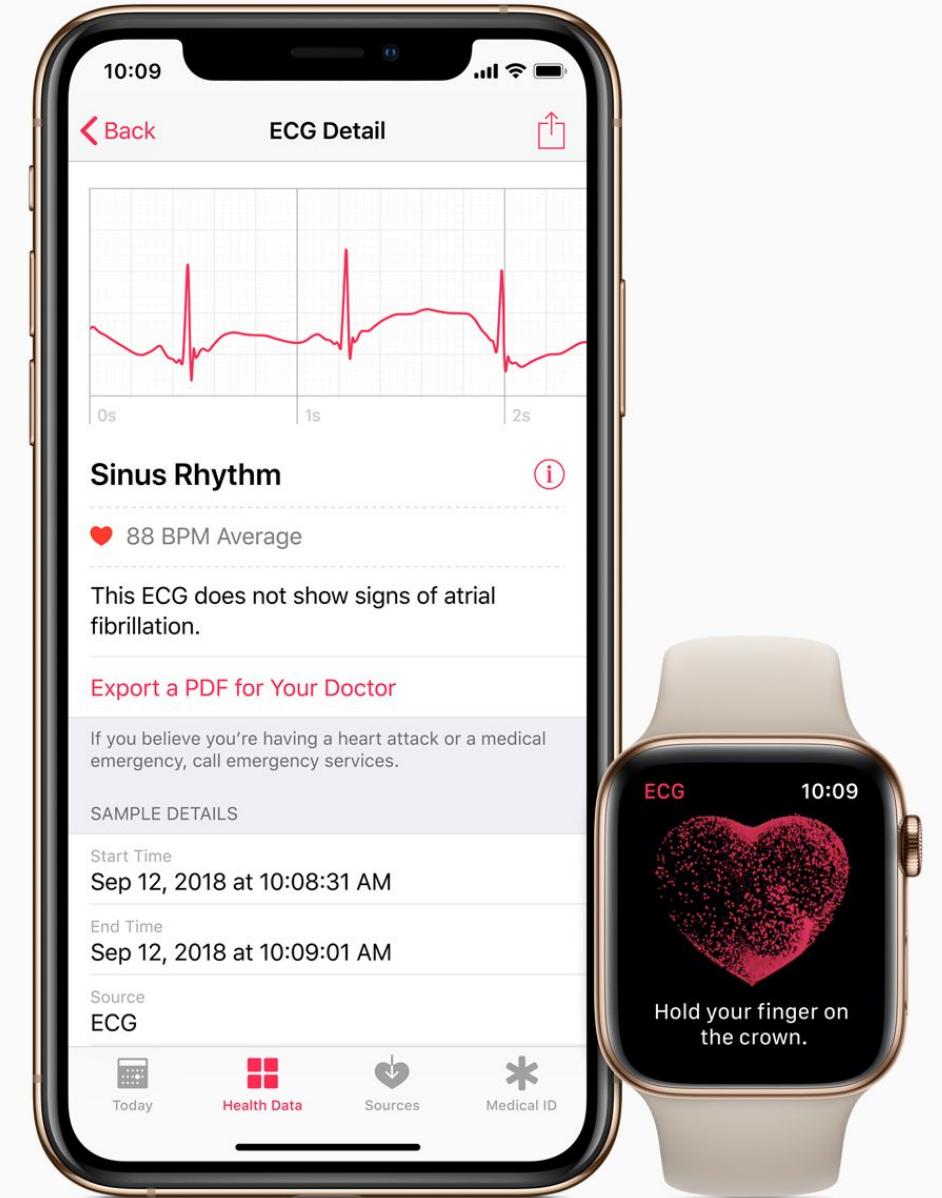
The interface shows a search results page for medical studies. At the top, there are filters for Modality (CT), Body part (Chest), gender (Male/Female), and age (35-110). Below this, a list of findings includes Abdominal Aortic Aneurysm (7,127), Aortic Stentgraft (6,422), Appendicitis (30), and Benign appearing Nodules (565). The main area displays a grid of study thumbnails, each with a study ID, series ID, and a brief description. Below the thumbnails, a detailed view of a chest CT scan for patient Robin Bates is shown. The view is a transverse slice with a scale bar of 10 cm. A callout box from the AI1 module states "Lung Nodules" and "No lung nodule has been detected." with "Not Detected" and "Detected" buttons. The AI1 interface also shows the patient's name, date, and some study parameters. At the bottom, two more study details are visible: one for a different patient with a 120kV, 13mA scan, and another for a GE MEDICAL SYSTEMS Discovery STE machine.

¿Productos basados en datos?

kaia



¿Productos basados en datos?

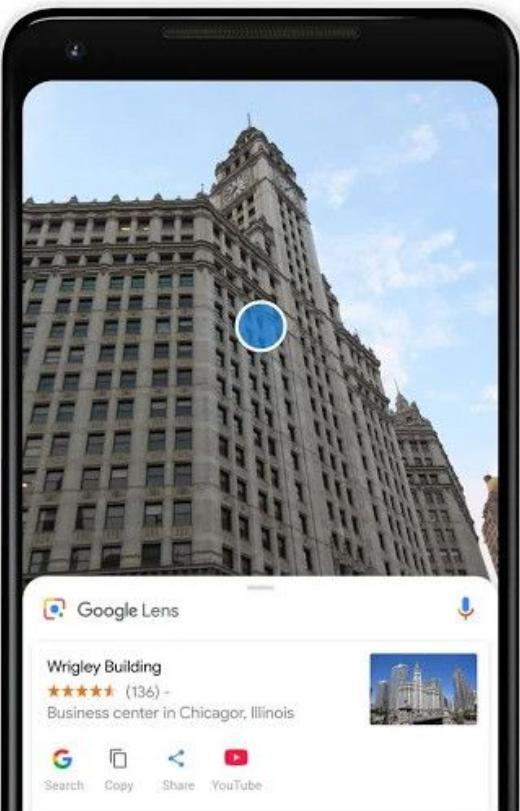


¿Productos basados en datos?

Take action on text



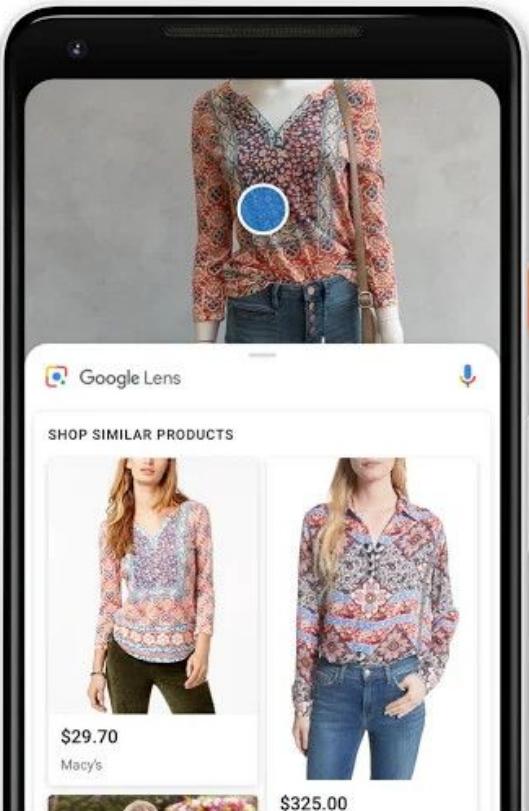
Learn more about the world



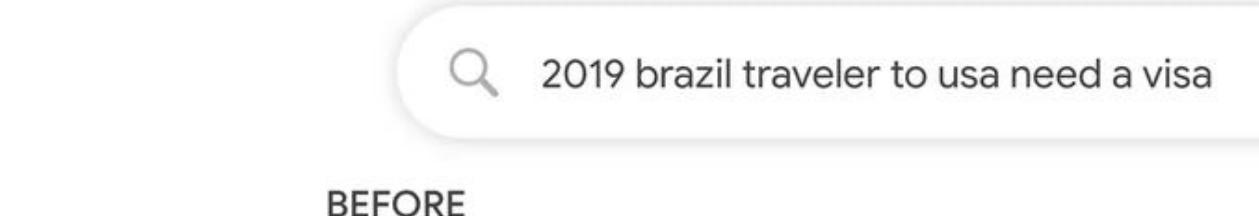
Identify plants and animals



Find a look you like



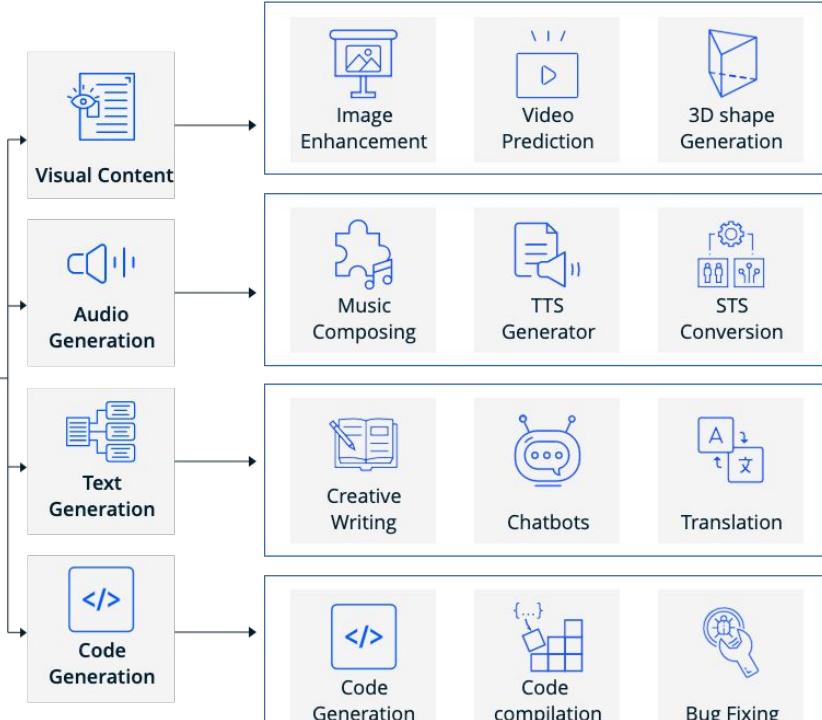
¿Productos basados en datos?



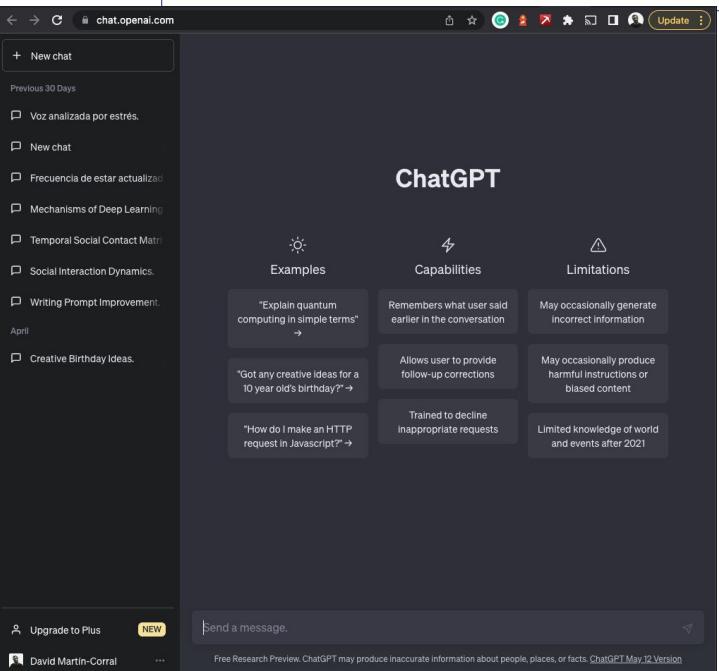
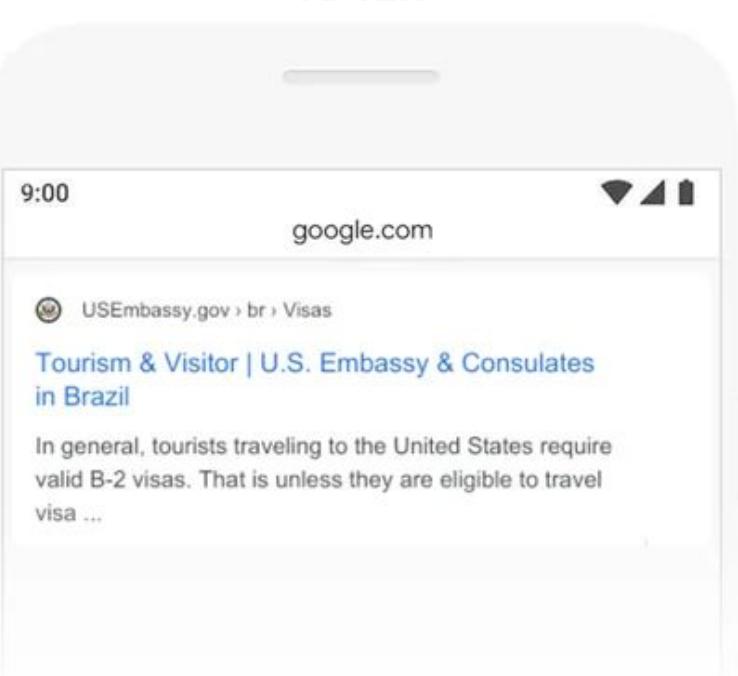
BEFORE



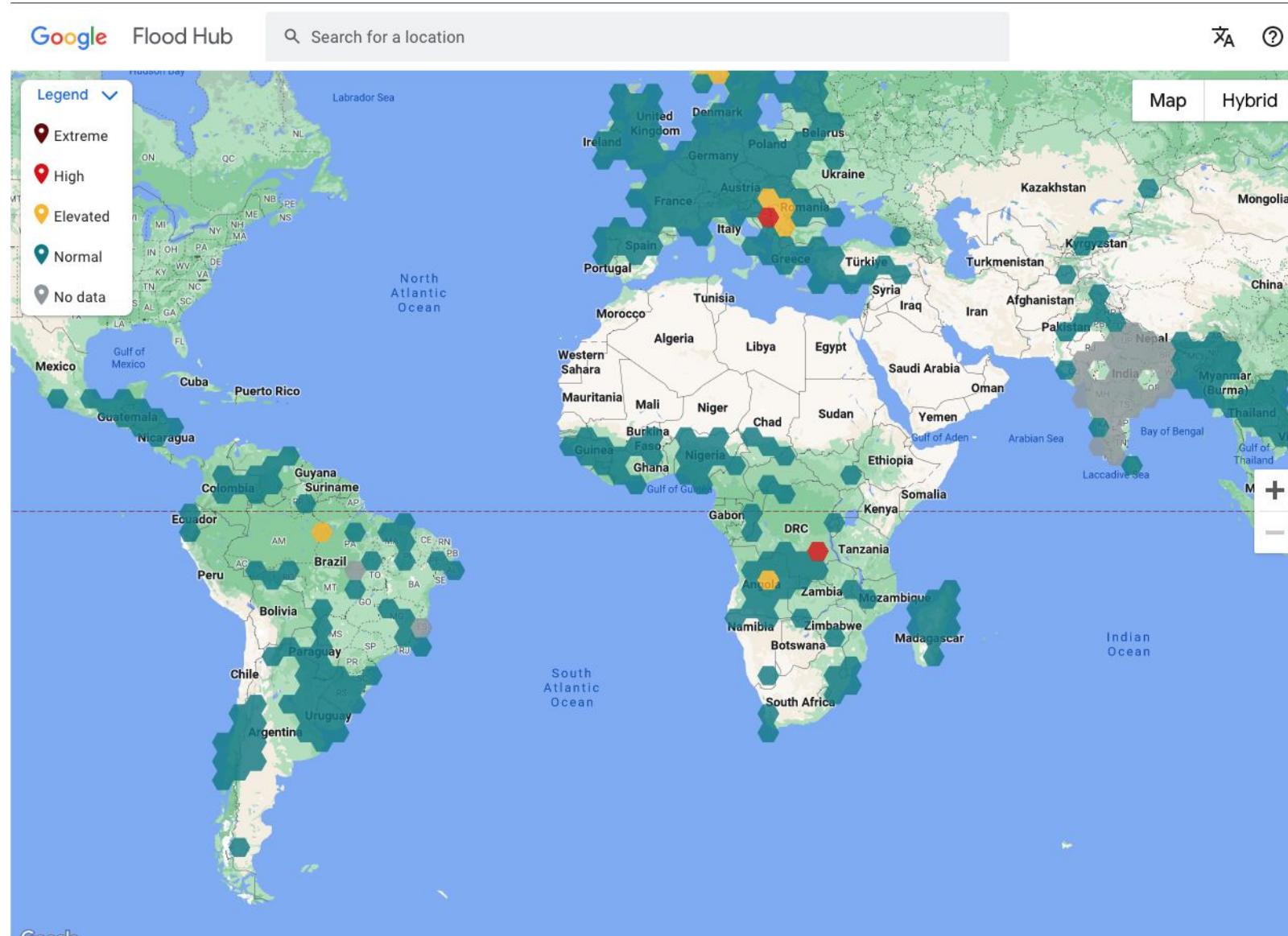
Generative AI use cases



AFTER



¿Productos basados en datos?



Modelos de negocio

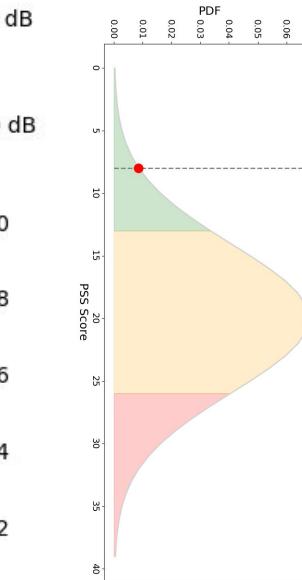
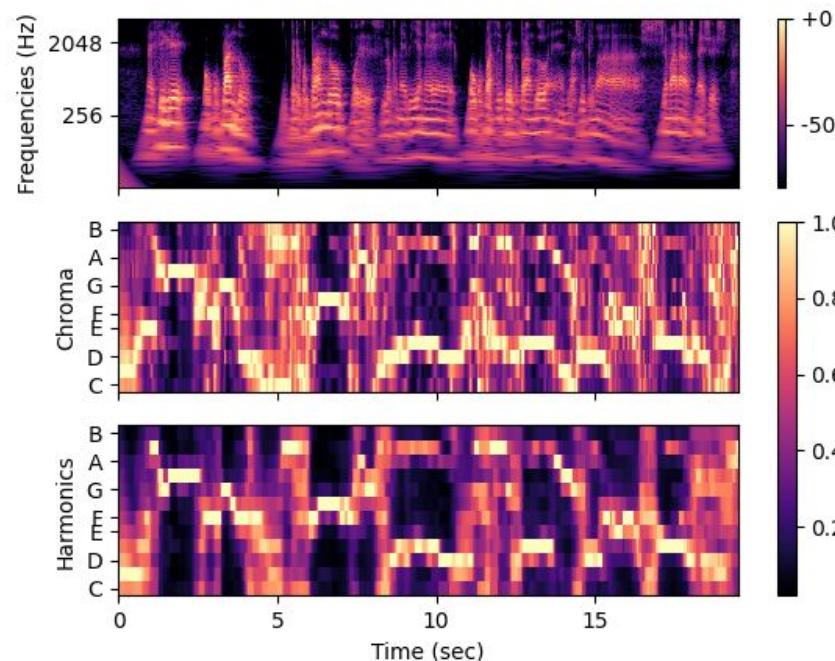
Posibles modelos para monetizar los datos en el entorno actual.

- ▶ **Usuarios de datos:** Empresas que utilizan datos para elaborar estrategias y crear mejores productos.
- ▶ **Proveedores de datos:** Empresas que se dedican principalmente al comercio de datos.
- ▶ **Redes de distribución:** Empresas con un modelo de negocio publicitario.
- ▶ **Facilitadores de infraestructura:** Empresas que participan en el suministro de infraestructura de datos, análisis y consultoría.

Mi proyecto actual

Biomarcadores de salud mental a partir de la voz.

Producto basado en datos. App que recolecta datos, monitoriza el estado de salud mental y crea sonidos personalizados para meditar profundamente y reducir el estrés.



09:59 🔍 🌐 87% 🔋

← 24 de abril de 2023

Estrés Bajo

Nivel 16 sobre 44 (36%) Cambio Baja -1 (-6%)

Autoestima 63% Impotencia 44%

Un 75.1% de las personas están más estresadas que tú.

Frecuencias Tienen menor intensidad DO#, DO y LA.

Identidad Neutral

III □ < 95

This section is a screenshot of a mobile application interface. It displays various psychological metrics and a comparison with the general population. It includes a stress level indicator, a progress bar for the current level, and a comparison bar for self-esteem and helplessness. It also shows a global stress statistic and a frequency analysis section. At the bottom, there are two circular charts for 'Identidad' and 'Neutral' categories, each divided into several colored segments representing different voice qualities.