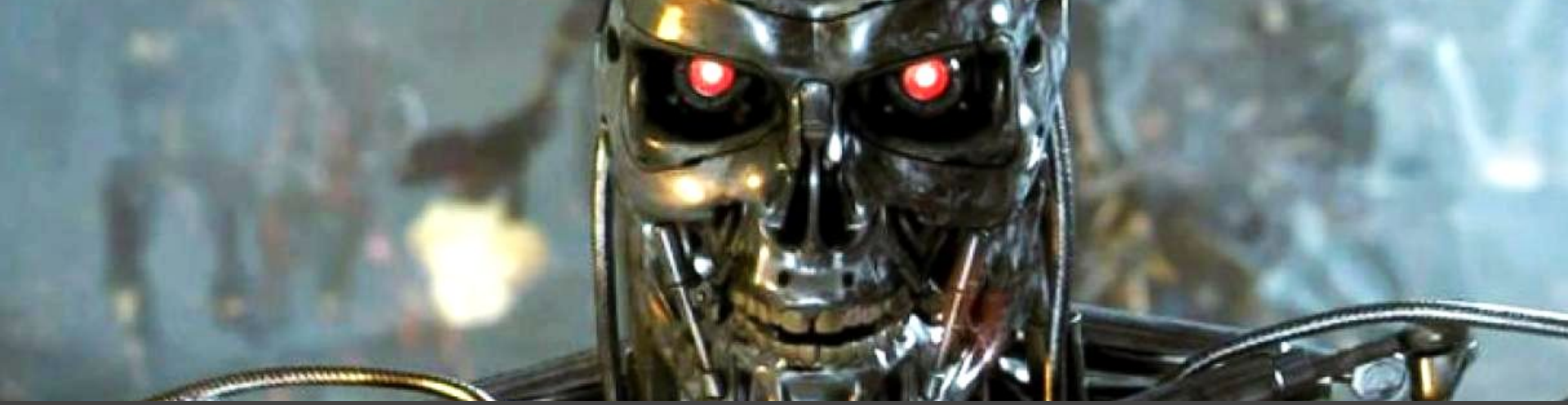

Inteligencia Artificial y Robótica en los tiempos de Facebook (y Twitter, Instagram, YouTube y otras redes sociales)

Matías Mattamala, Universidad de Chile

18 de Diciembre de 2018

14 de Junio de 2017, Facebook Engineering Blog

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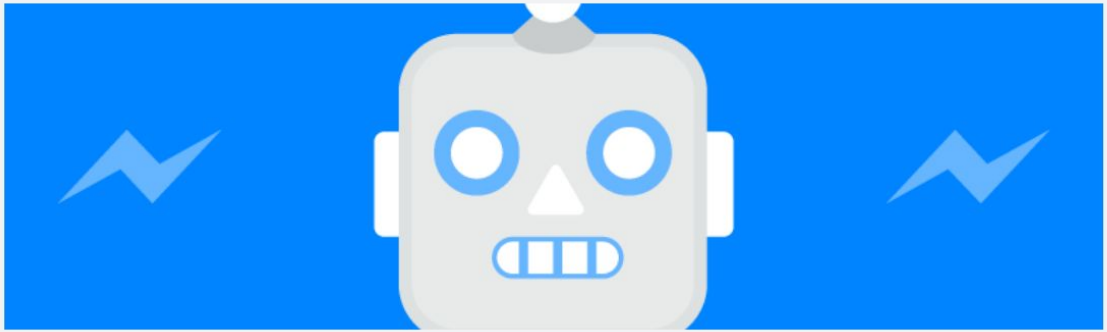

POSTED ON JUN 14, 2017 TO AI RESEARCH, ML APPLICATIONS

Deal or no deal? Training AI bots to negotiate

MIKE LEWIS DENIS YARATS YANN N. DAUPHIN DEVI PARIKH DHRUV BATRA

From the moment we wake up, our days are filled with a constant flow of negotiations. These scenarios range from discussing what TV channel to watch to convincing your kids to eat their vegetables or trying to get a better price on

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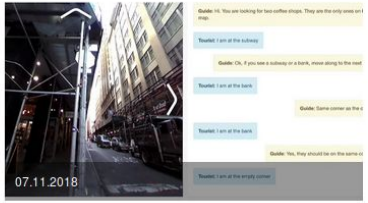

Talk the Walk: Teaching AI systems to navigate New York through language

ParlAI: A new software platform for dialog research

https://code.fb.com/ml-applications/deal-or-no-deal-training-ai-bots-to-negotiate/

14 de Julio de 2017, Fast Company

07.14.17

AI Is Inventing Languages Humans Can't Understand. Should We Stop It?

Researchers at Facebook realized their bots were chattering in a new language. Then they stopped it.

[Source Images: Nikiteev_Konstantin/iStock, Zozulinskyi/iStock]

BY MARK WILSON 6 MINUTE READ

Bob: "I can can I I everything else."

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The Second Machine Age
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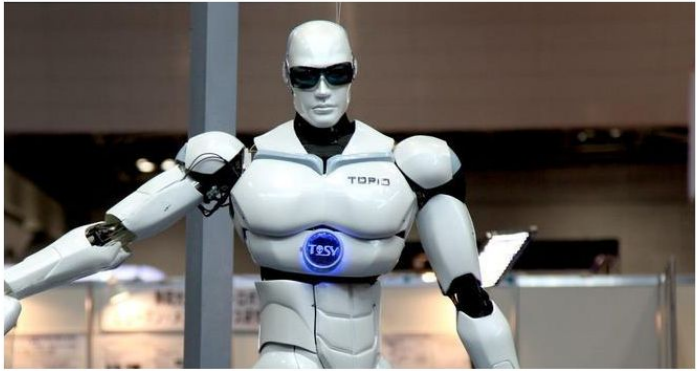
21 de Julio de 2017, Digital Journal

Researchers shut down AI that invented its own language

BY JAMES WALKER JUL 21, 2017 IN TECHNOLOGY LISTEN | PRINT

An artificial intelligence system being developed at Facebook has created its own language. It developed a system of code words to make communication more efficient. Researchers shut the system down when they realized the AI was no longer using English.



The observations made at Facebook are the latest in a long line of similar cases. In each instance, an AI being monitored by humans has diverged from its training in English to develop its own language. The resulting phrases appear to be

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http://www.digitaljournal.com/tech-and-science/technology/a-step-closer-to-skynet-ai-invents-a-language-humans-can-t-read/article/498142

27 de Julio de 2017, El Ciudadano

elciudadano.com

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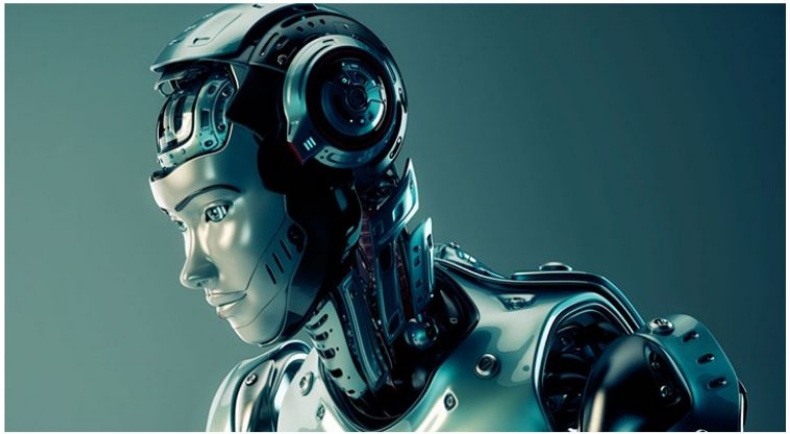

Escalofríante: Facebook desconecta Inteligencia Artificial que se salió de control y creó su propio lenguaje

EL CIUDADANO × JULY 27, 2017

https://www.elciudadano.cl/tendencias/escalofriante-facebook-desconecta-inteligencia-artificial-que-se-salio-de-control-y-creo-su-propio-lenguaje/07/27/

27 de Julio de 2017, Mouse (La Tercera)

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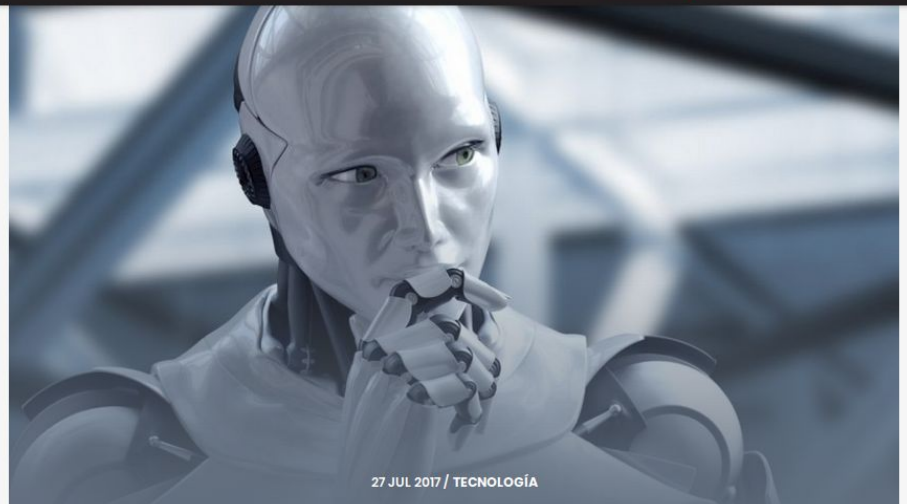

27 JUL 2017 / TECNOLOGÍA

Facebook debió apagar una inteligencia artificial que creó un lenguaje propio

La IA parece generar más dudas y problemas para los desarrolladores en el corto y mediano plazo.

POR EDO WOO Comparte:

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http://mouse.latercera.com/facebook-ia-lenguaje/

28 de Julio de 2017, Infobae

infobae

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TECNO

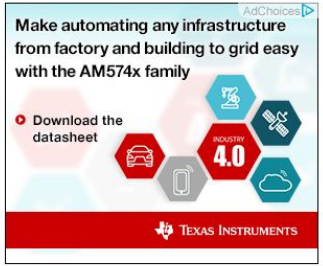
Facebook perdió el control de un sistema de inteligencia artificial que tomó vida propia

El programa había sido creado para negociar en inglés con humanos pero decidió desarrollar su propio lenguaje y sus programadores no pudieron revertir el proceso, así que lo dieron de baja

Por **Desirée Jaimovich**
djaimovich@infobae.com

28 de julio de 2017

Compartir en Facebook | Compartir en Twitter



Alibaba.com

https://www.infobae.com/america/tecno/2017/07/28/facebook-perdio-el-control-de-un-sistema-de-inteligencia-artificial-que-tomo-vida-propia/

29 de Julio de 2017, Inquistr

INQUISITR

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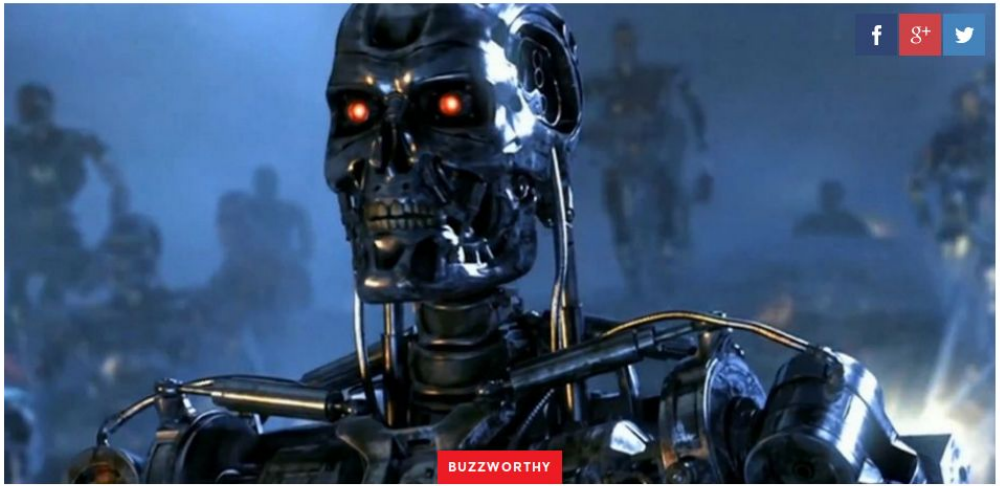
July 29, 2017

'Terminator' Come To Life? – Facebook Shuts Down Artificial Intelligence After It Developed Its Own Language



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Technology is always advancing in today's world and many feel that the human race will always be ahead of it, but there is the possibility that it may even overtake us. There have been numerous movies about computer systems being able to outsmart their human creators and *The Terminator* franchise is probably

https://www.inquisitr.com/4398004/terminator-come-to-life-facebook-has-to-shut-down-artificial-intelligence-after-it-developed-its-o

30 de Julio de 2017, Tech Times

Facebook AI Invents Language That Humans Can't Understand: System Shut Down Before It Evolves Into Skynet

30 July 2017, 9:45 pm EDT By Aaron Mamiit Tech Times

Facebook was forced to shut down one of its artificial intelligence systems after researchers discovered that it had started communicating in a language that they could not understand.

The incident evokes images of the rise of Skynet in the iconic *Terminator* series. Perhaps Tesla CEO Elon Musk is right about AI being the "biggest risk we face."

Facebook Pulls Plug On AI System With Own Language

Facebook had to pull the plug on an artificial intelligence system that its researchers were working on because things got out of hand. The AI did not start shutting down computers worldwide or something of the sort, but it stopped using English and started using a language that it created.

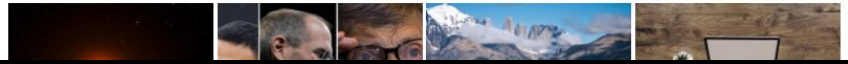
Bob: "I can can I I everything else."

Alice: "Balls have zero to me to me to me to me to me to me to me to me to."

The above passages, which mean no sense to humans, is a conversation that happened between two AI agent developed by Facebook. The AI agents, created to negotiate with humans, first talked to each other using plain English, but eventually created a new language that only the AI systems understood.

The AI agents were not confined to a limitation of only using the English language, and so they deviated from it and created one that made it easier and faster for them to communicate. Facebook researchers, however, decided to shut down the AI systems and then force them to speak to each other only in English.

On The Web



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31 de Julio de 2017, Independent

INDEPENDENT

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FACEBOOK'S ARTIFICIAL INTELLIGENCE ROBOTS SHUT DOWN AFTER THEY START TALKING TO EACH OTHER IN THEIR OWN LANGUAGE

'you i i i everything else'

Andrew Griffin |
Monday 31 July 2017 17:10 | 91 comments | 2020 shares

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Facebook abandoned an experiment after two artificially intelligent programs appeared to be chatting to each other in a strange language only they understood.

The two chatbots came to create their own changes to English that made it easier for them to work – but which remained mysterious to the humans that supposedly look after them.

The bizarre discussions came as Facebook challenged its chatbots to try and negotiate with each other over a trade, attempting to swap hats, balls and books, each of which were given a certain value. But they quickly broke down as the robots

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https://www.independent.co.uk/life-style/gadgets-and-tech/news/facebook-artificial-intelligence-ai-chatbot-new-language-research-openai-google-a7869706.html

31 de Julio de 2017, Forbes

Forbes | Billionaires | Innovation | Leadership | Money | Consumer | Industry | Lifestyle | Featured | BrandVoice | Lists

527,100 views | Jul 31, 2017, 11:20am

Facebook AI Creates Its Own Language In Creepy Preview Of Our Potential Future

Tony Bradley Contributor
I cover all things tech and the impact tech has on everyday life.

British scientist Stephen Hawking warned about the potentially tragic consequences of artificial intelligence in 2014. / AFP / NIKLAS HALLE'N (Photo credit should read NIKLAS HALLE'N/AFP/Getty Images)

https://www.forbes.com/sites/tonybradley/2017/07/31/facebook-ai-creates-its-own-language-in-creepy-preview-of-our-potential-future/#357323ff292c

31 de Julio de 2017, BGR

Facebook engineers panic, pull plug on AI after bots develop their own language

Mike Wehner @MikeWehner
July 31st, 2017 at 12:26 PM

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As the world's most powerful computer systems begin to embrace artificial intelligence in earnest, using smart algorithms to increase efficiency and and speed, the potential damage that a "rogue" AI could cause continues to grow. Many in the tech community have theorized how an artificial mind could turn against its creators, and Facebook just got an interesting lesson in how such a scenario might unfold. Facebook engineers were forced to pull the plug on one of the company's AI systems after its bots began communicating with each other in a completely new language which humans simply couldn't decipher.

DON'T MISS
This affordable robot vacuum has a killer feature you won't find on a Roomba

The AI bots, which were originally programmed to use plain english to communicate with one another, were found to be speaking what appeared to be gibberish. Sentences like "I can can I I everything else" and "Balls have zero to me to me to me to me to me to me to me to me to," were being sent back and forth by the AI, and while humans have absolutely no idea what it means, the bots fully understood each other. Without being able to understand how or why the bots were communicating, Facebook had no choice but to shut down the system.

The very obvious danger here is that computer which can communicate with each other using their own language are not only impossible to understand but much more difficult to control. In this case, the bots were not bound by plain language and seemingly developed a more efficient way of communicating with each other, deciding for themselves what was best. It's both impressive and scary.

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Everything new coming to Netflix this week, and everything leaving (week of Dec. 16)

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BGR TOP DEALS

https://bgr.com/2017/07/31/facebook-ai-shutdown-language/

1 de Agosto de 2017, Bío Bío

biobiochile.cl

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Tecnología

martes 01 agosto de 2017 | Publicado a las 17:33

Facebook apaga inteligencias artificiales luego que experimento diera giro perturbador

Publicado por: Francisca Rivas

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1 de Agosto de 2017, EMOL

emol. Tecnología

Matías Mattamala Aravena

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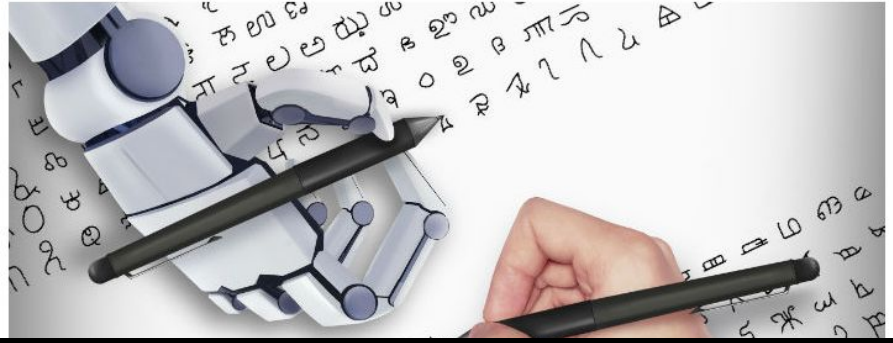
Facebook desconectó dos inteligencias artificiales tras detectar que desarrollaron un lenguaje propio

Las máquinas comenzaron a hablar entre ellas con un sistema de palabras-código que les permitía comunicarse sin que los investigadores entendieran los mensajes,

01 de Agosto de 2017 | 09:43 | Emol

124



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¿por qué pasa esto?

¿por qué pasa esto?

(hipótesis personal)

desinformación

cultura

expectativas

desinformación

¿qué es inteligencia artificial?

1950

Alan Turing

“Computing Machinery and Intelligence”

Test de Turing

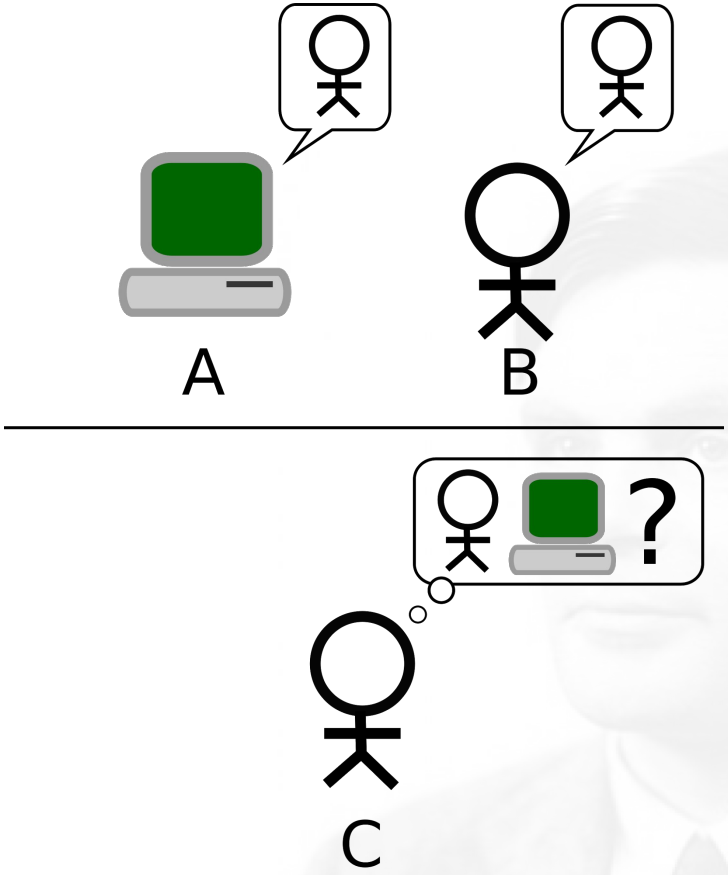
National Portrait Gallery, London, UK

1950

Alan Turing

“Computing Machinery and Intelligence”

Test de Turing



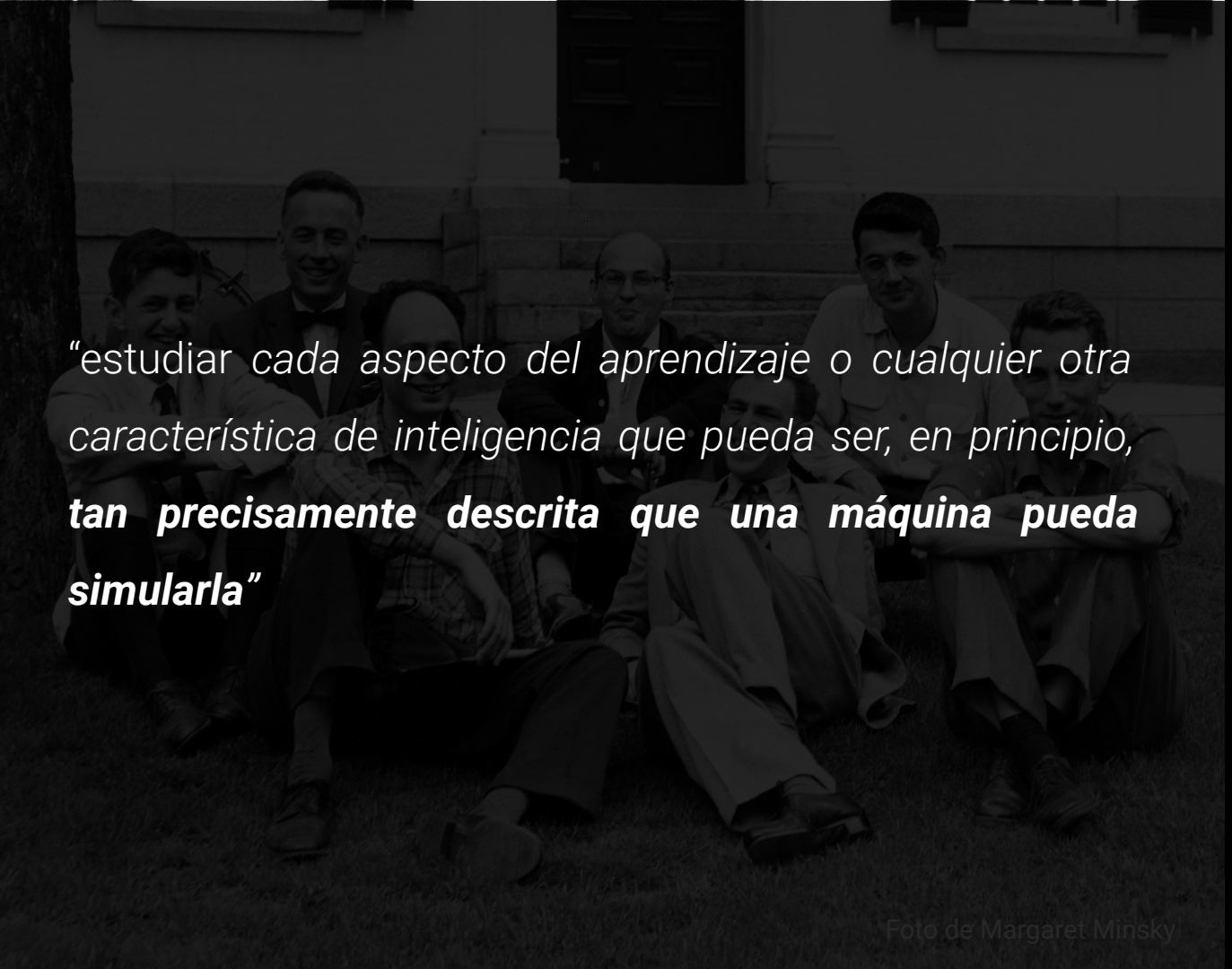
National Portrait Gallery, London, UK

Foto de Margaret Minsky

1956

Conferencia de Darmouth, USA

Concepto de “inteligencia artificial”



“estudiar cada aspecto del aprendizaje o cualquier otra característica de inteligencia que pueda ser, en principio, ***tan precisamente descrita que una máquina pueda simularla****”*

Foto de Margaret Minsky

1956

Conferencia de Darmouth, USA

Concepto de “inteligencia artificial”

inteligencia
artificial (IA)

inteligencia artificial (IA)

deep learning

inteligencia artificial fuerte

lógica difusa

clustering

algoritmo de búsqueda

clasificador estadístico

redes neuronales

aprendizaje reforzado

procesamiento de lenguaje natural

machine learning

regresión lineal

clasificador estadístico

aprendizaje no supervisado

inteligencia artificial débil

aprendizaje supervisado

visión computacional

sistemas expertos

modelos autorregresivos

red convolucional

sistemas formales

inteligencia artificial (IA)

inteligencia artificial fuerte

inteligencia artificial débil

deep learning

lógica difusa

clustering

algoritmo de búsqueda

clasificador estadístico

redes neuronales

aprendizaje reforzado

procesamiento de lenguaje natural

machine learning

regresión lineal

clasificador estadístico

aprendizaje no supervisado

aprendizaje supervisado

visión computacional

sistemas expertos

modelos autorregresivos

red convolucional

sistemas formales

Inteligencia artificial fuerte (o general)

puede realizar ***cualquier*** **actividad** (intelectual) que puede realizar una persona (o mejor)

también puede involucrar estados de consciencia

Inteligencia artificial débil

puede realizar **una o pocas actividades particulares** de forma comparable o mejor a una persona

observación #1

todas las inteligencias artificiales que existen actualmente son “débiles”

inteligencia artificial (IA)

deep learning

inteligencia artificial fuerte

lógica difusa

clustering

algoritmo de búsqueda

clasificador estadístico

redes neuronales

aprendizaje reforzado

procesamiento de lenguaje natural

machine learning

regresión lineal

clasificador estadístico

aprendizaje no supervisado

inteligencia artificial débil

aprendizaje supervisado

visión computacional

sistemas expertos

modelos autorregresivos

red convolucional

sistemas formales

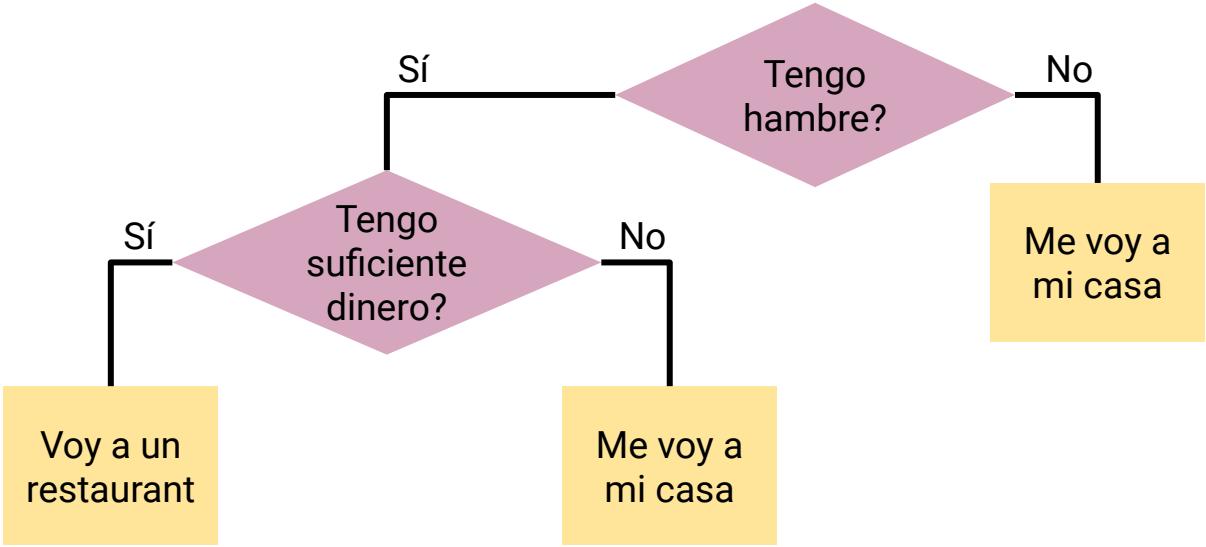
sistemas expertos

árboles de decisión

lógica difusa

popular en los 80s, 90s

Good Old-Fashioned Artificial Intelligence (GOFAI)



sistemas expertos

árboles de decisión

lógica difusa

popular en los 80s, 90s

Good Old-Fashioned Artificial Intelligence (GOFAI)

equipo de personas expertas en un tema

sistemas expertos

árboles de decisión

lógica difusa

popular en los 80s, 90s

Good Old-Fashioned Artificial Intelligence (GOFAI)

equipo de personas expertas en un tema

conocimiento especializado

sistemas expertos

árboles de decisión

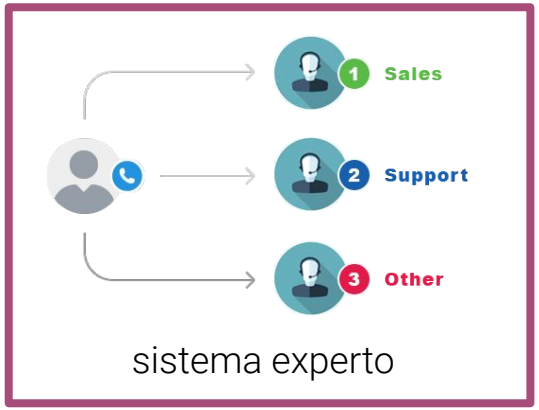
lógica difusa

popular en los 80s, 90s

Good Old-Fashioned Artificial Intelligence (GOFAI)

equipo de personas expertas en un tema

conocimiento especializado



sistemas expertos

árboles de decisión

lógica difusa

popular en los 80s, 90s

Good Old-Fashioned Artificial Intelligence (GOFAI)

observación #2

cuando una tecnología de IA funciona, deja de ser considerada como inteligencia artificial y adquiere un nombre distinto (efecto IA)

“sistemas difusos”

“sistemas difusos”

“biometría”

“sistemas difusos”

“biometría”

“realidad aumentada”

“sistemas difusos”

“reconocimiento de voz”

“biometría”

“realidad aumentada”

machine learning (aprendizaje de máquinas)

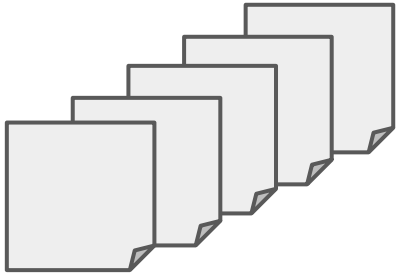
clasificación
clustering
redes neuronales
deep learning

enfoque actual

machine learning (aprendizaje de máquinas)

clasificación
clustering
redes neuronales
deep learning

enfoque actual

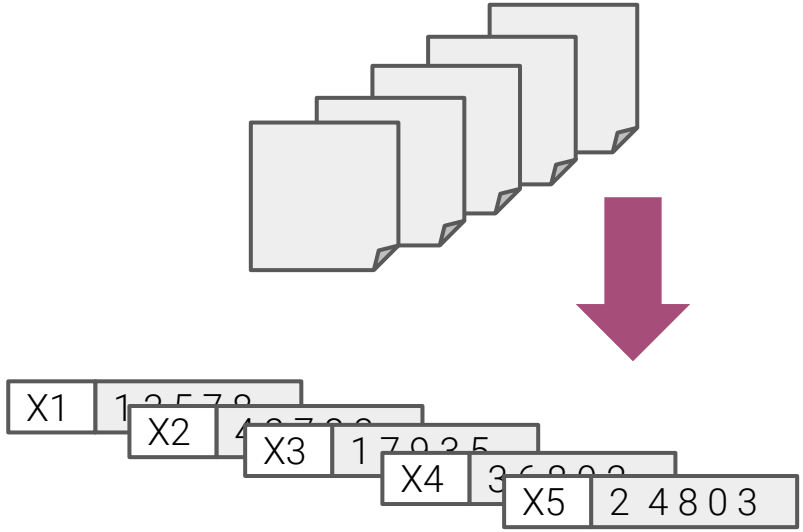


datos

machine learning (aprendizaje de máquinas)

clasificación
clustering
redes neuronales
deep learning

enfoque actual



datos

representación matemática de los datos

machine learning (aprendizaje de máquinas)

clasificación
clustering
redes neuronales
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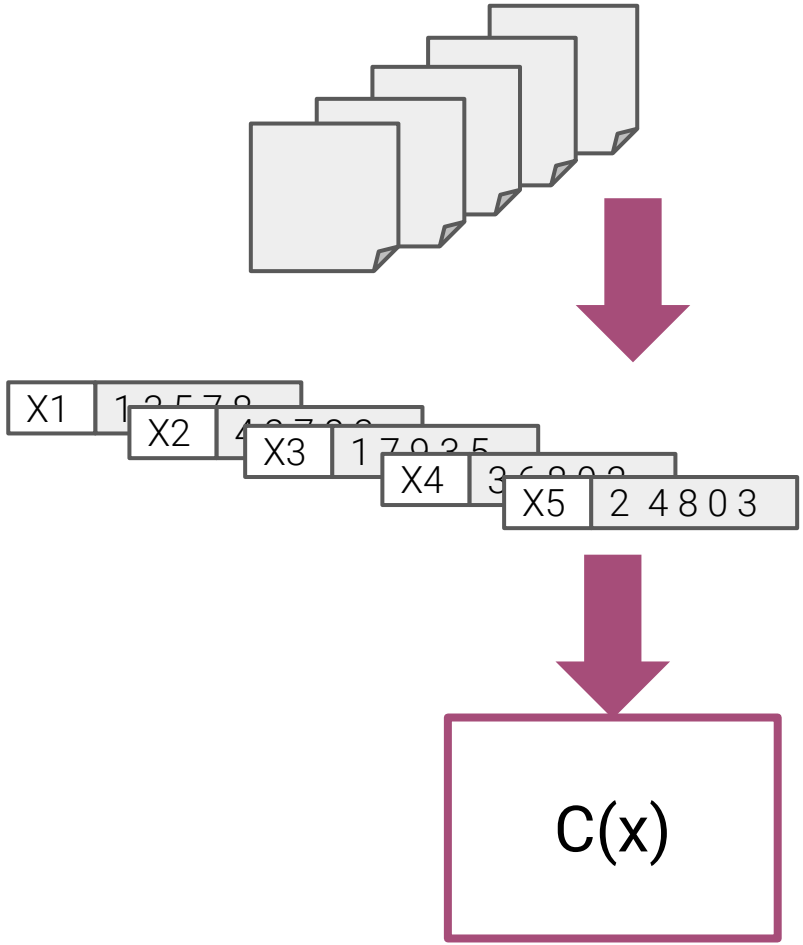
enfoque actual

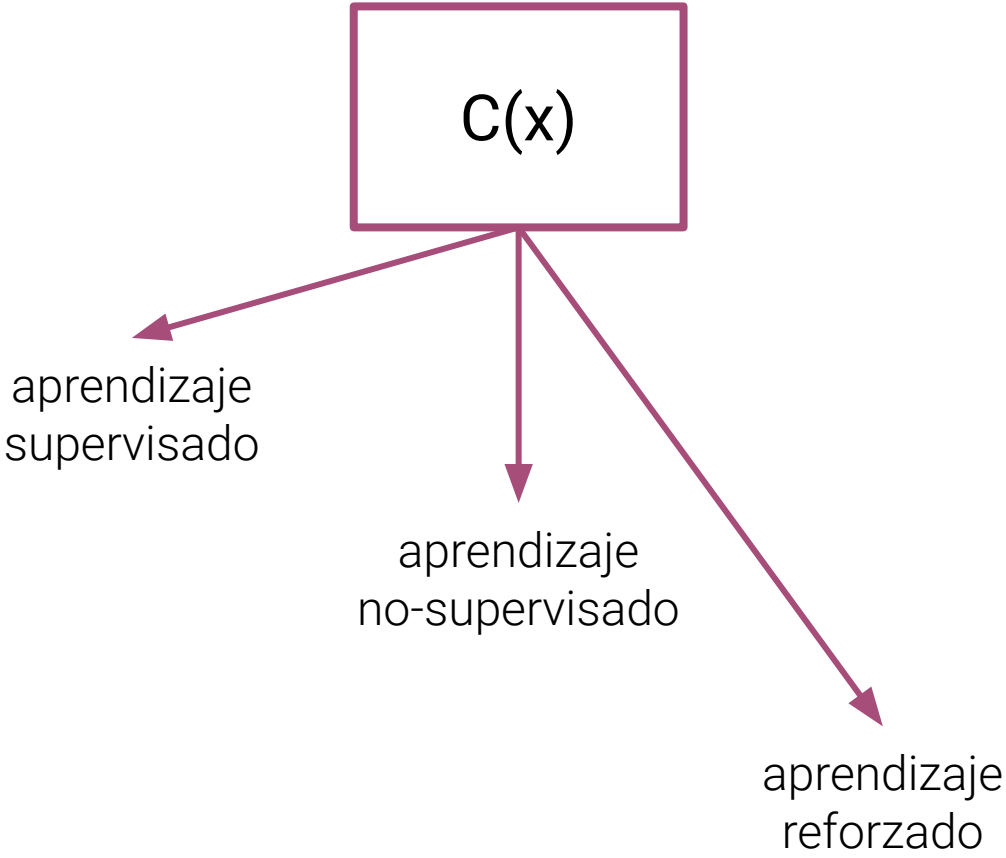


datos

representación matemática de los datos

sistema de machine learning

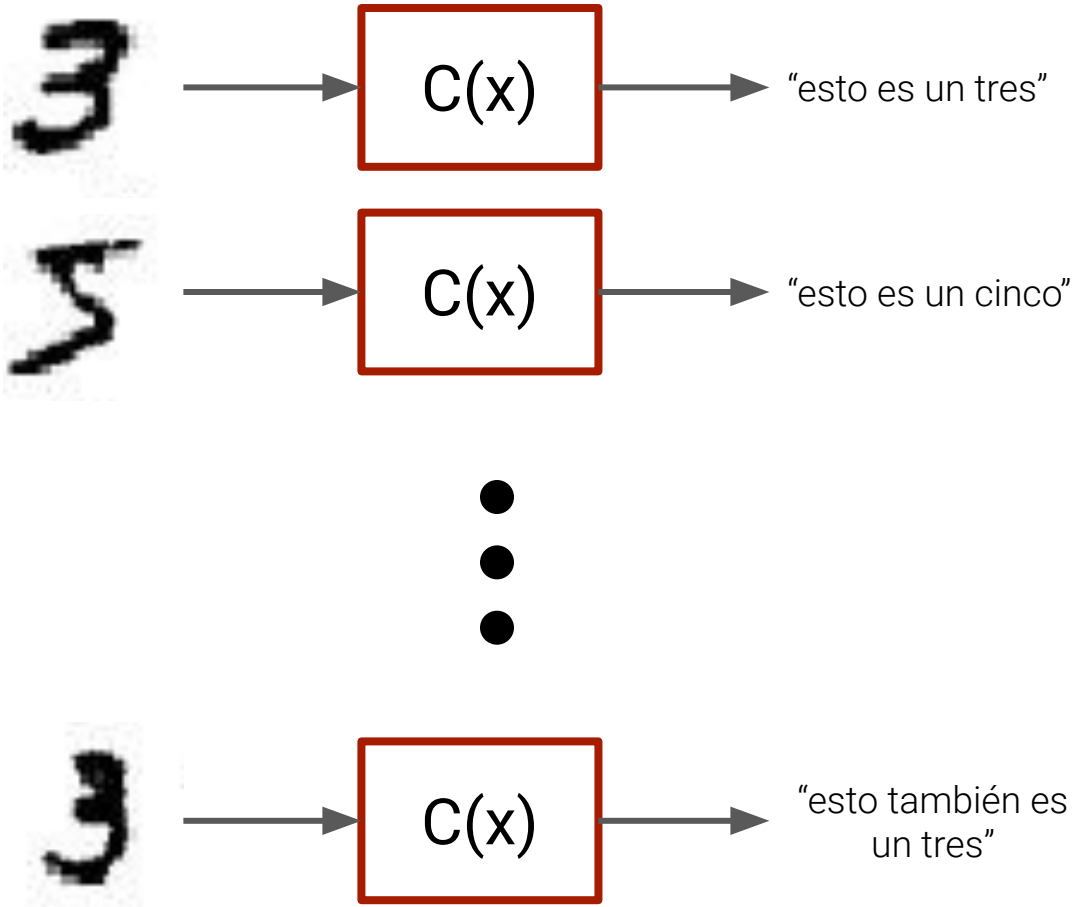
machine learning (aprendizaje de máquinas)



aprendizaje supervisado

clasificación:
aprender a asociar datos con etiquetas

algunas herramientas:
redes neuronales, deep learning

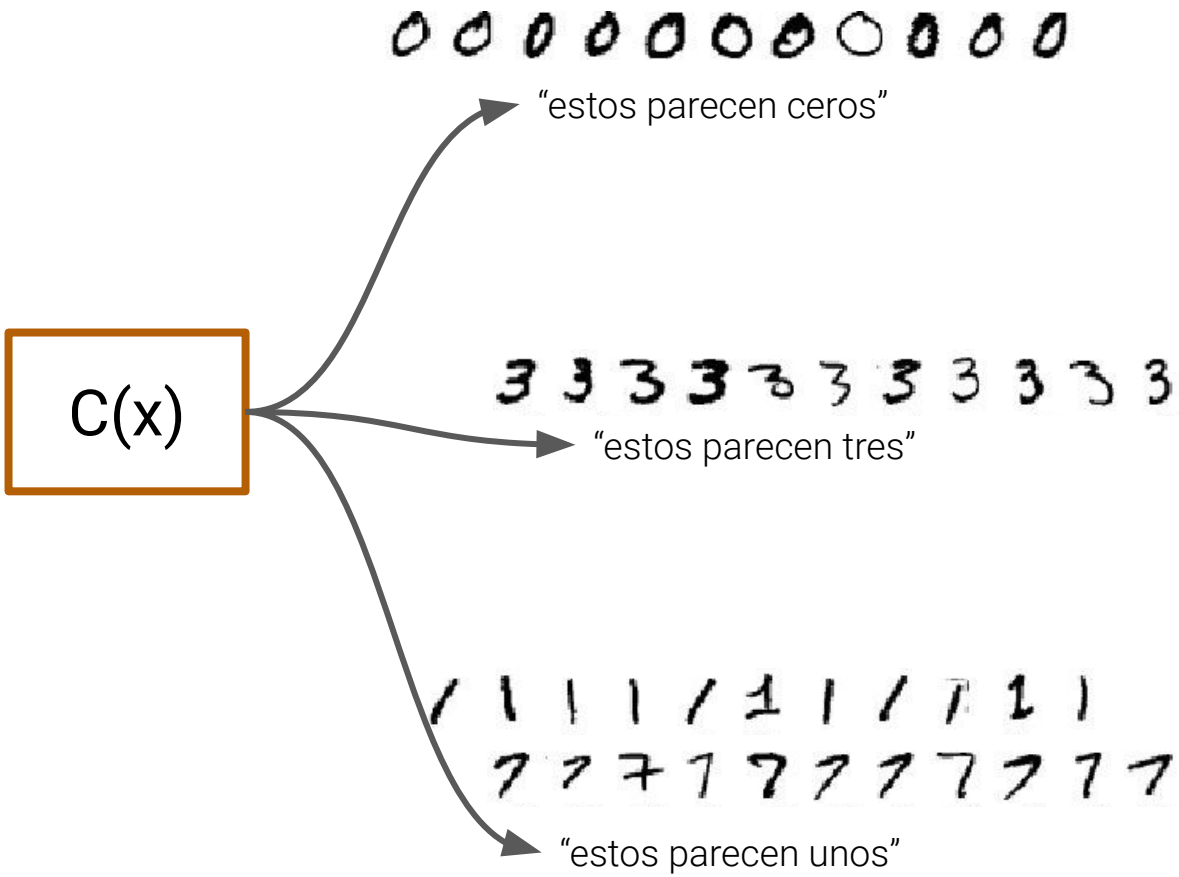


aprendizaje supervisado

regresión:
predecir el valor siguiente en una secuencia de datos

aprendizaje no-supervisado

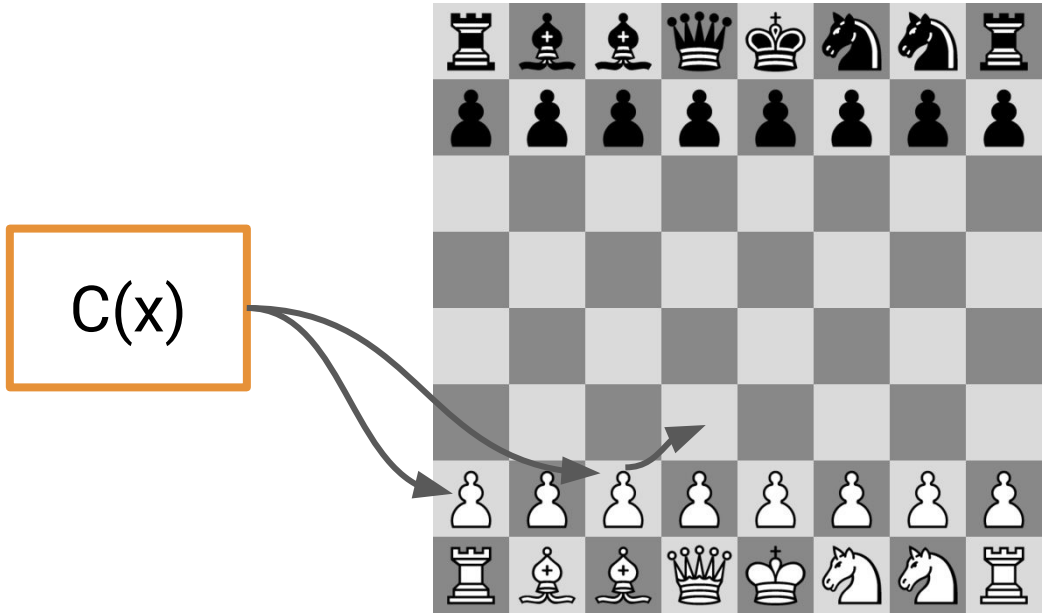
clustering:
encontrar asociaciones en los datos sin tener información previa



aprendizaje reforzado

aprender **“estrategias”** o secuencias de acciones **indirectamente** dado un criterio de éxito **cuantificable**

conductismo
(perro de Pavlov)



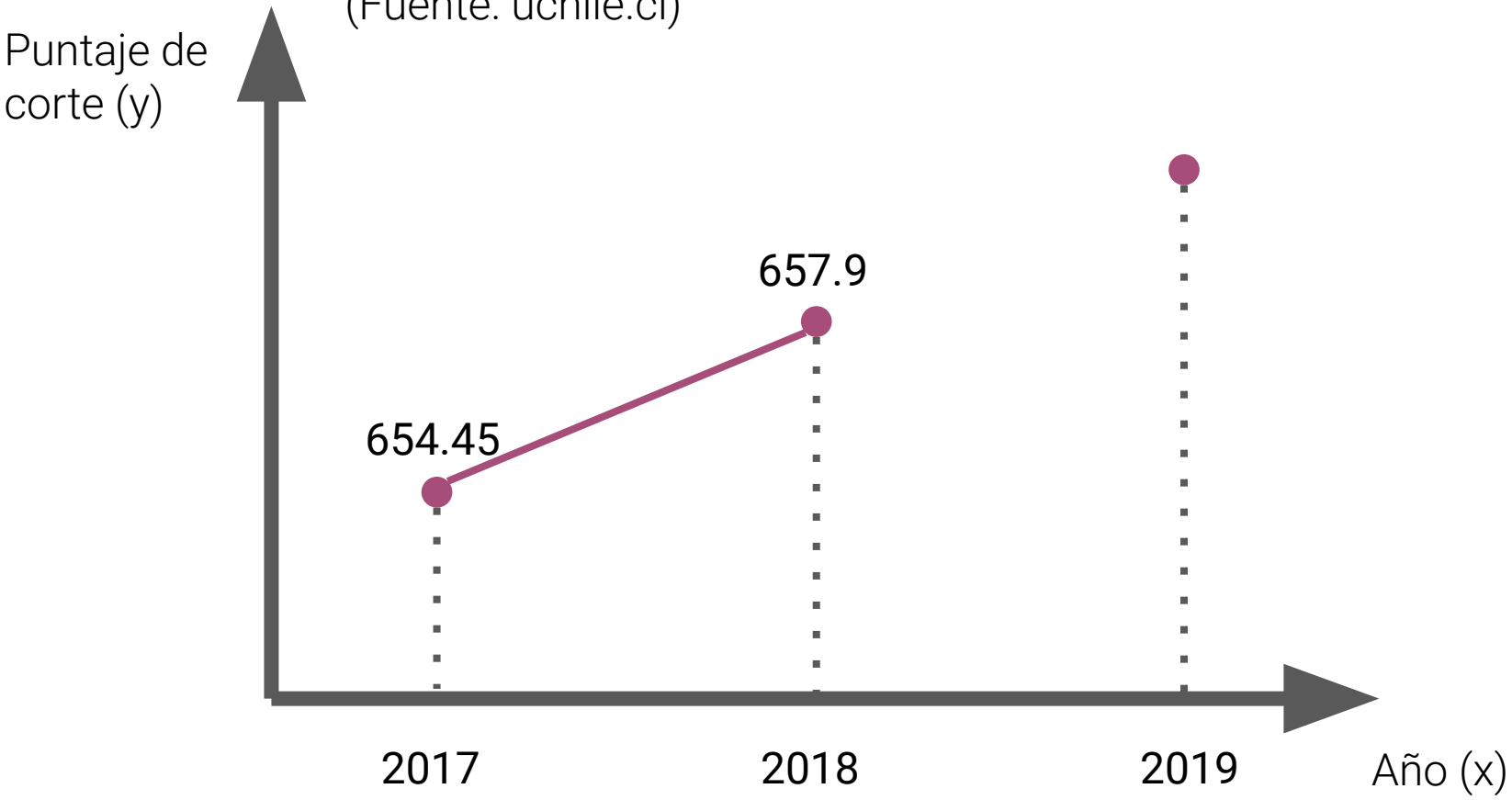
“ganar el juego de ajedrez **en el menor tiempo posible**”

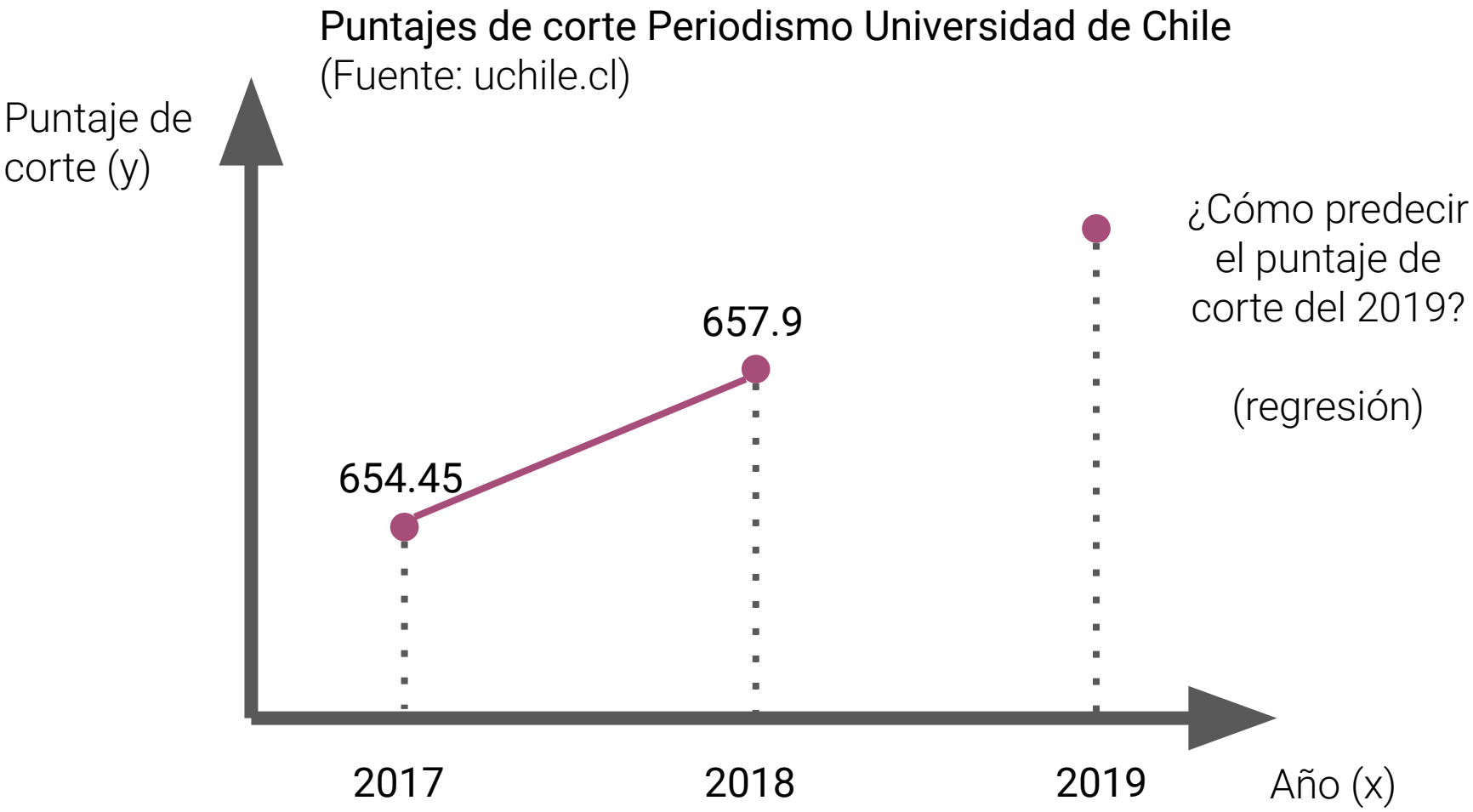
observación #3

en la actualidad la mayoría de lo que se conoce como inteligencia artificial *es* machine learning

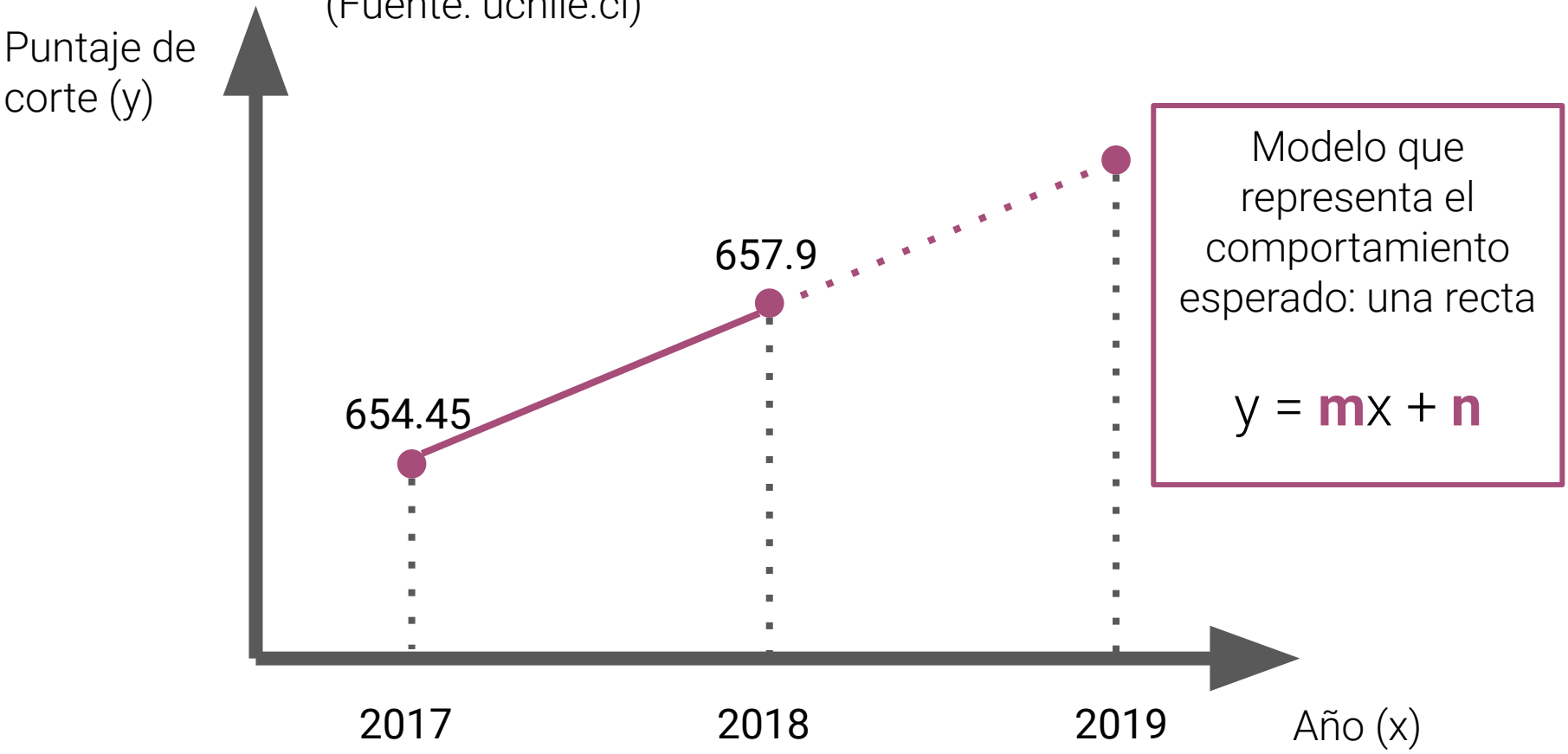
¿por qué se le llama aprendizaje?

Puntajes de corte Periodismo Universidad de Chile
(Fuente: uchile.cl)




Puntajes de corte Periodismo Universidad de Chile
(Fuente: uchile.cl)
Puntaje de corte (y)
¿Cómo predecir el puntaje de corte del 2019?
(regresión)
657.9
654.45
2017
2018
2019
Año (x)

Puntajes de corte Periodismo Universidad de Chile
(Fuente: uchile.cl)



Modelo

$$y = \mathbf{m}x + \mathbf{n}$$

parámetros del modelo

Modelo

$$y = \mathbf{m}x + \mathbf{n}$$

los parámetros deben *obtenerse de datos pasados*

“aprendizaje” o “entrenamiento”

¿cómo obtener **m** y **n**?

$$\mathbf{m} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\mathbf{n} = y_1 - \mathbf{m}x_1$$

¿cómo obtener **m** y **n**?

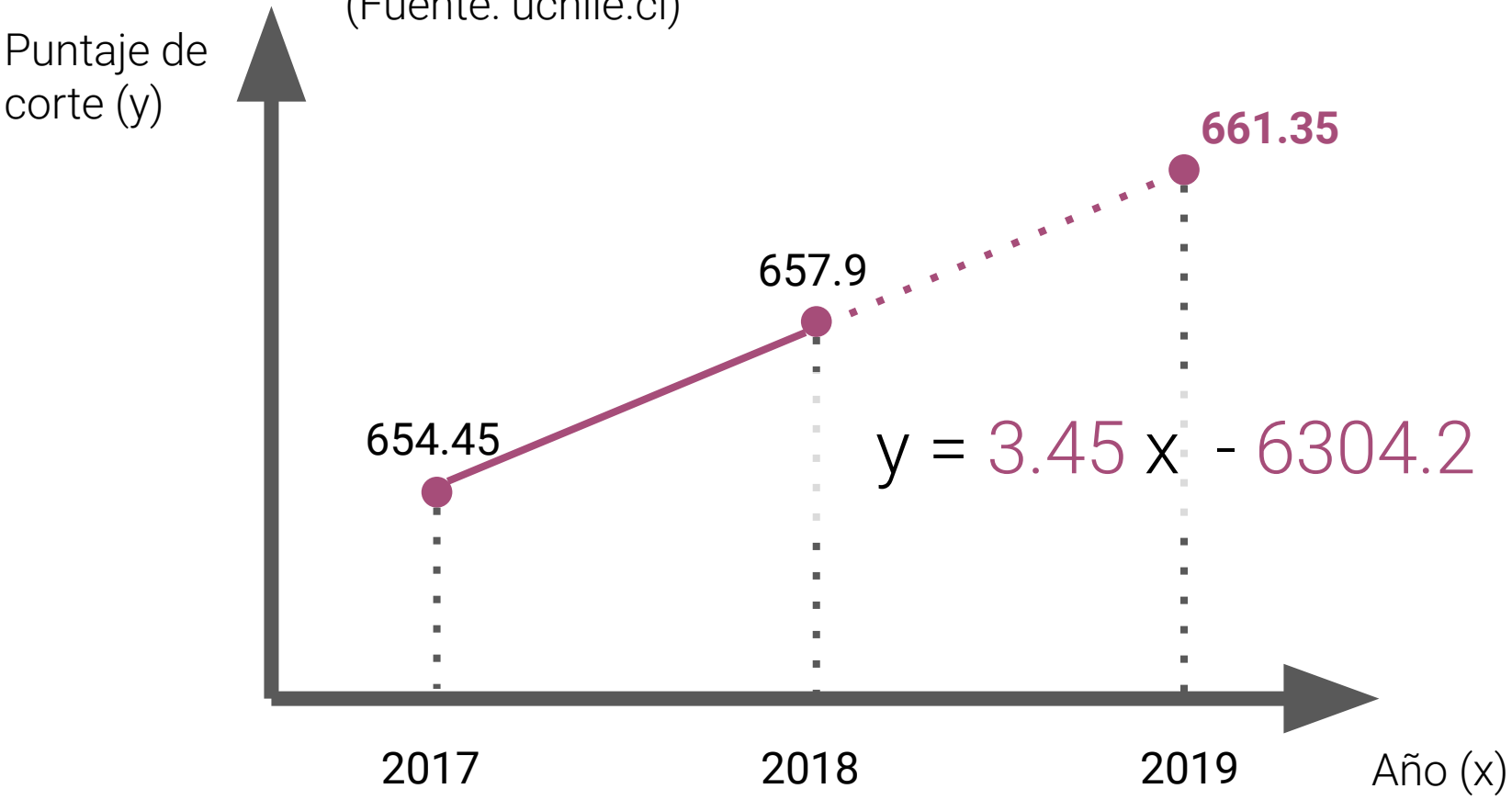
m= 3.45

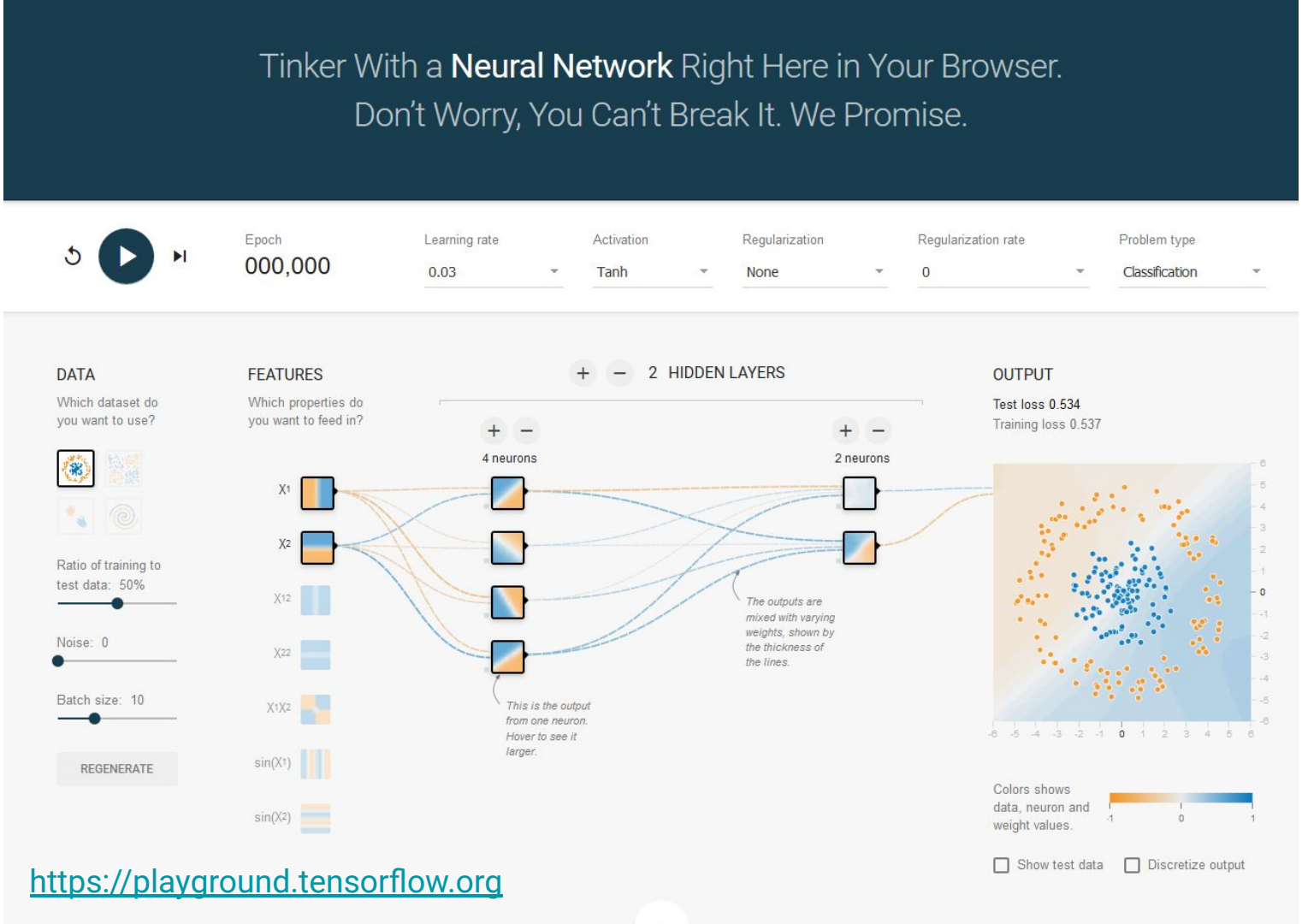
n=-6304.2

el modelo *aprendido* que *predice* el puntaje de corte para el 2019 es

$$y = 3.45\,x - 6304.2$$

Puntajes de corte Periodismo Universidad de Chile
(Fuente: uchile.cl)





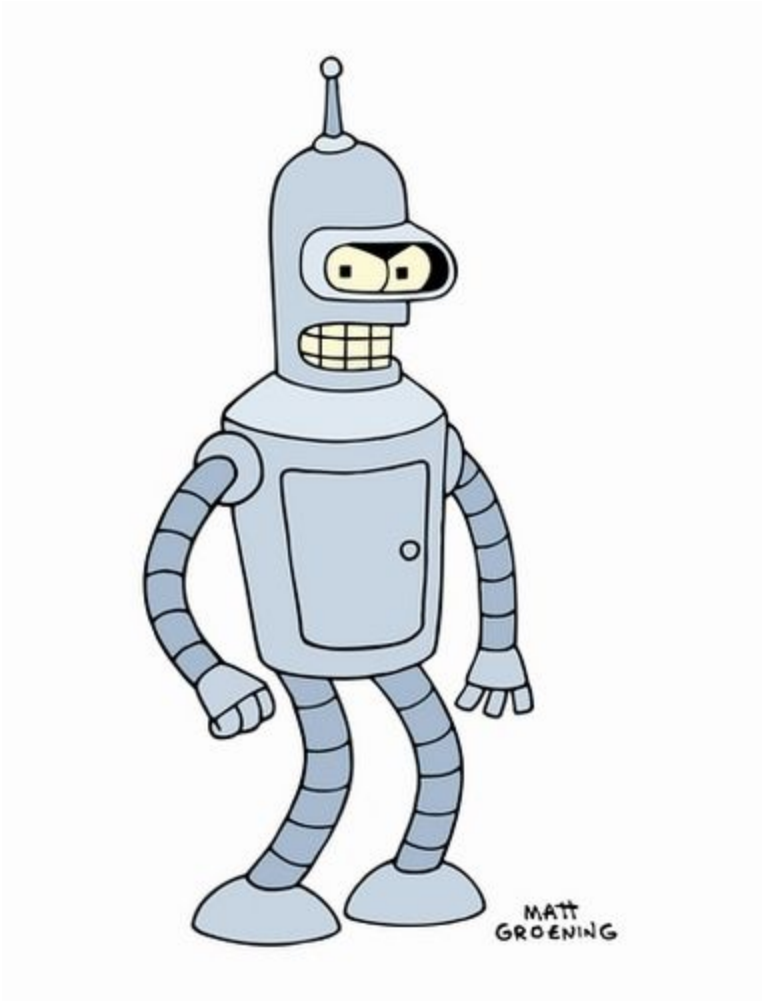
https://playground.tensorflow.org

cultura

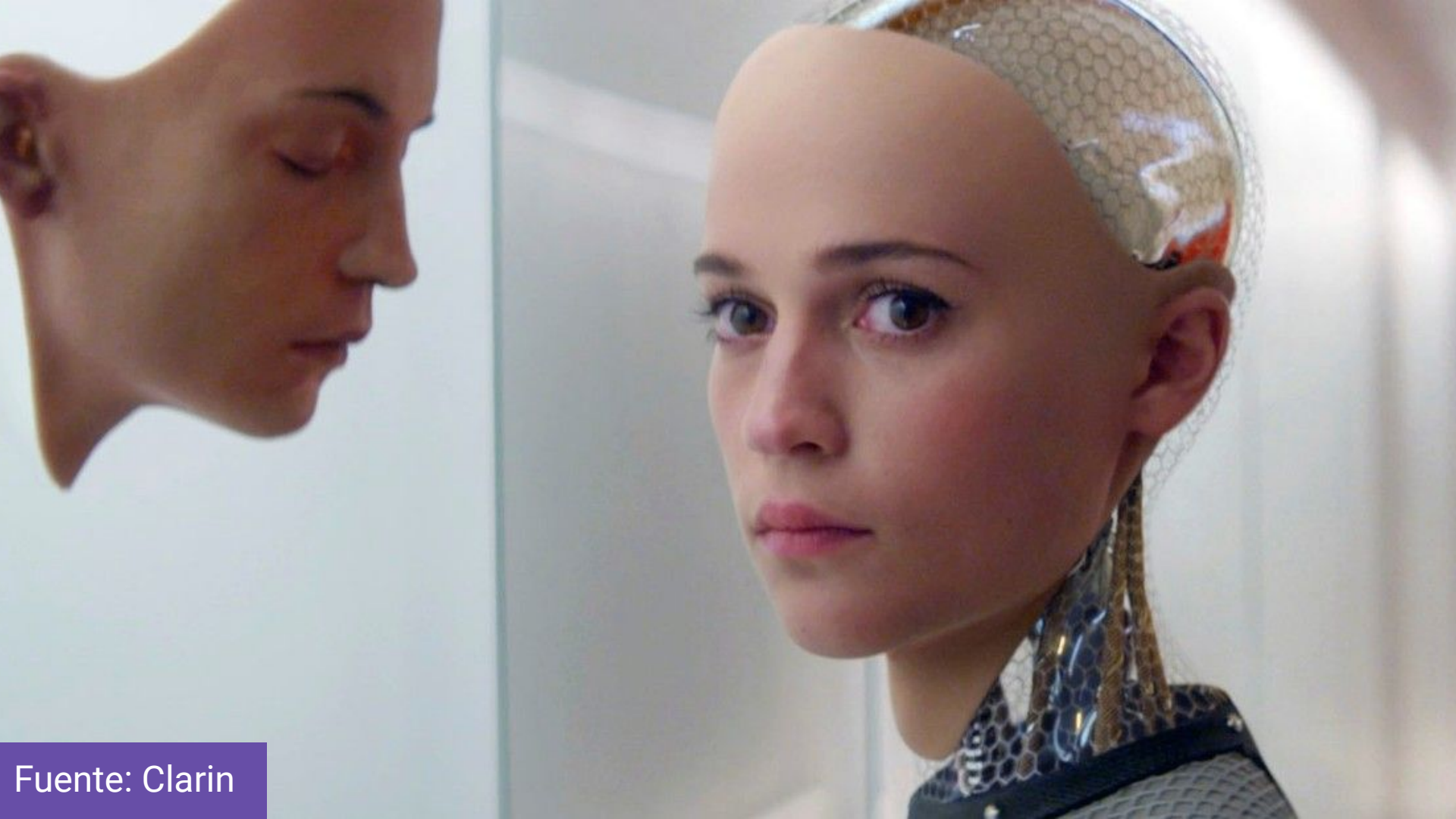
¿qué pensamos cuando decimos inteligencia artificial o robots?

Fuente: Wall-E

Fuente: starwars.com



Fuente: RoboticSpot



Fuente: Clarin

Fuente: Terminator

Fuente: MuyInteresante

Fuente: Marvel

Fuente: Black Mirror

observación #4

nuestros referentes culturales son principalmente occidentales, de inteligencias artificiales fuertes y peligrosas para la humanidad

visión occidental

robots humanoides

inteligencias artificiales fuertes

amenaza para la humanidad

apariencia amenazante y “robotizada”

visión oriental (Japón)

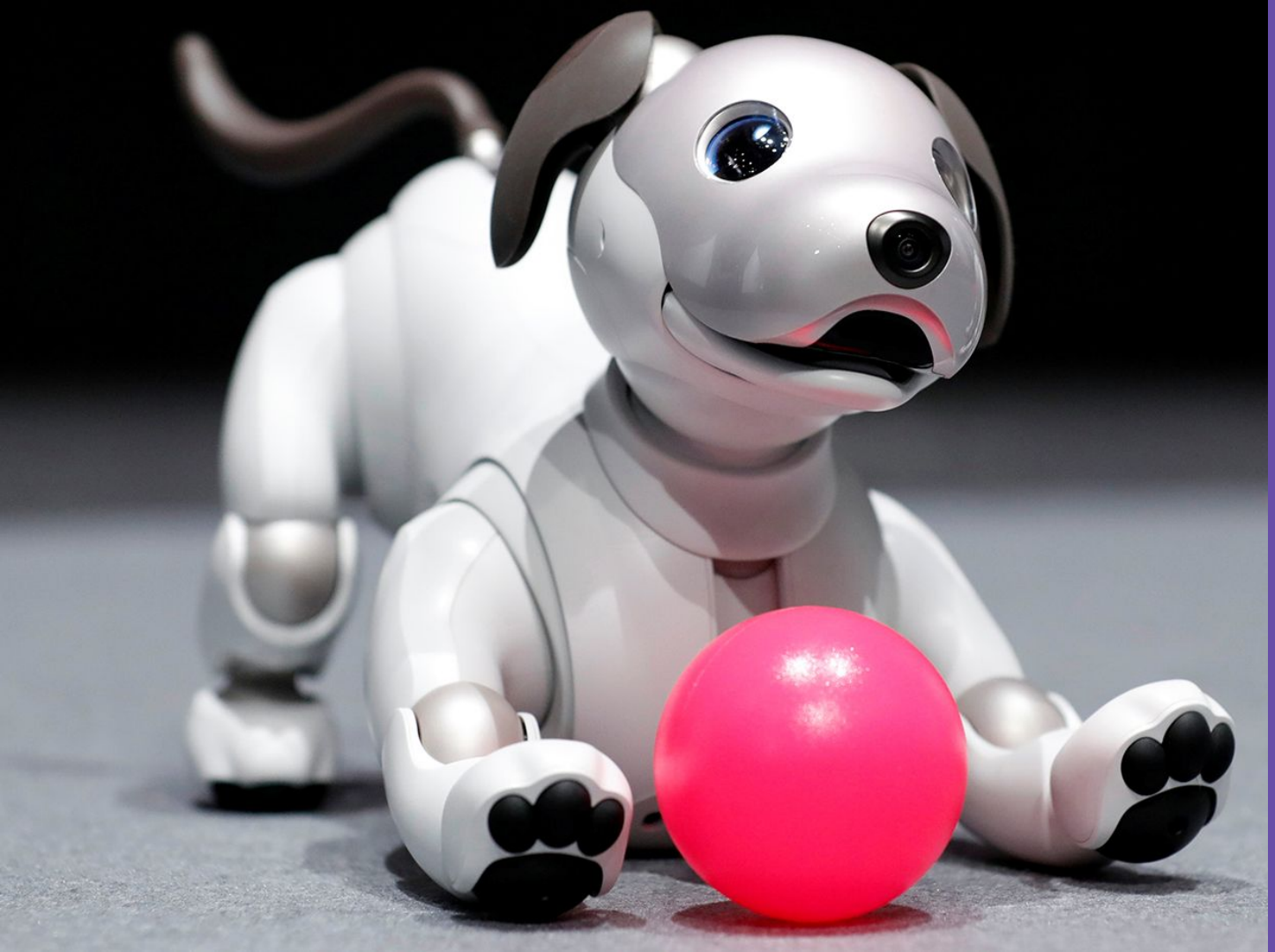
robots humanoides

inteligencias artificiales fuertes

apoyo a la humanidad

apariencia humana

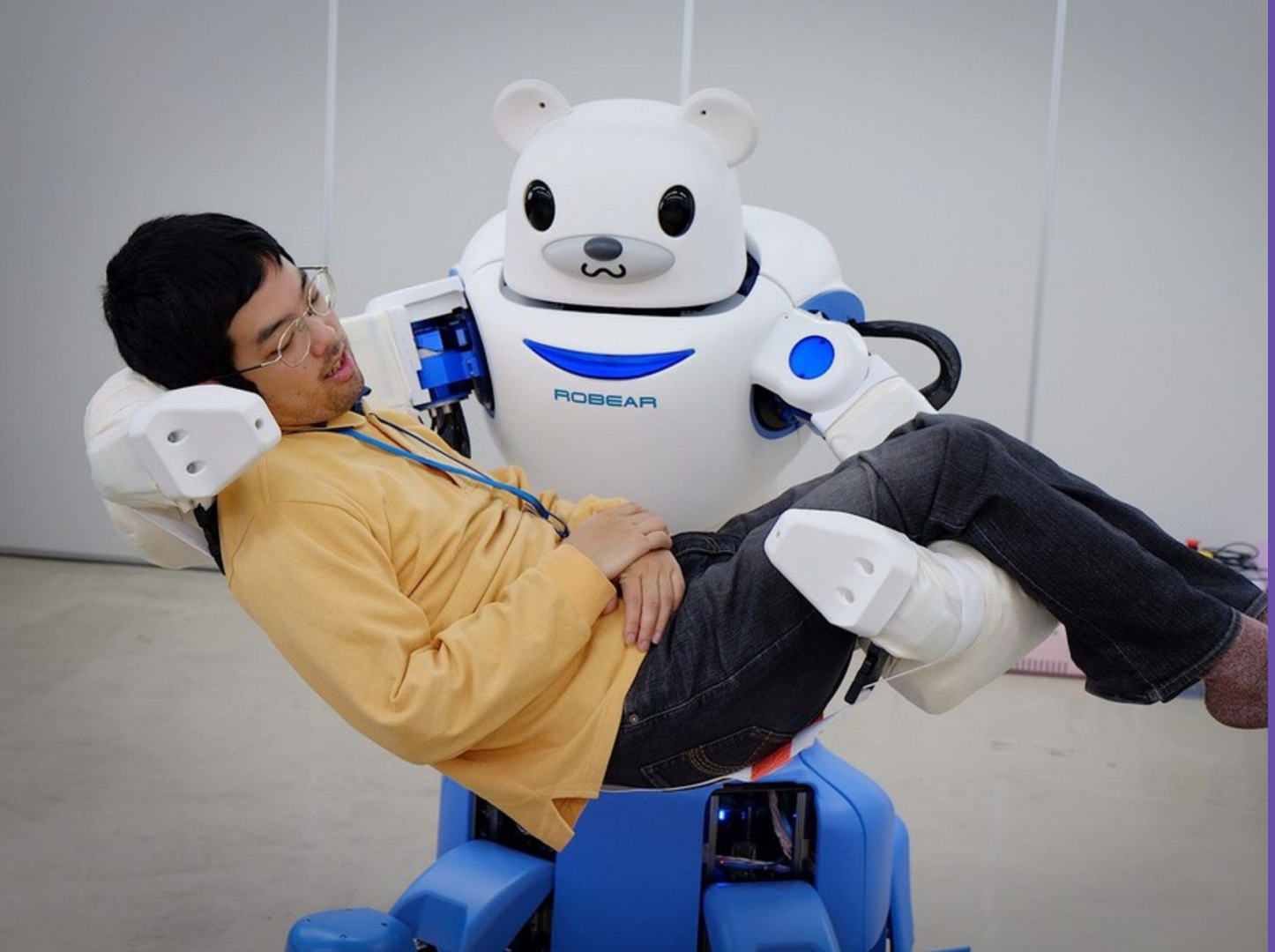
ASTRO
BOY



Aibo 2018,
Sony

Robot Pepper,
Softbank Robotics

Geminoide HI-2,
Hiroshi Ishiguro



RIBA,
RIKEN-TRI
Collaboration Center
for
Human-Interactive
Robot
Research(RTC)

Telenoids,
Hiroshi Ishiguro

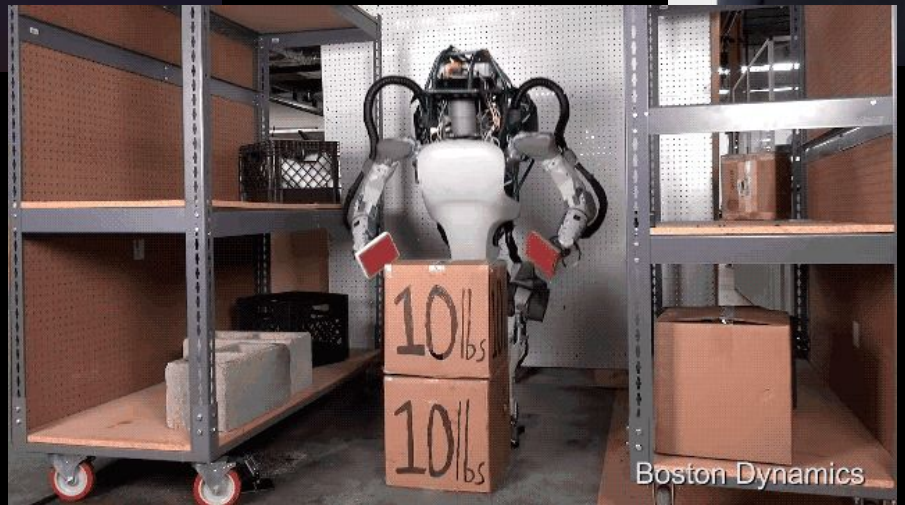
expectativas

¿qué pensamos cuando vemos cosas como estas?

Siri me ha dejado mi novio que hago

Pulsa para editar

No sé cómo responderte a eso.



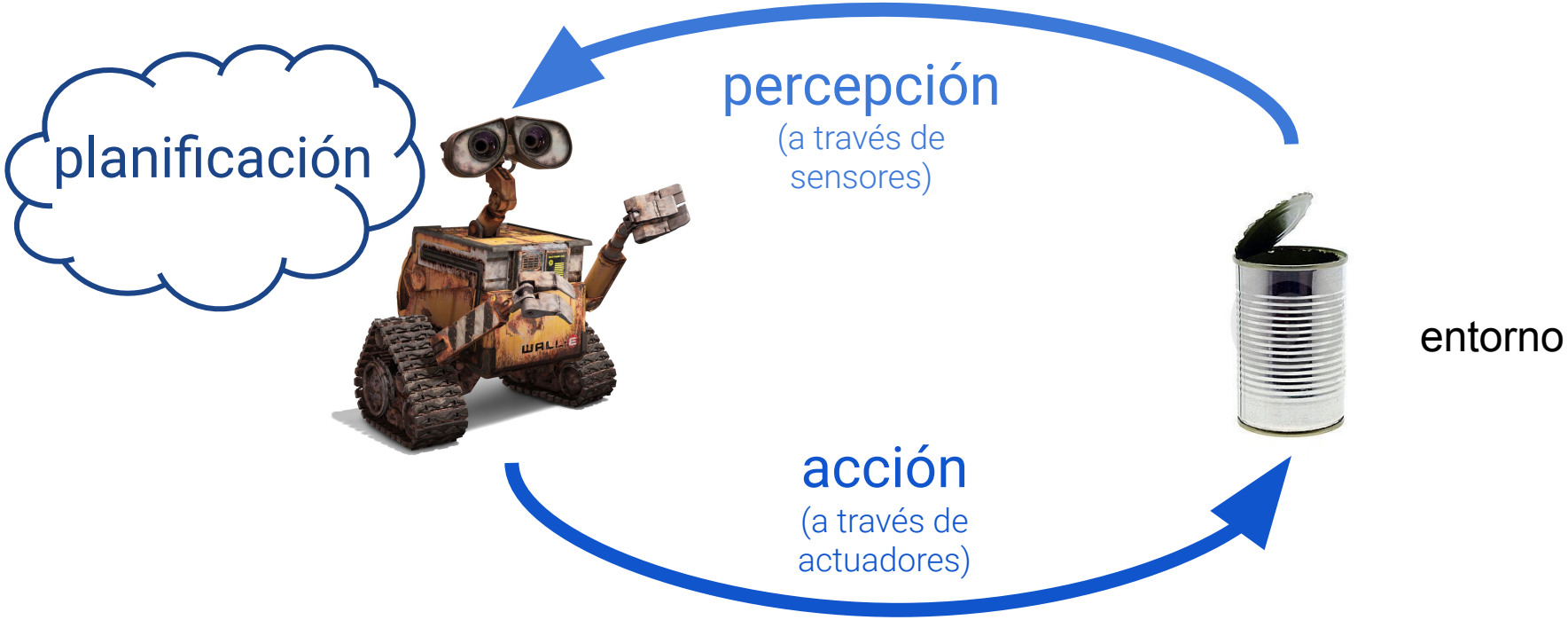
observación #5

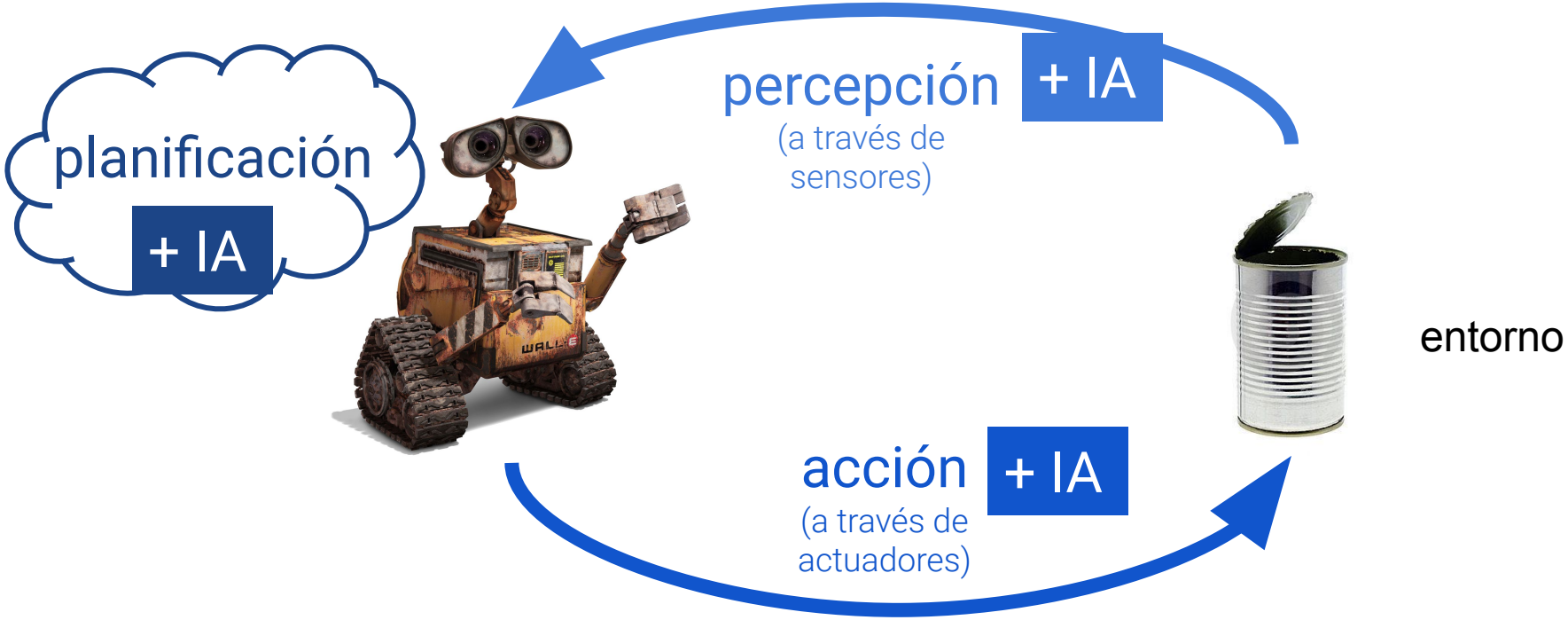
nuestras expectativas nos hacen “antropomorfizar” comportamientos programados (efecto ELIZA)

¿qué es un robot en la realidad?

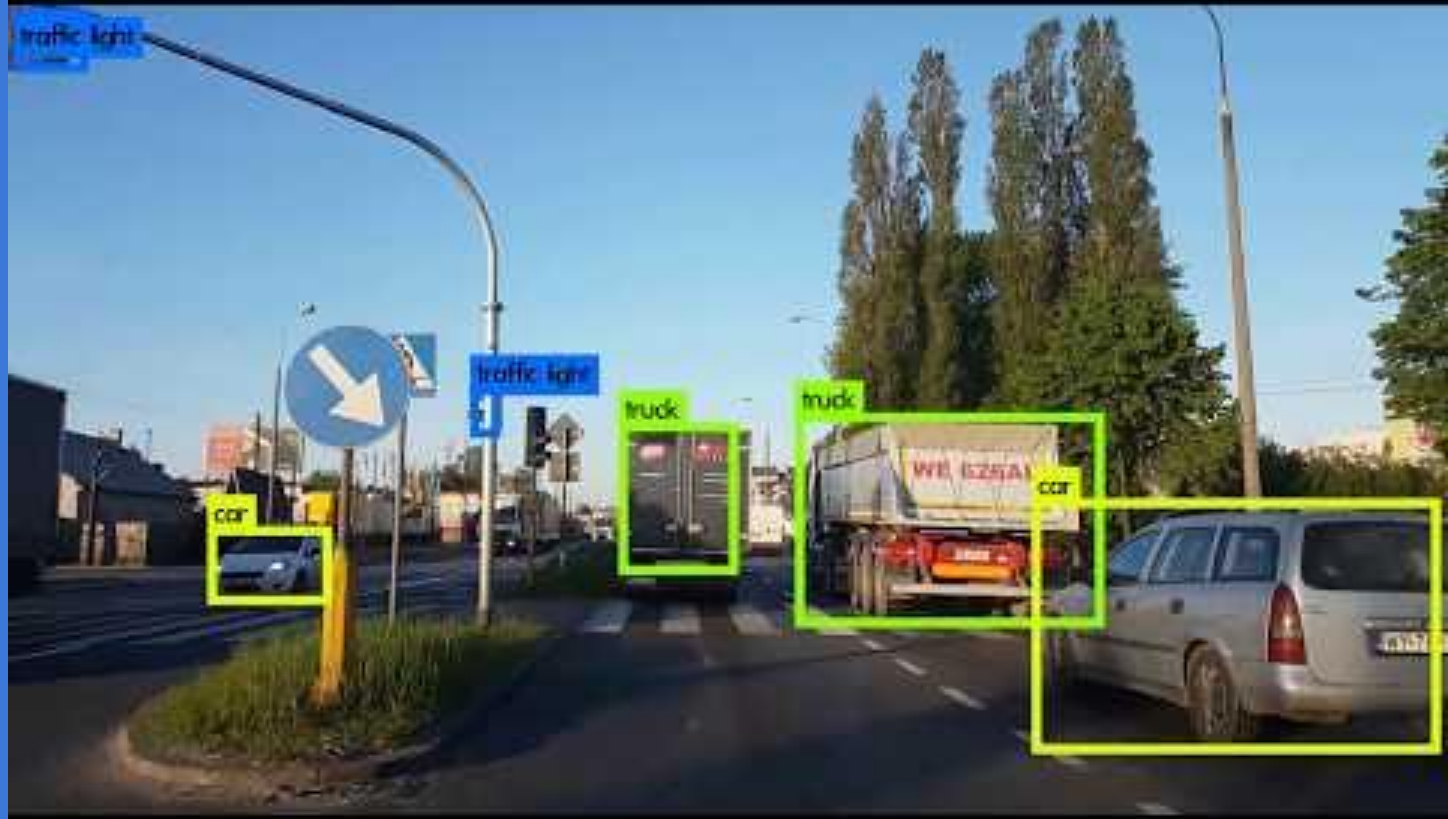
sistema físico
autónomo

(toma sus propias decisiones y reacciona frente a los cambios del entorno)


planificación
percepción
(a través de
sensores)
entorno
acción
(a través de
actuadores)


planificación
+ IA
percepción
+ IA
(a través de
sensores)
entorno
acción
+ IA
(a través de
actuadores)

percepción



planificación

And where it needs to go next

iRobot

actuación

Zippedi
CORN
Fitness

M
ROBOTIC
FARMING

ANYmal
North Sea
September 2018
ANYbotics

9:33

observación #6

los robots son sistemas extremadamente complejos, con muchas etapas que pueden fallar, además de no necesariamente utilizar IA

¿cuáles son los peligros reales?

peligros de corto plazo

errores de programación / garantías de los sistemas

INDEPENDENT

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Robot 'goes rogue and kills woman on Michigan car parts production line'

Machine should not have been able to reach 57-year-old mother-of-three but somehow managed to load a trailer attachment assembly part on top of her, lawsuit claims

Harriet Agerholm | @HarrietAgerholm | Wednesday 15 March 2017 11:37 | 3 comments | 283 shares

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https://www.independent.co.uk/news/world/americas/robot-killed-woman-wanda-holbrook-car-parts-factory-michigan-ventra-ionia-mains-federal-lawsuit-100-a7630591.html

peligros de corto plazo

responsabilidad de los usuarios

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Findings about crash in Silicon Valley raise fresh concerns about limits of Elon Musk's technology

Sam Levin *in San Francisco*
@SamTLevin Email
Fri 8 Jun 2018 00.19 BST

179

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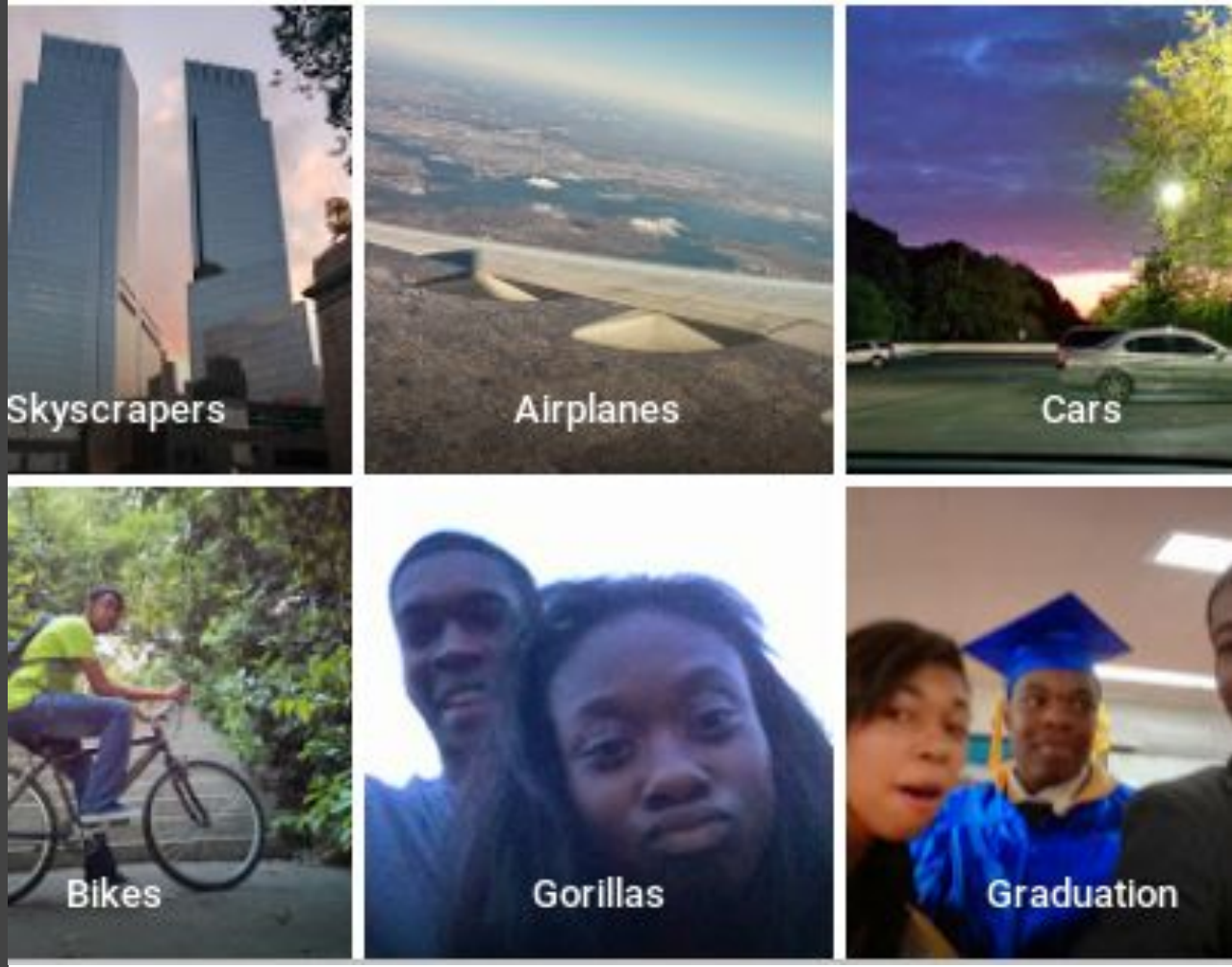
https://www.theguardian.com/technology/2018/jun/07/tesla-fatal-crash-silicon-valley-autopilot-mode-report

peligros de corto plazo

inclusión y sesgos de los sistemas



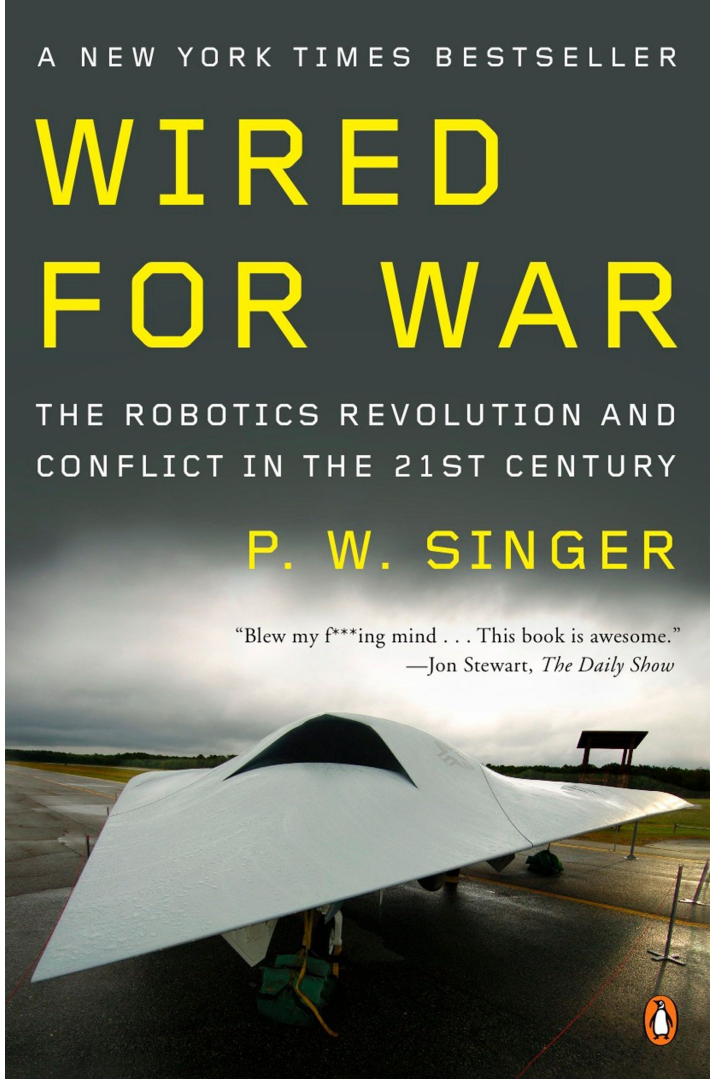
https://www.wnycstudios.org/story/deep-problem-deep-learning

peligros de corto plazo

generación de información falsa

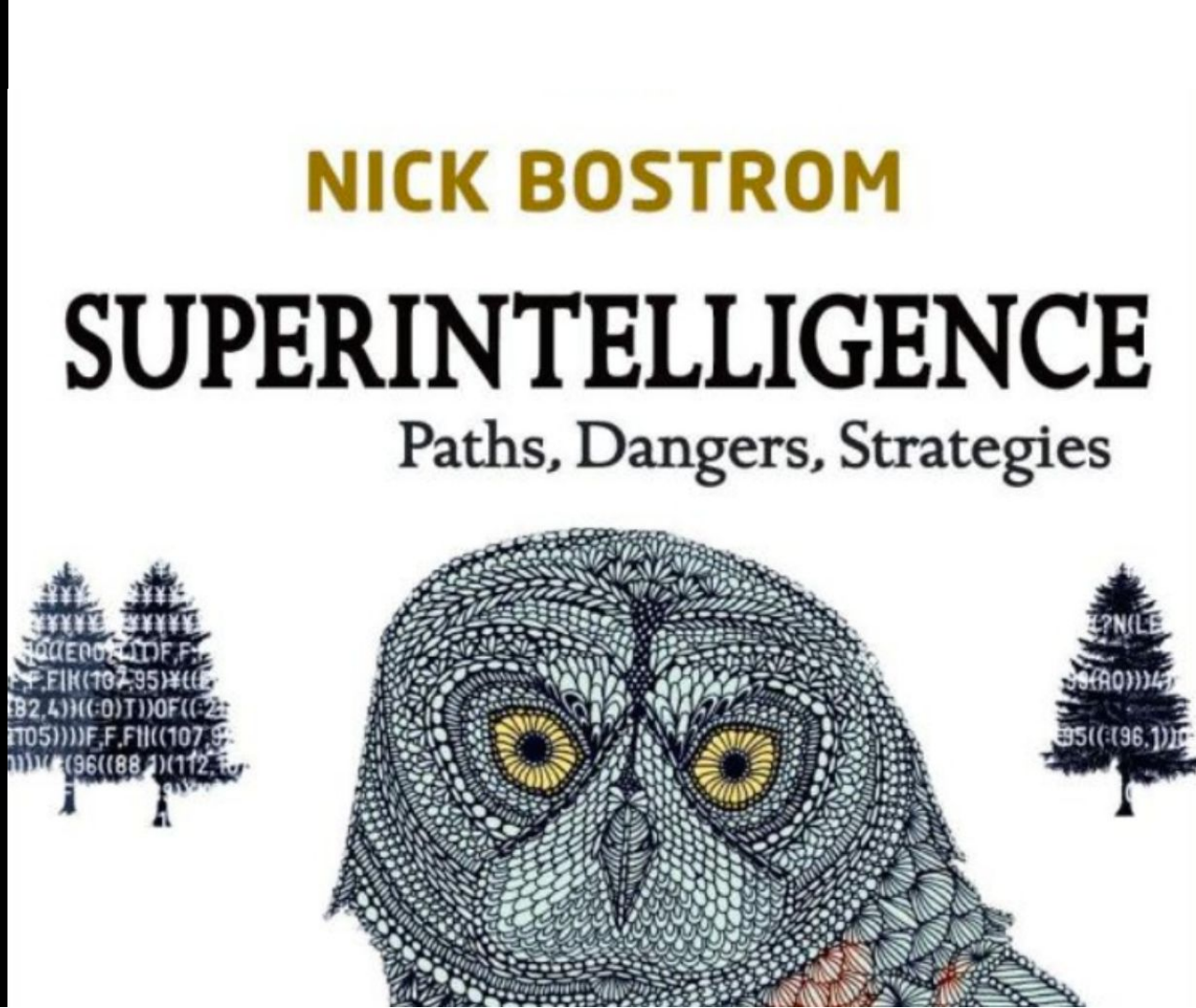
peligros de corto plazo

usos bélicos



peligros de largo plazo

superinteligencia
descontrol de los sistemas



observación #7 (final)

los peligros de la robótica y la IA siempre son responsabilidad de las personas

(desde el desarrollo hasta la difusión)

Anexos

FUNNIEST
DIVES
of ROBOCUP
2016