

Desmitificando la inteligencia artificial

Víctor Orozco

19 de octubre de 2019

Nabenik

Introducción

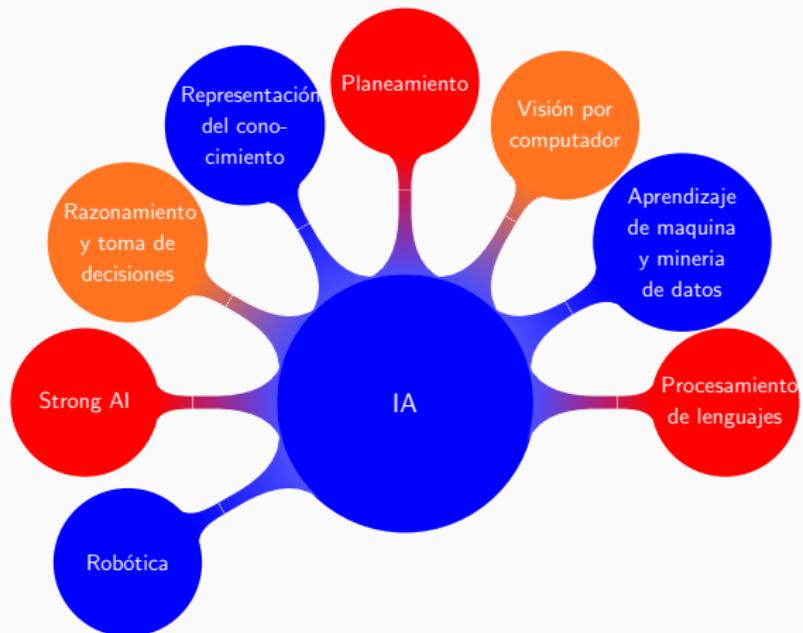
Víctor Orozco

- Java Champion
- Ex becario OAS-GCUB
- Dukes Choice Award 2016
-GuateJUG-
- CTO/Founder -Nabenik-
- @tuxtor
- The J*

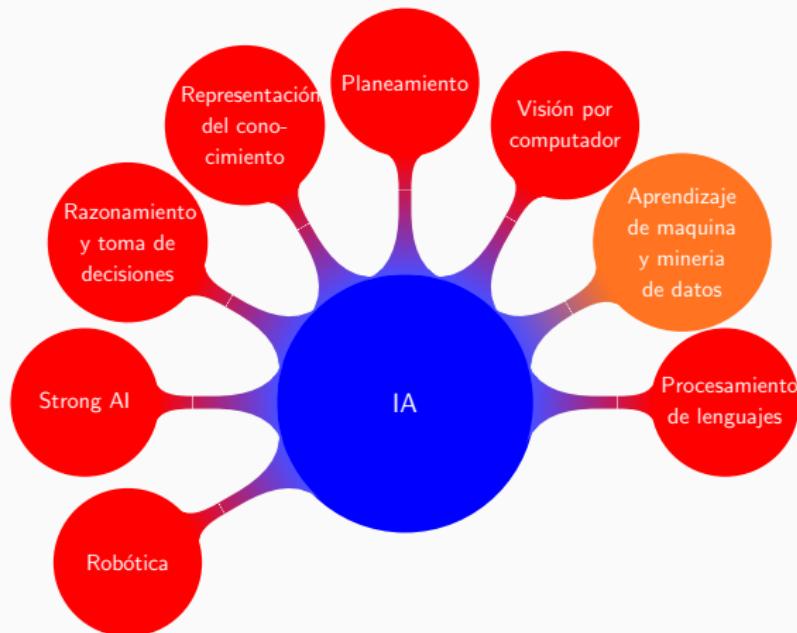


- **Entender y construir** entidades inteligentes.
- Primeros pasos en robótica
- Programas que puedan/sepan reaccionar ante incertezas (CS)

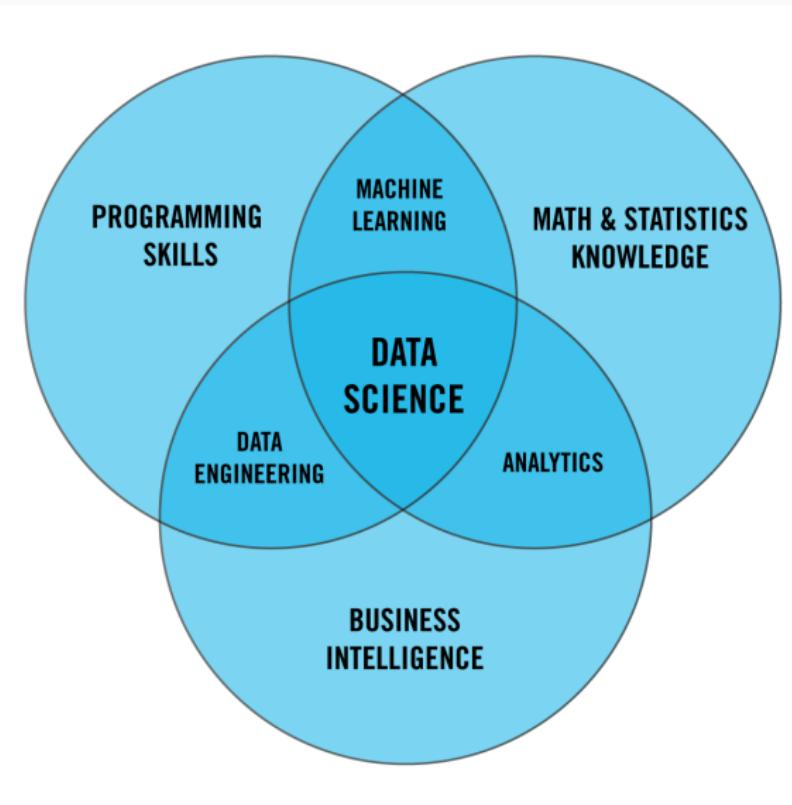
Ramas clásicas



Ramas clásicas



Ramas clásicas



¿Por qué?

Motivación

FORTUNE

NEWS POPULAR VIDEOS FORTUNE 500

Artificial Intelligence OCTOBER 28, 2016

More Chip Sector Consolidation as Macom Buys Applied Micro 8:34 AM EST

What Ashton Kutcher Said in Defense of Airbnb to a Code Pink Protestor 8:30 AM EST

These 'Never Trumpers' Are Now Saying Maybe to White House Jobs 7:35 AM EST

Carrie Underwood: Not Your Typical Athleisure Celeb 7:30 AM EST

Citi and J.P. Morgan Just Topped the Global Regulators List of Important Banks 7:24 AM EST

Facebook Plans to Add 500 New Staff in Britain in 2017 7:09 AM EST

Blackstone Is Reportedly in Talks to Sell \$2.3B in Property to This Chinese Group 6:56 AM EST

India Train Crash Death Toll Hits 142 6:24 AM EST

Machine learning will drop the cost of making predictions, but raise the value of human judgement.

To really understand the impact of artificial intelligence in the modern world, it's best to think beyond the mega-research projects like those that helped Google recognize cats in photos.

According to professor Ajay Agrawal of the University of Toronto, humanity should be pondering how the ability of cutting edge A.I. techniques like **deep learning**—which has boosted the ability for computers to recognize patterns in enormous loads of data—could reshape the global economy.

Making his comments at the Machine Learning and the Market for Intelligence **conference** this week by the Rotman School of Management at the University of Toronto, Agrawal likened the current boom of A.I. to 1995, when the Internet went mainstream. Gaining enough

Photograph by Agilio Mike — Getty Images/Photo Researchers RM

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Fortune



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Fortune



Motivación

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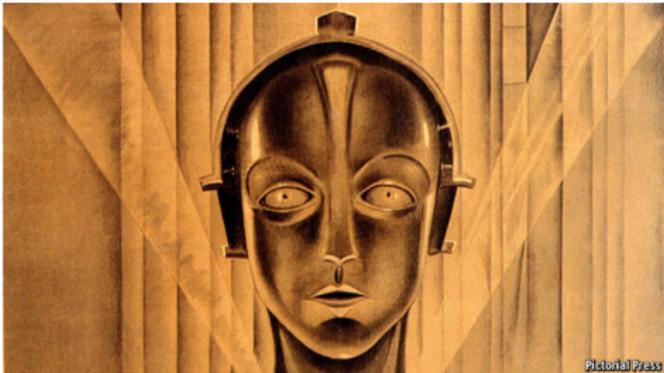
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Artificial intelligence

March of the machines

What history tells us about the future of artificial intelligence—and how society should respond

Jun 25th 2016 | From the print edition

 Pictorial Press

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EXPERTS warn that "the substitution of machinery for human labour" may "render the population redundant". They worry that "the discovery of this mighty power" has come "before we knew how to employ it rightly". Such fears are expressed today by those who

Motivación

The screenshot shows a dark-themed mobile application interface for a music streaming service. At the top, there is a search bar with the placeholder "Search" and an "UPGRADE" button. Below the search bar, a navigation menu includes "OVERVIEW", "CHARTS", "GENRES & MOODS", "NEW RELEASES", "DISCOVER" (which is underlined in green), and "CONCERTS".

The main content area features a section titled "New Releases For You" with four cards:

- Your Release Radar**: An abstract graphic with blue wavy lines.
- 20... al Mundo de los Sueños (Live)** by **Saurom**: Cover art shows a figure in a red cape on stage.
- A Arte De Os Paralamas Do Sucesso**: Cover art features three people in a circle.
- XXI - Klavier** by **Rammstein**: Cover art features the Rammstein logo and the word "KLAVIER".

Below this section is another titled "Similar to Ximena Sariñana" with four cards:

- A red album cover with the title partially visible.
- Siddhartha** by **VIENTO DEL PEZ**: Cover art shows a fish-like shape.
- A yellow album cover featuring a cocktail garnished with cherries.
- Las Danielas**: Cover art features a person in a hat.

At the bottom of the screen, there are navigation icons: a left arrow, a play/pause button, a right arrow, and a refresh/circular arrow icon. The number "10" is located in the bottom right corner.

Motivación

More items to consider [See more](#)



Inspired by your browsing history [See more](#)



Aprendizaje

Mejores predicciones

Inferencia

BACKGROUND KNOWLEDGE



NEW INFORMATION



INFERENCE



- Estadística inferencial (Excel, BI)
 - Regresión de datos
 - Redes bayesianas
- **Aprendizaje de maquina** (Sistemas de recomendación, chatbots)
 - Perceptrones
 - Redes neurales
 - Clustering
 - KNN
 - SNA

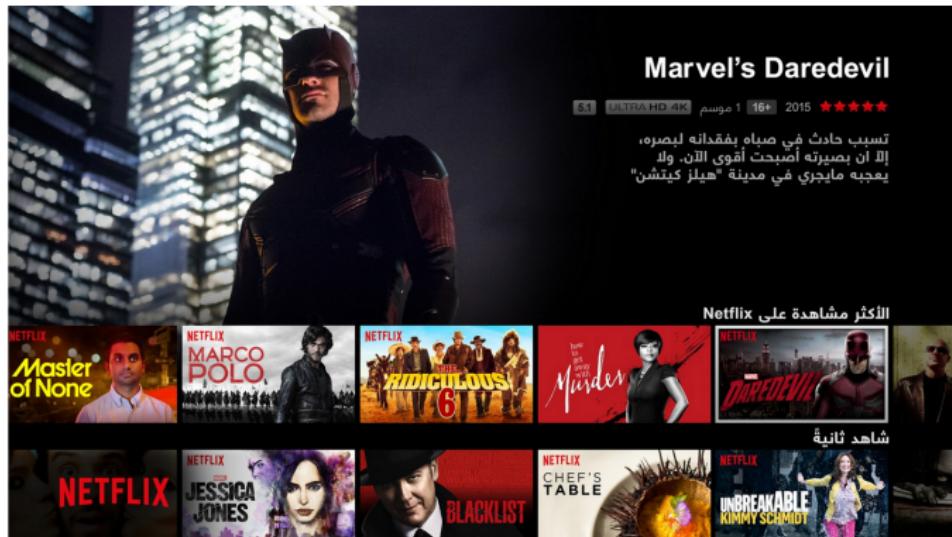
Mejores predicciones

- Venta (Chatbots, sistemas de recomendación)
- Fidelización (Software consciente de contexto, análisis de redes sociales)
- Producción (Redes neurales, redes bayesianas)
- Análisis (Map-Reduce (aka Big Data))

Recommending for the World

#AlgorithmsEverywhere

by [Yves Raimond](#) and [Justin Basilico](#)



The Netflix experience is driven by [a number of Machine Learning algorithms](#): [personalized ranking](#), [page generation](#), [search](#), [similarity](#), [ratings](#), etc. On the 6th of January, we

Inferencia (retos)

- Problema
- Modelo
- Implementación

1-2-3 Machine Learning

1. Normalizar los datos
2. Crear el modelo
3. Entrenar el modelo
4. Comprobar su funcionamiento

Que

- Probabilidad
- Estructura
- Conceptos ocultos (Hidden concepts)

Donde

- Supervised learning (objetivo)
- Unsupervised learning (conceptos ocultos)
- Reinforcement learning (feedback)

Para que

- Predicciones
- Diagnóstico
- Sumarizaciones

Como

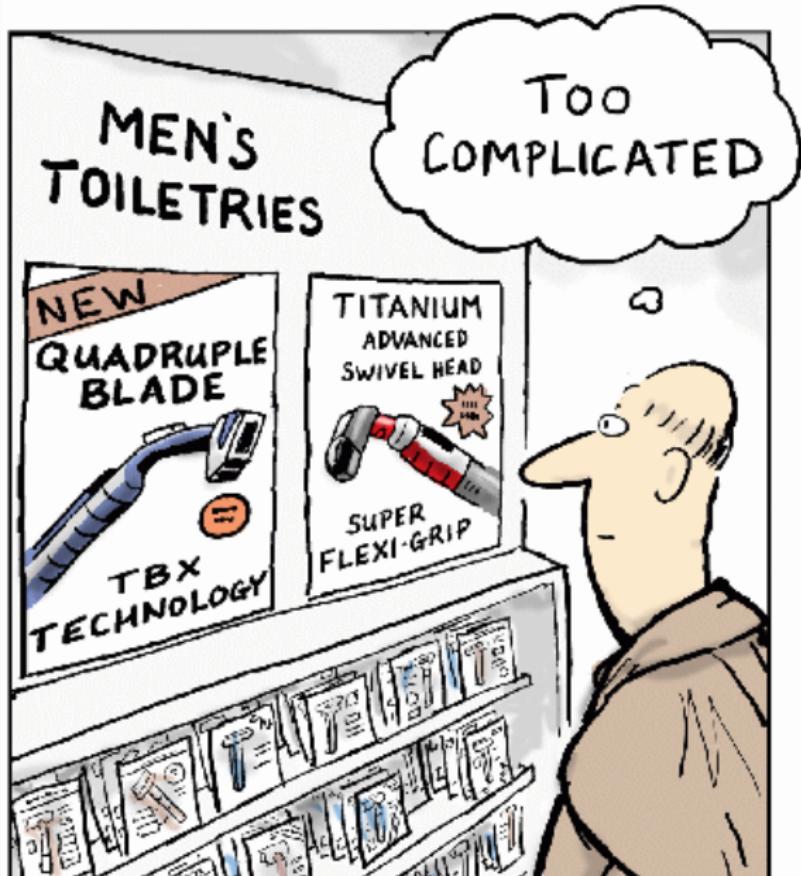
- Pasivo (Observador)
- Activo
- Offline
- Online

Salida

- Clasificación (Binario)
- Regresión (Continuo)

Detalles

- Generativo (Generalizaciones)
- Discriminativo (Distinguir)



Navaja de Occam

"Pluralitas non est ponenda sine necessitate"

"Plurality is not to be posited without necessity"

Navaja de Occam (Español)

Cuando se tienen dos teorías que obtienen las mismas predicciones, generalmente la más simple es la mejor

Bibliotecas

Principales

- DeepLearning4J <https://deeplearning4j.org/>
- BID Data Project
<http://bid2.berkeley.edu/bid-data-project/>
- Neuroph <http://neuroph.sourceforge.net/index.html>
- Smile <http://haifengl.github.io/smile/>

Complementarias

- Commons Math
<http://commons.apache.org/proper/commons-math/>
- Eclipse Collections
<https://www.eclipse.org/collections/>

- AmazonML
<https://aws.amazon.com/machine-learning/>
- Bluemix - Watson <https://www.ibm.com/cloud-computing/bluemix/watson>
- Oracle Advanced Analytics <https://www.oracle.com/database/advanced-analytics/index.html>

Demo

Demo 1 - Panchito

Panchito el Bot Bayesiano

Demo

1. Mamiferos
2. Aves
3. Sangre fria
4. Pez
5. Anfibios
6. Insectos
7. Maritimo

Demo

1. Cabello
2. Plumas
3. Huevos
4. Leche
5. Volador
6. Acuatico
7. Depredador
8. Dientes
9. Columna vertebral
10. Respira
11. Venenoso
12. Aletas
13. Cantidad piernas
14. Cola
15. Domestico

Demo

1. Learning rate: Velocidad de aprendizaje
2. Momentum: Controla convergencia hacia mínimos
3. Error: Mientras menor sea el error, mayor la aproximación*

Demo

1. Input: 16
2. Output: 7
3. Middle: 2
4. Error: 0.2, Momentum: 0.7

Demo

1. Input: 16
2. Output: 7
3. Middle: 2
4. Error: 0.3, Momentum: 0.7

Demo

1. Input: 16
2. Output: 7
3. Middle: 6
4. Error: 0.6, Momentum: 0.4

Experiencias previas

- **Problema:** Mejorar las recomendaciones en ISO 27001
- **Modelo:** Clasificación inmediata mediante análisis de redes sociales
- **Implementación:** JGraph + JUNG + Commons Math + Java FX

JRiskSimulator

- **Problema:** Adaptar la recomendación de un profesional de acuerdo a las recomendaciones de mis amigos
- **Modelo:** Clasificación inmediata mediante perceptrones + Análisis de redes sociales
- **Implementación:** Neuroph + Commons Math + Lucene Search + Java EE

The screenshot shows the Medmigo website homepage. At the top left is the Medmigo logo. To the right are links for "Para profesionales", the Spanish flag, and "Iniciar Sesión". Below the header is a search bar with the placeholder "Busca un profesional de la salud" and a "Buscar" button. A large, smiling man with grey hair is the central image. In the background, a woman and a child are visible. A dark blue banner at the bottom contains the text "Confía en Medmigo" and "Busca profesionales de la salud en los que tus amigos, otros profesionales de la salud y la comunidad confian". There are three small white dots below the banner. At the very bottom center is a small icon.

Para profesionales

Español (ES) Iniciar Sesión

Busca un profesional de la salud

Buscar

Confía en Medmigo

Busca profesionales de la salud en los que tus amigos, otros profesionales de la salud y la comunidad confian

● ● ●

- **Problema:** Indexar n cantidad de biblias en un metabuscador que soporte "palabras parecidas"
- **Modelo:** Binary tree + Tokenization + Levenshtein distance + Lazy data fetch
- **Implementación:** NLP + Lucene Search + Java EE

The screenshot shows a dark-themed website for "BIBLE GENERATION". At the top right are links for "Cerrar Sesión" and a download icon. On the left is a small logo. The main title "BIENVENIDO A BIBLE GENERATION" is centered in large blue letters. Below it is a subtitle: "Es una generación que vive completamente convencida y apasionada por la Biblia, creyendo que esta, es la Palabra de Dios." A search bar at the bottom has the text "jesub" entered. To the right of the search bar is a blue "BUSCAR" button. Below the search bar, several short Spanish text snippets are listed:

- Cndó Jesús ✨tnta gnt, subió a mntaña y c sentd. Los discípulos se acerkan.
- Entonces Jesús c subió a la 🌋 y l viento c calmó. Los discípulos estan muy asombrados 😱
- Después Jesús dispidió a la gnt, subió a l 🌋 y c fue al piblo d Magadán.
- Cndó Jesús staba subiendo a la brk 🌋 l q ahra staba sno le rogó q lo djara ir cn él.
- Entonces Jesús ls dejó, vivió a subir a la bark 🌋 y c fue al otro lado d lgo.
- Dspas l diablo 🤢 llevó a Jesús a la ciudd d Crusién. Allí lo subió a la part ms alta dl templo 🏛
- Cndó lta la gnt c hbio ido, Jesús subió slo a 1 crro pra orar 🙏. Allí stuvo orando 🙏 hasta q anochció.
- Jesús salió d allí y lgó a la orilla d l Lgo d Galilea. Luego subió a 1 crro y c sntd.

Fin

Gracias

- me@vorozco.com
- <http://vorozco.com>
- <http://github.com/tuxtor/slides>



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