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Introducción a la Ciencia de Datos

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Noticias del día

Qué ha pasado en el mundo de Data Science?

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IBM to Buy Red Hat, the Top Linux Distributor, for $34 Billion

IBM's purchase of Red Hat, the largest distributor of the open-source operating system Linux, is the latest competitive step among large business software companies to gain an edge in the cloud computing market. Pau Barrena/Agence France-Presse — Getty Images

Cloudera and Hortonworks Announce Merger to Create World's Leading Next Generation Data Platform and Deliver Industry's First Enterprise Data Cloud

Published: October 3, 2018

Establishes a superior unified platform and clear industry standard from the Edge to AI

Strategic combination accelerates market development, fuels innovation and produces substantial benefit for customers, partners and community

PALO ALTO, Calif. & SANTA CLARA, Calif.--(BUSINESS WIRE)--Oct. 3, 2018--Cloudera, Inc. (NYSE:CLDR) and Hortonworks, Inc. (Nasdaq:HDP) jointly announced today that they have entered into a definitive agreement under which the companies will combine in an all-stock merger of equals. The transaction, which has been unanimously approved by the Boards of Directors of both companies, will create the world's leading next generation data platform provider, spanning multi-cloud, on-premises and the Edge. The combination establishes the industry standard for hybrid cloud data management, accelerating customer adoption, community development and partner engagement.

1

Anuncios parroquiales

Proyecto Final

Proyecto Final

El objetivo es que trabajen en el proyecto a lo largo del curso.

Conforme vayamos aprendiendo las herramientas, se recomienda las practiquen con sus propios datos.

Vayan formando sus equipos oportunamente.

Recursos

- Los tutoriales de Python van a estar disponibles toda la clase
- El machote para el reporte final ya esta en la pagina web.

2

Gobierno y Administración del Dato

Tenemos que entender nuestra materia prima

Que es Machine Learning?

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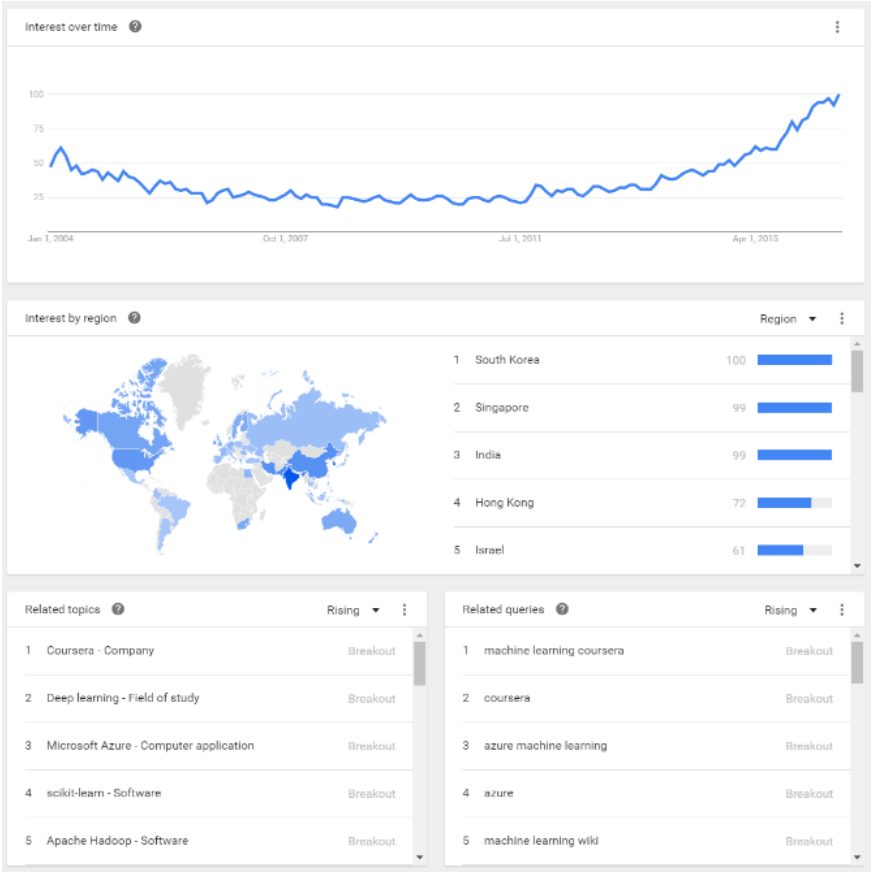
- Durante los 80s – 90s, mucho de lo que hoy llamamos Machine Learning se denominaba Inteligencia Artificial. IA era un termino sombrilla para todo lo que implicaba un entrenamiento usando datos.
  - Redes Neuronales
  - Algoritmos genéticos
  - Lógica difusa
  - Modelos probabilísticos

Renacimiento de AI-ML

- A finales de 1990s, mucha gente comenzó a utilizar herramientas más formales para el aprendizaje, mucha gente de matemáticas y estadística comenzaron a involucrarse con la comunidad de Machine Learning.
- IA se renombro Machine Learning, y muchos algoritmos clásicos de IA fueron adoptados por la comunidad de ML
  - Maquinas de Soporte Vectorial
  - K-Means
  - Regresión Lineal
  - Inferencia Bayesiana



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ML ha logrado lo que se pensaba imposible

Google's Computer Program Beats Lee Se-dol in Go Tournament

By CHOE SANG-HUN MARCH 15, 2016

Lee Se-dol with his daughter Lee Hye-lim on his way to the last Go match with Google's AlphaGo artificial intelligence program in Seoul, South Korea. Kim Hong-Ji/Reuters

SEOUL, South Korea — Ending what was billed as the match of the century, a Google computer program defeated a South Korean master of Go, an ancient board game renowned for its complexity, in their last face-off on Tuesday.

The program AlphaGo's 4-1 victory was a historic stride for computer

Todo mundo está haciendo ML

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Apple acquires machine learning startup Turi, formerly known as GraphLab and Dato

JORDAN NOVET AUGUST 5, 2016 1:51 PM

TAGS: APPLE, DATO, GRAPHLAB, MACHINE LEARNING, TOP STORIES, TURI

Image Credit: Mr. Gray/Flickr

Apple has acquired Turi, a machine learning software startup. The startup formerly went by the names GraphLab and Dato.

Apple provided no information other than its standard boilerplate message for confirming acquisitions. "Apple buys smaller technology companies from time to time, and we generally do not discuss our purpose or plans," an Apple spokesperson told VentureBeat in an email. (Hat tip to Geekwire for breaking

Press Releases

HyTrust Unveils Enhanced Workload Security Solutions for the New Multi-Cloud World

DataVisor Raises $8.4M to

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Business

Crystal Ball for Corn Crop Yields Will Revolutionize Commodity Trading

TellusLabs is using NASA imagery, machine learning, and expert knowledge about vegetation to deliver accurate, in-season agricultural yield estimates.

by Elizabeth Woyke August 9, 2016

Deriving financial insights from satellite images isn't a new idea, but TellusLabs is putting a twist on it. The Boston startup analyzes satellite imagery from NASA as well as weather data from the National Oceanic and Atmospheric Administration and seasonal, crop-growing information from the U.S. Department of Agriculture. It then uses machine-learning algorithms to generate intelligence about natural resources, such as predicting agricultural yields.

The strategy might sound similar to that of other satellite imagery analysis companies like Descartes Labs and Orbital Insight. However, TellusLabs plans to differentiate itself by applying scientific expertise in vegetation and climatology to its analysis, maintaining a narrow focus on natural resources, and quickly rolling out new products. Its goal is to be "a Bloomberg terminal for Earth signals." "There's a broad base of people who have to make tough decisions around natural resources, and we want to give them quality data, quickly," says TellusLabs CEO and cofounder David Potere.

Libros

- Bishop, Christopher M. *Pattern recognition and machine learning*. Springer, 2006.
- Rogers, Simon, and Mark Girolami. *A first course in machine learning*. CRC Press, 2011. (http://www.dcs.gla.ac.uk/~srogers/firstcourseml/)
- James, Gareth, et al. *An introduction to statistical learning*. New York: Springer, 2013. (http://www-bcf.usc.edu/~gareth/ISL/)
- Petersen, Kaare Brandt, and Michael Syskind Pedersen. *The matrix cookbook*. Technical University of Denmark 7 (2008): 15. (https://www.math.uwaterloo.ca/~hwolkowi/matrixcookbook.pdf)

Actividad Grupal

1st Message

- Mafia
- Poder
- Corrupción
- Complot
- México

2nd Message

- Gol
- México
- Tirititito
- Fútbol

Como supieron?

- Las palabras están asociadas a cada persona
- Su cerebro correlaciona las palabras con las personas.
- Su cerebro calcula las probabilidades conjuntas de que la persona esté asociada al mensaje.

Reglas del juego

- Datos:
  - Documentos - > Texto
  - Imagenes - > Pixeles
  - Canciones -> notas, tonos
- Features, Características:
  - Textos -> Cadenas: hi, ho, amigo, ayuda
  - Imagenes -> RGB, DN, grayscale, flotantes
  - Tonos -> Flotantes que representen el tono.

Aprendizaje Supervisado

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- Set de datos etiquetados
  - Set de emails con spam/not spam.
  - Reviews de Amazon (Estrellas)
  - Facebook like/not like.
  - Stock Market - > Volumen
- Algoritmo
  - Regresión Lineal
  - Regresión Logística
  - Maquinas de Soporte Vectorial
  - Deep Learning (Neural Networks and Convolutional NN)

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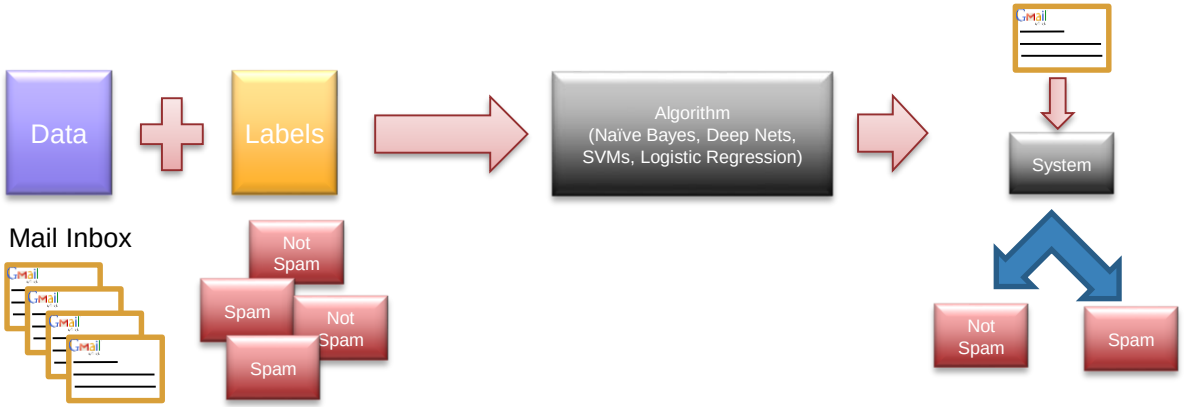
Aprendizaje Supervisado



Cada categoría tendrá features que lo van a caracterizar

Spam: Offer, Viagra, medicine, Free, Conference in China

Not Spam: UP, Machine Learning, Evento, Mia, Mónica

Métodos de Validación

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- Análisis de Sesgo
  - *“The needs of the Many outweigh the needs of the few”*
    - *Spock*
  - No le quieres decir a alguien que tiene cancer, pero **en verdad** no le quieres decir a alquien que no tiene, en caso de que si tenga.

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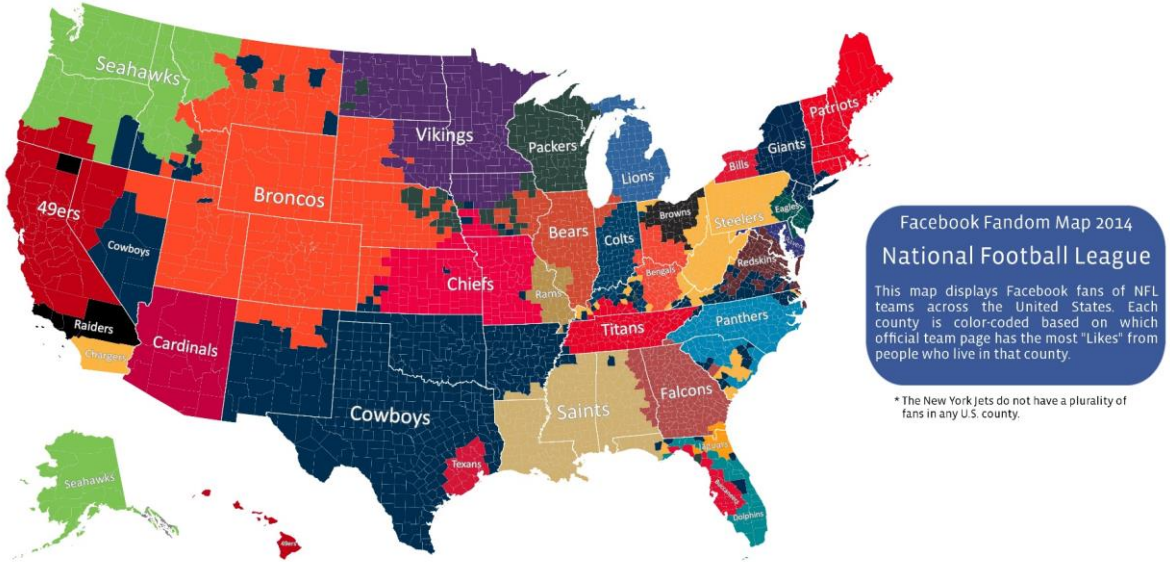

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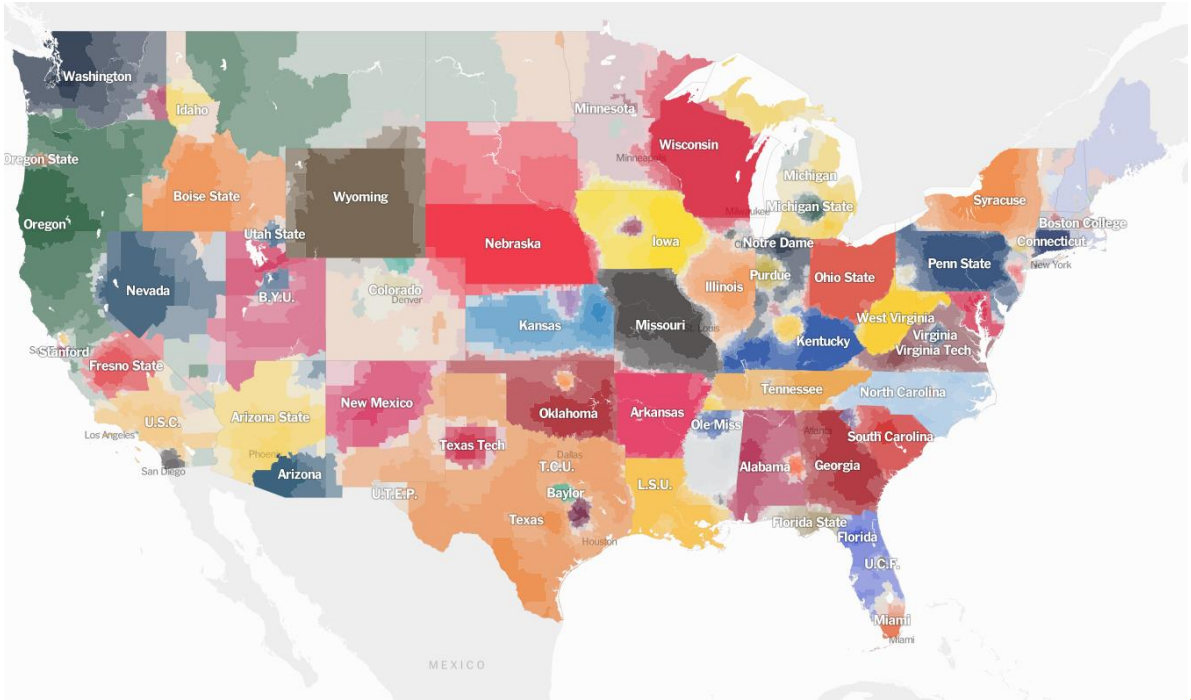

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Descubrimiento de conocimiento

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- No necesitamos etiquetas
- Los datos se organizan sólos
- La mayoría de los algoritmos descubren solos esa organización

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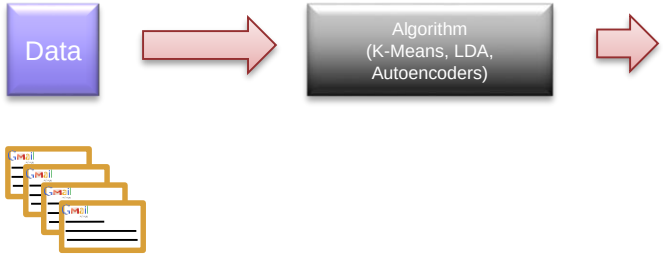
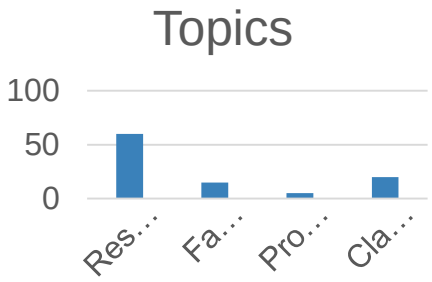
Aprendizaje no Supervisado





Inbox

Los elementos que describen cada datum, en este caso son las palabras en cada email.

Cada tópico tendrá características que los separen del resto.

Investigación: NLP, Propuesta, Machine Learning, Deep Nets, Bayesian

Family: Mia, Casa, Mexico

Classes: Calificaciones, Tarea, Extensión, Horas de oficina