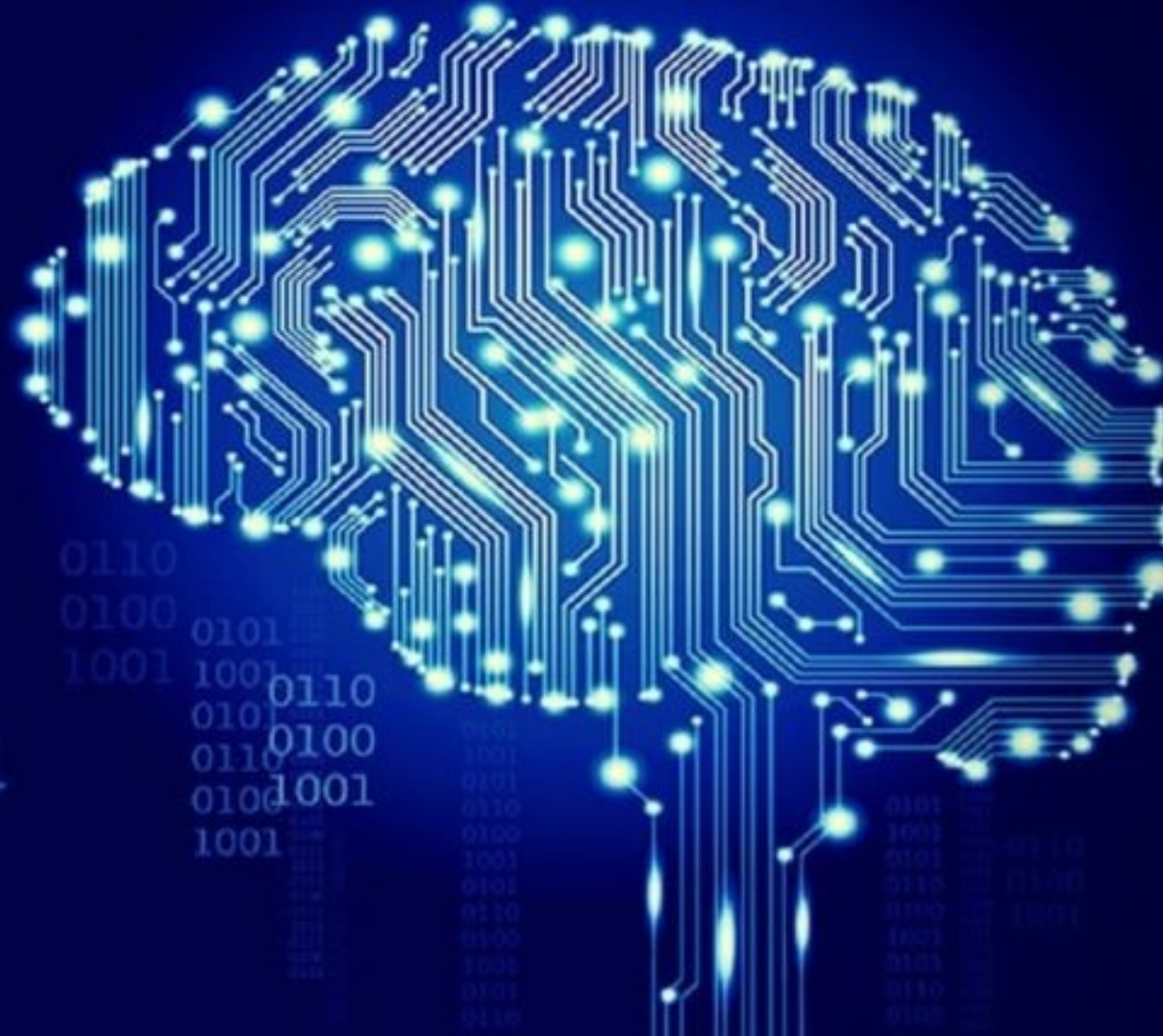


# “Python – Librerías de IA”

Python  
A.I.  
Inteligencia Artificial

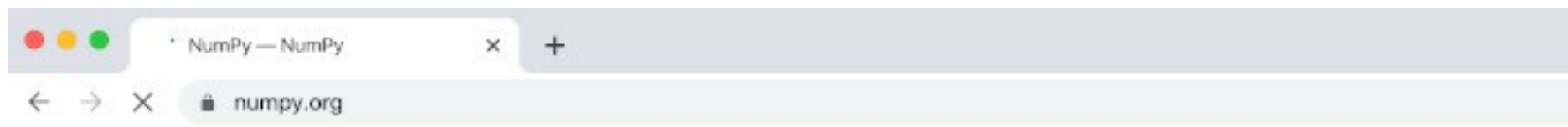


Rogelio Ferreira Escutia

# Cálculo Numérico

# Numpy

- NumPy proporciona una estructura de datos universal que posibilita el análisis de datos y el intercambio de datos entre distintos algoritmos.
- Las estructuras de datos que implementa son vectores multidimensionales y matrices con capacidad para gran cantidad de datos.
- Además, esta librería proporciona funciones matemáticas de alto nivel que operan en estas estructuras de datos.



# NumPy

NumPy.org

## NumPy

NumPy is the fundamental package for scientific computing with Python. It contains among other things:

- a powerful N-dimensional array object
- sophisticated (broadcasting) functions
- tools for integrating C/C++ and Fortran code
- useful linear algebra, Fourier transform, and random number capabilities

Besides its obvious scientific uses, NumPy can also be used as an efficient multi-dimensional container of generic data. Arbitrary data-types can be defined. This allows NumPy to seamlessly and speedily integrate with a wide variety of databases.

NumPy is licensed under the [BSD license](#), enabling reuse with few restrictions.

## Getting Started

To install NumPy, we strongly recommend using a *scientific Python distribution*. See [Installing the SciPy Stack](#) for details.

Many high quality online tutorials, courses, and books are available to get started with NumPy. For a quick introduction to NumPy we provide the [NumPy Tutorial](#). We also recommend the [SciPy Lecture Notes](#) for a broader introduction to the scientific Python ecosystem.

For more information on the SciPy Stack (for which NumPy provides the fundamental array data structure), see [scipy.org](#).

### About NumPy

[Community](#)

[License](#)

[Code of Conduct](#)

[Old array packages](#)

# Machine Learning

# scikit-learn

- ?



# scikit-learn

Machine Learning in Python

Getting Started

What's New in 0.22

GitHub

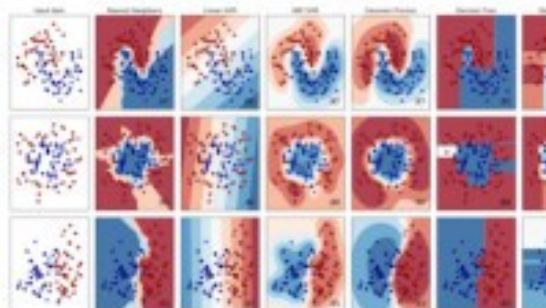
- Simple and efficient tools for predictive data analysis
- Accessible to everybody, and reusable in various contexts
- Built on NumPy, SciPy, and matplotlib
- Open source, commercially usable - BSD license

## Classification

Identifying which category an object belongs to.

**Applications:** Spam detection, image recognition.

**Algorithms:** SVM, nearest neighbors, random forest, and more...

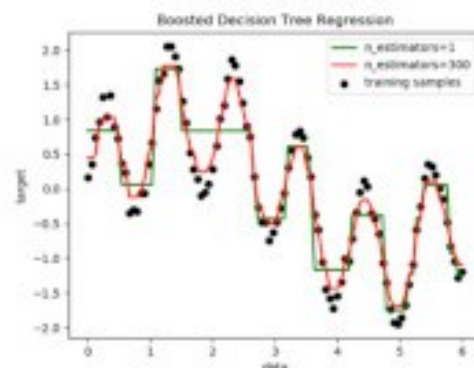


## Regression

Predicting a continuous-valued attribute associated with an object.

**Applications:** Drug response, Stock prices.

**Algorithms:** SVR, nearest neighbors, random forest, and more...



## Clustering

Automatic grouping of similar objects into sets.

**Applications:** Customer segmentation, Grouping experiment outcomes

**Algorithms:** k-Means, spectral clustering, mean-shift, and more...

K-means clustering on the digits dataset (PCA-reduced data). Centroids are marked with white cross



# Deep Learning



# TensorFlow

- ?

# An end-to-end open source machine learning platform

TensorFlow

For JavaScript

For Mobile & IoT

For Production

The core open source library to help you develop and train ML models. Get started quickly by running Colab notebooks directly in your browser.

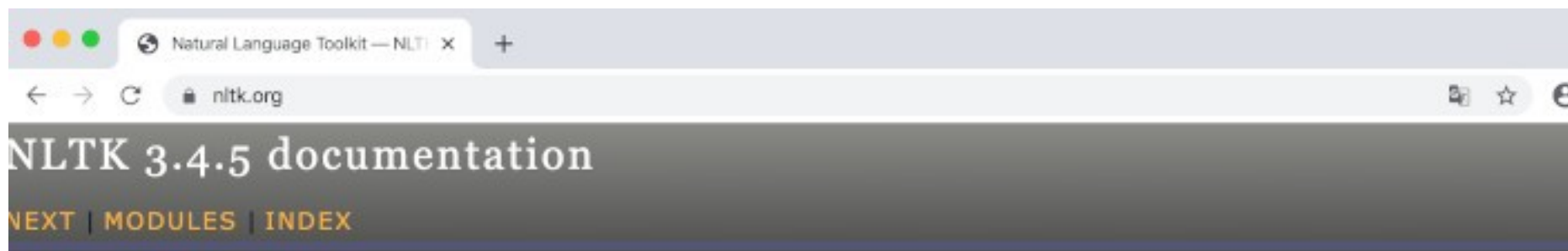
Get started with TensorFlow



# Lenguaje Natural

# NLTK

- ?



## Natural Language Toolkit

NLTK is a leading platform for building Python programs to work with human language data. It provides easy-to-use interfaces to [over 50 corpora and lexical resources](#) such as WordNet, along with a suite of text processing libraries for classification, tokenization, stemming, tagging, parsing, and semantic reasoning, wrappers for industrial-strength NLP libraries, and an active [discussion forum](#).

Thanks to a hands-on guide introducing programming fundamentals alongside topics in computational linguistics, plus comprehensive API documentation, NLTK is suitable for linguists, engineers, students, educators, researchers, and industry users alike. NLTK is available for Windows, Mac OS X, and Linux. Best of all, NLTK is a free, open source, community-driven project.

NLTK has been called "a wonderful tool for teaching, and working in, computational linguistics using Python," and "an amazing library to play with natural language."

[Natural Language Processing with Python](#) provides a practical introduction to programming for language processing. Written by the creators of NLTK, it guides the reader through the fundamentals of writing Python programs, working with corpora, categorizing text, analyzing linguistic structure, and more. The online version of the book has been updated for Python 3 and NLTK 3. (The original Python 2 version is still available at [http://nltk.org/book\\_1ed](http://nltk.org/book_1ed).)

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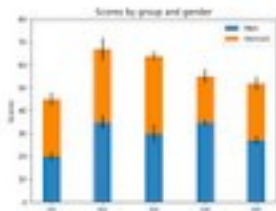
[HOWTO](#)

### SEARCH

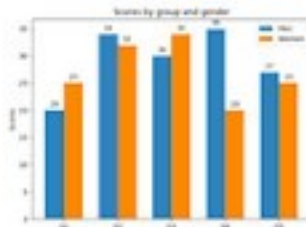
# Visualización de Datos

# Matplotlib

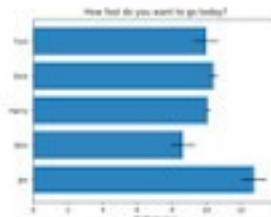
- **Matplotlib es la librería gráfica de python estándar y la más conocida.**
- **Puedes usar matplotlib para generar gráficos de calidad necesaria para publicarlas tanto en papel como digitalmente.**
- **Con matplotlib puedes crear muchos tipos de gráficos: series temporales, histogramas, espectros de potencia, diagramas de barras, diagramas de errores, etc.**



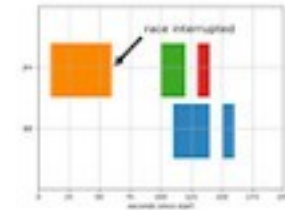
Stacked Bar Graph



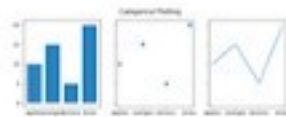
Grouped bar chart with labels



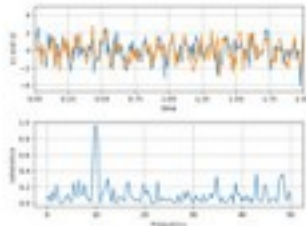
Horizontal bar chart



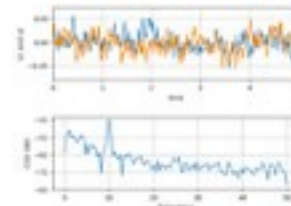
Broken Barh



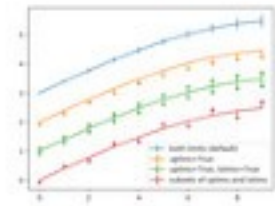
Plotting categorical variables



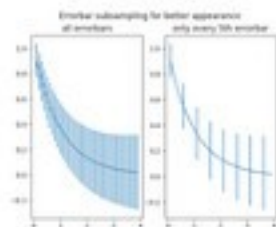
Plotting the coherence of two signals



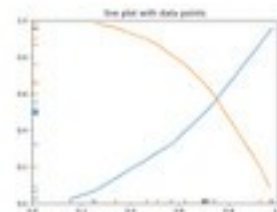
CSD Demo



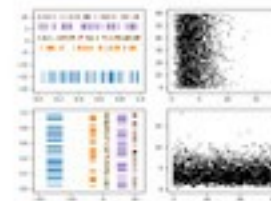
Errorbar limit selection



Errorbar Subsample



EventCollection Demo



Eventplot Demo



Filled polygon



# matplotlib

Version 3.1.1

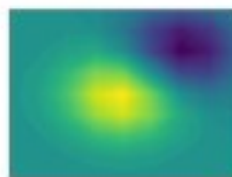
Fork me on GitHub

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Matplotlib is a Python 2D plotting library which produces publication quality figures in a variety of hardcopy formats and interactive environments across platforms. Matplotlib can be used in Python scripts, the Python and IPython shells, the Jupyter notebook, web application servers, and four graphical user interface toolkits.



Matplotlib tries to make easy things easy and hard things possible. You can generate plots, histograms, power spectra, bar charts, errorcharts, scatterplots, etc., with just a few lines of code. For examples, see the [sample plots](#) and [thumbnail gallery](#).

For simple plotting the `pyp1ot` module provides a MATLAB-like interface, particularly when combined with IPython. For the power user, you have full control of line styles, font properties, axes properties, etc, via an object oriented interface or via a set of functions familiar to MATLAB users.

Quick search

Matplotlib 3.0 is Python 3 only. For Python 2 support, Matplotlib 2.2.x will be continued as a LTS release and updated with bugfixes until January 1, 2020.

[Support Matplotlib](#)



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Departamento de Sistemas y Computación***

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                      http://www.xumarhu.net/***

***Twitter:           http://twitter.com/rogeplus***

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