

Requerimientos para el código del libro:

- Python >3.4.3
- SciPy >0.14.0
- NumPy >1.9.1
- sci-kit learn >0.15.2
- matplotlib >1.4.0
- pandas >0.15.2

Extras:

- NLTK (Natural Language Processing)
- FLASK (Web)
- seaborn (Statistical data visualization)
- Theano (GPU Acceleration)

Web de la editorial: <http://www.packtpub.com>

Tipos de Machine Learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning

David Wolpert's “No Free Lunch Theorems”:

The Lack of A Priori Distinctions between Learning Algorithms - D.H. Wolpert; 1996

No Free Lunch Theorems for Optimization - D.H. Wolpert and W.G. Macready, 1997

Formas de instalar paquetes en Python:

```
>>> pip install somepackage
>>> pip install somepackage --upgrade
>>> conda install somepackage
>>> conda update somepackage
```

Tutoriales:

NumPy) http://wiki.scipy.org/Tentative_NumPy_Tutorial
Pandas) <http://pandas.pydata.org/panda-docs/stable/tutorials>
Matplotlib) <http://matplotlib.org/users/beginner.html>
IPython) <https://ipython.org/ipython-doc/3/notebook/index.html>
Sci-kit Learn) <http://scikit-learn.org/stable>

Logistic Regression: From Introductory to Advanced Concepts and Applications - Dr. Scott Menard; Sage Publications

The Nature of Statistical Learning Theory - Vladimir Vapnik; Springer Science and Media

A Tutorial on Support Vector Machines for Pattern Recognition - Chris J.C. Burgess; Data Mining and Knowledge Discovery 2(2):121-167, 1998

LIBLINEAR <http://www.csie.ntu.edu.tw/~cjlin/liblinear>

LIBSVM <http://www.csie.ntu.edu.tw/~cjlin/libsvm>

An algorithm for finding best matches in logarithmic expected time - J.H. Friedman, J.L. Bentley, R.A. Finkel; ACM Transactions on Mathematical Software (TOMS), 3(3): 209-226, 1977

Metrics:

<http://scikit-learn.org/stable/modules/generated/sklearn.neighbors.DistanceMetric>

The Elements of Statistical Learning - Trevor Hastie, Robert Tibshirami, and Jerome Friedman; Springer (section 3.4)

Feature Selection: http://scikit-learn.org/stable/modules/feature_selection.html

Manifold: <http://scikit-learn.org/stable/modules/manifold.html>

A Study of Cross-validation and Bootstrap for Accuracy Estimation and Model Selection - R. Kohavi et al; In *Ijcai*, volume 14, pages 1137-1145, 1995

Analysis of Variance of Cross-validation Estimators of the Generalization Error - M. Markatou, H. Tian, S. Biswas, G.M. Hripcsak; *Journal of Machine Learning Research*, 6: 1127-1168, 2005

Improvements on Cross-validation: The 632+ Bootstrap Method - B. Efron and R. Tibshirani; *Journal of the American Statistical Association*, 92(438):548-560, 1997

Bias in Error Estimation When Using Cross-validation for Model Selection - S. Varma, R. Simon; *BMC bioinformatics*, 7(1):91, 2006

Scoring Parameters in GridSearch:
<http://scikit-learn.org/stable/modules/model-evaluation.html>

The Use of the Area Under the ROC Curve in the Evaluation of Machine Learning Algorithms - A.P. Bradley; *Pattern Recognition*, 30(7): 1145-1159, 1997

Stacked Generalization - David H. Wolpert; *Neural Networks*, 5(2): 241-259, 1992

Bagging Predictors - L. Breiman; *Machine Learning*, 24(2): 123-140, 1996 [online]

The Strength of Weak Learnability - R.E. Schapire; *Machine Learning*, 5(2): 197-227, 1990

Experiments with a New Boosting Algorithm - Y. Freund, R.E. Schapire, et al; *ICML*, volume 96, pages 148-156, 1996

An Improvement of Adaboost to Avoid Overfitting - G.Raetsch, T. Onoda, K.R. Mueller; *Proc. of the Int. Conf. on Neural Information Processing*. Citeseer, 1998

The BigChaos Solution to the Netflix Grand Prize - A. Toescher, M. Jahrer, R.M. Bell; *Netflix prize documentation*, 2009.
web:BigChaos: http://www.stat.osu.edu/~dmsl/GrandPrize2009_BPC_BIGCHAOS.pdf

El modelo es muy complejo...
<http://techblog.netflix.com/2012/04/netflix-recommendations-beyond-5-stars.html>

Learning Word Vectors for Sentiment Analysis - A.L. Maas, R.E. Daly, P.T. Pham, D. Huang, A.Y. Ng, C. Potts; *Proceedings of the 49th Annual Meeting of the Association for Computational Linguistics: Human Language Technologies*, pages 142-150, Portland, Oregon, USA, June 2011

Words vs Character N-Grams for Anti-Spam Filtering - Ioannis Kanaris, Konstantinos Kanaris, Ioannis Houvardas, Efstathios Stamatatos; *International Journal on Artificial Intelligence Tools*, 16(06): 1047-1067, 2007

Regex <https://developers.google.com/edu/python/regular-expressions>

Regex <https://docs.python.org/3.4/library/re.html>

An algorithm for suffix stripping - Martin F. Porter; *Program: electronic library and information systems*, 14(3):130-137, 1980

NLTK <http://www.nltk.org>

Libro NLTK <http://www.nltk.org/book>

NLTK STEM <http://www.nltk.org/api/nltk.stem.html>

Influence of word normalization on text classification - Michal Toman, Roman Tesar, Karel Jezek; *Proceedings of InSciT*, pages 354-358, 2006

Naive Bayes and Text Classification I: introduction and theory - S. Raschka; *Computer Research Repository (CoRR)*, abs/1410.5329, 2014

web: <http://arxiv.org/pdf/1410.5329v3.pdf>

Murmurhash <http://sites.google.com/site/murmurhash/>

Latent Dirichlet Allocation - D.M. Blei, A.Y. Ng, M.I. Jordan; The Journal of Machine Learning Research, 3: 993-1022, 2003

“word2vec”:

Efficient Estimation of Word Representations in Vector Space; arXiv: 1301.3781, 2013

web: <https://code.google.com/p/word2vec>

Serialización en Python (Pickle) <https://docs.python.org/3.4/library/pickle.html>

Forma más eficiente de serializar arrays de NumPy:
Joblib <https://pypi.python.org/pypi/joblib>

Sqlite <http://www.sqlite.org>

Sqlite Python <http://docs.python.org/3.4/sqlite3.html>

Sqlite manager <http://addons.mozilla.org/en-US/firefox/addon/sqlite-manager>

FLASK <http://flask.pocoo.org/docs/0.10>

WTForms:

WTForms Docs <https://wtforms.readthedocs.org/en/latest>

```
>>> pip install wtforms
```

JINJA <http://jinja.pocoo.org>

Housing Dataset <https://archive.ics.uci.edu/ml/datasets/Housing>

Seaborn <http://stanford.edu/~mwaskom/software/seaborn>

Introduction to Linear Regression Analysis - Montgomery, D.C., Peck, E.A., Vining, G.G.; John Wiley and Sons, 2012, pp. 318-319

The Classical Linear Regression Model - Dr. Stephen Pollock
web: <http://www.le.ac.uk/users/dsgp1/COURSES/MESOMET/ECMETXT/06mesmet.pdf>

RANSAC Threshold:

Automatic Estimation of the Inlier Threshold in Robust Multiple Structures Fitting - R. Toldo, A. Fusiello; Image Analysis and Processing - ICIAP 2009, pages 123-131. Springer, 2009

Otras opciones: Ridge Regression, Least Absolute Shrinkage and Selection Operator (LASSO), Elastic Net

Linear Model http://scikit-learn.org/stable/modules/linear_model.html

Support Vector Machines for Classification and Regression - S.R. Gunn et al; ISIS technical report, 14, 1998

SVM

<http://scikit-learn.org/stable/modules/generated/sklearn.svm.SVR.html#sklearn.svm.SVR>

Clustering: Prototype (centroid, mediod), Hierarchical, Density-based
Quality test: elbow method, silhouette plots

k-means++: The Advantages of Careful Seeding - D. Arthur, S. Vassilvitskii; Proceedings of the eighteenth annual ACM-SIAM symposium on discrete algorithms, pages 1027-1035, Society for Industrial and Applied Mathematics

A Fuzzy Relative of the Isodata Process and its Use in DETecting Compact Well-separated Clusters - J.C. Dunn; 1973

Pattern Recognition with Fuzzy Objective Function Algorithms - J.C. Bezdek; Springer Science and Business Media, 2013

Comparative Analysis of k-means and Fuzzy c-means Algorithms - S. Ghosh, S.K. Dubey; IJACSA, 4: 35-38, 2013

A Tutorial on Spectral Clustering - U. Von Luxborg; *Statistics and computing*, 17(4): 395-416, 2007
web: <http://arxiv.org/pdf/0711.0189v1.pdf>

Google Translate
<http://googleresearch.blogspot.com/2015/07/how-google-translate-squeezes-deep.html>

DeepFace: Closing the gap to human-level performance in face verification - Y. Taigman, M. Yang, M. Ranzato, L. Wolf; *Computer Vision and Pattern Recognition CVPR, 2014 IEEE Conference*, pages 1701-1708

DeepSpeech: Scaling up end-to-end speech recognition - A. Hannum, C. Case, J. Casper, B. Catanzaro, G. Daimos, E. Elsen, R. Prenger, S. Satheesh, S. Sengupta, A. Coates, et al; *arXiv: 1412.5567*, 2014

Toxicity prediction using deep learning - T. Unterthiner, A. Mayr, G. Klambauer, S. Hochreiter; *ArXiv: 1503.01445*, 2015

“The Vanishing Gradient Problem”

The Elements of Statistical Learning - T. Hastie, J. Friedman, R. Tibshirani; *Volume 2*, Springer, 2009

Pattern Recognition and Machine Learning - C.M. Bishop et al; *Volume 1*, Springer New York, 2006

(MNIST) *Gradient-based Learning Applied to Document Recognition* - Y. LeCun, L. Bottou, Y. Bengio, P. Haffner; *Proceedings of the IEEE*, 86(11): 2278-2324, November, 1998
web: <http://yann.lecun.com/exdb/mnist>

Learning Deep Architectures for AI - Y. Bengio; *Foundations and Trends in Machine Learning*, 2(1):1-127, 2009

Convolutional NNs<http://yann.lecun.com>

Best Practices for Convolutional Neural Networks Applied to Visual Document Analysis - P.Y. Simard, D. Steinkraus, J.C. Platt; *IEEE*, 2003, p.958

Long Short-term Memory - S. Hochreiter, J. Schmidhuber; *Neural Computation*, 9(8): 1735-1780, 1997

Theano<http://deeplearning.net/software/theano>

Theano tutorial
<http://deeplearning.net/software/theano/tutorial/index.html#tutorial>

Theano - Yoshua Bengio, LISA <http://lisa.iro.umontreal.ca>

Pylearn 2<http://deeplearning.net/software/pylearn2>

Lasagne<https://lasagne.readthedocs.org/en/latest>

Keras<http://keras.io>

Theano: A CPU and GPU Math Compiler in Python - J. Bergstra, O. Breuleux, F. Bastien, P. Lamblin, R. Pascanu, G. Desjardins, J. Turian, D. Warde-Farley, Y. Bengio; *Proc. 9th Python in Science Conf.*, pages 1-7, 2010

SymPy<http://www.sympy.org>

Configurar GPU en Theano
<http://deeplearning.net/software/theano/tutorial/using-gpu.html#using-gpu>

Configurar Theano
<http://deeplearning.net/software/theano/library/config.html>

Manejo de Memoria en Theano
<http://deeplearning.net/software/theano/tutorial/aliasing.html>

Principales Expertos Actuales en Machine Learning:

- Geoff Hinton <http://www.cs.toronto.edu/~hinton/>
- Andrew Ng <http://www.andrewng.org>
- Yann Lecun <http://yann.lecun.com>
- Juergen Schmidhuber <http://people.idsia.ch/~juergen>
- Yoshua Bengio <http://www.iro.umontreal.ca/~bengioy>