

# ADENINE — A Data Exploration pIpeliNE

**Samuele Fiorini**  
**Federico Tomasi**  
**Annalisa Barla**

SAMUELE.FIORINI@DIBRIS.UNIGE.IT  
FEDERICO.TOMASI@DIBRIS.UNIGE.IT  
ANNALISA.BARLA@UNIGE.IT

*Department of Informatics, Bioengineering,  
Robotics and System Engineering (DIBRIS)  
University of Genoa  
Genoa, I-16146, Italy*

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## Abstract

Abstract here.

**Keywords:** Exploratory data analysis, unsupervised learning, dimensionality reduction, clustering

## 1. Introduction

## 2. Implementation

From an algorithmic standpoint, **adenine** is built upon the concept of *pipeline*, that is a sequence of four fundamental steps: (i) missing values imputing, (ii) data preprocessing, (iii) dimensionality reduction and (iv) clustering. For each step, a fair number of off-the-shelf algorithms implementations are available (see Table 2). None of such steps are mandatory. The vast majority of the algorithm implementation is inherited from the machine learning Python library `scikit-learn` (Pedregosa et al., 2011; Buitinck et al., 2013). **{except KNN imputing}**.

## 3. Experiments and results

To assess the quality of the obtained results, we tested **adenine** on a set of synthetic and real dataset.

**{parla qui dei test synth} {TGCA}**

## 4. Conclusions

## References

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Table 1: Pipelines building blocks and relative references (which are not reported when the definition is given in Section 2).

Step	Algorithms	Ref.
Imputing	Mean	(Troyanskaya et al., 2001)
	Median	
	KNN	
Preprocessing	Recentring	
	Standardize	
	Normalize	
	MinMax	
Dimensionality reduction	Principal component Analysis (PCA)	(Jolliffe, 2002)
	Incremental PCA	(Ross et al., 2008)
	Randomized PCA	(Halko et al., 2011)
	Kernel PCA	(Schölkopf et al., 1997)
	Isomap	(Tenenbaum et al., 2000)
	Locally linear embedding	(Roweis and Saul, 2000)
	Spectral embedding	(Ng et al., 2002)
	Multidimensional scaling	(Borg and Groenen, 2005)
	t-Distributed Stochastic Neighbor Embedding (t-SNE)	(Van der Maaten and Hinton, 2008)
Clustering	K-means	(Bishop, 2006)
	Affinity propagation	(Frey and Dueck, 2007)
	Mean Shift	(Comaniciu and Meer, 2002)
	Spectral	(Shi and Malik, 2000)
	Hierarchical	(Friedman et al., 2001)

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