pca

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/home/mpastor/soft/eTAM/src/pca.py

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# -*- coding: utf-8 -*-
#
#    Description    PCA toolkit using NIPALS algorithm
#
#
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#
#    (c) PhI 2013
```

Modules

numpy

Functions

center(X)
Centers the numpy matrix (X) provided as argument

deflatePC(X, t, p)
Deflates the numpy X matrix (X) using the numpy scores (t) and loadings (p)
using the NIPALS algorithm

Returns
X: the deflated X matrix
SSX: Sum-of-squares of the X matrix before the deflation
SSXex: Sum-of-squares of the scores vector, hence explained by this PC

extractPC(X)
Computes a single PC from the numpy X matrix (X) provided as argument
using the NIPALS algorithm

NIPALS-PCA is iterative and runs until convergence. Criteria used here are:
- less than 100 iterarios
- changes in any p value <= 1.0E-9

Returns two numpy vectors
t: scores
p: loadings

projectPC(X, mu, p, a)
The numpy X matrix (X) is projected into an existing PCA model to extract a single PC

This call is repeated A times (one for each model dimension) passing the deflated X matrix in
each call

The value of a is only used to check if this is the first call. If true, the matrix is centered using
the model mean vector (mu)

Returns three numpy objects
X: deflated X matrix
t: scores
d: distance to model

readData(filename)
Reads a numpy X matrix from a file in GOLPE .dat format

Returns the X matrix as a numpy matrix