ECOLE NATIONALE DE LA STATISTIQUE
ET DE L'ANALYSE DE L'INFORMATION

PROJECT TITLE

Project Description

TITLE

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rédigé par
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22 Mai 2022

Résumé

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contribution

si jamais vous apercevez des fautes dans le polycopié, merci de rédiger une *issue* sur Github à l'adresse :

correctif

LaTeX-Template/issues

contact

mail DEV : redacted@gmail.com

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Annexe A

Some Appendix

Contents

A.1 with subsection

A.2 and another one

Annexe B

some code

données fonctionnelles pour le praticien

```r
    # --- install --- #
    install.packages(c("fda", "fda.usc"))
    # --- general packages --- #
    library(data.table)
    # --- FDA packages --- #
    library(fda)
    library(fda.usc)
```

```r
# |     date      | $X_1$ | $X_2$ | $\cdots$ | $X_p$ |
# | Jan 1st 12:00 | ⋮   | ⋮   |     | ⋮   |
data <- fread("data.csv")


# un individu = une ligne
# donc pour une série temporelle, il faut transposer les observations et avoir la suite des données disposées sur une ligne.
fdata_standard_index <- fda.usc::fdata(
    mdata = t(X),
    argvals = to_unit_interval(
    #               ↑
    # on doit ramener les dates dans l'intervalle $[0, 1]$
        data[, .(date)]
    )
)
```

```r
nb_points <- ncol(fdata)
nb_ts <- nrow(fdata)

fda_optim_basis <- fda.usc::optim.basis(
    fdataobj = select_representative_observations_for_mean_function_fdata(fdata_ts = fdata, is_iid = is_iid),
```

```
    type.CV = fda.usc::GCV.S,
    W = NULL,
    lambda = lambda_CV_look_list,
    numbasis = num_basis__seq,
    type.basis = "bspline",
    verbose = TRUE
)
```

```
fda_optimal_basis <- ...
fdata_obj_temp <- fda_optimal_basis[["fdata.est"]]
fdata_obj <- fda.usc::fdata2fd(fdata_obj_temp)
fpca_result <- fda::pca.fd(
    fdobj = fdata_obj,
    nharm = 3,
    # centrer les données
    centerfns = TRUE
)
```

Regardons désormais à quoi ressemble la sortie :

$$\texttt{fpca\_result\$scores} = \begin{array}{c} \\ \downarrow [X_i] \end{array} \begin{array}{c} \longrightarrow [\phi_k] \\ \begin{bmatrix} \ddots & \cdots & \vdots \\ \vdots & \xi_i^{[k]} = \langle X_i - \mu | \phi_k \rangle & \vdots \\ \cdots & \cdots & \ddots \end{bmatrix} \end{array}$$

```
list(
        fpca_result = fpca_result,
        scores = fpca_result$scores,
        eigenfunctions = fpca_result$harmonics,
        explained_variance = fpca_result$varprop
    )
```

Annexe C

Testing

In this test we will invoke one command from each file in the commands folder.

— commands/editor/main **citationrequise :** (citation requise)
— commands/graphics/awesomebox **chk :**

test validé

— commands/graphics/blackbox **greenboxed/blackboxed :** test validé test validé
— commands/graphics/circled **circled :** 1
— commands/graphics/colorize **colorize :** test validé
— commands/macro/img **includeimage :** label

FIGURE C.1 – Images/ensai_logo.png

— commands/macro/macro **el :** ▷
— commands/maths/convergence **cvL :** $u_n \xrightarrow[n\to+\infty]{\mathbb{L}^p} \ell$
— commands/maths/ensembles **intervaleint :** $[\![p\,,\,q]\!]$
— commands/maths/fonctions_et_operateurs **distnorme / indicatrice :** $\|x-y\|_\infty / \mathbb{1}_A$
— commands/maths/limites **grandop :** $\underset{\mathbb{P}}{\mathcal{O}}\left(n^{-\frac{1}{5}}\right)$
— commands/maths/preuve

Démonstration. coucou mon loulou

› 1.

le premier

A. le premier A □

B. le premier B □

□

› 2.

□

le deuxième □

— commands/maths/proba_lettres **E / P / IH :** $\mathbb{E}$ / $\mathbb{P}$ / $\mathbb{H}$
— commands/maths/proba **indep** : $\perp\!\!\!\perp$
— commands/maths/property **orthonorm :** $\overset{\perp}{\|\cdot\|}$
— commands/maths/suites **soussuite :** $(u_{n_n})_{n\geq 0}$
— commands/definition/custom_colors
— commands/definition/define **ra :** ›
— commands/definition/lorem **lorem :** Lorem ipsum dolor sit amet. Ut expedita sunt est delectus quia ad nostrum delectus eum magni dolor. Eos nemo minima sit deleniti porro et necessitatibus minima ab quia necessitatibus in beatae autem et voluptas labore.
— commands/definition/pgfplot
— commands/definition/redefine
— commands/definition/theorem_styles

Annexe D

Documentation

D.1 Packages & Dependencies

D.2 Commands

D.2.1 Commands Description

Command	location	Description	Example
commands/editor			
\citationrequise	main.tex	Avertissement pour l'éditeur : une citation est à insérer ici	(citation requise)
\exemplerequis	main.tex	Avertissement pour l'éditeur : un exemple est à insérer ici	(exemple concret requis)
\editorwarn	main.tex	Avertissement pour l'éditeur	(texte custom)
\editlater	main.tex	Avertissement pour l'éditeur : une modification est à apporter ici	(texte custom)

commands/graphics/✱

Description
Displays an environment delimited with a blue line on the left, with an Info Icon located at the left of the line

Command	location	color	symbol
\info	awesomebox.tex	flatuicolors_blue	symbol :
\chk	awesomebox.tex	flatuicolors_green	symbol :
\brain	awesomebox.tex	flatuicolors_purple_light	symbol :
\warn	awesomebox.tex	flatuicolors_orange_light	symbol :
\nope	awesomebox.tex	flatuicolors_red_light	symbol :
\cogs	awesomebox.tex	flatuicolors_imperial	symbol :
\citer	awesomebox.tex	flatuicolors_corn_flower	symbol :
\avion	awesomebox.tex	flatuicolors_purple_dark	symbol :
\question	awesomebox.tex	flatuicolors_aqua	symbol :
\idee	awesomebox.tex	flatuicolors_yellow	symbol :
\book	awesomebox.tex	flatuicolors_orange_light	symbol :
\flask	awesomebox.tex	flatuicolors_blue_devil	symbol :

commands/graphics/✱

Description
Displays an environment delimited with a blue line on the left, with an Info Icon located at the left of the line

Command	location	short desc.	Example
\blackboxed	blackbox.tex	black rect. box	custom text
\greenboxed	blackbox.tex	green rect. box	custom text
\blueboxed	blackbox.tex	blue rect. box	custom text
\purpleboxed	blackbox.tex	purple rect. box	custom text
\orangeboxed	blackbox.tex	orange rect. box	custom text
\redboxed	blackbox.tex	red rect. box	custom text
\aquaboxed	blackbox.tex	aqua rect. box	custom text
\icon	blackbox.tex	fontawesome icon with text	GitHub
\circled	circled.tex	circled text	1
\colorize	colorize.tex	colored text	custom text

commands/maths/$*$

Description
The commands associated with symbols and other things for mathematics / mathematical environments

Command	location	short description	Example

**commands/maths/*

Description
Displays an environment delimited with a blue line on the left, with an Info Icon located at the left of the line

commands/definition

definition/custom_colors.tex

Description
Custom colors that can be used in other commands such as `\colorize[color]{text}`

color name	color
flatuicolors_orange	
flatuicolors_orange_light	
flatuicolors_red_light	
flatuicolors_tomato	
flatuicolors_yellow	
flatuicolors_green	
flatuicolors_greenish	
flatuicolors_blue	
flatuicolors_blue_light	
flatuicolors_blue_deep	
flatuicolors_blue_devil	
flatuicolors_purple	
flatuicolors_purple_light	
flatuicolors_purple_dark	
flatuicolors_rose	
flatuicolors_biscay	
flatuicolors_imperial	
flatuicolors_aqua	
flatuicolors_magenta	
flatuicolors_light_gray	

D.2.2 Commands Code Examples

Command	Arguments	Code	Render

Bibliographie

(1) A. Monfort C. Gourieroux and A. Trognon. Pseudo maximum likelihood methods : Theory. *The Econometric Society*, 52(3), 1984. pages 681-700. DOI : https ://doi.org/10.2307/1913471.