Pink
A User Manual

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Documentation is like sex:

when it is good, it is very, very good;

and when it is bad, it is better than nothing.[1].

À nos pauvres étudiants qui ont été forcés de souffrir pendant des heures sur ce logiciel.

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[1]Attributed to Dick H. Brandon, pioneer in computer law.

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Chapter 1

Introduction

PINK is an image processing library developed at ESIEE Paris for research and teaching purposes. It contains implementations of over 200 algorithms for image segmentation and filtering. Most of the operators come from mathematical morphology, but it contains operators from different fields. Pink is free software licensed under the CeCILL license.

We are interested in the continuous development of Pink. It has already been proven useful in many applications and we are constantly looking for new ones.

This manual aims at referencing most functions of PINK, hopefully in a didactic manner.

History

Pink is Not Khoros

Related software

These days, image processing is a technology and something such as PINK is best used as a component among others. For optimal use, the following packages should be installed:

- imview

- Python (version 2.7 preferred) ; with the following packages:

    - numpy
    - scipy
    - matplotlib
    - python-vtk
    - python-image (PIL)
    - python-image-tk

- Doxygen

- ActiveTcl 8.3

- VTK

- MPlayer

- Gnuplot

Other software may prove useful:

- OpenCV

- ITK

Contributors

PINK is the result of many thousands of hours of work, and includes contributions from this (non-exhaustive) list of people

Code under the main CeCILL license:

- Michel Couprie : main author, initial design

- László Marak (ujoimro) : library, port to Python, continuous maximum flows, Total-Variation denoising, Python front-end, native Microsoft Windows port.

- Laurent Najman : localextrema, saliency

- Hugues Talbot : fmm, fast morphological operators, region growing; this documentation.

- Jean Cousty : redt 3d (reverse euclidean distance transform - algo de D. Coeurjolly), watershedthin, opérateurs sur les graphes d'arêtes (GA), minimum cost forest (MSF), waterfall, recalagerigide translateplane

- Xavier Daragon: dist, distc (Quadratic Euclidian Distance in 3D)

- André Vital Saude: radialopening, divers scripts tcl, hma

- Nicolas Combaret: toposhrinkgray, ptselectgray

- John Chaussard: lballincl, cropondisk, shrinkondisk

- Christophe Doublier: zoomint

- Hildegard Koehler: lintophat

- Cédric Allène: gettree, histolisse, labeltree, nbcomp, pgm2vtk, seuilauto

- Gu Jun: maxdiameter

- Sébastien Couprie: mcsplines.c

- Rita Zrour: medialaxis (exact Euclidean medial axis - algorithm of Rémy Thiel), dist, distc (Quadratic exact Euclidean distance - algorithm of Saito-Toriwaki, in 2D)

- Laurent Mercier: gestion d'un masque dans delaunay

- Benjamin Raynal: parallel 3D thinning

- Nivando Bezerra: parallel grayscale thinning

Code under different free software licenses:

- David Coeurjolly: lvoronoilabelling.c

- Dario Bressanini: mcpowell.c

- Andrew W. Fitzgibbon: lbresen.c

- Lilian Buzer: lbdigitalline.cxx

Chapter 2

Tutorial

This chapter explains how to start PINK and how to use it.

2.1 Starting PINK and related software

2.2 Examples

We will show a lot of Python code:

2.2.1 Code highlighting

Testing Listings:

```python
#!/usr/bin/env python
#

print("Hello World of Pink/Python\n")
```

Testing fancyvrb

Program 1: hello in Python

```python
1  #!/usr/bin/env python
2  #
3
4  print("Hello World of Pink/Python\n")
```

2.2.2 Dynamic content

Some code and its output: The following program produces the plot from Fig. 2.1.

Program 2: A plotting example

```python
1  import numpy as np
2  import matplotlib.pyplot as plt
3
4  fig = plt.figure()
5  ax1 = fig.add_subplot(111)
6  t = np.arange(0.01, 10.0, 0.01)
7  s1 = np.exp(t)
8  ax1.plot(t, s1, 'b-')
9  ax1.set_xlabel('time (s)')
10 ax1.set_ylabel('exp')
```
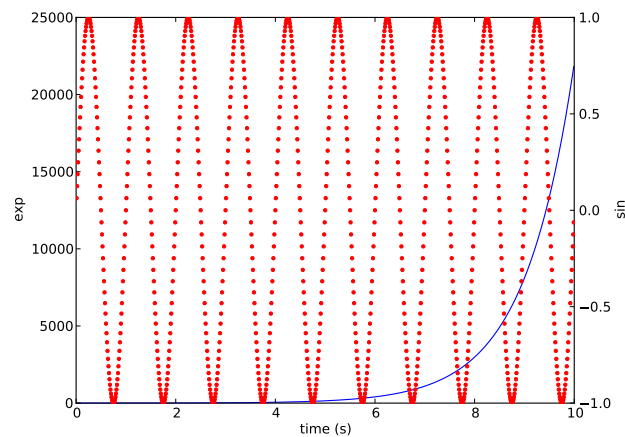
Figure 2.1: The functions sin and exp together from program 2.

Program 3: An image processing example

```
2
3  from skimage import data, filter, io
4
5  # not hard !!
6  def sampleproc(image):
7      edges = filter.sobel(image)
8      return edges
9
10  ## saving procedure
11  def saveimages(path1, path2):
12      inputimg = data.coins()
13      outputimg = sampleproc(inputimg)
```

Figure 2.2: Program 3 and its result.

```
11
12  ax2 = ax1.twinx()
13  s2 = np.sin(2*np.pi*t)
14  ax2.plot(t, s2, 'r.')
15  ax2.set_ylabel('sin')
16  #plt.show()
```

2.2.3   Image processing

An example of processing?

2.3   Pink and other image-related software

2.4   Exercises

Appendix A

Compiling and installing PINK

Not as difficult as it may seem.

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