

voronoi

The morphological skeleton of an image is the set of its non-zero pixels which are equidistant to its boundaries. More info on [Wikipedia](#).

Thinning an image consists in reducing its non-zero pixels to their morphological skeleton. More info on [Wikipedia](#).

VoronoiSkeleton is a C++ class made for the fast computing of Voronoi diagrams of monochrome images. It contains different implementations of thinning algorithms:

- Zhang - Suen explained in 'Afast parallel algorithm for thinning digital patterns' by T.Y. Zhang and C.Y. Suen and based on [this implementation](#)
- Guo - Hall explained in 'Parallel thinning with two sub-iteration algorithms' by Zicheng Guo and Richard Hall and based on [this implementation](#)
- a morphological one, based on the `erode()` and `dilate()` operators. Coming from previous work by [Félix Abecassis](#).

Aspecial care has been given to optimize the 2 first ones. Instead of re-examining the whole image at each iteration, only the pixels of the current contour are considered. This leads to a speedup by almost 100 times on experimental tests.

Licence

LGPL v3, check file `LICENCE`.

Dependencies

You need the following libraries before compiling :

- `cmake` (`$ sudo apt-get install cmake`),
- `OpenCV` (`$ sudo apt-get install libopencv-dev`)

How to build the program

The project is based on a `CMakeLists`. It is easy to build the program on a Unix computer. Go in the source folder and type:

```
1 $ mkdir build
2 $ cd build
3 $ cmake ..
4 $ make
```

For Windows users, some instructions are available on OpenCV website:

http://opencv.willowgarage.com/wiki/Getting_started .

How to use the program

To display the help, from the main folder, run the generated executable '`build/test_voronoi`' with no arguments. It will display the help of the program.

Related projects

[mnist-digits-as-stroke-sequences](#) Code project to transform the well known MNIST handwritten digit images to sequences of pen strokes, in order to obtain a data set for sequence learning.

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