

Assignment subject and preparation

Subject

Implement the object discretization method and the boundary tracking algorithm by using the C++ library DGtal (Digital Geometry Tools and Algorithm).

Preparation

- 1 Download the library DGtal with its additional tools at:
<http://libdgtal.org/download/>
- 2 Install it following the instruction here:
<http://libdgtal.org/doc/nightly/FAQDGtalCmake.html>

Your own codes (in C, C++, Java, etc.) without using the DGtal library will be also accepted. Please ask if your chosen language can be allowed before starting coding.

Implementation and experiments

- 1 Generate Euclidean shapes (disk, ellipse, triangle, square, etc) and discretize them with different resolutions (Gauss discretization),

(The following pages may help:

<http://libdgtal.org/doc/nightly/moduleShape.html>,

http://libdgtal.org/doc/nightly/dgtal_dgtalboard.html)

- 2 Extract their contours with inter-pixel boundary,

(The following page may help:

<http://libdgtal.org/doc/nightly/tutoShapeGridCurveEstimator.html>)

- 3 Measure their areas and perimeters (by simply counting the numbers 2-cells and 1-cells, respectively), and compare them with the ground truths (make a graph of resolutions vs. errors).

Bonus: Jordan (inner and/or outer) discretization, extension to 3D.

Practical information

- **Code and report submission and deadline:** October 23, 2012 (send a compressed file by mail with the title of “assign1 of DG”)
- **Grading policy:** 15% of 50% for all the assignments
- **Evaluation environment:** Linux ubuntu (This means that your program will be compiled and ran with a linux environment for its evaluation, without any special setting.)
- **Note:** Please attach with your code a **makefile**.