Master 2 "SIS" Digital Geometry

ASSIGNMENT 2:
DISCRETE LINE RECOGNITION AND POLYGONALISATION

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Assignment subject and preparation

Subject

Implement

- the grid-intersection discretization method for curves,
- the incremental algorithm for arithmetic line recognition, and
- the (simple) polygonalisation method,

with a help of the C++ library DGtal.

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

Implementation and experiments

1 Make Euclidean curves (lines, conic and trigonometric curves, etc) and discretize them by using grid-intersection discretization (obtain 8-curves),

2 Choosing a starting point in a 8-curve, and recognize an arithmetic line incrementally (choose a direction as well); the following page may help: http://libdgtal.org/doc/stable/modulegeometry2d.html)

3 Make a polygonal approximation of a 8-curve by runnig iteratively the above incremental arithmetic line recognition (once you cannot add a new point into a current recognized arithmetic line, you restart a new arithmetic line recognition by setting the point as a new starting point),

4 Analyse the complexity of the polygonalisation method,

5 By changing the starting point, test several times the polygonalisation, and compare the results.

Key module: ArithmeticalDSS

Bonus: Extension to 3D (3D grid-intersection discretization, 3D arithmetic line recognition, and polygonalisation of a 3D discrete curve.

Practical information

- **Code and report submission and deadline**: November 6, 2012 (send a compressed file by mail with the title of "assign2 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**.