DGtal: Digital Geometry Tools and Algorithms
http://liris.cnrs.fr/dgtal

The DGtal Team

DGtal Meeting, September 2011

DGtal : why, who

Objectives

- to make easier discrete geometry for the neophyte (student, researcher from another field, . . .)

- to test quickly new ideas, with objective comparison wrt existant works

- to make easier the implementation of demonstrators

- to help spread our research results to other domains
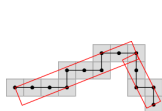
- to pursue a federative project

Who ? for now . . .

- LIRIS (Lyon)

- Gipsa-lab (Grenoble)

- GREYC (Caen)

- LAMA (Chambéry)
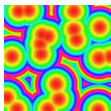
- LORIA (Nancy)
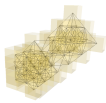
DGtal : what for ?

Main features

- to define digital objects in arbitrary dimension
- to propose algorithms for topological and geometric analysis
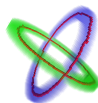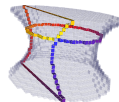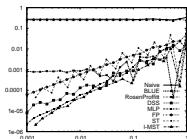- to provide I/O mechanisms and visualization tools
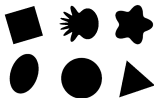

DSS

DT

Objects

Thinning

Cellular model

Estimators

Shape DB

Contours

. . .

DGtal philosophy and structure

- Genericity and efficiency : C++ library, concepts
- LGPL or GPL with restrictions
- user friendly, not necessarily kernel-developer friendly

Kernel

Basic types, data structures

- digital space, point, sets, lin. algebra
- software infrastructure : trace, concept validation, …

Images

- generic container
- several implementation : standard, other adapted to big images

Base modules

Topology module

- digital topology : connectedness, border, simple points
- grid topology : cells, contours, surfaces, tracking
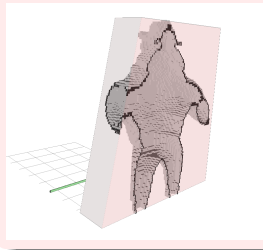
Geometry module

- primitives, DSS recognition
- contour analysis : decomposition, convexity, estimators
- volumetric analysis : area/volume, distance transforms, medial axis

Other modules, or modules with external dependencies

2D, 3D/2D vector export (PDF, SVG,...)
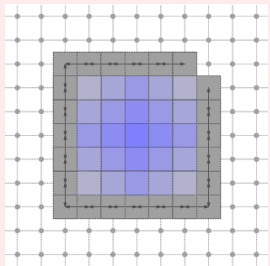
3D visualization

Backends
- Kiteware's ITK
- VIGRA (soon)

Import/export
- images (ImageMagick)
- volumes (libvol)

Project modules
- noisy objects (GeoDIB)
- ...

DGtal Roadmap

New in milestone 0.4beta (now)

- Kernel update : refactoring of the kernel classes
- 2D, nD-volumetric geometry : geometric estimators, easy multigrid analysis
- 3D visualization with QGLviewer
- Easier use of streams for vector export (with libBoard and Cairo)
- grid or interpixel topology : cells, digital surfaces, surface tracking
- implicit/parametric shape factory
- Infrastructure : git repository and github project managment system, better cmake scripts

Join DGtal

- new contributors are welcome (new bug-reporters, documentation readers are welcome too)
- collaborative forge, development infrastructure

DGtal Team

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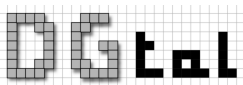
D. Cœurjolly
G. Damiand
T. Roussillon
M. Tola

J.-O. Lachaud
X. Provençal

B. Kerautret

S. Fourey

I. Sivignon

Program of the tutorial day

- 9h accueil
- 9h30 DGtal Overview, How to download and install DGtal ?
- Kernel Introduction (David)
- 10h30 Digital Domains (Guillaume)
- (break)
- 11h00 Digital Topology & Khalimsky spaces (Jacques-Olivier)
- 12h00 lunck
- 13h30 Streams, visualization, ... (Bertrand)
- 14h30 2D geometry (Tristan)
- 15h00 Volumetric geometry (David)
- 15h30 2D estimators (? ?)
- (break)
- 16h00 DGtal tools (demo, Bertrand / David)
- 16h30 Discussions
- 17h30 The End