Olena: a Developer's Handbook

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1 The Olena source tree

The Olena source tree is divided into several distrinct components:

'`top source directory`'
: The base directory for Olena sources. It contains Autoconf/Automake definitions that allow the following toplevel operations:
  - creation of initial configuration files (`make all`);
  - installation of header files from '`oln/`' to the system (`make install`);
  - compilation of demonstration programs in '`demo/`' (`make demo` and `make check`);
  - compilation and execution of the testsuite from '`tests/`' (`make check`);
  - compilation and installation of user programs from '`utilities/`' to the system (`make all` and `make install`).

  Note that it *does not* allow generating documentations from '`doc/`'. This is covered below.

'`tools/`'
: Some tools used by various other build phases.

'`oln/`'
: The Olena sources. Only C++ header files can be found in this directory and its sub-directories. These files are autonomous, and can be installed in any directory on the system.

'`demo/`'
: Some demonstration C++ sources.

'`doc/`'
: The documentation subdirectory. Items in this directory are controlled by an autonomous build process, i.e. they have their own Autoconf/Automake definitions. However, these definitions rely on files located in '`tools/`', and use comments from the C++ sources to generate TeX sources.

'`utilities/`'
: User-level Olena commands. Auto-generated sources in this directory yield at compilation time a set of user shell commands exhibiting several Olena features.

You can find in the following sections a more detailed description of the contents of each directory.

In addition to these directories, several toplevel files are worth of interest:

'`README`'
: First-time documentation. Introducts briefly how to use Olena.

'`NEWS`'
: Report main additions to Olena version by version. Updated at each release.

'`ChangeLog`'
: Report changes to Olena for each minor revision. Updated often.

'`ISSUES`'
: Describes several major issues about Olena[1].

'`THANKS`'
: Credits. Lists people that have contributed to Olena together with their achievements[2].

'`Makefile.am`'
'`configure.ac`'
: Global Automake/Autoconf control definitions.

All other files in the toplevel directory should be automatically generated.

[1] FIXME: this information seems outdated

[2] FIXME: check this

1.1 'tools/'

This directory contains several tools pertaining to the build process:

'depcomp'

'install-sh'
'missing'

'mkinstalldirs'
: Autoconf-related scripts (should be auto-imported by `autoreconf` if needed[3]).

'texinfo.tex'
: Texinfo definitions for the documentation (should be auto-imported by `autoreconf` if needed[4]).

'scandefs.pl'
: A perl script that extracts definitions from the `configure`-generated 'oln/config/config.hh'[5], creating 'oln/config/pconf.hh', which is itself included by 'oln/config/system.hh'. See the Automake definition file 'oln/Makefile.am' for a description of this process.

In addition, it contains a file 'ChangeLog' describing changes to files in this directory.

1.2 'oln/'

This directory contains the main Olena sources. Each Olena component is located in a directory grouping all components by "categories". Here are the subdirectories:

'config/' Olena global configuration definitions, reachable by including 'oln/config/system.hh'.

'meta/' C++ meta-programming utilities. Here is a non-exhaustive list of components:

- static arrays ('array*.hh');
- static comparisons ('cmp.hh' and 'ucmp.hh');
- static control structures ('control.hh');
- static logical operators ('logic.hh');
- static miscellaneous intefer functions ('ufuncs.hh');
- pervasives controlling static hierarchies ('types.hh').

'types/' Definitions for value types.

'core/' Definitions for image types and various other Olena data types. This directory contains definitions for:

- image types;
- structural element types (windows, neighborhoods);
- iterators;
- points;
- borders.

[3] FIXME: check this
[4] FIXME: check this
[5] in turn generated from 'oln/config/config.hin'

‘`transforms/`’
: Transformation operators over images. Includes Fast Fourier Transforms (FFT) and Discreet Wavelets Transforms (DWT).

‘`morpho/`’ Morphological operators.

‘`level/`’ Level processing operators.

‘`convol/`’ Convolution operators.

‘`arith/`’ Arithmetical operators (over images). Covers both arithmetical, conversion and logical operators.

‘`convert/`’
: Value types conversion functions.

‘`io/`’ Input/Output operators for several Olena data types.

‘`utils/`’ Utility operators.

‘`math/`’ Utility mathematical functions.

In addition to these categories, four multi-purpose headers are provided in ‘`oln/`’:

‘`basics.hh`’
: recursively includes all *base types* definitions from ‘`core/`’.

‘`basics1d.hh`’
: recursively includes all definitions from ‘`core/`’ that allow handling of 1D images.

‘`basics2d.hh`’
: Likewise, for 2D images.

‘`basics3d.hh`’
: Likewise, for 3D images.

1.3 ‘doc/’

This directory contains all files needed to build the documentation, except headers files from ‘`oln/`’, which contain comments used in the documentation build process.

Here is a list of the most important files:

‘`doc/Makefile.am`’
: Automake definitions that control the documentation build process.

‘`doc/oln-dev.texi`’
: Master Texinfo source for the Olena Developer's Handbook.

‘`doc/oln-ref.tex`’
: Master TeX source for the Olena Reference Manual.

‘`doc/ref-types.tex`’
: Handwritten documentation about Olena value types, included in the Reference Manual.

‘`doc/ref-morpho.tex`’
‘`doc/ref-level.tex`’
: TeX sources describing Olena components. They are auto-generated by AutoGen from Olena C++ header files[6], using definitions in ‘`tpl/processing.tpl`’.

[6] more precisely, from C++ comments

‘`doc/bin/`’
: Auto-generated programs that create the pictures included in the Reference Manual.

‘`doc/html/`’
: The HTML version of the Reference Manual.

‘`tpl/processing.tpl`’
: AutoGen parameters for generating parts of the Reference Manual.

‘`img/`’
: A directory containing images used for example purposes in the Reference Manual[7].

Running `make all` in the ‘`doc/`’ toplevel subdirectory generates the Reference Manual and the Developer’s Handbook. To achieve this goal, it uses the Olena headers it can find in ‘`../oln`’ and the Texinfo source ‘`../tools/texinfo.tex`’[8].

[7] FIXME: isn’t this redundant with the toplevel img/ directory?

[8] FIXME: since this is the only dependency over ‘`texinfo.tex`’, and since no other file in Olena uses ‘`texinfo.tex`’, shouldn’t this file be moved into ‘`doc/`’?

2 Olena configuration

3 Using Olena from another project

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