INSTALLATION NOTES

Mario Radovich

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1 Description of the pipeline

The pipeline is composed of three modules aimed at the reduction and processing of wide-field images:

PREREPIX: prereduction of images;

ASTROMETRIX: astrometric calibration;

PHOTOMETRIX: photometric calibration.

All the modules of the pipeline are PERL scripts developed using the PDL module[1]: this allows to perform e.g. in C the most CPU consuming calculations (e.g. catalog matching) and easily access the results from the main PERL script. **Perl 5.6.0 or later version is required**; all the other required (PERL and external) libraries are provided in the distribution package; the scripts in the Install directory will compile and install the components necessary to run the pipeline.

In addition to PDL, other Perl modules and libraries (e.g. CFITSIO, PGPLOT) are needed. In order to make the installation easier, they are included in the distribution and may be built using the `mkPerl` script. *However, for any problem concerning their installation the user should check the README files or the web sites for these libraries/modules (see below)... or ask the system manager.*

2 How to install the pipeline

The shortest way to install the pipeline is to go to the `Install` directory and run the following `[perl]` scripts:

1. `mkStart [-i=~/PipeLibs]`, where the directory after the "-i" flag is the one when everything will be installed. This script will: (a) write the configuration file *Build.conf*, (b) write in the installation directory a script *pipe.csh* that must be run (e.g. `source pipe.csh`) before going to the next steps.
2. `mkLibs`. This will install the libraries (e.g. PGPLOT, CFITSIO).
3. `mkPerl` This will install the PERL modules (e.g. PDL, PGPERL).
4. `mkPipe` This will install all the pipeline modules. If an upgrade of the pipeline modules is needed, this is the only script to be run.

In all the scripts, if the `-test` flag is added then a list-only mode is run where nothing is written. Normally, if a module or library is already installed, the script will go to the next step: this can be changed adding the flag `-force`, that will install everything.

The configuration file *Build.conf* gives the names and version numbers of all the modules to be installed. The first entry is the output directory where all the stuff will be written. Three sections follow, giving (square brackets show which the pipeline modules involved, also given is the site where modules are available):

1. The *external* libraries (directory `ExtLibs`):
   - **CFITSIO** A library to handle FITS files (`http://heasarc.gsfc.nasa.gov/docs/software/fitsio/`) [all].
   - **PGPLOT** A library to generate plots (`http://www.astro.caltech.edu/~tjp/pgplot/`) [all].
2. The *PERL* modules (directory `PERL`):
   - **F77** Link C programs with Fortran subroutines (`http://www.cpan.org`) [required by PDL].
   - **Tie-IxHash** Keep the order in PERL hashes (`http://www.cpan.org`) [all].
   - **String-Approx** Approximate matching of strings (find the closest neighbor (`http://www.cpan.org`) [PREREPIX].

[1] See http://pdl.perl.org

- **PDL** Turn perl into an efficient numerical language for scientific computing (`http://pdl.perl.org`) [all].
- **Filters and Text::Balanced** These two Perl modules are needed for a propoer installation of PDL (since PDL 2.4.0).
- **PGPLOT** Interface between PERL and PGPLOT (`http://www.cpan.org`) [all].
- **CFITSIO** Interface between PERL and CFITSIO (`http://www.cpan.org`) [all].

3. The *pipeline* modules (file Pipe.tar.gz):

   - **PIPELINE** The compressed file/directory with the pipeline (Pipe.tar.gz).
   - **PREREPIX** The package to make the prereduction.
   - **ASTROMETRIX** The package to make astrometry.
   - **PHOTOMETRIX** The package to make photometry.
   - **PP** A library of modules with C code interfaced to PERL with PDL.

It is assumed that the SExtractor and (optionally) SWarp packages (`http://terapix.iap.fr`*) are installed.*

The `xxx_V` entries in the PERL section give the release of the modules to be installed, which is compared to that of the already installed modules.

A file `pipe.csh` is written in the output directory: it should be called e.g. in the `.login` to set the correct path and PERL definitions *BEFORE* the Perl and pipeline modules are installed.

```
#Example of pipe.csh:

setenv PIPE "/home/mario/PipeLibs/"
setenv PGPLOT_DIR `echo $PIPE`pgplot/
setenv PERL5LIB `echo $PIPE`lib/site_perl
set path=($path $PIPE/bin)
setenv PERL5LIB `echo $PERL5LIB`:`echo $PIPE`Prered
  set path=($path $PIPE/Prered )
setenv PERL5LIB `echo $PERL5LIB`:`echo $PIPE`Astrom
  set path=($path $PIPE/Astrom  $PIPE/Astrom/Tools)
setenv PERL5LIB `echo $PERL5LIB`:`echo $PIPE`Photom
  set path=($path $PIPE/Photom )
setenv PERL5LIB `echo $PERL5LIB`:`echo $PIPE`Swarp
  set path=($path $PIPE/Swarp )
```

Note: the scripts are usually executable without the necessity to type `perl <name_of_script` *IF* perl is installed in `/usr/bin/perl`. Otherwise it is necessary to type e.g. `perl $PIPE/Astrom/astrom` (or to set an alias).

2.1 Upgrade of the pipeline

It may happen that upgrades to pipeline scripts are available: in this case it is not necessary to reinstall everything from scratch. Just type: `mkPipe [-test]`. The *-test* flag may be used to check only what would be done. If the PP modules do not need to be recompiled, set *PP* to *no* in the configuration file.

3 Acknowledgments

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For any question, critics, comment, suggestion or advice, please write to `radovich@na.astro.it`. *I would be grateful for acknowledgment of the usage of this software and to be informed of any modification, so that I may include it in future releases.*