

The pstool package

Concept by Zebb Prime
Package by Will Robertson*

v1.0 2008/08/31

Abstract

This package defines the `\psfragfig` user command for including EPS files that use `psfrag` features in a pdf \LaTeX document. The command `\pstool` can be used to define other commands with similar behaviour.

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Part I

User documentation

1 Introduction

While directly producing PDF output with pdf \LaTeX is a great improvement in many ways over the ‘old method’ of $\text{DVI} \rightarrow \text{PS} \rightarrow \text{PDF}$, it loses the ability to interface with a generic PostScript workflow, used to great effect in numerous packages, most notably PSTricks and `psfrag`.

Until now, the best way to use these packages while running pdf \LaTeX

*wspr81@gmail.com

has been to use the `pst-pdf` package, which processes the entire document through a filter, sending the relevant PostScript environments (only) through a single pass of \LaTeX producing $\text{DVI} \rightarrow \text{PS} \rightarrow \text{PDF}$. The resulting PDF versions of each graphic are then included into the pdf\LaTeX document in a subsequent compilation. The `auto-pst-pdf` package provides a wrapper to perform all of this automatically.

The disadvantage with this method is that for every document compilation, *every* graphic must be re-processed. The `pstool` package uses a different approach to allow each graphic to be processed only as needed, speeding up and simplifying the typesetting of the main document.

At present this package is designed solely as a replacement for `pst-pdf` in the rôle of supporting the `psfrag` package (which it loads) in pdf\LaTeX .

More flexible usage to provide a complete replacement for `pst-pdf` (e.g., supporting the `\begin{postscript}` environment) is planned for a later release. If you simply need to automatically convert plain EPS files to PDF, I recommend using the `epstopdf` package with the `[update,prepend]` package options (`epstopdf` and `pstool` should be completely compatible).

2 Getting started

Load the package as usual; no package options are required by default, but there are a few useful options described later in section 3. Note that you do not need to load `psfrag` separately.

The generic command provided by this package is

```
\pstool [<graphicx options>] {<filename>} {<input definitions>}
```

It converts the graphic *<filename>.eps* to *<filename>.pdf* through a unique $\text{DVI} \rightarrow \text{PS} \rightarrow \text{PDF}$ process for each graphic, using the preamble of the main document. The resulting graphic is then inserted into the document, with optional *<graphicx options>*. The third argument to `\pstool` allows arbitrary *<input definitions>* (such as `\psfrag` directives) to be inserted before the figure as it is processed.

The command `\pstool` can take an optional `*` or `!` suffix to change the behaviour of the command:

`\pstool` Process the graphic *<filename>.eps* if *<filename>.pdf* does not already exist, or if the EPS file is *newer* than the PDF;

`\pstool*` Always process this figure; and,

`\pstool!` Never process this figure.

The behaviour in these three cases can be overridden globally by the package option `[process]` as described in section 3.1.

It is useful to define higher-level commands based on `\pstool` for including specific types of EPS graphics that take advantage of `psfrag`. As an example, this package defines the following command, which also supports the `*` or `!` suffixes described above.

`\psfragfig[<opts>]{<filename>}` This is the catch-all macro to support a wide range of graphics naming schemes. It inserts an EPS file named either `<filename>-psfrag.eps` or `<filename>.eps` (in that order of preference), and uses `psfrag` definitions contained within either `<filename>-psfrag.tex` or `<filename>.tex`.

This command can be used to insert figures produced by the MATHEMATICA package `MathPSfrag` or the MATLAB package `matlabfrag`. `\psfragfig` also accepts an optional braced argument as shown next.

`\psfragfig[<opts>]{<filename>}{<input definitions>}` As above, but inserts the arbitrary code `<input definitions>`, which will usually be used to define new or override existing `psfrag` commands.

3 Package options

3.1 Forcing/disabling graphics processing

While the suffixes `*` and `!` can be used to force or disable (respectively) the processing of each individual graphic, sometimes we want to do this on a global level. The following package options override *all* `\pstool` (and related) macros:

`[process=auto]` This is the default mode as described in the previous section, in which graphics with suffixes are only (re-)processed if the EPS file is newer or the PDF file does not exist;

`[process=all]` Suffixes are ignored and all `\pstool` graphics are processed;

`[process=none]` Suffixes are ignored and no `\pstool` graphics are processed.¹

Also note that it would be nice to detect the age of files other than the EPS and PDF graphics in order to affect the processing decisions. This is planned for a possible future release.

¹If `\pstool` is loaded in a L^AT_EX document in DVI mode, this is the option that is used since no external processing is required for these graphics.

3.2 Cropping graphics

The default option `[crop=preview]` selects the preview package to crop graphics to the appropriate size for each auxiliary process.

However, when an inserted label protrudes from the natural bounding box of the figure, or when the original bounding box of the figure is wrong, the preview package will not always produce a good result (with parts of the graphic trimmed off the edge). A robust method to solve this problem is to use the `pdfcrop` program instead.² This can be activated in `pstool` with the `[crop=pdfcrop]` package option.

In the future I plan to also support `epstool` for doing the same thing.

3.3 Temporary files & cleanup

Each figure that is processed spawns an auxiliary \LaTeX compilation through $\text{DVI} \rightarrow \text{PS} \rightarrow \text{PDF}$. This process is named after the name of the figure with an appended string suffix; the default is `[suffix={-pstool}]`. All of these suffixed files are “temporary” in that they may be deleted once they are no longer needed.

As an example, if the figure is called `ex.eps`, the files that are created are `ex-pstool.tex`, `ex-pstool.dvi`, The `[cleanup]` package option declares via a list of filename suffixes which temporary files are to be deleted after processing.

The default is `[cleanup={.tex, .dvi, .ps, .pdf, .log, .aux}]`. To delete none of the temporary files, choose `[cleanup={}]` (useful for debugging).

3.4 Interaction mode of the auxiliary processes

Each graphic echoes the output of its auxiliary process to the console window; unless you are trying to debug errors there is little interest in seeing this information. The behaviour of these auxiliary processes are governed globally by the `[mode]` package option, which takes the following parameters:

`[mode=batch]` hide almost all of the \LaTeX output (*default*);

`[mode=nonstop]` echo all \LaTeX output but continues right past any errors; and

`[mode=errorstop]` prompt for user input when errors in the source are encountered.

These three package options correspond to the \LaTeX command line options `-interaction=batchmode`, `=nonstopmode`, and `=errorstopmode`, respectively. When `[mode=batch]` is activated, then `dvips` is also run in ‘quiet mode’.

²`pdfcrop` requires a Perl installation under Windows, freely available from <http://www>.

3.5 Auxiliary processing command line options

The command line options passed to each program of the auxiliary processing can be changed with the following package options:

```
[latex-options] ;  
[dvips-options] ;  
[ps2pdf-options] ; and,  
[pdfcrop-options] .
```

For the most part these will be unnecessary, although passing the correct options to ps2pdf can sometimes be a little obscure. For example, I use the following for generating figures in my thesis:

```
ps2pdf-options={-dCompatibilityLevel=1.4 -dPDFSETTINGS=/prepress}
```

I believe this incantation forces fonts to be embedded within the individual figure files, without which some printers and PDF viewers have trouble with the textual labels.

4 Miscellaneous details

4.1 The `\EndPreamble` command

At present, pstool scans the preamble of the main document by redefining `\begin{document}`, but this is rather fragile because many classes and packages do their own redefining which overwrites pstool's attempt. In this case, place the command

```
\EndPreamble
```

where-ever you'd like the preamble in the auxiliary processing to end (although it must be placed before `\begin{document}` for obvious reasons). This is also handy to bypass anything in the preamble that will never be required for the figures but which will slow down or otherwise conflict with the auxiliary processing.

4.2 Cross-reference limitations

The initial release of this package does not support cross-references within the psfrag labels of the included graphics. (If, say, you wish to refer to an equation number within a figure.) A future release of pstool will hopefully lift this limitation.

4.3 A note on file paths

pstool does its best to ensure that you can put image files where-ever you like and the auxiliary processing will still function correctly. In order to ensure this, the external pdf_latex compilation uses the `-output-directory` feature of pdf_lTeX. This command line option is definitely supported on all platforms in TeX Live 2008 and MiKTeX 2.7, but earlier distributions may not be supported.

One problem that pstool does not (currently) solve on its own is the inclusion of images that do not exist in subdirectories of the main document. For example, `\pstool{../Figures/myfig}` will not process by default because pdf_lTeX usually does not have permission to write into folders that are higher in the hierarchy than the main document. This can be worked around presently in two different ways: (although maybe only for Mac OS X and Linux)

1. Give pdf_latex permission to write anywhere with the command:
`openout_any=a pdflatex ...`
2. Create a symbolic link in the working directory to a point higher in the path: `ln -s ../../PhD ./PhD`, for example, and then refer to the graphics through this symbolic link.

I hope to directly solve this problem in the future by using a caching folder for the auxiliary processing in such cases.

5 Package information

The most recent publicly released version of pstool is available at CTAN:

<http://tug.ctan.org/pkg/pstool/>

Historical and developmental versions are available at GitHub:

<http://github.com/wspr/pstool/>

While general feedback at wspr81@gmail.com is welcomed, specific bugs should be reported through the bug tracker at FogBugz: <https://wspr.fogbugz.com/> (click 'TASKS: Enter a New Case').

5.1 Licence

This package is freely modifiable and distributable under the terms and conditions of the L^AT_EX Project Public Licence, version 1.3c or greater (your choice). The latest version of this license is available at: <http://www.latex-project.org/lppl.txt>. This work is maintained by WILL ROBERTSON.

Part II

Implementation

LaTeX2e file ‘pstool.sty’ generated by the ‘filecontents’ environment from source ‘pstool’ on 2009/04/24.

```
1 \ProvidesPackage{pstool}[2008/08/31_v1.0
2   Wrapper_for_processing_PostScript/psfrag_figures]
```

External packages

```
3 \RequirePackage{%
4
5   catchfile,color,ifpdf,ifplatform,graphicx,psfrag,suffix,xkeyval}
6 \RequirePackage{inversepap}[2008/07/31_v0.2]
```

Allocations

```
\if@pstool@always@ 6 \newif\if@pstool@always@
\if@pstool@never@ 7 \newif\if@pstool@never@
\if@pstool@pdfcrop@ 8 \newif\if@pstool@pdfcrop@
\if@pstool@verbose@ 9 \newif\if@pstool@verbose@
\pstool@out 10 \newwrite\pstool@out
```

These are cute

```
\OnlyIfFileExists 11 \providecommand\OnlyIfFileExists[2]{\IfFileExists{#1}{#2}{}}
\NotIfFileExists 12 \providecommand\NotIfFileExists[2]{\IfFileExists{#1}{#2}{}}
```

5.2 Package options

```
crop 13 \define@choicekey*{pstool.sty}{crop}[\@tempa\@tempb]{%
14   preview,pdfcrop}{%
15     \ifcase\@tempb\relax
16     \@pstool@pdfcrop@false
17     \or
18     \@pstool@pdfcrop@true
19     \or
20     \fi
21 }
22 \define@choicekey*{pstool.sty}{process}[\@tempa\@tempb]{%
```