

pdfflatexpicscale

Peter Willadt*

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Abstract

pdfflatexpicscale is software that scales bitmap images to be included into Pdf \LaTeX documents down to a size sufficient for printing. This document describes installation and usage.

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1 Introduction

Picture size matters. Digital cameras produce unnecessary large images, this leads to excessive download times and wasted processing power in the print driver, for example. Tuning images by hand is fine, but it costs lots of time and there may be situations where you need e.g. low-res pictures for the web and

*willadt at t-online.de

high-res pictures for print. When there are requirements that force the size of images in our document to change, the fun will probably be gone.

Hopefully TUGboat will accept an article accompanying this description.

2 Installation

2.1 Prerequisites

You have to install ImageMagick and Perl. If you are using Linux, please use the tools of your distribution, if they are not already installed. As a windows user, you may probably use the official ImageMagick distribution at <http://www.imagemagick.org/script/download.php>. For Perl, you got more options. I have tested pdfflatexpicscale with ActiveState ActivePerl, but other distributions should work too.

You also need the following Perl modules: `File::Basename`, `File::Spec`, `File::Copy`, and `Getopt::Long`. There are several ways to get these modules, if you have not got them already:

- use your Linux distribution's software manager
- use the Perl CPAN module
- use ActiveState's ppm software, if you use ActivePerl.

Detailed description of these procedures is beyond the scope of this document.

There are no special requirements for the versions of the software to install, but it may be wise to use recent versions, as there have been security flaws with ImageMagick.

2.2 Installation

If the prerequisites have been fulfilled (which is perhaps standard for a Linux computer), it is sufficient to move the file `pdfflatexpicscale.pl` to a place that is included in your PATH and to make it executable. Of course, there are alternatives. You may perhaps prefer to type `perl /path/to/pdfflatexpicscale.pl myarticle` instead.

3 Basic usage

3.1 Preparing your L^AT_EX file, Part 1

I will assume that you use the `graphicx` package to include images. The most important point is *not* to give path names when you use `\includegraphics`. You do not have to keep all graphics in the current directory, as the `graphicx` package comes with the `\graphicspath` directive.

So, if you have all images in the directory where your L^AT_EX file resides, you are done with this. If not, you should undertake the following steps:

1. List every path to images within the `\graphicspath` directive.

2. Remove the paths from the `\includegraphics` commands.

Here is an example: If your \LaTeX file looks like this:

```
Some text...
\includegraphics[size=2in]{/home/fred/photo1}
Some other text...
\includegraphics[size=1in]{/srv/www/htdocs/logo}
```

then you should edit it to the following:

```
\graphicspath{{/home/fred/}{/srv/www/htdocs/}}
Some text...
\includegraphics[size=2in]{photo1}
Some other text...
\includegraphics[size=1in]{logo}
```

You hopefully do not have distinct pictures with the same name in the listed folders. With `\graphicspath` you have to use double braces, even if you use only one directory.

3.2 Preparing your \LaTeX file, Part 2

As size and resolution of images will change, you should specify the display size of your images by means that are independent of the image, e.g. by using something like

```
\includegraphics[width=.3\textwidth]{...}
or
\includegraphics[width=2cm]{...}
```

3.3 A complete example

The workflow looks like this:

- Edit your file.
- Run `Pdf \LaTeX` on your file.
- Create a directory for your scaled pictures.
- Run `pdflatexpicscale` on your file.
- Change the `\graphicspath` directive in your file to use the downscaled images.
- Run `Pdf \LaTeX` on your file.

Let us assume that your \LaTeX document is called `myarticle.tex`, that all images reside in the project directory and that you have done the preparation steps described above. Let us further assume that you want to produce a PDF file suitable for preview with 72 dpi image resolution.

So you create a subdirectory called `previewpix` and run `Pdf \LaTeX` like usual on `myarticle`. Then you issue

```
pdflatexpicscale --printdpi=72 --destdir=previewpix myarticle
```

If you are curious, you may insert `--verbose` anywhere before your project name (and before running it). Then you fire up your editor and add the following line near the beginning of your \LaTeX file:

```
\graphicspath{{previewpix/}}
```

You may probably check the size of `myarticle.pdf`. Then run Pdf\LaTeX again on `myarticle`. I have told you to use double braces with `\graphicspath`, haven't I? If you still are curious, you can again check the size of `myarticle.pdf`.

When it gets to preparing a print version, you create a directory for images with more detail, say `printpix`. You reset the `\graphicspath`, run Pdf\LaTeX , issue

```
pdflatexpicscale --printdpi=300 --destdir=printpix myarticle
```

and set `\graphicspath{{printpix/}}` before the next Pdf\LaTeX run.

4 Advanced usage

4.1 Excluding files from scaling

You will probably exclude files from scaling when you think that scaling will do damage. You may achieve this by several means. Before you ask. Enumerating files to exclude is not really cool, so this is not supported.

1. Use `\includegraphics` for this files with full path names. This is uncool, but can be done.
2. Pack these files into a special source directory. Read the following explanation.

It works like this: you create three directories for pictures:

- One for images to stay unscaled. Let's call it `hires`
- One for images to scale. Let's call it `images`
- One for downscaled images. Let's call it `printing`

Then you use the feature of `\graphicspath` to include several directories. Before the first \LaTeX run, you say

```
\graphicspath{{hires/}{images/}}
```

and after `pdflatexpicscale` is through, you change it to

```
\graphicspath{{hires/}{printing/}}
```

4.2 Gory details

`pdflatexpicscale` reads the log file, not the \LaTeX source. So you have to run Pdf\LaTeX at least once before something can happen.

Pure black-and-white images will be treated different from other picture files: They get four times the resolution, as probably every pixel counts. Images that are only a little larger than ideal will not get scaled, but you may change this from the command line. If an image will not be scaled, it will be just copied to the destination directory.

`pdflatexpicscale` looks only for the width of images, so if you intend do do anisotropic scaling you will not get best results.

Clipping will not work with `pdflatexpicscale`. The *graphicx* package devises picture size from the picture file, then applies clipping to it and afterwards does scaling, rotation and so on. As `pdflatexpicscale` changes pictures (as well dimensions as nominal resolution), clipping results will change too, you will end up with a mess. The same thing happens when you do not give the figure dimensions in units relying only on document properties (like page width).

4.3 Command line options

All command line options have to be prepended by two minus signs. If they take arguments, you should add an equal sign and the argument to your option. All command line options are optional, but you have to specify a project name.

destdir followed by *a directory name relative to the current directory* specifies where the scaled pictures should go. The default is **printing**. The directory has to exist, `pdflatexpicscale` will not create directories.

printdpi followed by the resolution in dpi lets you change the target resolution. Default is 300, for online use you may supply 96, e.g.

srcdir followed by *the directory where your unscaled pictures are* is normally not required, as `pdflatexpicscale` gets the path names from the log file it reads. You may set this option if you have already changed the `\graphicspath` and are too lazy to change it again. The default is empty.

printdpi followed by a numer lets you change the range in which pictures remain unscaled because they are near the target resolution. Default is 20, that means 20 percent. If target resolution is 300 dpi, files up to 320 dpi get accepted too. Change to 0 if you want no tolerance.

verbose entertains you by showing what the program is about to do.

version shows the software version.

Calling `pdflatexpicscale` without any options and without a project name will display a short usage text.

4.4 Printer testing

You can—and you should—actually print a file with images scaled to distinct resolutions and compare the results. If paper quality matters for you (inkjet user?), you should repeat this with different paper.

If you belong to the once-privileged class of people who own a PostScript printer, you may copy the file `testprinter.ps` to your printer. For all other folks, this file is useless. Software like Ghostscript will convert the rasters to uniform colored areas. Anyway, here is what you should see:

- The uppermost part of the page will present squares filled with lines. With my printer, 100 lpi is the best I can get.

- The middle part of the page shows squares with five levels of gray with dotted raster. The result should be similiar.
- The bottom of the page is dedicated to the ends of the gray scale. Can you distinguish 94% gray from white? Or 6% gray from black?

5 License

pdfflatexpicscale.pl and the accompanying files are subject to the current version of the L^AT_EX project public license.

6 Bugs, Improvements, and Changes

Please submit bug reports to the package author (me). I will be glad to make the package better.

6.1 Changelog

2016-07-28 Upload of first public version to CTAN.

2016-07-31 Reformatted *Gory details* section and added information about anisotropic scaling and clipping

2016-08-02 Fixed some typos. Corrected handling of lines wrapped in the log file.