PDF presentations using the *Marslide* package

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Abstract

The *Marslide* package is useful for creating high quality PDF presentation slides, especially when mathematics is required. It works equally well with both pdf-LaTeX and LaTeX+dvips+distill methods for generating documents in PDF format [2].

The package does not of itself provide a lot of new functionality; rather it combines the use of existing packages in a consistent way, solving problems of compatibility and loading-order. With such problems solved, the full power of packages such as hyperref, texpower, geometry and everyshi can be exploited fully, to produce presentation slides that rival, indeed surpass, what can be achieved with other tools.

Some new sub-packages are included to make it easy to use alternative fonts (in particular Lucida for mathematics, and some Adobe or TrueType fonts), and to place background images on every page. An extended option-loading mechanism allows for arbitrary extension of the package, and customised document styles.

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What's in a name?

The collection of LaTeX macros that are used within what we now call the *Marslide* package have been developed over many years, in response to a direct need for projecting mathematics for lectures and seminar talks. Professor Jerrold Marsden, at the California Institute of Technology's Control and Dynamical Systems group, is a prolific writer of advanced mathematics texts. Jerry has used TeX exclusively for many years, both for book manuscripts and for lectures and seminars. One of us (Wendy) is his administrative assistant.

The other (Ross) has enjoyed several invitations to visit CalTech, for the purposes of helping to debug/develop TeXniques for use in the books, and to share TeXpertise in web-site construction and on-screen presentations via the 'CalTeX Talks' lecture series [4, 5, 6, 7]. Some of these visits have correlated well with annual TUG meetings in the USA; the WaRMreader macros [9] (the subject of another talk at this meeting) were developed to solve a specific problem concerning the labelling of graphics for some of Jerry's many books.

The *Marslide* package itself was developed so as to have a unified way to prepare slides for two different situations:

- lectures and talks, involving significant amounts of mathematics and written text in a classroom setting;
- copying a particular style, developed initially using PowerPoint, to be used at a particular meeting where several presenters were to be using the same uniform style.[1]

In this latter case, the need to include a significant amount of properly typeset mathematics meant that a good TeX-based solution needed to be developed. This was done, to the great satisfaction of all who viewed the presentation. Thus the 'Mars' in 'Marslide' refers to Prof. Marsden, not to the heavenly body.[2]

[1] This style was developed by Peter Schröder, for the Multiresolution Simulation & Engineering Design (mRSED) project at CalTech.

[2] However, the association is not entirely misplaced, as Jerry's work in many-body problems includes techniques for the calculation of orbits of planets and spacecraft. This includes simulations for actual space-missions to the red planet.

Marslide, as a meta-package

Although loaded as a LaTeX package, using a command such as

```
\usepackage[options]{marslide}
```

it is better to think of *Marslide* as being a *meta*-package, for the following reasons.

1. There are not many new commands or environments defined within `marslide.sty` itself. Most of the specialised behaviour is achieved by loading other packages, already available with all LaTeX distributions; e. g. geometry, graphicx, hyperref, color, verbatim, fontenc, multicol and also amssymb, amsmath, tabularx.
2. Extra packages texpower, everyshi and eso-pic are used for specialised effects. These are available at CTAN or elsewhere on the internet.
3. To adjust font-sizes and page-layout to be suitable for a screen presentation, *Marslide* overrides such aspects of the document-class chosen with the `\documentclass` command. (The reason why *Marslide* was not implemented as a document-class is discussed below.)
4. Extra subsidiary packages hugefonts, bgimages and lucrotis have been written primarily for use with *Marslide*. (These packages are sufficiently self-contained, to be usable also in other contexts.)
5. *Marslide* can be customised to include extra features. Indeed it *must* be customised. A subsidiary file `marsdefs.sty` is loaded as the default customisation when no alternative option has been specified.
6. Customisation is achieved using a flexible extension to LaTeX's optional argument mechanism. For example,

   ```
   \usepackage[...,mydefs]{marslide}
   ```

   will cause a file `mars-mydefs.sty` to be read at the appropriate time during processing of the document preamble, provided such a file is in the current working directory, or can be found on the usual search paths. (Any string instead of `mydefs` can be used, except for strings that correspond to valid options to marslide or the packages listed in items 1, 2 and 4 above or to the lucidabr package.)

The reason for this structure is because *Marslide* needs to load packages such as geometry, hyperref, etc. with some specific optional parameters. However, some of these packages can conflict with one another, in the sense that reversing the loading order can lead to unexpected results from the LaTeX processing.

Authors may wish to use other options as well with these packages. This can be done using LaTeX's `\PassOptionsToPackage` command, *before* the command to load marslide.

Similarly, authors may wish to load other packages as well as those provided automatically as part of the *Marslide* setup. Beware that the use of extra packages increases the possibility of encountering situations where unexpected effects may occur due to incompatibilities, or a dependency on the order in which the packages need to be loaded. To be able to deal with such dependencies it is important that packages may be loaded either before, or after `marslide.sty` is read. Since it is an error in LaTeX to use `\usepackage` *before* the `\documentclass` command, it was necessary to *not* write `marslide.cls`, but use `marslide.sty` as a (*meta*-)package.

Note that it is possible that some packages may not give the correct results when loaded *either before or after* marslide, due to conflicts with other packages. Instead, such packages may need to be loaded *as part of Marslide*. This is a secondary purpose of the customisation mechanism, outlined in item 6 above, which causes the customisation file to be read after most of the standard packages in items 1, 2 and 4, but before the geometry package has been read. LaTeX's `\RequirePackage` command can be used within the customisation file, to load such packages.

Not just for PDF

In setting-up the package-loading structure (as described above) for *Marslide*, much care was taken to ensure that features worked correctly whatever processor was used. Thus the appearance of the PDF document should be the same, whether it is generated directly using pdf-LaTeX(i.e pdf-TeX [8], with the `pdflatex.fmt` format) or using LaTeX, followed by a distillation to PDF of the resulting PostScript job.

Indeed the `.dvi` output from LaTeX can be used directly for the presentation, either by (color) printing to transparencies, or directly onscreen with a dvi-viewer. Even the sequential page-building features of the texpower package are available in the dvi version, and some viewers support the hyperlinking features produced using hyperref. This latter requires that the correct driver files are loaded for the particular TeX

implementation. The WaRM team[3] have successfully used *Marslide* with teTEX under Unix, and *Textures*[4] for the Macintosh, as well as with pdf-TEX.

Customisation

As noted above, a customisation file is *required* to use *Marslide*. The main purposes of this customisation are to:

1. establish the size and orientation of the paper, and the area in which typesetting is to occur;
2. select the font-faces and sizes to be used for the typesetting;
3. choose colours for textual and graphic elements in the resulting slides;
4. declare graphics for logos, and define other special features to appear on all pages, or just some of them.

It is also usual to define macros for establishing running headers and/or footers within the customisation file, and to define commands making it easy to layout a distinctive title-page for the presentation. These things could be defined within the document preamble, but it is neater to hide them away within the customisation file, so that the document source is not cluttered with hard-to-read macro definitions.

The default customisation file provides a good starting point for defining your own. Firstly you should copy `marsdefs.sty` and rename this copy before making any changes inside. Since it contains a `\ProvidesPackage` command, using `\filedate` and `\fileversion`, please adjust these within the copy.

The default customisation begins by loading the geometry package, as follows:

```
\usepackage[landscape, letterpaper, verbose,
%,textheight=5.5 truein %calculated by geometry
%,textwidth=10.0 truein %calculated by geometry
 ,voffset=-.35pt
 ,hoffset=0pt
 ,tmargin=0pt
 ,bmargin=0pt
 ,lmargin=36pt
 ,rmargin=36pt
 ,headheight=78pt
 ,headsep=20pt
 ,footskip=0.20 truein   %non-mRSED
 ,tmargin=.10truein
 ]{geometry}
\addtolength{\voffset}{-.10truein}
```

The sizes given here work very nicely for US-letter sized paper, oriented as landscape. Consult documentation on the geometry for the use of any of these parameters, if it's not clear from the names. In practice, small adjustments to margins or offsets may be needed to remove a single row or column or white pixels at the edge of the paper, when the slide presentation is viewed in a PDF browser. (It is better to do this kind of edit within a customisation file rather than within a larger package.)

The default `marsdefs.sty` also allows for using Lucida fonts, as an alternative to TEX's standard Computer Modern fonts. Of course, you'll need to have purchased a set of Lucida fonts, and have correctly installed them for your TEX application, to be able to use this option. Using the option `lucida`, when loading the marslide, causes a file `lucrotis.sty` to be read. This in turn loads the lucidabr package, along with suitable options, some of which may have been inherited from options given to marslide. Options, such as `callig`, `handw`, `sslucida`, `seriftt`, can be used to determine which of the Lucida fonts is used for the main text font, and the facee used with `\texttt`. Other options, such as `T1`, `OT1`, `7bit`, `8bit` determine which font encoding to use, by loading the fontenc package with an appropriate option.

The lucrotis also allows for the use of Adobe's Rotis font, which has an unusual, but quite pleasing, appearance in its semi-serif form. To use this, you'll need to have `.pfb` (or other PostScript) files for the fonts, and have installed appropriate metrics, virtual fonts and `.fd` files. Metrics and TEX/LATEX-specific files can be distributed with *Marslide*, but you'll need to purchase the fonts themselves from Adobe, if you wish to use these fonts. Similarly the interface files can be constructed (e.g. using the fontinst package) for use with *Marslide*, but that's a whole other story.

Features & Documentation

Most of the special features of *Marslide*, some using the default `marsdefs` customisation file, are displayed in the PDF documentation that accompanies the package, at its distribution site[5]. Figures 1–5 reproduce this documentation, as slides created using the package itself, then captured as 4-up using the pdfpages package.

[3] **W**endy **a**nd **R**oss **M**(oore or **M**cKay, take your pick!).
[4] produced by Blue Sky Research; see the website http://www.bluesky.com/.
[5] http://www.cds.caltech.edu/~wgm/WARM/slides/marslide/

These slides show how to make use of features such as:

- heading levels: different font-sizes, bullets, colorings and indents;
- colors: RGB-codes, color-names and color commands;
- font-sizes, ligatures and accents;
- colored banners: in the header, or part of the body-text;
- dingbats: different shapes and sizes, open or solid;
- graphics: imported using `\includegraphics`;
- hyperlinks: for cross-references, citations, etc.

There are some newer features which are not yet documented there. These include:

- using a background image on every page, or several images on select pages;
- removing the banner in the header, for a larger text-body;
- generation of PDF bookmarks to document sections, or pages where the banner text changes;
- macros to insert hyperlinks to external movie files, with a poster-picture as the hyperlink button to start the movie;
- set a margin to avoid the edges of the paper that cannot be printed, but which does not show when the PDF slides are viewed in a browser.

More examples

Figure 6 shows a document style that could be used effectively at a large conference or congress. This document presents the speakers and abstracts for just one lecture session or mini-symposium on a specialised topic. Typically there'll be many of these, distributed together on CD-ROM, with speaker and subject indexes for the whole congress.

Figure 7 shows lecture slides that one author has used when teaching a mathematics course. Such documents are available to students from a web-site, so that they can review the lecture presentation. As there are typically many incremental page-builds, these documents are not suitable for printing as lecture notes. Instead, a 4-up version is provided of the fully-built pages, as are presented here in this proceedings volume.

Elsewhere in this volume are other papers by the same author(s) [10, 9]. These include further examples of the use of *Marslide*.

References

[1] Adobe Systems Inc.; Acrobat Reader, viewer for PDF format [2] documents, available free of charge from http://www.adobe.com/.

[2] Adobe Systems Inc.; "Portable Document Format, Reference Manual, Version 1.3"; March 11, 1999.

[3] Adobe Systems Inc.; "`pdfmark` Reference Manual"; Technical Note #5150; Adobe Developer Relations; Revised: March 4, 1999.

[4] CalTEXTalk #1, June 1998: "Automatic Generation of Web-sites using LaTeX2HTML"; online abstract: http://www.cds.caltech.edu/caltex/1998/.

[5] CalTEXTalk #2, July 1999: "TEX is Alive and Well for Web-based Presentation of Mathematics"; abstract: http://www.cds.caltech.edu/caltex/1999/.

[6] CalTEXTalk #3, May 2000: "High Quality Electronic Presentation of Mathematics; Using PDF, TEX/LaTeX, and More"; abstract: http://www.cds.caltech.edu/caltex/2000/.

[7] CalTEXTalk #4, August 2001: "Advanced uses of pdfLaTeX"; abstract: http://www.cds.caltech.edu/caltex/2001/.

[8] Hàn, Thế Thành; pdfTEX, free software for generating documents in PDF format, based on the TEX typesetting system. Available for all computing platforms; see http://www.tug.org/applications/pdftex/.

[9] McKay, Wendy and Moore, Ross and Ruark, Tom; "Adobe plugin for WARMreader" TEX Users Group 2001 Proceedings, (elsewhere in this volume).

[10] Moore, Ross and Griffin, Frances; "MacQTEX: Online self-marking Quizzes, using pdfTEX and exerquiz" TEX Users Group 2001 Proceedings, (elsewhere in this volume).

Figure 1: Marsden Slide Package Documentation; pages 1–4, showing different heading levels with associated bullets, coloring and font-sizes. Also some mathematics is shown.

Figure 2: Marsden Slide Package Documentation; pages 5–8, showing examples of code-listings, color-specifications and some predefined color-commands for partical graphic elements and styles of text.

Figure 3: Marsden Slide Package Documentation; pages 9–12, showing the sizes associated with LaTeX's size commands, and examples testing that ligatures and accents are correctly formed.

Figure 4: Marsden Slide Package Documentation; pages 13–16, showing how to include graphics and colored banners, as well as examples of inserting dingbats either explicitly or implicitly.

Figure 5: Marsden Slide Package Documentation; pages 17–20, showing the full range of available dingats at different sizes, and how to use hyperlinks in the bibliography.

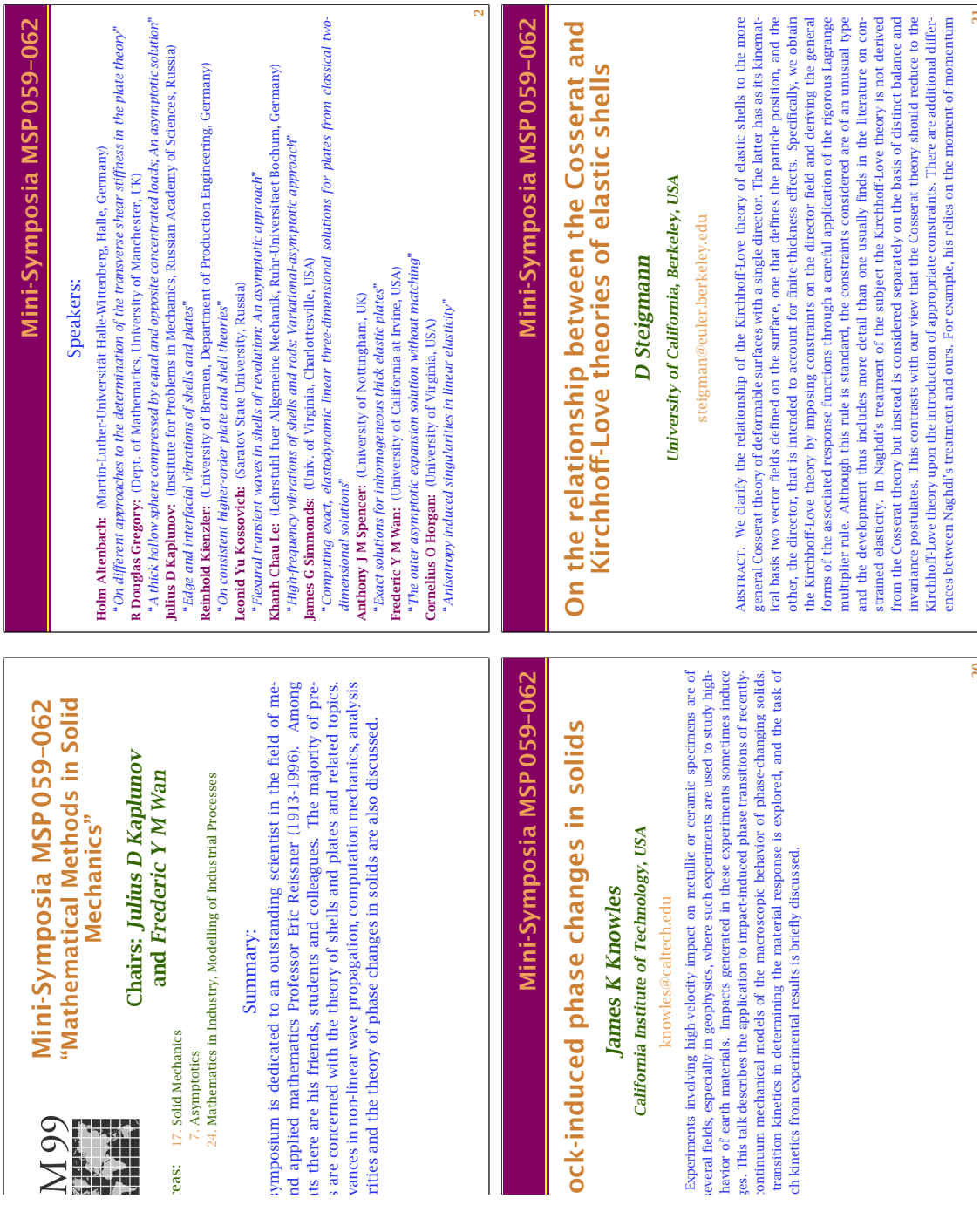

Figure 6: Introductory slides for a congress mini-symposium, with speaker listing and abstracts of all the talks.

Figure 7: Lecture slides for use in mathematics teaching.