

PROSPER: LaTeX-based Computer Presentations

By Matthias Heil and Andrew L. Hazel

In many branches of science and engineering, presentation software—usually Microsoft’s PowerPoint—has become a popular tool for the delivery of research talks. Increasingly, such software is also being used in teaching. If used properly, presentation software combines the advantages of traditional “chalk and talk”-based teaching (arguments can be developed step by step; sections of text can be erased while others are kept “on the blackboard”) with the benefits of computer-generated OHP slides, ensuring an attractive appearance regardless of the speaker’s handwriting. It also makes it possible to incorporate computer-generated graphics and animations.

Frédéric Goulard has developed a new document class that allows the creation of computer-based presentations in LaTeX: PROSPER, based on the seminar class, originally written by Timothy Van Zandt. The class, documentation, and many examples can be downloaded from the PROSPER home page <http://prospcr.sourceforge.net>. A number of style files are provided, defining generic templates for each slide (e.g., colours, fonts, logos), which can easily be modified to suit individual needs.

Once the LaTeX source has been processed, the DVI file can be used to generate two different output formats: Portable Document Format (PDF), for displaying the slides on-screen, or PostScript, for printing backup transparencies. PostScript files are produced in the normal manner, via `dvips`, and the PDF files are derived from the PostScript by `ps2pdf`, available with recent GhostScript distributions. Because PROSPER does not yet support `pdflatex`, direct conversion to PDF from the source is not possible.

PDF is a highly portable format and can be displayed on a wide variety of hardware platforms with the Acrobat reader (available for free download from <http://www.adobe.com/products/acrobat>). Acroread includes a full-screen mode for presentations (produced by `<Ctrl L>`) and supports a number of different transition effects between slides (e.g., replace, dissolve, glitter) that can be defined in the LaTeX source.

A key feature of the PROSPER class is the use of overlays to control the appearance of certain sections of text on the screen, as illustrated in the following example.

```
\overlays{3}{
\begin{slide}{Title of the slide}
This text is visible throughout.
\untilSlide{2}{This text appears until slide two.}
\fromSlide{2}{This text appears from slide two.}
\onlySlide{3}{This text only appears on slide three.}
\end{slide}}
```

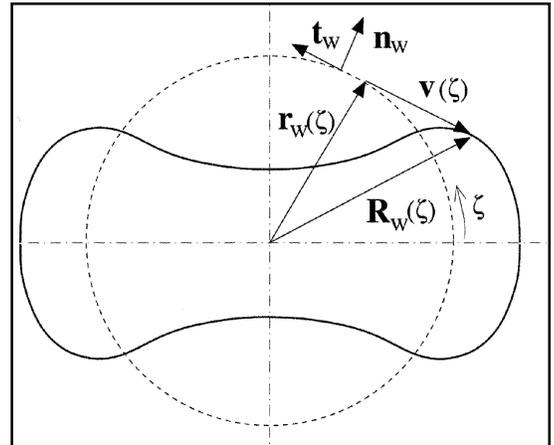
In this example, text specified in the arguments remains displayed at its original position, even if the space “above” it becomes available subsequently. The starred versions of the three commands (e.g., `\fromSlide*{n}{}`) reformat the page to fill any gaps that appear when material is removed and should be used for replacement purposes.

External graphics can be included with standard LaTeX packages, such as `epsfig` and `graphics`, and the `pstricks` package can be used to produce lively annotations and effects; see the file `prospcr-tour.tex` included in the distribution. The PROSPER class includes the `hyperref.sty` package by Sebastian Rahtz, which can be used to define internal and external hyperlinks within the document. In particular, hyperlinks to external animations can be created via the command

```
\href{run:WonderfulAnimation.avi}{Start animation}
```

The hyperlink “Start animation” spawns a multimedia player, defined by Acroread, that displays the movie `WonderfulAnimation.avi` in a new window. In this example, `WonderfulAnimation.avi` must be in the same directory as the PDF file, although, of course, relative file names can be specified. Direct links to Acroread menu options can also be created, as in the following example:

```
\Acrobatmenu{NextPage}{Next}
\Acrobatmenu{PrevPage}{Prev}
```



Opening slide from the authors’ PROSPER presentation on Lagrangian wall mechanics.

which defines two hyperlinks, Next and Prev, to the next and previous pages, respectively. Speakers who include such links in their generic style files can use wireless mice to control their presentations.

Two examples illustrating the on-screen manipulation of fairly complex equations and the use of associated graphics can be found at <http://www.maths.man.ac.uk/~mheil/Prosper>.

When we first used PROSPER we were amazed by how easy it was to convert existing LaTeX-generated slides into electronic presentations. We have now used PROSPER for many research presentations and occasionally for teaching. The following points might be useful for newcomers to computer-based presentations:

- LCD projectors are now widely available at conferences, and incompatibilities between laptops and the projectors tend to be rare(r). Nevertheless, we still prepare “backup” OHP slides in case of any hardware problems.

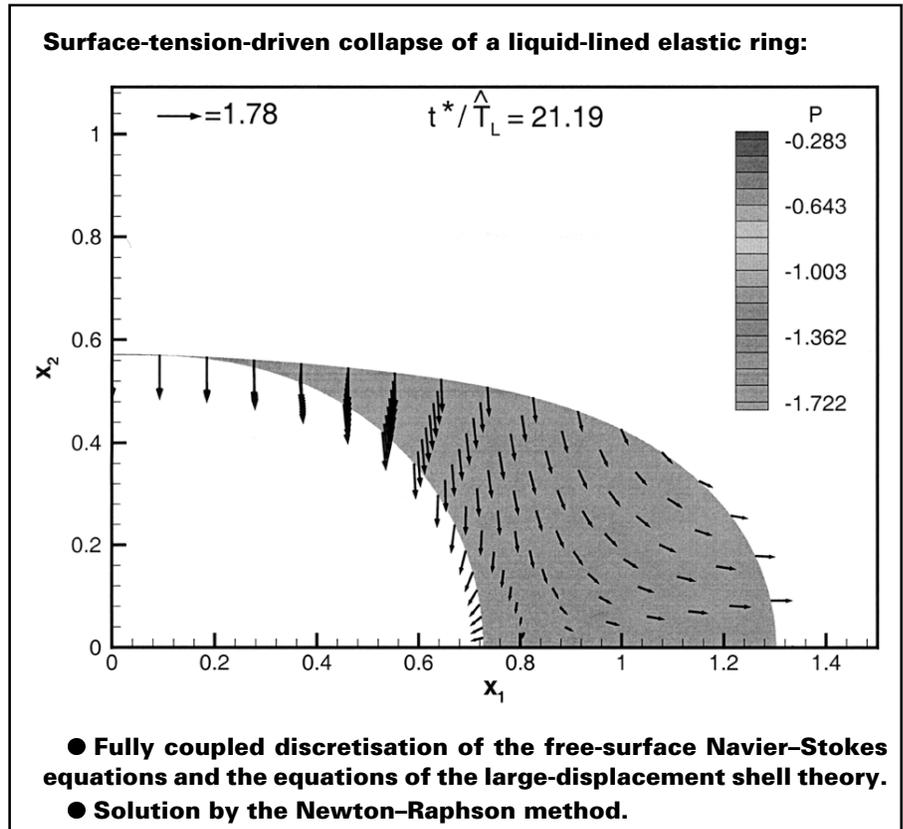
- One drawback of any computer-based presentation is that it is impossible to see the next slide before it appears on the screen. To ensure a smooth talk, speakers need to commit the sequence of their slides to memory. We (and a few other speakers whose talks we have attended) have occasionally been surprised by the appearance of “unexpected” slides.

- Many speakers use Post-It notes to attach brief comments to their OHP transparencies. We achieve this effect by using the `\onlyslide{}` command to briefly display any such notes (in a smaller font size) on the screen.

- It is very easy to customise the style files to include logos, frames, and colourful backgrounds. However, it is important to remember that graphics can be distracting and that some backgrounds strongly reduce the readability of the text. For maximum contrast, we prefer black text on a white background and tend to use colour only to highlight important sections of the text and the equations.

To summarise, we feel that Frédéric Goulard has created an extremely useful tool, one that we expect to become very popular within the mathematical sciences community.

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Another PROSPER sample from the authors: results displayed as a pseudo-animation.