

Classes Writing for Wizard Apprentices

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1. Introduction

Categories of T_EXnicians:

Wizards: They know everything. No lectures needed for them.

Beginners: They've just started. Lots of great literature for them¹.

Wizard Apprentices: People who know Class Guide² by heart and have The Companion³ on the shelf. This lecture is for them!

¹See, for example Jim Hefferon, "Minutes in Less Than Hours: Using L^AT_EX Resources," *TUGboat* 26/3 (2005), Peter Flynn, "Rolling Your Own Document Class: Using L^AT_EX to Keep Away From the Dark Side," *TUGboat* 28/1 (2007), Scott Pakin, "Good Things Come in Little Packages: An Introduction to Writing .ins and .dtx Files," *TUGboat* 29/2 (2008), Niall Mansfield, "How to Develop Your Own Document Class—Our Experience," *TUGboat* 29/3 (2008)

²Johannes Braams et al., L^AT_EX 2_ε For Class and Package Writers, 2006, <http://www.ctan.org/tex-archive/macros/latex/doc/clsguide.pdf>.

³Frank Mittelbach et al., *The L^AT_EX Companion* (Boston: Addison-Wesley Professional, 2004), series Addison-Wesley Series on Tools and Techniques for Computer Typesetting.

2. Interfaces

2.1. You May Be Tempted To Change L^AT_EX Interfaces...

Example: Problems with sectioning.

`\section[Short Title]{Full Title}` is overloaded. Why Short Title both for headers *and* TOC?

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`section*` is overloaded. Why *both* no numbers and no TOC?

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Your users may want to add packages. If you change interface, you ask for trouble.

2.3. Example: Chapters In Nostarch Package

1

MORBIAC ORCI ET NISL HENDRERIT MOLLIS



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First idea:

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Current implementation⁵:

```
\chapter[Short Title]{Long Title}  
\chapterart{Artwork}
```

⁴That's me

3. Compatibility

3.1. Compilation Paths

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\ifpdf\relax
  \pdfpageheight=\paperheight
  \pdfpagewidth=\paperwidth
  \pdfvorigin=1in
  \pdfhorigin=1in
\fi
```

⁶Heiko Oberdiek, The ifpdf Package, 2006.

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And test, test, test!

⁶Heiko Oberdiek, The ifpdf Package, 2006.

3.2. Hyperref

Your users *are* going to use hyperref⁷.

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Solution 1: Add

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\AtBeginDocument{\@ifpackageloaded{hyperref}{%  
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Solution 2: Write you own wrapper and instruct the users to call it through `\usepackage`.

⁷Sebastian Rahtz and Heiko Oberdiek, Hypertext Marks in \LaTeX : a Manual for Hyperref, 2006.

3.3. Amsmath, Listings And Others. . .

Mathematicians use amsmath⁸, programmers use listings⁹. . .

You need to *know* your users!

Be prepared to patch your class when the packages change!

⁸Michael Downes and Barbara Beeton, User's Guide for the amsmath Package (Version 2.0), 2002.

⁹Carsten Heinz and Brooks Moses, The Listings Package, 2007.

4. Some Tools

Man must shape his tools
lest they shape him.

Arthur R. Miller

Packages that make *your* life easier:

geometry: Quick setup of page dimensions¹⁰.

caption: Tuning of captions¹¹.

fancyhdr: Setting headers and footers¹².

ifpdf: Conditional code for DVI and PDF routes¹³.

¹⁰Hideo Umeki, The geometry Package, 2008.

¹¹Axel Sommerfeldt, Typesetting Captions with the caption Package, 2007.

¹²Piet van Oostrum, Page Layout in L^AT_EX, 2004.

¹³Oberdiek, *op. cit.*

5. From Scratch Or Not From Scratch?

Two approaches:

1. Start from scratch, using snippets of code from `article` or `book`.
2. Use `LoadClass` as the base and redefine everything.

I use the latter one, but it is the matter of taste.

6. Frontmatter And Title Pages

I always turn to the sports pages first, which record people's accomplishments. The front page has nothing but man's failures

Chief Justice Earl Warren

Front matter takes 60% of your time for articles and 80% for books. . . .

6.1. Simple Commands

Define internal macro to use later:

```
\def\author#1{\gdef\@author{#1}}
```


6.2. Commands With Optional Arguments

Two internal macros, `\@title` and `\@shorttitle`. with commands like `\title{On Mice and Men}` or

```
\title[Robinson Crusoe]{%  
  The Life and strange Surprizing Adventures of Robinson Crusoe of  
  York, Mariner: Who lived Eight and Twenty Years, all alone in an  
  un-inhabited Island on the coast of America, near the Mouth of the  
  Great River of Oroonoque; Having been cast on Shore by Shipwreck,  
  where-in all the Men perished but himself. With An Account how he  
  was at last as strangely deliver'd by Pyrates. Written by Himself}
```

Here we use `\@ifnextchar[` construction:

```
\def\title{\@ifnextchar[{\title@i}{\title@ii}}  
\def\title@i[#1]#2{\gdef\@shorttitle{#1}\gdef\@title{#2}}  
\def\title@ii#1{\title@i[#1]{#1}}
```

6.3. Cumulative Macros

What if we want to repeat commands?

```
\author{A.U.~Thor \and C.O.R.~Respondent \and C.O.~Author}  
\affiliation{Construction Engineering Research Laboratory\  
  U.S. Army Engineer Research and Development Center\  
  2902 Newmark Drive\  
  Champaign, IL 61826-9005}
```

```
\author{John~M.~Smith}  
\affiliation{Coastal and Hydraulics Laboratory\  
  U.S. Army Engineer Research and Development Center\  
  3909 Halls Ferry Road\  
  Vicksburg, MS 39180-6199}
```

Use `\g@addto@macro`.

This follows the ideas of¹⁴:

```
\def\author#1{%
  \ifx\@empty\authors\gdef\authors{#1}\else
  \g@addto@macro{\authors}{\and#1}\fi
  \ifx\@empty\@addresses\gdef\addresses{\author{#1}}\else
  \g@addto@macro{\addresses}{\par\author{#1}}\fi

\def\affiliation#1{%
  \ifx\@empty\@addresses\gdef\addresses{#1\par}\else
  \g@addto@macro{\addresses}{#1\par\vspace{\baselineskip}}\fi}
```

The command `\andify`¹⁵ helps to typeset this.

¹⁴Michael Downes and Barbara Beeton, *The amsart, amsproc, and amsbook document classes*, 2004.

¹⁵*Idem*

7. Conclusions

1. Writing classes is not hard.
2. You write for users: try to think like a one.
3. Test, test, test.

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