The **alttex** package

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This is the package `alttex` which will try to give an experimental new way to write X∃LATEX[1] code. So far it is mostly done with very dirty code and actually it's a collection of things that come into my mind during boring lectures. Maybe someone will have fun with the following code fragments.

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[1]If you don't know about X∃LATEX, see the appendix.4.2

1 introduction

The problem I have with LaTeX[2] is the antique way of typing. Because most people still use a hopelessly outdated keyboard layout („qwerty" or slightly adapted versions of that), LaTeX doesn't make use of some cool features. I'm not talking about writing chinese or arabic text! Maybe this example will make the idea clear:

In standard LaTeX, one has to write

```
This is the normal text, then comes the itemization:
\begin{itemize}
  \item text for first item
  \item \begin{itemize}
        \item this is an item inside an item…
        \item[$\Rightarrow$] Here an item with a formula: $\int_a^b x^2 dx$
        \end{itemize}
  \item and the outer itemize goes on…
\end{itemize}
```

Using this package and having a superior keyboard layout[3], you can simply write:[4]

```
This is the normal text, then comes the itemization:

• text for first item
•

   ‣ this is an item inside an item
   ‣[ ⇒] Here an item with a formula: $∫_a^b x² dx$

• and the outer itemize goes on…

And your normal text goes on…
```

Well, actually I'm lying now because this is not fully implemented so far. But it's the aim of this package to provide this – besides many, many other funny and cool things. The aim is to offer a more „wysiwyg" way, without loosing anything of logical markup. One still can re\define the • if he doesn't like the way his items look. I have just started to write the package, there will be much more stuff here in the future.

Ok, enough blahblah, now comes the code. We begin with the uninteresting preamble stuff:

1 `\ProvidesPackage{alttex}`

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[2]I'll write LaTeX instead of XƎLaTeX—saves me two keystrokes. Most of the code below *only* works with XƎLaTeX. If you need support for [utf8]inputenc or LuaLaTeX, please contact the author.

[3]E. g. the ergonomic layout NEO.

[4]The lmodern font I'm using here does not have the symbol for the inner item , so we change to DejaVu Sans Mono here.

```
2
3 \RequirePackage{amsmath}
```

\usepackage   Now, this is the first highlight. It is an extremely simple and stupid approach to load missing packages on-the-fly, just like MikT_EX does. We re\define the \usepackage and hope, it works. Only working with texlive! If you're using MikT_EX, put a

> \let\usepacke\oldpackage

into your preamble, *directly* after loading `alttex`. If this does not work, delete the following lines from your `alttex.sty`.

```
 4 \let\oldpackage\usepackage
 5 \def\usepackage#1{
 6   \AtBeginDocument{hallo}
 7   \IfFileExists{#1.sty}{
 8     \oldpackage{#1}
 9   }{
10     \immediate\write18{tlmgr install #1}
11   }
12 }
```

So far, this code seems to be a bit buggy, but it should work anyhow.

Now load some nice packages and testing wether you're running X_EL^AT_EX or not.

```
13 \RequirePackage{exscale}
14 \RequirePackage{ifxetex}
15 \RequirePackage{hhline}
16 \ifxetex
17 \typeout{Loading XeTeX, everything's fine.}
18 \else
19   \typeout{^^J%
20   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!^^J%
21   ! This package can only be compiled with XeLaTeX.^^J%
22   ! pdfLaTeX cannot handle unicode the way it is used here.^^J%
23   ! If you want to have support for [utf8]inputenc, please contact the author.^^J%
24   ! If you want to use LuaLaTeX, give it a try:^^J%
25   ! comment out the lines 32,33,35-43.^^J%
26   ! Please e-mail me the result of your experiences!^^J%
27   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!^^J%
28   }
29   \errmessage{No XeLaTeX, no alttex. See the log for more information.}
30   \endinput
31 \fi
32
```

We need `exscale` to write really big formulae, and `ifxetex` to check wether one uses the correct engine.

2 Textmode

2.1 no escape

\noescape You want to write plain text. Maybe you're annoyed by always escaping characters like _ # & { } $ ~ and so on. `\noescape` allows you to never escape anything—except the \, which still might be used for `\textit{}` or so. Or maybe not… because the { } are not escaped. Have to think about this one. Maybe the \ will be redefined to define { } by itself.

```
33 \def\noescape{
34   \catcode`\_= 11%
35   \catcode`\^= 11%
36   \catcode`\#= 11%
37   \catcode`\&= 11%
38   %\catcode`\{= 11%
39   %\catcode`\}= 11%
40   \catcode`\$= 11%
41   \catcode`\~= 11%
42   \makeatletter%
43   \catcode`\%= 11
44 }
```

The `\makeatletter` is not necessary. But it fitted into this line, so I will leave it here.

\oldescape Of course this has to be reset when doing anything like formula, tabular etc. Maybe I will be able to change the behaviour automatically. This idea has been inspired by a discussion on the ConTEXt mailinglist.

```
45 \def\oldescape{
46   \catcode`\%= 14%
47   \catcode`\_= 8%
48   \catcode`\^= 7%
49   \catcode`\#= 6%
50   \catcode`\&= 4%
51   %\catcode`\{= 1%
52   %\catcode`\}= 2%
53   \catcode`\$= 3%
54   \catcode`\~= 13%
55   \makeatother%
56 }
```

2.2 tabular

The way one has to type extensive tables is quite complex – and the resulting code is often not really readable. I don't have good ideas how to change this, but I'm thinking about it. Just a reminder to myself… mail me any suggestions for this!

I will try to implement cool stuff from the hhline-package.

This will be the first attempt to make tabulars easier: Mostly you want an `\hline` after an `\\`. So let's try something like:

Type \§ at the end of a line, and you get an \hhline:

```
57 \def\§{\\ \hhline}
```

This is shurely not a good symbol for this purpose, but I don't have a better idea so far. At least it's a "bar", so one can guess what it should do.

3 Math stuff

3.1 braces

\newbraces
\oldbraces

Now this is something most LATEX-beginners don't recognize and wonder why the formula looks so ugly: The braces () do not fit to the hight of the formula. This can be achieved by putting \left and \right in front of the braces. But actually, this is annoying! In almost any case you want this behaviour, so this should be the standard. So we redefine the way braces are handled. With \newbraces the ( ) always fit. If you prefer the normal LATEX way, use \oldbraces to reset everything. This new behaviour should be extended to other characters like | [{ < and so on. Maybe in some later version.

I would have never been able to implement this without the help of the mailinglist members of tex-d-l@listserv.dfn.de!

The redefinition of \mathstrut is necessary when using amsmath (you will use amsmath when typesetting formulae, won't you?), because the hight of formulae is determinated by the hight of a brace. But using ( ) as \active characters, we need another brace here. So we take [. This will probably also change. But the code is working fine for ( ).

Maybe one could "temporarily hardcode" the hight of [and then use this...

```
58 \makeatletter
59 \def\resetMathstrut@{%
60    \setbox\z@\hbox{%
61      \mathchardef\@tempa\mathcode`\[\relax
62      \def\@tempb##1"##2##3{\the\textfont"##3\char"}%
63      \expandafter\@tempb\meaning\@tempa \relax
64    }%
65  \ht\Mathstrutbox@\ht\z@ \dp\Mathstrutbox@\dp\z@
66 }
67 \makeatother
68
69 \edef\oldbraces{
70   \mathcode`(\the\mathcode`(
71   \mathcode`)\the\mathcode`)
72 }
73 \begingroup
74   \catcode`(\active \xdef({\left\string(}
75   \catcode`)\active \xdef){\right\string)}
76 \endgroup
77
78 \def\newbraces{
79   \mathcode`("8000
80   \mathcode`)"8000
```

3.2 huge display math

hugedisplaymath Sometimes, especially in presentations, you might need an really big formula. Imagine two hours of struggle with transformations—and finally there is the beautiful formula. Now you can say

```
\begin{hugedisplaymath} E = mc^2 \end{hugedisplaymath}
```

There should be several steps of size, maybe.

```
82 \def\hugedisplaymath{
83   \makeatletter
84     \makeatother
85   \Huge
86     \begin{equation*}
87 }
88 \def\endhugedisplaymath{
89   \end{equation*}
90 }
```

3.3 unicode math

Typing math in TeX is no great fun – you have to write things like \int instead of $\int$ and so on. Have a look at the following formula:

```
\int_\infty^\infty \sum_a
```

$\int$ The code again is stolen and I don't understand, why it does what it does, but it does it: The first argument is the character you want to use for "unicode math", the second one is the TeX-command.

```
91 \makeatletter
92 \def\altmath#1#2{%
93   \expandafter\ifx\csname cc\string#1\endcsname\relax
94     \add@special{#1}%
95     \expandafter
96     \xdef\csname cc\string#1\endcsname{\the\catcode`#1}%
97     \begingroup
98       \catcode`\~\active  \lccode`\~`#1%
99       \lowercase{%
100      \global\expandafter\let
101         \csname ac\string#1\endcsname~%
102      \expandafter\gdef\expandafter~\expandafter{#2}}%
103     \endgroup
104     \global\catcode`#1\active
105   \else
106   \fi
107 }
108 \makeatother
```

6

We will make a switch to turn this stuff on or off, so it does not interfere with the unicode-math package. This list will increase by time. If you are missing a symbol, just send me the `\altmath{X}{\Xcode}`-line. I would be very thankful if anybody could send me a whole list of symbols!

```
109 \def\makealtmath{
110 \altmath{ }\alpha
111 \altmath{ }\beta
112 \altmath{ }\gamma
113 \altmath{ }\delta
114 \altmath{ }\Rightarrow
115 \altmath{ }\Leftarrow
116 \altmath{ }\Leftrightarrow
117 \altmath{ }{\int}
118 }
```

There will be an `\makenormalmath`-switch as well.

4 Lists and such things

4.1 itemize with a single character

• instead of `\item` Here we use an active character (mostly a unicode character bullet •) for the whole construct. And another one for nested itemizations (like a triangular bullet ‣).

This does—guess it—not work correctly so far. I'm trying to find a tricky way so that the ending character is not necessary any more. So far one has to end an itemize with something like an – (em-dash). There will also be a possibility to change the characters responsible for the whole action.[5]

`\newitemi` The following ugly peace of code is writen by me, defining the conditional inser-
`\newitemii` tion of the `\begin{itemize}`. This will be assigned to an active character using `\makeitemi` and `\makeitemii`, respectively.

```
119 \def\outside{o}
120 \def\inside{i}
121 \let\insideitemizei\outside
122 \let\insideitemizeii\outside
123
124 \def\newitemi{
125   \ifx\insideitemizei\inside
126     \expandafter\item%
127   \else
128     \begin{itemize}
129       \global\let\insideitemizei\inside
130       \expandafter\item%
131   \fi
132 }
133
134 \def\newitemii{
```

---

[5]The triangular bullet sign does not appear here – the font is lacking it…

```
135    \ifx\insideitemizeii\inside
136      \expandafter\item%
137    \else
138      \begin{itemize}
139        \global\let\insideitemizeii\inside
140        \expandafter\item%
141    \fi
142 }
```

Ok, the following code is stolen from the `shortvrb` package, and I don't understand anything of it. But I keep on trying... nevertheless, it's working fine, as far as I can see.

`\makeitemi` With this macro, you can define the character you want to use for first-level
`\makeitemii` itemize. (Guess the sense of `\makeitemii`...) Default ist • for first-level and ⸱ for second-level. Maybe this will be extended till fourth level. More doesn't seem to make any sense.

```
143 %
144 \makeatletter
145 \def\makeitemi#1{%
146    \expandafter\ifx\csname cc\string#1\endcsname\relax
147      \add@special{#1}%
148      \expandafter
149      \xdef\csname cc\string#1\endcsname{\the\catcode`#1}%
150      \begingroup
151        \catcode`\~\active  \lccode`\~`#1%
152        \lowercase{%
153        \global\expandafter\let
154          \csname ac\string#1\endcsname~%
155        \expandafter\gdef\expandafter~\expandafter{\newitemi}}%
156      \endgroup
157      \global\catcode`#1\active
158    \else
159    \fi
160 }
161
162 \def\makeitemii#1{%
163    \expandafter\ifx\csname cc\string#1\endcsname\relax
164      \add@special{#1}%
165      \expandafter
166      \xdef\csname cc\string#1\endcsname{\the\catcode`#1}%
167      \begingroup
168        \catcode`\~\active  \lccode`\~`#1%
169        \lowercase{%
170        \global\expandafter\let
171          \csname ac\string#1\endcsname~%
172        \expandafter\gdef\expandafter~\expandafter{\newitemii}}%
173      \endgroup
174      \global\catcode`#1\active
175    \else
```

```
176    \fi
177 }
```

Now there are the two helperfunctions – no guess what they are really doing.

```
178 \def\add@special#1{%
179    \rem@special{#1}%
180    \expandafter\gdef\expandafter\dospecials\expandafter
181 {\dospecials \do #1}%
182    \expandafter\gdef\expandafter\@sanitize\expandafter
183 {\@sanitize \@makeother #1}}
184 \def\rem@special#1{%
185    \def\do##1{%
186      \ifnum`#1=`##1 \else \noexpand\do\noexpand##1\fi}%
187    \xdef\dospecials{\dospecials}%
188    \begingroup
189      \def\@makeother##1{%
190        \ifnum`#1=`##1 \else \noexpand\@makeother\noexpand##1\fi}%
191      \xdef\@sanitize{\@sanitize}%
192    \endgroup}
193 \makeatother
```

4.2   enumerate with a single character

[1], [2]   And we do just the same stuff with \enumerate. But here we take the character [1] as first level item, the [2] as second level etc. This may be confusing some way, but just try it.

For the implementation: copy-pasted the code above, nothing interesting so far.

```
194 \def\inside{i}
195 \def\outside{o}
196 \let\insideenumi\outside
197 \let\insideenumii\outside
198
199 \def\newenumi{
200    \ifx\insideenumi\inside
201      \expandafter\item%
202    \else
203      \begin{enumerate}
204        \global\let\insideenumi\inside
205        \expandafter\item%
206    \fi
207 }
208
209 \def\newenumii{
210    \ifx\insideenumii\inside
211      \expandafter\item%
212    \else
213      \begin{enumerate}
214        \global\let\insideenumii\inside
```

```
215        \expandafter\item%
216    \fi
217 }
218
```

We use the same methods as above, still not understanding, what they are doing. Just changing two lines of code and hoping, everything will be fine.

```
219 \makeatletter
220 \def\makeenumi#1{%
221    \expandafter\ifx\csname cc\string#1\endcsname\relax
222      \add@special{#1}%
223      \expandafter
224      \xdef\csname cc\string#1\endcsname{\the\catcode`#1}%
225      \begingroup
226        \catcode`\~\active  \lccode`\~`#1%
227        \lowercase{%
228        \global\expandafter\let
229           \csname ac\string#1\endcsname~%
230        \expandafter\gdef\expandafter~\expandafter{\newenumi}}%
231      \endgroup
232      \global\catcode`#1\active
233    \else
234    \fi
235 }
236
237 \def\makeenumii#1{%
238    \expandafter\ifx\csname cc\string#1\endcsname\relax
239      \add@special{#1}%
240      \expandafter
241      \xdef\csname cc\string#1\endcsname{\the\catcode`#1}%
242      \begingroup
243        \catcode`\~\active  \lccode`\~`#1%
244        \lowercase{%
245        \global\expandafter\let
246           \csname ac\string#1\endcsname~%
247        \expandafter\gdef\expandafter~\expandafter{\newenumii}}%
248      \endgroup
249      \global\catcode`#1\active
250    \else
251    \fi
252 }
253 \makeatother
254
```

Finally, we set the default characters for the items and enumerations:

```
255 \makeitemi•
256 \makeitemii
257 \makeenumi¹
258 \makeenumii²
```

And that's it.

Happy altT$_E$Xing!

A very short introduction to XƎLATEX

Everything you have to know about XƎLATEX to use this package: Write your LATEX file just as you are used to. But save it as utf8-encoded, *do not* use
`\usepackage{inputenc}` and `\usepackage{fontenc}`,
but *do use*
`\usepackage{xltxra}`.
This loads some files that provide all the cool stuff XƎLATEX offers. You don't have to take care of letters TEX would not understand – XƎTEX understands every character you type. But sometimes the font may not have the symbol for this – then you can use `\fontspec{fontname}`, where `fontname` is the name of a font on your system, e. g. `Arno Pro`, `Linux Libertine` etc. Of course, you don't compile with the command `latex file.tex`, but `xelatex file.tex`. You get a pdf as output. Nevertheless, XƎTEX is not pdfTEX, so you cannot use microtypographic extensions… :(

   If you have any trouble using XƎLATEX, just mail me!