WhizzyTEX*

Active-DVI	Emacs
WHIZZY-TEX	{\sc WhizzyTeX}

*An **Emacs** minor-mode for **incremental viewing of LaTeX documents***

Didier Rémy

Version 1.3.5, June 9, 2020

Abstract

WhizzyTEX is an Emacs minor mode for incrementally viewing LaTeX documents that you are editing. It works under Unix with `gv` and `xdvi` viewers, but the **Active-**DVI viewer will provide much better visual effects and offer more functionalities.

In addition, when used with **Active-**DVI, **WhizzyTEX** allows for mouse edition of dimensions and floats, which can be used to adjust spaces, move or resize objects visually.

*WhizzyTEX is free software, Copyright ©2001, 2002, 2003, 2004, 2010, 2011, 2013, 2020 INRIA and distributed under the GNU General Public License (See the COPYING file enclosed with the distribution).

Contents

1 Installation **3**
- 1.1 Requirements . . . 3
- 1.2 Get the source . . . 3
- 1.3 Warning! . . . 3
- 1.4 Customizing the installation . . . 4
- 1.5 Manual installation . . . 5
- 1.6 Automatic upgrading (depreciated) . . . 6

2 Using WhizzyTEX **6**
- 2.1 Loading `whizzytex.el` . . . 6
- 2.2 Quick start . . . 7
- 2.3 Editing . . . 8

3 Error recovery and debugging **8**
- 3.1 Errors while WhizzyTEX-ing . . . 8
- 3.2 Error during initialization . . . 9
- 3.3 Errors while editing . . . 10
- 3.4 Debugging . . . 11

4 On line help **12**

5 Configuration **12**
- 5.1 Emacs global configuration . . . 12
- 5.2 File-based configuration . . . 12
- 5.3 Modes . . . 15
- 5.4 Viewer types . . . 16
- 5.5 Configuration via configuration files . . . 17
- 5.6 Watching other files . . . 17
- 5.7 Frequency of recompilation . . . 18
- 5.8 WhizzyTEX-ing macro files . . . 18
- 5.9 Cross-references, page and section numbers . . . 18
- 5.10 Per session LATEX customization . . . 18
- 5.11 System, user, and local customization . . . 18

6 Viewers **19**
- 6.1 Viewing with **Active-DVI** . . . 19
- 6.2 Defining your own previewer . . . 20
- 6.3 Viewing with `xpdf` . . . 20

7 Whizzy Effects **20**

8 WhizzyEDITing **21**
8.1 Enabling edition with the \adviedit macro 21
8.2 Performing mouse edition under **Active-**DVI control 22
8.3 Examples 23
8.4 Writing whizzy-editable macros 25

9 A quick overview of the implementation **26**
9.1 Emacs code 27
9.2 LaTeX code 27
9.3 Bash code 28
9.4 Interaction between the components 28
9.5 Whizzy edition 28

1 Installation

1.1 Requirements

WhizzyTeX is designed for `Unix` plateforms[1].

To use WhizzyTeX, you need `Emacs` or `XEmacs`, some standard `latex` distribution, `bash`, and at least one DVI, Postscript or PDF previewer, such as `advi`, `xdvi`, or `dvips` combined with `gv`, or `xpdf`.

WhizzyTeX has been developed under Linux but has not been extensively tested on other platforms. However, LaTeX and Emacs are quite portable and possible compatibility problem with the bash shell-script should be minor and easily fixable. Hence WhizzyTeX should work with all distributions of `latex` that are compliant to the standard.

1.2 Get the source

Get the source `whizzytex-1.3.5.tgz` from the distribution, uncompress and untar it in some working directory, as follows:

```
gunzip whizzytex-1.3.5.tgz
tar -xvf whizztex-1.3.5.tar
cd whizzytex-1.3.5
```

Then, the installation can be automatic (default or customized), or manual.

1.3 Warning!

Many Linux installations make `xdvi` a shell-script that erroneously end with the line `xdvi.bin "$@"` instead of `exec xdvi.bin "$@"`. The later is needed to preserve the process id, so that signals sent to `xdvi` are correctly received and handled by `xdvi.bin`.

[1] It has been reported to successfully work on Windows under Cygwin—See the FAQ.

Since correct signal handling is crucial for WhizzyTEX, and this problem is so common we provide a script to check your configuration with the command

```
./checkconfig
```

By default, this check is performed by automatic installation below.

1.4 Customizing the installation

To customize the installation, you can edit `Makefile.config`, manually. You may also use either the command

```
./configure
```

This command may be passed arguments to customize your installation. Call it with the option `-help` to see a list of all options. By default, the configuration is not interactive. However, you may call it with option `-helpme` to have the script do more guessing for you and prompt for choices if needed.

Note that by default, the Emacs-lisp code whizzytex.el is not byte-compiled. You need to pass the option `-elc` to `configure` in order to byte-compiled it.

Checking `Makefile.config` A misconfiguration of your installation, or —much more subttle— a misconfiguration of other commands (it appears that some installations wrap scripts around standard commands that are sometimes incorrect and break their normal advertized interface) may lead to systematic errors when launching WhizzyTEX. To prevent delaying such obvious errors, some sanity checks are done after `Makefile.config` has been produced and before building other files. These include checking for mandatory bindings (useful for manual configuration) and for the conformance of `initex`, `latex`, and viewers commands to their expected interface.

Checking viewers interface implies simulating a small WhizzyTEX session: a small test file is created for which a specializled version of latex format is built and used to run LATEX on the test file; finally, required viewers are tested on the DVI output, which opens windows, temporarily.

If the sanity check fails, at least part of your configuration is suspicious. If some windows remain opened, your confirguration is likely to be erronesous (and so, even if not detected by the script).

However, if you really know what you are doing, you may bypass the check by typing `make config.force`, which will stamp your `Makefile.config` as correct without checking it. Checking compliance to viewers interface is also bypassed if you you do not have a connection to X. Conversely, you may force checking manually by typing `./checkconfig`.

At the end of customization, proceed as described in Section **??**.

Customization notes By default, WhizzyTEX assumes the standard convention that `latex` is the command name used to call LATEX, `initex` the command name used to build a new format, and `latex` is the predefined latex format.

If your implementation of LATEX uses other names, you may redefine the variables `INITEX`, `LATEX`, and `FORMAT` accordingly in the file `Makefile.config`. For instance, `platex` could be use the default configuration

```
INITEX = iniptex
LATEX = platex
FORMAT = platex
BIBTEX = jbibtex
```

This would be produced directly with the configuration line:

```
./configure -initex iniptex -latex platex -format latex -bibtex jbibtex
```

If you wish to run WhizzyTEX with several configurations, you must still choose a default configuration, but you will still be able to call WhizzyTEX with another configuration from Emacs (see Section 5.2 below).

It is possible to load this setup dynamically by creating, for example, by including the following lines:

```
INITEX = iniptex
LATEX = platex
FORMAT = platex
BIBTEX = jbibtex
```

in a configuration file (see Section 5.2).

During the configuration, you must at least choose one default previewer type among `advi`, `xdvi`, and `ps`, and at most one default previewer for each previewer type you chose. You will still be able to call WhizzyTEX with other previewers from Emacs, via Emacs configuration (see Section 5.1).

1.5 Manual installation

Since WhizzyTEX only need three files to run, installation can also be done manually:

`whizzytex.el`

This could be installed in a directory visible by Emacs, but does not need to, since you can always use the full path when you load it or declare autoload.

No default location.

`whizzytex`

This file is a bash-shell script that should be executable. There is not reason to have it visible from the executable path, since it should not be used but with WhizzyTEX.

The variable `whizzy-command-name` defined in `whizzytex.el` contains its full path (or just its name if visible from the executable path).

Default value is `/usr/local/bin/whizzytex`

You may need to adjust the path of `bash` in the very first line of the script, as well as some variables in the manual configuration section of the script.

`whizzytex.sty`

This file are `latex2e` macros. There is no reason to put this visible from LaTeX path, since it should not be used but with WhizzyTeX.

Variable `PACKAGE` defined in `whizzytex` the full path (or just the name if the path is visible from LaTeX.

Default value is `/usr/local/share/whizzytex/latex/whizzytex.sty`

1.6 Automatic upgrading (depreciated)

For convenience, the distribution also offers a facility to download and upgrade new versions of WhizzyTeX (this requires `wget` to be installed). If automatic upgrading does not work, just do it manually.

All operations should be performed in the WhizzyTeX top directory, *i.e.* where you untar whizzytex for the first time, that is right above the directory from were you made the installation. We assume that have created a link to the current version subdirectory:

```
ln -s whizzytex-1.3.5 whizzytex
```

(the manager will then update this link when version changes). Alternatively, you can also use the full name `whizzytex-1.3.5` in place of `whizzytex` below. The main commands are:

```
make -f whizzytex/Manager upgrade
make -f whizzytex/Manager install
```

The command `upgrade` will successively download the newest version, unpack it, copy the configuration of the current version to the newest version, and bring the newest version up-to-date. The command `install` will install files of the newest version.

The following command will (re-)install an old version:

```
make VERSION=<version> download downgrade install
```

2 Using WhizzyTeX

2.1 Loading `whizzytex.el`

Maybe, `whizzytex` is already installed on your (X)Emacs system, which you may check by typing:

```
ESC x whizzytex-mode RET
```

If the command is understood, skip this section. Otherwise, you should first load the library `whizzytex.el` or, better, declare it autoload. To do this permanently, include the following declaration in your Emacs startup file (which probably is `~/.emacs` if you are using `Emacs`):

```
(autoload 'whizzytex-mode
    "whizzytex"
    "WhizzyTeX, a minor-mode WYSIWIG environment for LaTeX" t)
```

This asumes that `whizzytex.el` has been installed in your (X)Emacs `load-path`. Otherwise, you may either adjust the load-path appropriately, or replace `whizzytex` by the full path to the file `whizzytex.el`, which depends on your installation and can be obtained by typing `make where` in the installation root directory. For instance, if you are using Emacs, the default location for `whizzytex.el` is `/usr/local/share/whizzytex/lisp/whizzytex.el` (but it will be different if you are using XEmacs or a customized installation).

2.2 Quick start

WhizzyTEX runs as a minor mode of Emacs to be launched on a LATEX Emacs buffer. The extension of the buffer should be `.tex`. WhizzyTEX also understands `.ltx` extensions, but gives priority to the former when it has to guess the extension. Other extensions are possible but not recommended.

> *The file attached to the buffer must exists and either be a well-formed LATEX source file, or be* mastered, i.e. *loaded by another LATEX source file. Thus, whenever the buffer does not contain a* `\begin{document}` *command), WhizzyTEX will search for its master file, asking the user if need be, so as to first launch itself on a buffer visiting the master file. In particular, an empty buffer will be considered as beeing mastered, which may not be what you intend.*

To start WhizzyTEX on either kind of buffer, type:

```
ESC x whizzytex-mode RET
```

By default, this should add new bindings so that you can later turn mode on and off with key strokes `C-c C-w`. This will also add a new menu `Whizzy` in the menu bar call "the" menu below. (If you are using the `auctex`, your may use other configuration key strokes to avoid clashes (see online emacs-help).

When `whizzytex-mode` is started for the first time on a new buffer, it attempts to configure buffer local variables automatically by examining the content of file, and using default values of global bindings.

You may customize default settings globally by running appropriate hooks or locally by inserting appropriate comments in the source file —see the manual below.

You may also change the settings interactively using the menu, or tell whizzytex-mode to prompt the user for confirmation of file configuration by passing prefix argument 4 (using, for instance, key sequence `C-u C-c C-w`).

2.3 Editing

Once `whizzytex-mode` is on, just type in as usual. WhizzyTEX should work transparently, refreshing the presentation as you type or move into your LATEX buffer.

Additionally, a gray overlay is put outside of the current slice (the *slice* is the region of your buffer under focus, which is automatically determined by WhizzyTEX). When a LATEX error occurs and it can be localized in the source buffer, a yellow overlay also is put on the region around the error, and removed when the error is fixed.

Furthermore, when an error is persistent for several slices or some amount of time, the interaction-buffer will pop up with the error log (this option can be toggled with the `Auto interaction` menu entry).

The buffer mode line also displays a brief summary of WhizzyTEX's status. When `whizzytex-mode` is on, the line contain `Whizzy`.n where n is a numeric indication of the load in number of buffer changes between two slices (so the higher, the slower).

However, `Whizzy`.n is changed to `Whizzy-`e where *err* range over `FORMAT`, `LATEX`, or `SLICE` an indicates that while formating or LATEXing the full document, or while recompiling the current slice. Errors have priority in this order. That is, if there is both an error in the format and the slice, only the `FORMAT` error will be repported.

When a `SLICE` error occurs, emacs attempts to locate the error and overlay the region that caused the error. (This identifies the text around which the error was detected by LATEX, which may not be the text that caused the error.) One can jump to the current error location by calling the `Jump to error` menu emty (or the equivalent key sequence).

3 Error recovery and debugging

WhizzyTEX makes a good attempt at doing everything automatically. However, there remain situations where the user need to understand WhizzyTEX —when WhizzyTEX does not seem to understand the user anymore.

3.1 Errors while WhizzyTEX-ing

Quite often, the error overlay is sufficient to fix a latex source error. Actually, the error overaly may just indicate that you are in the middle of typing a command or an environment, in which cases WhizzyTEX will indicate temporarily report an undefined command or and ill-balanced environment. Whether an overlay is ephemerous and mean an incomplete edition or persistent and mean a real LATEX error is usually unambiguous. In addition, because WhizzyTEXing is dynamic and the error is repported immediately it is usually easier to fix a real error than it would be in a batch compilation, and without even looking at the error message.

Indeed, WhizzyTEX also display the LATEX error message (and other processsing messages) in its interaction buffer. The interaction buffer is named from the master file name surrounded by `*` characters. By default, the interaction buffer appears in a pop up window a few seconds after an error persists and is pop down when the error disapears.

For serious debugging, you may unset `Auto interaction` menu entry so as to see the interaction buffer permanently. You may also unset `Auto Shrink output` menu entry to keep all log information (by default, the interaction window is shrunk at every slice).

The `View Log...` menu entry can be used to view the compele log files of last actions performed by whizzytex (`format`, `latex`, `slice`).

3.2 Error during initialization

The most delicate part of WhizzyTEX is when starting `whizzytex-mode`, and usually for the first time in a new buffer, since at that time all kinds of initialization errors may occur (in addition to LATEX errors.

WhizzyTEX will attempt to identify the error and report appropriate messages in the interaction buffer. (In case an error occurs —or nothing happens— always have a look at the interaction buffer first, even if it did not prompt automatically.)

WhizzyTEX keeps more debugging information during initialization phase, and if an error occurs during initialization, it will keep all log files. Once initialization has succeeded WhizzyTEX turns into normal more and by default all log and auxiliary files will be removed error et exit (including at exit on error). However, WhizzyTEX can also be launched in debug more, which will keep additional debugging information including after initialization.

To see log information, use the `View log...` menu entry and the completion buffer. Available log files are `command`, `format`, `latex`, `slice`, and `view`. The command log is simple the list of arguments—one per line—with which the shell script `whizzytex` was called; the log file view is the content of the standard error description the viewer. Some logs may not be available if an error occured before the corresponding command has been called.

Most frequent errors are described below, in chronological order.

Emacs fails during setup This is the easiest case, because WhizzyTEX has not been called yet, so it is only involves debugging under emacs. You may check the emacs error messages (emacs buffer `*Messages*`), check the on-line documentatino of variables set or functions calls, and in case of uncaught fatal errors, you may `ESC X toggle-debug-on-error` to get help from Emacs, and try to fix the problem.

Note that setup may succeed, but not be result as expected. You may see what configuration files have been loaded in different buffers: `*Message*` for emacs customization, the interaction buffer for shell-script customozation, and the format log file for latex configuration.

Emacs cannot find whizzytex This should typically be an installation problem, where the variable `whizzytex-command-name` is erroneous (maybe you need to give the full path). Try to evaluate `(shell-command whizzy-command-name)` in the minibuffer, which of course should fail, but only after the command has been reached.

WhizzyTEX cannot build a format Then WhizzyTEX will refuse to start.

The problem could result from an abnormal interaction between your macros and WhizzyTEX macros, but this situation seems rather unfrequent. So there is most probably an error in your macros. Try to compile LATEX your file.

By default the interaction window will pop-up with an section of the format log, but you can also view the log of latex formatting

. If this is not enough, you may need view log files. However, log files are normally removed when WhizzyTEX exits. To keep log files on, you must retart WhizzyTEX in debug mode (select the debug mode in the menu and restart WhizzyTEX). Then, you can check the `format` log and if necessary the `command` with which WhizzyTEX has been launched. (Once the bug is fixed, you should switch off the debug mode, which may slow down WhizzyTEX.)

WhizzyTEX cannot launch the previewer Usually, this is because whizzytex received wrong previewer parameter. See the command echoed in the interaction buffer or try to evaluate `(whizzy-get whizzytex-view-mode)`.

Other errors There are two remaining problems that could happen at launch time, but that are not particular to launch time: WhizzyTEX could not recompiled the whole document or the current slice. However, these should not be fatal. In the former case, whizzytex will proceed, ignoring the whole document (or using the slice instead if you are in duplex mode). In the later case, whizzytex will replace the slice by an empty slice —and print a welcoming document, as if you launched WhizzyTEX outside of any slice.

3.3 Errors while editing

After initialization time, WhizzyTEX will keep recompiling slices as you type or move, but also recompiles the format and the whole document when you save a file. Each of this step may failed, but this should not be fatal, and Emacs should report the error, possible pop up the interaction window, and continue.

WhizzyTEX fails on the current slice This should not be considered as an error, it **must** happen during edition. In particular, WhizzyTEX is not much aware of LATEX and could very well slice in the middle of the typesetting of an environment or a macro command. This should not matter, since the erroneous slice will be ignore temporarily until the slice is correct again.

WhizzyTEX keeps failing on the current slice The slice can also be erroneous because the Emacs did not correctly inferred where to insert the cursor, which may slice erroneous, although what you typed is correct. Hopefully, this will not occur too often, and disappear as you move the point. It should also disappear if you switch off both `Point visible` and `Page to Point` options, which is actually a good thing to do when you suspect some misbehavior. This will make WhizzyTeX more robust, but less powerful and more boring.

WhizzyTEX does not seem to slice at all The interaction window does not produce any output. Try to move in the slice, or to another slice.

If nothing happens, check the interaction window, to see if it did attempt to recompile the slice. If nothing happens in the interaction window, check for Emacs messages (in the `*Messages*` buffer). You may also check for the presence (and content) of the slice by visiting `_whizzy_filename.tex` or

```
_whizzy_filename/input/_whizzy_name.new
```

If neither file exists, it means that Emacs did not succeed to slice, which you may force by evaluating `(whizzy-observe-changes t)`. This can be run in even if `whizzytex-mode` is suspended, which may avoid automatic processing of slices, and their erasure.

If the slice is present, you may try to compile it by hand (outside of Emacs) with

```
latex '&_whizzy_filename' _whizzy_filename.tex
```

and see if it succeeds.

Reformatting failed Formatting errors are fatal during initialization, but accepted once initialized. In case of an error during reformatting, WhizzyTEX will ignore the error and continue with the old format. This means that new macros may be ignored leading to further slicing errors. When rebuilding the format failed, the mode-line string will display the suffix `FMT` until the error is fixed. See the interaction buffer or select `format` from the `log...` menu entry).

You may also force reformatting by typing the `reformat` command in the interaction buffer.

Whizzytex cannot process the whole document This is very likely a problem with you document, so try to LATEX it first. There is a small possibility of strange interaction between your macros and WhizzyTEX package. Try to turn options `Page to Point` and `Point visible` off and retry. This will make WhizzyTEX more robust (but also less powerful and more boring).

3.4 Debugging

If you are still completely lost after trying all of the above help, you may turn on the debugging mode by typing either line in the interaction window:

```
trace on
trace off
```

or with the menu entry `Debug`. The entry can also be called to start WhizzyTEX, which will then start in debugging mode, including during initialization.

If need be, you can also turn emacs debug mode on and off with

```
ESC x toggle-debug-on-error RET
```

If you are still stuck, then you are left on your own and need real debugging. If this is your first attempt at WhizzyTEX, you should suspect your global configuration. You should then try it first with the examples of the distribution. Otherwise, you may rollback to a file and configuration that used to work (e.g. one of the distribution), and make incremental or logarithmic changes until you hit the problem.

4 On line help

The Emacs source is fully documented and most of the documentation is available as on-line Emacs help, through the `Help` entry of the `Whizzy` menu and following hyperlinks. Alternatively, you can type

```
ESC x describe-function RET whizzytex-mode RET
```

(In XEmacs, you may need to use

```
ESC x hyper-describe-function RET whizzytex-mode RET
```

instead of `describe-function` to see hyper-links.)

To avoid redundancy, on-line help is not reproduced here, configuration described in the next section.

5 Configuration

This section describes how to use and parameterize WhizzyTEX. Section 5.2, 5.3 and 5.4 are also available as online help.

5.1 Emacs global configuration

See Emacs help for `whizzy-default-bindings` and `whizzytex-mode-hook` for list of bindings.

The Emacs on-line help for `whizzytex-mode` lists all user-configurable variables, which may be given default values in your Emacs startup file to be used instead of WhizzyTEX own default values.

5.2 File-based configuration

WhizzyTEX allows for inlined customization in the source file, as described below. While this mecanism is quit convenient for short and simple customization (such as selecting the output format and previewer or sectioning), it is harsh and *depreciated* for advanced customization, for which you should prefer local customozation files (see Section 5.11).

A configuration line is one that starts with regexp prefix "`^%; +`" followed by a configuration keyword. If two configuration lines have the same keyword, only the first one is considered. The argument of a configuration line is the rest of the line stripped of its white space.

The keywords are:

whizzy-master ⟨`master`⟩
: This only makes sense for a file loaded by a *master* file. ⟨`master`⟩ is the relative or full name of the master file. Optional surrounding quotes (character `"`) stripped off, so that `"foo.tex"` and `foo.tex` are equivalent.

whizzy-macros ⟨`master`⟩
: This is equivalent to **whizzy-master** ⟨`master`⟩, but for a file containing macros. The file is not sliced while editing, but saving it reformats the master.

whizzy [⟨`slicing`⟩] [⟨`viewer`⟩ [⟨`command`⟩]]
[`-mkslice` ⟨`command`⟩] [`-mkfile` ⟨`command`⟩]
[`-tex` ⟨`suffix`⟩] [`-initex` ⟨`initex`⟩] [`-latex` ⟨`latex`⟩] [`-fmt` ⟨`format`⟩]
[`-bibtex` ⟨`bibtex`⟩] [`-dvicopy` ⟨`command`⟩] [`-watch`] [`-duplex`] [`-trace`]

All arguments are optional, but if present they must appear in order and on a single line:

⟨`slicing`⟩
: determines the way the document is sliced (see section 5.3).

⟨`viewer`⟩
: is the type of viewer and can only be one of `-advi`, `-xdvi`, `-ps`, or `-pdf` (see section 5.4)

`-display` ⟨`display`⟩
: specifies which X display to show the DVI previewer in, such as `:0.1` for multi-display set-ups.

⟨`command`⟩
: is optional and is the command used to call the viewer (of course, it should agree with ⟨`viewer`⟩).

`-mkslice` ⟨`command`⟩
: tells WhizzyTEX to use ⟨`command`⟩ to preprocess the slice. The command ⟨`command`⟩ will receive only one argument which is the slice to be produced `_whizzy_basename.tex` (or `_whizzy_basename.ltx` if the extension of the master file is `.ltx`) from the original `_whizzy_basename.new` (whose name is obtained by replacing the suffix ".tex" or ".ltx" by ".new") By default, the command `mv` is used to move the original to the destination. (See the example in `./examples/gpic/`)

The Unix `make` *can itself be used as a preprocessor (with an appropriate* `Makefile`*). However, one may have to work around* `make`*'s notion of time (using FORCE),*

which is usually too rough. This is safe, since WhizzyTEX tests itself for needed recompilations.

`-mkfile` ⟨`command`⟩
: executes "⟨`command`⟩ ⟨`filename`⟩" before recompiling every time a buffer is saved. The argument "⟨`filename`⟩" is the buffer-file-name path relative to the path of the master file directory.

`-makeindex` ⟨`command`⟩
: uses "⟨`command`⟩ ⟨`filename.idx`⟩" for rebuilding the index instead the default "⟨`makeindex`⟩ ⟨`filename.idx`⟩". If "⟨`command`⟩" is false, then do not attempt to rebuild the index.

`-bibtex` ⟨`bibtex`⟩
: uses ⟨`bibtex`⟩ for the bibtex command instead of the value assign to BIBTEX in `Makefile.config` (or `whizzytex`)

`-initex` ⟨`initex`⟩
: uses ⟨`initex`⟩ for the initex command instead of the value assign to INITEX in `Makefile.config` (or `whizzytex`)

`-latex` ⟨`latex`⟩
: uses ⟨`latex`⟩ for the latex command instead of the value assign to LATEX in `Makefile.config` (or `whizzytex`)

`-fmt` ⟨`format`⟩
: uses ⟨`format`⟩ for the latex format instead of the default value, usually fmt (see configuration).

  This can either be used in combination with `-latex` *and* `-initex`*, or alone. For instance,* `hugelatex` *could be used (depending on your LaTeX configuration) to build a larger format to process huge files.*

`-dvicopy` ⟨`command`⟩
: uses ⟨`command`⟩ instead of the default (mv) to copy DVI files (from `FILE.dvi` to `FILE.wdvi`). This can be used with command `dvicopy` so as to expand virtual font, which advi does not understand yet)

`-watch`
: watches other files than just the slice (see Section 5.6).

`-duplex`
: launches another window with the whole document (which is recompiled every time the source buffer is saved).

  With `-advi` *previewers, both views communicate with Emacs and can be used to navigate through source buffers and positions.*

`-trace`
: traces all script commands (for debugging purposes only.)

For instance, a typical configuration line will be:

```
%; whizzy subsection -dvi "xdvi -s 3"
```

It tells whizzytex to run in subsection slicing mode and use a `dvi` style viewer called with the command `xdvi -s 3`. This is also equivalent to

```
%; whizzy subsection -dvi xdvi -s 3
```

since Emacs removes outer double-quotes in option arguments.

A more evolved configuration line is:

```
%; whizzy -mkslice make -initex iniptex -latex platex -fmt platex
```

It tells WhizzyTEX to use `iniptex` and `platex` comands instead of `initex` and `latex` and to use the format file `platex.fmt` instead of `latex.fmt`. Moreover, it should use `make` to preprocess the slice.

whizzy-paragraph `regexp`
This sets the Emacs variable `whizzy-paragraph` to `regexp`.

5.3 Modes

WhizzyTEX recognizes several modes, `slide`, `section`, `subsection`, `paragraph`, `document`, and `node`, described below.

The mode determines the slice of the document being displayed and indirectly the frequency of slicing.

Note that in any mode but `none` slices are always included in the file beeing editing or other files included. When slice delimitors are not found, the slice default to the whole file. The slice may also be empty if the cursor is located before `\begin{document}` or after `\end{document}`.

slide The mode `slide` is mainly used for documents of the class seminar. In slide mode, the slide is the text between two `\begin {slide}` comments (thus, the text between two slides is displayed after the preceding slide).

In slice modes, overlays are ignored *i.e.* all overlays all displayed in the same slide, unless a command `\overlay {`n`}` occurs on the left of the point, on the same line (if several commands are on the same line, the right-most one is taken), in which case only layers $p \leq n$ are displayed.

section In `section` mode, the slice of text is the current chapter, section.

subsection As `section` but also slice at subsections.

paragraph The `paragraph` mode is a variation on section mode where, the separator `whizzy-paragraph` is defined by the user (set to two empty lines by default) instead of using `\section` and `\subsection` commands. subsection.

document The `document` take the region between `\begin{document}` and `\end{document}` as the slice. Hence it defaults to the file when the file is a slave, which does not contain `\begin{document}`.

none In `none` slicing mode, there is no sectioning unit at all and the whole document is recompiled altogether. Currently, pages are not turned to point and the cursor is not shown as in `document` mode, because full documents are not sliced. (A slicing document mode could be obtained by working in paragraph mode, with an appropriate regexp.)

5.4 Viewer types

See help for `whizzy-viewers`.

The previewer types can have three possible values: `-advi`, `-dvi`, `-ps`, or `-pdf`.

The previewer type should agree with the previewer command in several ways:

- They tell how to trigger reload on the previewer. This may signal the previewer with signal `SIGHUP` for `-ps` or `SIGUSR1` for `-dvi` and `-advi`, or to establish the previewer as a remote server with `-pdf`.

  In particular, if you write a front-hand shell-script `viewer` to the call previewer, and want to use `viewer` as the previewer, you should arrange for `viewer` to understand these signals (and forward them to the previewer). The simplest way is to hand your script with an exec command calling the `gv`, `dvi` or `advi`.

  Also, the option `-pdf` assumes `xpdf` remote server (launched with the whizzytex process id as name) and its reload protocol. Thus, if you wish to use another previewer, you also need to cutomize the variable `RELOAD` of the shell-script.

- They tell whizzytex whether to process the slice to Postscript (with `-ps`) or to DVI format (with `-dvi` and `-advi` or directly generate `pdf` output with `pdflatex`.

- Moreover, `-advi` requires the previewer to recognize additional `\special` commands, in particular source line information of the form:

```
#line 780, 785 <<to<<rec>><<ognize>>additional>> manual.tex
```

Then, the previewer command is the command to call the previewer. This string will be passed as such to the WhizzyTEX shell-script. Note that the name of the `dvi` or postscript file will be appended to the previewer command.

5.5 Configuration via configuration files

This is preferable to file-based configuration. WhizzyTEX also recognizes configuration files `whizzy.sh`, `whizzy.sty`, `whizzy.el` in either your home directory or the current working directory.

File `whizzy.sh` is read by the script `whizzytex` after some defaults values (usually determined by the configuration) have being assigned to variables. Hence, it can be used to redefined those values.

Here are typical default values that can be redefined.

Variable	**default value**	**other value**	**Meaning**
`LATEX`	`latex`	`elatex`	latex program
`FORMAT`	`latex`	`elatex`	format basefile name
`FMT`	`fmt`	`efmt`	format extenstions
`DVICOPY`	`mv`	`dvicopy`	transformation *f*`.dvi` file into *f*`.wdvi`
`BIBTEX`	`bibtex`	`ebibtex`	bibtex program
`MKSLICE`	`defaultmkslice`	`.`	hook for preprocessing slices
`MKFILE`	`defaultmkfile`	`.`	hook for preprocessing files
`MAKEINDEX`	`makeindex`	`.`	command for making index

See `whizzytex` for other bindings. Other shells environment values such as `TEXINPUTS` may be defined here as well.

File "whizzy.el" is read by emacs when turning the whizzytex mode on for the first time. File "whizzy.sty" is read by latex every time the document is reformatted.

You may also use files ⟨*masterbasename*⟩`.wsh`, ⟨*masterbasename*⟩`.wel`, ⟨*masterbasename*⟩`.wsty`, in the current working directory to only load the file when running whizzytex on the master file ⟨*masterbasename*⟩.

5.6 Watching other files

WhizzyTEX is designed to watch other files and not just the slice saved by Emacs. In fact, it watches any file dropped in the pool directory. For instance, if your source file uses images, you can just change the image and drop the new version in the pool. Then WhizzyTEX will pick the new version, move it to the working directory and recompile a new slice. Be aware of name clashes: if you drop a file in the pool, it will automatically be move to the working directory with the same name, overriding any file of the same name sitting there.

However, activity is entirely controlled by Emacs, since after every iteration WhizzyTEX waits for Emacs to send a new command (usually the empty command that means iterate again). Hence, other files will only be taken into account at the next iteration. If you really wish these files to be watched you need to instrument emacs to send and empty line input to the interaction buffer regularly, even when idle.

5.7 Frequency of recompilation

To obtain maximum WhizzyTEX effect, a new slice should be save after any edition changed or any displacement that outside of the current slice. However, to avoid overloading the machine with useless and annoying refreshments, some compromise is made, depending on Emacs several parameters: edition *v.s.* move Emacs last commands, successful *v.s.* erroneous last slice, and the duration of last slice recompilation. This usually works well. However, different behavior may wish to be obtained in different situations. For instance, when editing on a lab-top, one may wish to save batteries by keeping the load rather low, hence not using the full power of the processor. Conversely, one may wish WhizzyTEX to be as responsive as possible. There is an function `whizzy-load-factor` that control a variable of the same name, which can be used to adjust the responsiveness (by increasing or decreasing the load-factor). This simply adds extra delays between slicing.

The format is automatically recompiled at the beginning of each session, and whenever the buffer containing the file is saved. That is, to load new packages or define new global macros (before the `\begin{document}`), it suffices to save the current file.

5.8 WhizzyTEX-ing macro files

Macro files can be **WhizzyTEX**-ed as well. The effect is them only to automatically call `reformat` when the file is saved. Files can also be declared as macro-files with `whizzy-macro` file configuration keyword (see Section 5.2), which argument should then indicate the master file. Files with `.sty` extension are by default considered as macro files and their master file is guessed if possible.

5.9 Cross-references, page and section numbers

The slice is always recompiled with the `.aux` file of the whole document. In paragraph mode, cross references and section numbers are recompiled whenever the buffer itself is saved (manually). The recompilation of the whole document is off in slide mode.

5.10 Per session LATEX customization

The Emacs variable `whizzy-customize` (that can be set interactively from the `Customize slice` menu) may contain a few LATEX commands to be inserted at the beginning of each slice, which allows a per-session customization. Customization can be easily changed anytime in the middle of a session. For instance, setting this variable to `\large` can be used to temporarily enlarge the text, while keeping the same page layout.

5.11 System, user, and local customization

WhizzyTEX is a three-part engine, with Emacs, Latex, and the glue Bash-script running altogether. Some of the parameters can be adjusted at installation-time by modifying the

respective files `whizzytex.el`, `whizzytex.sty`, or `whizzytex` of the distribution. However, you should normally not have to do that after installation (and even only exceptionnally during installation), and instead use system, user, or local configuration files.

When launched, each engine looks for configuration files in appropriate directories with basenames `whizzy.el`, `whizzy.sh`, `whizzy.sty` and `whizzy.cfg`, respectively. The Emacs configuration search path is defined by the emacs variable variable `whizzy-configuration-path`. Search path for Bash and Latex settings are composed of the directories `CONFIGDIR/`, `$HOME/.whizzytex/` and the current directory (actually `$TEXINPUTS` for latex). All configuration files found are loaded, in the order given above. The difference between `whizzy.sty` and `whizzy.cfg` is that the former is loaded after all latex packages and typically use to change the behavior of those packages while the later is loaded first, before `\documentclass` and is rather use used to redefined commands of "whizzytex" or defined extra macros before loading the document (e.g. as arguments that could normally be defined on the commandline while calling `latex`).

Remark that a local configuration file (*i.e.* one in the current directory) can be used to make per-document configuration by testing on jobname.

6 Viewers

6.1 Viewing with Active-DVI

Active-DVI is a DVI previewer with several additional features. In particular, it recognizes extra specials, some of which are particular useful for whizzytex that allows a two way communication between the source Emacs buffer and the previewer:

- The previewer will automatically turn pages for you, as you are editing. This is done by telling Emacs to save the current position in the slice. Then, the recompilation of the slice will include the current position as an hyperref location `Start-Document` whenever possible. Then, just tell **Active-DVI** to automatically jump at this location when it opens/reloads the file (option -html Start-Document).

- Conversely, **Active-DVI** can dump source file positions on clicks, when available (usually on `shift-mouse-1` or `mouse-1` in `edit` mode), that is forwarded to Emacs so that it can move to the corresponding line.

  To enjoy this feature, the option `-advi` should be used instead of `-dvi`. This will produce extra information (such as source line numbers) using `\special` that most DVI previewers do not recognize and may complain about.

- **Active-DVI** does not currently recognizes virtual fonts, but `dvicopy` can be used to expand them. See the option `-dvicopy` in Section 5.2.

- If you have a recent version of **Active-DVI** (version number exists and is greater than 1.5.2), you can also enjoy the multiple view mode, which is configured by default

(variable `MULTIPLE` is set to `true` in Makefile.config). In this case, **WhizzyTEX** will call the previewer both the slice and the whole document in the same window and may automatically switch from the slice to the whole document when clicking on local hyperrefs that are out of the slice (press `Esc` to come back). You can also switch between views by pressing `w` and when on the whole document view, goto the page when the cursor is in Emacs by pressing `W`.

Warning! If by mistake or misconfiguration, the multiple view is enable and your version of advi does not support multiple views, you will only see the full document view and never see the slice.

6.2 Defining your own previewer

To use your own command as a previewer, you must choose either type `-dvi` or `-ps` . In particular, your previewer should accept `SIGUSR1` (for `-dvi`) signal or `SIGHUP` (for `-ps`) signal and respond by reloading the file.

6.3 Viewing with `xpdf`

WhizzyTEX also works with `pdf` using the `xpdf` previewer and its remote server capabilities to reload the file and jump to the cursor position (this does not work with `acroread` because they is no simple way to tell `acroread` to reload its file in batch). You must choose `-pdf` as previewer type, which will also set other variables so as to compile the document with pdflatex instead of latex. You must leave the default previewer command, i.e. enter `-pdf .` and not `-pdf xpdf` (or else understand the internals of the `whizzytex` script) because other options need to be passed to `xpdf`.

When compiling with `pdflatex`, you need to explicitly use the package `hyperref`.

Another solution is to compile via the generation of a Postscript file `ps` and its translation to PDF using `ps2pdf`. This allows the use of `pstricks`. In this case, you tune the configuration manually, following the example given in `examples/ps2pdf/`.

7 Whizzy Effects

Since WhizzyTEX knowns about the current point in the buffer, rendering of the document may depend on that possition. For examples, an environment may be displayed differently when the point is inside or outside the environment. A natural choice is to make drawer-like environments that are *closed* when the point is outside and *open* when the point is inside.

WhizzyTEX provides a the macro `\WhizzyInsideEnvironment` to help make such effects. It takes the same parameters as the command `\newenvironnement`. The first argument should be the name of an existing environment, which will behave as before when the point appears outside and according to the new definition when the points is inside. The second and first arguments defines the behavoir as do the arguments of `\newenvironment`. However, `\WhizzyInsideEnvironment` also defines the macro `\out@myenv` and `endout@myenv` to refers

to the cursor-outside version of the environment. Typically, these macros can be used in the second and third argument of `\WhizzyInsideEnvironment` to define the cursor-inside version by difference with the cursor-outside version.

The example `effects` shows two applications. First, a `drawer` environment is used to delimit sections and make them open or closed automatically as cursor moves. Second, using the `exercise` package, we provide a cursor-inside version of the answer environment that inline the answer rather than pushing it to the Appendix.

8 WhizzyEDITing

This feature requires at least version `1.60` of **Active-**DVI.

When used together with Active-DVI, WhizzyTEX can be made much mode powerful. In particular, it is not difficult to lift WhizzyTEX from an incremental viewer to an assistant editor.

What was a dream has now become real. The latest version Active-DVI provides a notion of active boxes. The DVI may be annotated with `advi: edit` specials commands. When **Active-**DVI is put in edition mode, active boxes are drawn on top of the previewer window and can be move or resized with the mouse. When the mouse is released, the new size or position is printed on standard output together with the action to be taken and received by emacs watching the output. Emacs has then enough information to adjust some dimensional parameters in the source buffer. Just after this edition, the new slice is processed and the new position is displayed. Thanks to the short incremental loop, this almost appears as if actions where executed by Active-DVI itself.

Indeed, WhizzyEDITing is not meant to break up the structual edition philosophy of TEX and LATEX. Its incremental viewing is an assistant to an not a replacement of structural source edition. Mouse editing should also be seen similarly. In particular, all editions are visible in the emacs source buffer, can be saved, manually changed or disable. Moreover, Whizzy-editing is not meant for document layout (even it can occassionally be used for that, *e.g.* in slides), but rather to help adjust dinmensions that require manual tuning.

For instance, imaging you are importing an Encapsulated Postscript picture you would like to place some bubble whose origin must be position precisely inside the picture. Then, you'd better do it with the mouse rather than by small measurements or adjustements. Drawing a graph with a few nodes may now become quite confortable with PStricks, with the advantage of remaining within LATEX rather than using some external tool. Finally, Whizzy-editing is likely to be convenient when writting slides with visual gadgets. For instance, adjusting bubbles with the mouse is likely to be more efficient than doing it by hand.

8.1 Enabling edition with the `\adviedit` macro

Active-DVI provides one general editing command that can be used by **WhizzyTEX** for all mouse editing. The syntax of this command is

`\adviedit`[tag]{⟨*options*⟩}{⟨*body*⟩}

where ⟨*options*⟩ is a comma separated list of bindings according to the `keyval` package. Each binding is either of the form ⟨*var*⟩=⟨*float*⟩ where ⟨*var*⟩ ranges other letters `x`, `y`, `h`, `w`, `d` in lowercase or uppercase, or `field`=⟨*dimension*⟩ where ⟨*field*⟩ ranges over ⟨*unit*⟩ and ⟨*min*⟩.

The ⟨*field*⟩ respectively bindings specifies the unit, which default to `1em`, and the minimal dimension of boxes. Both fields are inherited, which enable inner edition to be scale altogether. The ⟨*var*⟩ bindings defines values for the corresponding variables. The are not inherited. On the opposite, they are always reset to default values. Lowercase letters mean that the corresponding variables are whizzy-editable, while uppercase letters treat them as constants. The expression `body` should be horizontal box material: it is then placed in an `\hbox` at coordinates (`x`, `y`) relatively to the current position. Moreover, a virtual box of width `w`, height `h`, and depth d is draw at that position when editing is made active. The box can this float around the current point and has no dimension. However, a box with no coordinates specified is fixed and has the dimensions of `w`, `h`, and `d`. When not specified, these fields takes the value of the box in which body is typeset. All dimensions `x`, `y`, `w`, `h`, and `d` are bound to `advix`, `advix`, `adviy`, `adviw`, `advih`, and `advid` macros during the evaluation of ⟨*body*⟩.

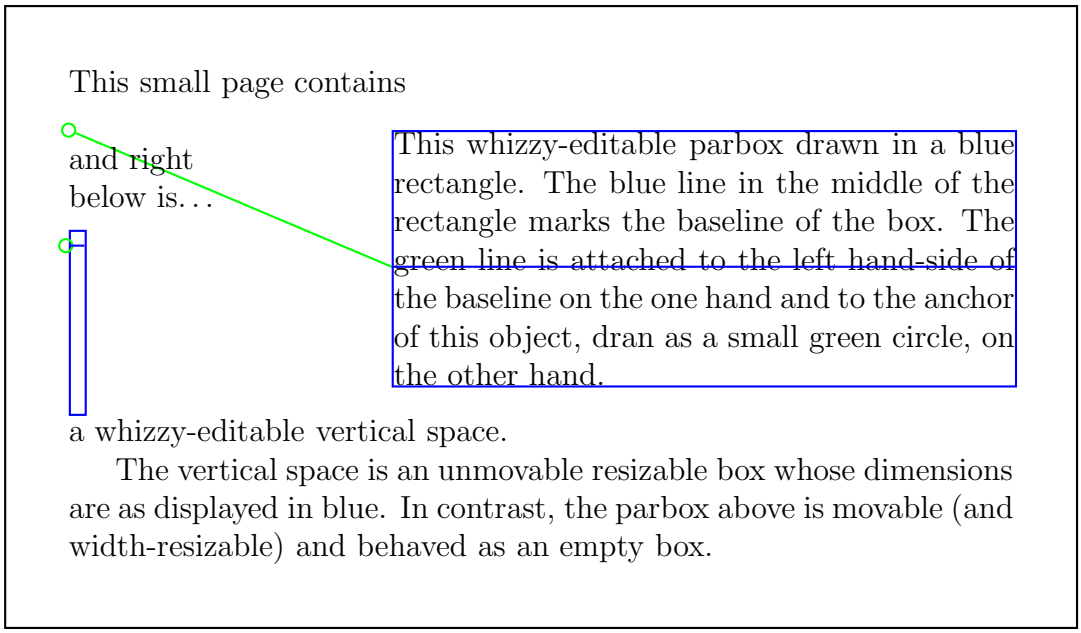
Whizzy-editable objects can be nested. All parameters are reset to default values, within the new object. Sometimes, emacs may be confused and take an object for another. In these rare cases, the two objects can use the ⟨*tag*⟩ argument to be distinguished. This argument does nothing but being passed to **Active-**DVI and sent back to Emacs to identified the object exactly.

8.2 Performing mouse edition under Active-DVI control

This section depends entirely on **Active-**DVI*. Hence, it may depend on your version of* **Active-**DVI *or how you have parameterized it. The appearance and description below is based on default bindings for version* `1.50+3`*.*

To actually *edit* whizzy-editable objects, you need to toggle the *edit* mode of **Active-**DVI. You can do this interactively by key stoke `e` in the **Active-**DVI window. You may also start **Active-**DVI in *edit* mode by passing the option `-edit`.

When in edit mode, whizzy-editable objects are drawn as below:



You may edit such objects in two ways:

- **move** them, using the middle button.
- **resize** them, using the right button for width and height or the shift-right button for depth.

When pressing the button on the corresponding rectangle, the mouse shape should intuitively illustrate the action to be perfomed. However, some actions may be inhibited. For instance, the `\parbox` can only be moved or resized in width and the vertical space can only be resized in depth but not be moved. When an action (either *move* or *resize*) is disable in all directions, the cursor will not changed. When resizing is enabled both in *height* and in *depth*, the default action is *height* and you must press the shift key to perform the *depth* resizing.

Finally, an edition can be aborted by pressing the *meta* key (actually the one bound to *modifier-1*) while release the mouse.

8.3 Examples

Several examples can be found in file `example/edit/main.tex` coming with **Active-**DVI distribution. Here are a couple of simple ones. For example,

```
\adviedit{x=-2.8845,y=0.2717}{A}
```

will simply place make the letter A whizzy-movable. The values of x and y when unspecified defaults to 0. Values for W, H or D when not given, will default to the value of A. However, if W, H, or D are zero (or too small) they will default to some small value.

```
\adviedit{X=2,Y=3}{A}
```

can simply be used instead of the latex *put* command. Spaces are also whizzy-adjustables: an horizontal space is just

```
\adviedit{w}{\hspace{\adviw}}
```

Note that the material is placed into a default `\hbox`. Thus, for vertical spaces, one need and explicit `\vbox`:

```
\adviedit{d}{\vtop {\vspace {\advid}}}
```

Note that

```
\adviedit{h}{\vbox {\vspace {\advih}}}
```

would do as well, but would usually be less intuitive, graphically.

A paragraph of adjustable size:

```
\adviedit{w}{\parbox[c]{\adviw}{text material}}
```

Whizzy-edition can also be used to resize images (as well as return them)

```
\adviedit{w,h}{\includegraphics[width=\adviw,height=\advih]{caml.eps}}
```

Note that while "adviedit must remain in the should, hence the whole line cannot be abbreviated into a macro, one can freely abbreviate its body, and it is quite easy to build a camel caravan:

```
\adviedit[A]{w,unit=\hsize}{%
  \setedit{unit=0.2\adviw}%
  \def \camel{\includegraphics[width=\adviw,height=\advih]{caml.eps}}%
  \adviedit{x,y,w,h}{\camel}%
  \adviedit{x,y,w,h}{\camel}%
  \adviedit{x,y,w,h}{\camel}%
  \adviedit{d}{\vtop{\vspace\advid}}%
  \hspace{\adviw}%
}
```

Be aware that a camel may hide another one! Indeed, at the beginning all camels are superposed. The first caml you pick is the one in front. An interesting use of units is to let an inner editable command sets its unit according to the dimension of an outer command, as illustrated above. Here the outer object (tagged `A`) is used to control the origin and scale of the projection. Then, each camel can be translated and resized, but relatively to this origin and this scale. Thus moving of rescaling the outer object will treate the caravan as a whole. The last line allow expansion of the bounding box as needed. The one before last sets the vertical ratio of the bounding box. The result can be seen in Figure 1. Below is another example with two circles:

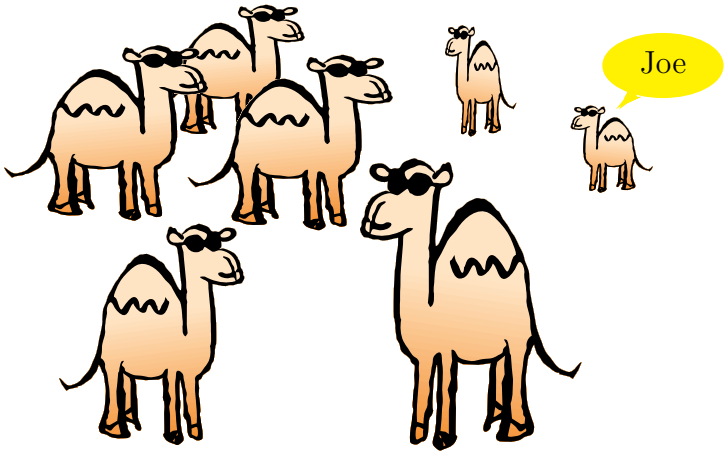


Figure 1: A Whizzy-editable Camel Caravan

```
\adviedit[A]{w=4}
  {\setedit{unit=\adviw}%
   \psset{boxsep=0pt,framesep=0pt}%
   \hbox to \adviw
     {\circlenode{A}{\hspace {\adviw}}\hss
      \adviedit[B]{w=0.5}{\circlenode{B}{\hspace{\adviw}}}}}
```

Many LaTeX commands such as `\hspace`, `\parbox`, *etc.* are parameterized by dimensions. However, some other commands, such as `\picture`, `\pspicture` and most PsTricks commands, `\bubble`, and `\adviedit` itself are parameterized by a coefficients (floats) and, separately, a dimension.

To whizzy-edit such coefficients, there are also commands `\advicx`, `\advicy`, `\advicw`, `\advich`, and `\advicd` that contain the float ratio of the corresponding dimension with respect to `\adviunit`—whenever the dimension is itself defined. As an example, the position of bubble can whizzy-edited as follows:

```
\adviedit{h=1.8902,w=1.5259,unit=\bubbleunit}
  {\bubble{anchored text}(\advicw,\advich){bulle text}}
```

8.4 Writing whizzy-editable macros

Although the command `\whizzyedit` is quite general and powerful, the user may wish to write its own versions. One must then be careful that the macro correctly passes its name to **Active-**DVI. For instance, rebinding or partially evaluating the macro `\adviedit` does not work, since then the text-source macro will not be `\adviedit` anymore. See the latex `advi.sty` source package for envolved examples.

Below are just a couple of simple examples. We can abbreviate the example of adjustable horizontal spaces defining the following macro:

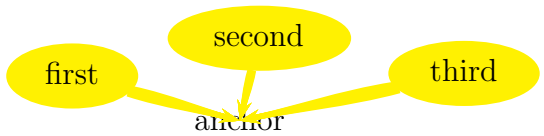


Figure 2: A bubble flower

```
\newcommand{\advihspace}[1]
   {\adviedit{comm=\advihspace,#1}{\hspace{\adviw}}}
```

The argument `comm=\advihspace` set the name of the calling source text macro to `\advihspace`. Then, you may simply write:

```
\advihspace{w}
```

instead of

```
\adviedit{w}{\hspace{\adviw}}
```

The macro could additionally check that `w` is indeed defined.

Another example of specialization is to place bubbles: so as to be more intuitive, the orgin of the edition should start at the center rather then at the left of the anchor, which requires a small acrobatics with boxes and dimensions:

```
\newcommand{\editbubble}[3]
   {\setbox0=\hbox{#2}\copy0\hbox to 0em {\kern-0.5\wd0\relax
    \bbb@dima=\ht0\bbb@dimb=\dp0
    \setbox0=\null\ht0=\bbb@dima\dp0=\bbb@dimb
      {\adviedit{comm=\editbubble,unit=\bubbleunit,#1}
         {\bubble{\box0}(\advicw,\advich){#3}}}\hfilneg}}
```

Then a nicely editable bublle can be obtained with

```
\editbubble{w,h}
  {\editbubble{w,h}
    {\editbubble{w,h}{flowers}{First}}
    {Second}}
  {third}
```

(See the result in Figure 2)

9 A quick overview of the implementation

In short, WhizzyTEX is selecting a small slice of the document that you are editing around the cursor (according to the selected mode) and redisplay the slice incrementally as it changes through edition.

- **Emacs is watching you** typing and moving in the Emacs buffer attached to the LaTeX source file that your editing and keeps saving the current slice (current slide, section, or subsection, according to the mode).
- **A shell-script daemon** keeps recompiling whenever a new slice (or other files) are produced, and if recompilation succeeds, tels the previewer to updates the display of the slice.
- **A few LaTeX macros** allow to build a specialized format with all macro loaded, which considerably speed up the time for slicing. Additionally, the slice is a bit instrumented to show the cursor, and includes specials that allows back-pointing from the DVI file into the Emacs buffer.

The rest of this section briefly describe these three parts[2], and their interactions.

9.1 Emacs code

The main trick is to use `post-command-hook` to make Emacs watch changes. It uses `buffer-modified-tick` to tell if any editing has actually occurred, and compare the point position with the (remembered) position of the region being displayed to see if saving should occur. It uses `sit-for` to delay slicing until at least the time of slice computation has ellapsed since last saving, a significant number of editing changes has occurred, or iddleness.

WhizzyTeX can also display the cursor position, in which case slices are also recomputed when the cursor moves, but with lower priority.

9.2 LaTeX code

The main TeX trick is to build a format specialized to the current document so as to avoid reloading the whole macros at each compilation. This is (almost[3]) entirely transparent, that is, the source file does not have to understand this trick.

This is implemented by redefining `\documentclass` which in turn redefines `\document` to execute `\dump` (after redefining `\document` to its old value and `\documentclass` so that it skips everything till `\document`). This is robust —and seems to work with rather complex macros.

The specialized format can be used in two modes: by default it expects a full document: it them dumps counters at sectioning commands (chapters, sections, and subsections). This is useful to correctly numberred sections and pages on slices.

There are also a a few other used to get more advanced behavior, especially to dump source line numbers and file names so that the previewer can transform clicks into source file positions.

[2]This section is not quite up-to-date, hence it puts emphasis on the original design, but several aspects have changed significantly since the first version. Implementation of more recent features is thus omitted.

[3]`\begin{document}` should be typed as such without any white white space

When building the format, WhizzyTEX also look for a local file of name `whizzy.sty`, which if existing is loaded at the end of the macros. This may be used to add other macros in whizzy mode, *e.g.* some TEX environments may be redefined to changed they type setting, according to whether the current line is inside or outside the environment. (We have written such an extension for an exercise package that sends the answers at the end in an appendix, unless the cursor is inside the answer, in which case the answer is in-lined.)

9.3 Bash code

There is no real trick there. This is a shell-script watching the pool (a directory where slices and other new version of files must be dropped). It them recompiles a slice and wait for input (in stdin). It recognizes a few one-line commands as input `reformat`, `dupplex`, and by default just watch for the presence of a new slice. It recompiles the format file (and the page and section number, but in batch mode) whenever the source file (its Unix date) has changed and recompiles the slice whenever it is present (since WhizzyTEX renames —hence removes— the slice before processing it).

If the file has been recompiled successfully, it triggers the previewer (ghostscript or xdvi) so that it rereads the dvi or ps file. Otherwise, it processes the TEX log file and tries to locate the error. It then sends part of the log file with annotations to the `*TeX-shell*` buffer from which Emacs has been WhizzyTEX, so that Emacs can report the error.

9.4 Interaction between the components

The control is normally done by Emacs, which launches and kills the Unix daemon. Quitting the previewer should be noticed by the daemon, which tells Emacs to turn mode off before exiting.

Muliple WhizzyTEX running on the same file would certainly raise racing conditions between files and would not make sense. For that purpose, the daemon pid is saved in a file and WhizzyTEX will kill any old WhizzyTEX process on startup.

9.5 Whizzy edition

The macros `\adviedit` passes information to **Active-**DVI inside `edit` specials. This information is used to identify the source file command that requested some edition and is passed by from **Active-**DVI to emacs as command strings of the form:

```
<edit "\adviedit" ""[x=1.2001]" #56 @main.tex moveto 5.1529,-1.1708>
```

This command emitted by **Active-**DVI in its standard output is thus received by emacs via **WhizzyTEX** in the process buffer associated to the current session.

Emacs interprets such commands starting with the "`<edit` " prefix as whizzy edition commands. In the above example, the string `\adviedit` is a latex commands that should be present the master buffer `main.tex` at line `56` and with x coordinate equal to `1.2001`. Its `x` and `y` coordinates should be changed by `5.1529` and `-1.1708`. Usually, the command

can be precisely located by its line position in the buffer and one significant coordinates. In case of conflict, a tag optional argument pass `\adviedit` will be passed to **Active-**DVI and then sent back to emacs (which is filled in the empty string above).