

# The `lwtverb` package

Alexander Vasilevsky (kalaider)  
[a.kalaider@yandex.ru](mailto:a.kalaider@yandex.ru)

July 18, 2020

## 1 Introduction

There are many approaches to `text written in typewriter font`. Basic approach of using just `\tt` or `\texttt` does not support hyphenation and cannot be hard-wrapped, potentially causing overfull hbox warnings. Moreover, it is almost inappropriate for typesetting code as all special characters must be escaped manually.

Verbatim-like commands help here but they fail to break properly (`\verb`), extra fragile (cannot be used in section title, captions, etc.) or produce too ragged results (`\Verb` from `fancyvrb` with `breaklines` and `breakanywhere` options from `fvextra`). `minted` does not support breaking inline code at all. `url` or `xurl`-based solutions handle special characters inconsistently and have some limitations.

`lwtverb` tries to provide *robust* (just as `\Verb` with the help of `fvextra` is) command for *breakable* and *justifiable* inline verbatim text. What follows next is side-by-side comparison of different `\lwtverb` variants and `\lwtverb` with other viable approaches.

Section 2 describes features `lwtverb` provides. Section 3 shows a number of usage examples, some spacing tweaks “in action”, comparison to alternative approaches. Section 4 and section 5 describe command usage and available options. See section 6 for textual comparison to other approaches and section 7 to learn about `lwtverb` limitations.

## 2 Features

`lwtverb` provides a number of features useful for typesetting code and regular text in typewriter font. This section discusses what it can. See section 7 for what it cannot.

- Justifiable and breakable text in typewriter font.
- Line break can be marked with hyphen or any pair of user-provided symbols.
- If line break occurs at the space character, line break is not indicated.
- Subsequent spaces can be leaved as is, collapsed to a single space or removed entirely. If line break occurs between two space characters, it is configuration dependent whether they are removed or retained verbatim.

- Individual characters can be decorated. A variant of decoration function takes two arguments: the current character being typeset and its predecessor.
- Spaces can be replaced with custom characters so they can be highlighted and thus preserved.
- The implementation highly relies on `fvextra`, so curly-braced versions of `\lwtverb` and `\lwtcode` commands are robust just as curly-braced version of `\Verb`. Other provided commands (`\lwttt`, `\justtt`) are initially robust.

### 3 Examples

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.
--	--	--

Table 1: Here is how normal L<sup>A</sup>T<sub>E</sub>X renders the same text three times (just for comparison)

<code>\lwttt[b]{...}</code>	<code>\lwttt[h]{...}</code>	<code>\lwttt[w]{...}</code>
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Table 2: Here is how `lwtverb`'s `\lwttt` renders the same text with different options applied: `breakline`, `hyphenate` and `wrapline`



<code>\lwtttt{...}</code>	<code>\justtt{...}</code>	<code>\xurltt{...}</code>
Use other text with superduperveeerylooong words and words_with_special_characters, e.g. urls: <code>http://example.com/hard-to-break-it-properly</code> . Moreover, look at “<<” and “>>” symbols, they look different.	Use other text with superduperveeerylooong words and words_with_special_characters, e.g. urls: <code>http://example.com/hard-to-break-it-properly</code> . Moreover, look at “<<” and “>>” symbols, they look different. <i>(needs manual escaping)</i>	Use other text with superduperveeerylooong words and words_with_special_characters, e.g. urls: <code>http://example.com/hard-to-break-it-properly</code> . Moreover, look at “<<” and “>>” symbols, they look different.
<code>\commands</code> , e.g. <code>\LaTeX{}</code> , may produce extra spaces.	<code>\commands</code> , e.g. <code>\LaTeX{}</code> , may produce extra spaces. <i>(needs manual escaping)</i>	<code>\commands</code> , e.g. <code>\LaTeX{}</code> , may produce extra spaces.
<code>\lwttverb ... </code>	<code>\justverb{...}</code>	<code>\xurltt ... </code>
<code>\commands</code> , e.g. <code>\LaTeX{}</code> , may produce extra spaces.	<code>\commands</code> , e.g. <code>\LaTeX{}</code> , may produce extra spaces.	<code>\commands</code> , e.g. <code>\LaTeX{}</code> , may produce extra spaces.

Table 4: Comparison to `\justtt`, `\justverb` and `xurl`’s `\url` with the `obeyspaces` package option. *Note also that `hyperref` does actually interfere with `url`, so the result shown above is somewhat far from what it should/may be. See section 6 for discussion*

<code>\lwttt[w,poskrn=0.5em]↪{...}</code>	<code>\lwttt[w,negkrn=0.5em]↪{...}</code>	<code>\lwttt[w,monospaced]{...}</code>
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Table 5: Same text typeset with `lwttverb`’s `\lwttt` with interletter spacing adjusted differently

<code>\lwttt[w,m,poss=6em]{ ↪...}</code>	<code>\lwttt[w,m,negsp=1em]{ ↪...}</code>	<code>\lwttt[w,monospaced]{ ↪...}</code>
<p>             Lorem ipsum dolor              sit amet, consectetur              adipiscing elit. Ut              purus elit, vestibulum              ut, placerat ac,              adipiscing vitae, feli              ↪s. Curabitur dictum              gravida mauris. Nam              arcu libero, nonummy              eget, consectetur id,              vulputate a, magna.           </p>	<p>             Lorem ipsum dolor sit amet,              consectetur adipiscing              elit. Ut purus elit, ve              ↪stibulum ut, placerat              ac, adipiscing vitae, fe              ↪lis. Curabitur dictum              gravida mauris. Nam arcu              libero, nonummy eget, con              ↪sectetur id, vulputate              a, magna.           </p>	<p>             Lorem ipsum dolor sit              amet, consectetur              adipiscing elit. Ut              purus elit, vestibul              ↪um ut, placerat ac,              adipiscing vitae, fel              ↪is. Curabitur dictum              gravida mauris. Nam              arcu libero, nonummy              eget, consectetur id,              vulputate a, magna.           </p>

Table 6: Same text typeset with `lwttt` with interword spacing adjusted differently

<p>             Lorem ipsu              •m dolor s              •it amet, c              •onsectetu              •er adipis              •cing elit              •. Ut purus              elit, vest              •ibulum ut              •, placera              •t ac, ad              •piscing v              •itae, fel              •is. Curab              •itur dict              •um gravi              mauris. Na              •m arcu li              •bero, non              •ummy eget              consectetur              •er id, vu              •lputate a              magna.           </p>	<p>             Lorem ipsum d              •olor sit amet              •, consectetur              adipiscing eli              •t. Ut purus el              •it, vestibulum              ut, placerat ac,              adipiscing vit              •ae, felis. Cu              •rabitur dictum              gravida mauris              Nam arcu libero              •, nonummy eget              consectetur i              •d, vulputate a              magna.           </p>	<p>             Lorem ipsum dolor              sit amet, consec              •tetuer adipiscin              elit. Ut purus el              •it, vestibulum ut,              placerat ac, ad              •piscing vitae, fel              •is. Curabitur dictum              gravida mauris. Nam              arcu libero, nonummy              eget, consectetur              •r id, vulputate a,              magna.           </p>	<p>             Lorem ipsum dolor sit              amet, consectetur adi              •piscing elit. Ut purus              elit, vestibulum ut, p              •lacerat ac, adipiscin              vitae, felis. Curabitur              dictum gravida mauris.              Nam arcu libero, nonum              •my eget, consectetur              id, vulputate a, magna.           </p>
--	---	---	---

Table 7: Same text in columns of different width

<code>r1 = x;        // A</code>	<code>r1 = x;        // A</code>	<code>r1 = x; . . . . . // A</code>
<code>if (r1 != 0) // B</code>	<code>if (r1 != 0) // B</code>	<code>if (r1 != 0) // B</code>
<code>    y = 1;     // C</code>	<code>    y = 1;     // C</code>	<code>    y = 1; . . . // C</code>

Table 8: This example demonstrates the power of `monospaced` option (note that A, B and C are properly aligned) and compares it with the result of default and `showspaces` options. The table itself is typeset using fixed-width `p{...}` columns. The issue with default options originates from different space widths used in default and `monospaced`-like styles

## 4 Usage

`\lwtverb` Using `\lwtverb` is just as simple as regular `\verb`. Here is an example of `\lwtverb`:

While `{\LaTeX}` provides `\verb+\verb+` allowing us to output things verbatim, e.g. `\verb|{\LaTeX}|`, `{\thispkg}` provides `\lwtverb+\lwtverb+` allowing the same, e.g. `\lwtverb|{\LaTeX}|`.

While `LATEX` provides `\verb` allowing us to output things verbatim, e.g. `{\LaTeX}`, `\lwtverb` provides `\lwtverb` allowing the same, e.g. `{\LaTeX}`.

`\lwtverb` is based on `fvextra`. It provides two versions of `\lwtverb` syntax:

```
\lwtverb[<opts>](char)<input>(char)
\lwtverb[<opts>]{<input>}
```

The latter version should almost always be preferred because it much less fragile. It, however, has some limitations, e.g. may fail to properly typeset `\commands`, cannot have unpaired curly braces in argument, may gobble spaces. See section 7 and `fvextra` manual for more details.

`\lwtcode` `\lwtcode|...|` is just a shorthand for `\lwtverb[w]|...|`, i.e. it is a version of `\lwtverb` defaulted to `wrapline` style. It may be useful for typesetting inline code sensitive to line breaks.

`\lwttt` `\lwttt` is a limited version of `\lwtverb` with syntax of a regular command. It may be used in place of `\lwtverb` when it is just needed to typeset text without any special characters or commands in it. `\lwttt` may introduce extra space after commands. Note additional space after `\LaTeX` here: `{\LaTeX }`. `\lwtverb` handles this properly: `{\LaTeX}`.

`\justtt` `\justtt` is like a normal `\texttt` but adds shrinking, stretching and (proper lexical) hyphenation support by default. Not a verbatim command. Doesn't take any options.

`\jusverb` `\jusverb` is like a `\justtt` but does its best to handle special characters. Internally highly relies on `\detokenize`. Doesn't take any options.

## 5 Options

All `\lwtxxx` commands take the same options.

`decoration=<cmd1>`    `decoration, decoration2` and `spacebox` options allow altering style of individual symbols.  
`decoration2=<cmd2>`    The first one takes only a single parameter `<cur>`, the current character. `cmd2` takes  
`spacebox=<hbox>`      additionally `<prev>`, the previous character. Consider the example:

```
\lwtverb[decoration=\colorbox{lightgray}, spacebox=\framebox{}]|Text
with spaces.|
```

```
T e x t   w i t h   s p a c e s .
```

Another example allows different behavior for the first letter of the word.

```
\makeatletter\def\highlight#1#2{\ifx\@sptoken#2\textcolor{red}{#1}\els
\makeatother
\lwtverb[decoration2=\highlight]|Text with spaces.|
```

```
Text with spaces.
```

`gobble=<verbatim, no,`    The `gobble` option allows one to alter the behavior of `lwtverb` regarding spaces.  
`extra, all>`

The `verbatim` option value forces `lwtverb` to treat all spaces as normal characters except that line breaks near the spaces are not marked with `breaksymr` and `breaksyml`.

The default `no` value allows spaces at the beginning and at the end of the line to be gobbled. It is the default behavior L<sup>A</sup>T<sub>E</sub>X itself has. If `spacebox` is provided, `no` behaves exactly as `verbatim`.

The `extra` value leaves only a single space removing all subsequent spaces (may be useful in combination with `spacebox`).

The `all` value removes all spaces completely (even if `spacebox` is provided).

Here is how one may get all spaces obeyed and highlighted with dots.

```
\lwtcode[spacebox=\hbox to 0.5em {$\hfill\cdot\hfill$}]|Text with a
number of words. Spaces: 1[ ], 2[ ], 3[ ], 4[ ], 5[ ]. Note that
breaks at spaces are not marked with arrow sign, but_long_words_that_act
ually_break_somewhere_still_are.|
```

```
Text·with·a·number·of·wo
↳rds·.·Spaces:·1[·],·2[·
·],·3[···],·4[····],·5[·
····]·.·Note·that·breaks·a
↳t·spaces·are·not·marked
·with·arrow·sign,·but_lon
↳g_words_that_actually_br
↳eak_somewhere_still_are.
```

As this behavior is quite common, `showspaces` option is a shorthand for the desired behavior above. Here is how each option affects the outcome. `<value>` takes the `no`, `verbatim`, `extra` and `all` value correspondingly.

```
\lwtcode[gobble=<value>]|Text with a number of words. Spaces: 1[ ], 2[
], 3[ ], 4[ ], 5[ ]. Note that breaks at spaces are not marked with
arrow sign, but_long_words_that_actually_break_somewhere_still_are.|
```

```
Text with a number of words. Sp
↪aces: 1[ ], 2[ ], 3[ ], 4[
], 5[ ]. Note that breaks at
spaces are not marked with arrow
sign, but_long_words_that_actuall
↪y_break_somewhere_still_are.
```

```
Text with a number of words. Spa
↪ces: 1[ ], 2[ ], 3[ ], 4[
], 5[ ]. Note that breaks at
spaces are not marked with arrow
sign, but_long_words_that_actuall
↪y_break_somewhere_still_are.
```

```
Text with a number of words. Spa
↪ces: 1[ ], 2[ ], 3[ ], 4[ ], 5[
]. Note that breaks at spaces a
↪re not marked with arrow sign,
but_long_words_that_actually_brea
↪k_somewhere_still_are.
```

```
Textwithanumberofwords.Spaces:1[
]
↪,2[ ],3[ ],4[ ],5[ ].Notethatbreaksa
↪tspacesarenotmarkedwitharrowsig
↪n,but_long_words_that_actually_
↪break_somewhere_still_are.
```

Here is how each option behaves on the input consisting almost entirely of spaces:

```
no      “    !    ”
verbatim “    !    ”
extra   “    !    ”
all     “    !    ”
```

`breaksymr=<hbox>` `breaksyml=<hbox>` `breaksymr` and `breaksyml` allow to specify line break indicators, e.g. hyphen, arrow, etc. `lwtverb` effectively inserts `\discretionary{<breaksymr>}{<breaksyml>}{}` after each non-space character of the input.

```
\lwtverb[breaksyml=$\triangleleft$, breaksymr=$\triangleright$]|Long_w
↪ord_that_should_be_hyphenated.|
```

```
Long_word_that_▷
<should_be_hyph>
<enated.
```

`poskrn=<length>` `negkrn=<length>` Specifies interletter stretching (`poskrn`) and shrinking (`negkrn`) boundaries.



```
\lwtverb[poskrn=1em, negkrn=0.3em]|This_text_must_be_very_loose <filler_
↪r_text_that_should_wrap>|
\lwtverb[poskrn=1em, negkrn=0.3em]|This_text_must_be_very_tight <anoth
↪er_filler>|
```

```
This_text_must_be_very_loose
<filler_text_that_should_wrap>
This_text_must_be_very_tight <another_filler>
```

`possp=<length>` Specifies interword stretching (`possp`) and shrinking (`negsp`) boundaries.  
`negsp=<length>`

```
\lwtverb[possp=1em, negsp=0.3em]|Spaces here must be very wide <filler_
↪text_that_should_wrap>|
\lwtverb[possp=1em, negsp=0.3em]|Spaces here must be very short <anoth
↪r_filler>|
```

```
Spaces here must be reasonably wide
<filler_text_that_should_wrap>
Spacesheremustbeveryshort<another_filler>
```

`spwidth=<length>` Specifies interword space width in normal and verbatim `gobble` mode.  
`hardspwidth=<length>` Specifies a command with a three parameters, namely `<cur>`, `<prev>`, `<discretionary>`, i.e.  
`breakhandler=<cmd3>` current char, previous char and discretionary box. One should return `<discretionary>` in order to allow break and nothing to prevent it. E.g. here is how `keepwords`-like behavior may be achieved.

```
\def\ignorethree#1#2#3{}
\lwtverb[breakhandler=\ignorethree]|Will not be able to break words.
Long-word-that-is-to-be-normally-hyphenated will be left as is.|
```

```
Will not be able
to break words.
Long-word-that-is-to-be-normally-hyphenated
will be left as is.
```

One may imagine a requirement to break only at a certain symbol, e.g. hyphen. Here is how it may be achieved.

```
\def\breakhyph#1#2#3{\if-#2#3\fi}
\lwtverb[breakhandler=\breakhyph]|Will not be able to break words.
Long-word-that-is-to-be-normally-hyphenated will break at ‘-’.|
```

```
Will not be able to break
words. Long-word-that-is-to-
be-normally-hyphenated will
break at ‘-’.
```

Here we test if the previous character was a hyphen and if so insert discretionary.

`debug`    `Synonym of decoration=\colorbox{lightgray}.`

<code>breakline, b</code>	Synonym of <code>breaksymr={}</code> , <code>breaksyml={}</code> .
<code>wrapline, w</code>	Synonym of <code>breaksymr={\tiny\$\hookrightarrow\$}</code> , <code>breaksyml={}</code> .
<code>hyphenate, h</code>	Synonym of <code>breaksymr={-}</code> , <code>breaksyml={}</code> .
<code>monospaced, m</code>	All spacings are non-adjustable, all spaces are as in verbatim mode.
<code>showspaces</code>	Installs <code>spacebox</code> with a small central dot.
<code>obeyspaces</code>	Synonym of <code>gobble=verbatim</code> .
<code>nospaces</code>	Synonym of <code>gobble=all</code> .

## 6 Comparison to other approaches

There are plenty of packages and/or techniques that provide similar functionality. Why then `lwtverb`? Here is a brief overview of alternatives to `lwtverb` that reveals some subtleties of each of them.

`\tt`, `\texttt`

Requires manual escaping of special characters. Does not support hyphenation by default.

`\justtt`

Simple extension of the previous approach. See [this StackExchange answer](#) for details. `\detokenize` handles most of the special characters automatically, but fails with commands, e.g. `\detokenize{\LaTeX{}}` introduces unwanted extra space after the command name: `\LaTeX {}`. `\detokenize` also fails to preserve `<<` and `>>` resulting in `«` and `»` correspondingly. `lwtverb` provides `\justtt` (without `\detokenize`) and `\justverb` (`\detokenize`-based) just for completeness.

**L<sup>A</sup>T<sub>E</sub>X's** `\verb`

Does not allow line breaks inside words. May cause overfull hboxes. Very fragile.

**fancyvrb's** `\Verb`

With the help of `fvextra` supports line breaks anywhere in the string and can indicate breaks appropriately. Not justifiable — produces too ragged result. Without `breakanywhere` option may cause overfull hboxes with long enough words. See examples above. `fancyvrb` and `fvextra` provide `\SaveVerb`, `\UseVerb` and many more useful commands to cope with plain `\Verb` limitations. `lwtverb` does not provide such mechanism.

**minted's** `\mintinline`

Does not allow line breaks in inline code at all.

**url's or xurl's** `\url`

Does its job well but handles some characters inconsistently (e.g. `<<` is typeset in typewriter font, but `>>` is not). Suffers from the same problems as `\detokenize` does. `hyperref` may interfere with `url`. Actually, it can be seen on table 4. `\xurltt` from the example above is defined as follows: `\DeclareUrlCommand\xurltt{\urlstyle{tt}}`.

## 7 Limitations

There are many limitations the author is currently aware of:

- Missing support for inline math.
- Hyphenation does not take into account whether it is semantically allowed to break at certain position. True hyphenation is desirable for typesetting text but in such case simple `\justtt`-based approach would be enough.
- Only some of the command options have their package option equivalents. The user may, however, simply define his own command as `lwtverb` does with `\lwtcode`.
- There is no option to trim leading and trailing spaces. But is such an option really necessary?
- As with all other inline verbatim commands, `\lwtverb` and others are fragile. It means that `\lwtverb` (but not `\lwttt`) cannot be used in section names, captions, it may conflict with some tabular environments. `fvextra` fixes a lot of `fancyvrb`'s `\Verb` fragility issues, but not all and at some cost (whitespace preservation, alternative syntax with its own limitations, etc.). `lwtverb` tries to follow `fvextra` implementation in order to provide robust variant of `\lwtverb`.
- `\lwtverb|...|` may exhibit a bit strange behavior when passed as an argument to other commands (e.g. `\id{\lwtverb|\LaTeX }|` actually becomes “`\LaTeX`” instead of desired “`{\LaTeX }`”, where `\id` is defined as follows: `\def\id#1{#1}.` `\lwtverb{...}` survives and produces almost desired output “`{\LaTeX}`” but fails to preserve spaces after `\LaTeX`.

## 8 Historical notes

The package was originally implemented on top of `newverbs`. It provides very simple and straightforward approach to verbatim commands — one just needs to feed his command to `\Collectverb` which just passes collected input as an argument to provided command. It, however, is as fragile as `\verb` is, so it is hardly acceptable.

Implementation on top of plain `fancyvrb` was much less fragile, but it still was far from what it might be.

Current `fvextra`-based approach finally won and was adopted here.