

The **esrelation** Package

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1 Installation

The program termination problem, also known as the uniform halting problem, can be defined as: *Using a finite amount of time: determine whether a given program will always finish running or could possibly execute forever.*

The Metafont programming and L^AT_EX 2_ε package writing and T_EXmacro programming (*especially the T_EXmacro programming*) required to produce these symbols looked like it might, itself, never end. It took more than a year of work in fits and starts to understand how the jalousie of bits and pieces go together to make a font work with L^AT_EX. The Comprehensive L^AT_EX 2_ε Symbol List (<http://www.ctan.org/tex-archive/info/symbols/comprehensive/>) does not currently include this set, but on completion all of these files will be ready to upload in the correct formats for inclusion. These are implemented as a standard T_EX math symbol font, implemented with custom Metafont sources, rendered on-the-fly as needed by L^AT_EX 2_ε. Also provided in this package is a PostScript Type 1 version of the font. Symbols are accessed through macros defined in this package.

Installation involves copying the supplied files to their designated places within L^AT_EX's search path and updating T_EX's databases.

1. First, you need to find the folder `texmf-local` (on Unix the default is `/usr/local/texlive/texmf-local`). To do that, run:

```
kpsewhich --var-value TEXMFLOCAL
```

Subsequently, this directory will be referred to as **TEXMFLOCAL**.

2. Run L^AT_EX on `esrelation.ins`. Copy the files into the following directories, creating subdirectories as necessary:

- copy `esrelation.sty` and `uesrelation.fd` to:
`TEXMFLOCAL/tex/latex/esrelation`
- copy `esrelation.mf` and `esrelation10.mf` to:
`TEXMFLOCAL/fonts/source/public/esrelation`

If you also want to install the fonts in Type1 format:

- copy `esrelation10.pfb` to:
`TEXMFLOCAL/fonts/type1/public/esrelation`

- copy `esrelation.map` to:
`TEXMFLOCAL/fonts/map/dvips/esrelation`

Note that all created directories should be set to mode 755 and all files should be set to mode 644.

3. Update your \LaTeX font database. This is called the `ls-r` and lives in a few places. Fortunately, you can just run this, likely as `sudo` or `root` (`-H` sets `HOME` for the `sudo` environment):

```
sudo -H mktexlsr
```

4. Update your \TeX font map by running the command:

```
sudo -H updmap-sys --enable Map=esrelation.map
```

5. Update the font database again:

```
sudo -H mktexlsr
```

6. Open \LaTeX , and start relating.

2 Using esrelation

Load the package with `\usepackage{esrelation}`. Available symbols to be used from math mode:

`\relationrightproject` $\overrightarrow{A, Z}$

`\relationleftproject` $\overleftarrow{A, Z}$

`\relationlifting` $\underline{A, Z}$

`\restrictwand` i_{\downarrow}

`\restrictwandup` i_{\uparrow}

`\restrictbarb` R_{\downarrow}

`\restrictbarbup` R_{\uparrow}

`\restrictmallet` Z_{\downarrow}

`\restrictmalletup` Z_{\uparrow}

$$\overrightarrow{R_A}$$

$$\overrightarrow{0,1}$$

$$\overleftarrow{0,1}$$

$$\underline{0,1}$$

$$\overleftarrow{\overrightarrow{\overrightarrow{1,1}}}$$

$$\underline{xx>1,\,\,\,\mathbf{x}x=0}$$

$$\overline{\overline{\overline{x,X_{\downarrow}}}}$$

$$\overleftarrow{\overrightarrow{\overrightarrow{\overrightarrow{i,R}}}}$$

$$X_{\downarrow}\,X_{\downarrow}^2\,X_{\downarrow}^{\infty}$$

$$X_{\downarrow}$$

$$X_{\downarrow}$$

End. Try some more combinations now that it's running.