

EMP: Encapsulated METAPOST for L^AT_EX*

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Abstract

The EMP package allows to encapsulate METAPOST files in L^AT_EX sources. This is very useful for keeping illustrations in sync with the text. It also frees the user from inventing descriptive names for PostScript files that fit into the confines of file system conventions.

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*This is `emp.dtx`, version v1.00, revision 1.10, date 1997/11/12.

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1 Introduction

When adding illustrations to documents, one faces two bookkeeping problems:

1. How to encourage oneself to keep the illustrations in sync with the text, when the document is updated?
2. How to make sure that the illustrations appear on the right spot?

For both problems, the best solution is to encapsulate the figures in the \LaTeX source:

1. It is much easier to remember to update an illustration if one doesn't have to switch files in the editor.
2. One does not have to invent illustrative file names, if the computer keeps track of them.

Therefore EMP was written to allow to encapsulate METAPOST [1, 2] into \LaTeX [2, 3, 4].

These macros have some overlap with `feynMF` [2, 5], `axodraw` [6] and `mfpic` [2, 7]. In fact, most of the functionality of EMP is available from `feynMF`. Longer pieces of METAPOST code are however not very conveniently typed in `feynMF`, because there is no facility for multi line input (using `\fmfcmd` with long arguments can overflow METAPOST's input buffers because of the missing line breaks). Since `feynMF` provides much syntax that is superfluous for EMP's purpose (the EMP package exports only five new environments and five commands), it is more appropriate to create a separate small package than to add this functionality to `feynMF`. Similar comments apply to `mfpic`.

2 Usage

2.1 Commands and Environments

`empfile` All descriptions that should go into one METAPOST file are placed inside a `empfile` environment which takes the name of the METAPOST file as an optional argument:

```
\begin{empfile}[\langle METAPOST-file \rangle]
...
\end{empfile}
```

The default METAPOST-filename is `\jobname.mp`.

`emp` The `emp` environment contains the description of a single figure that will be placed at the location of the environment. Required arguments are the width and the height of the figure, in units of `\unitlength`. They will be available as the METAPOST variables `w` and `h`. The optional argument assigns a name to be used with `\empuse{\langle name \rangle}`.

```
\begin{emp}[\langle name \rangle](\langle width \rangle,\langle height \rangle)
\langle METAPOST-commands \rangle
\end{emp}
```

Note that this environment uses the `verbatim` package to process the input lines and can therefore *not* be used as an argument to another macros. To work around this problem, you can first use the `empdef` environment and `\empuse` it later.

`\empuse` Reuse a previously defined figure.

`empdef` The `empdef` environment is similar to `emp`, but the figure is not drawn. This is useful, because these environments use the `verbatim` package and can therefore *not* be used as an argument to another macros.

```
\begin{empdef}[\langle name \rangle](\langle width \rangle,\langle height \rangle)
  \langle METAPOST-commands \rangle
\end{empdef}
```

`empcmds` Write METAPOST commands to the current file outside of a figure.

```
\begin{empcmds}
  \langle METAPOST-commands \rangle
\end{empcmds}
```

`empgraph` The `empgraph` environment contains the description of a graph that will be placed at the location of the environment. The user is responsible for including the `graph` package by the using the command `\emppprelude{input graph}` in the preamble. Required arguments are the width and the height of the graph, in units of `\unitlength`. They will be available as the METAPOST variables `w` and `h`. The optional argument assigns a name to be used with `\empuse{\langle name \rangle}`.

```
\begin{empgraph}[\langle name \rangle](\langle width \rangle,\langle height \rangle)
  \langle METAPOST-commands \rangle
\end{empgraph}
```

`\empTeX` Define a L^AT_EX prelude to be written to the top of every METAPOST file. The default is `\documentclass[\langle ptsize \rangle]{article}`. If the prelude is not empty, `\begin{document}` will be added. Note that you have to run METAPOST as `TEX=latex mpost \langle filename \rangle` if the prelude calls L^AT_EX.

`\empaddtoTeX` Add to the L^AT_EX prelude. E.g. `\empaddtoTeX{\usepackage{euler}}` makes sure that METAPOST will use the Euler fonts for the labels.

`\emppprelude` Define and add to a METAPOST prelude to the top of every METAPOST file.

`\empaddtoprelude` The default is empty.

2.2 Examples

For a simple example, let's draw a smiling and a frowning face. Since they are identical except for the mouth, we prepare a macro for the common parts:

```
1 \*sample
2 \begin{empcmds}
3   vardef draw_face =
4     pair lefteye, righteye, nose[];
5     lefteye = c + (-0.25w,0.15h); righteye = c + (0.25w,0.15h);
6     nose1 = c - (0,0.05h); nose2 = c + (0,0.15h);
7     pickup pencircle scaled 1;
8     draw fullcircle xscaled w yscaled h shifted c;
9     draw fullcircle scaled 2 shifted lefteye;
```