GasTeX: Graphs and Automata Simplified in TEX

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Abstract

This is a very minimal startup guide including some examples.

For the documentation, please see `http://www.lsv.fr/~gastin/gastex/index.html`. Solutions to known problems can be found in this page. In particular, some problems which started with TeXLive 2021 and related to the use of the document class lipics-v2021, or the package todonotes, or the library shadows of tikz, and possibly other contexts.

The package consists of two files `gastex.sty` and `gastex.pro`.

- `gastex.sty` contains the definition of all GasTeX macros. This file could be in your working folder but it is best placed where `.sty` files are, e.g.,

  `.../texmf-dist/tex/latex/gastex/gastex.sty`
  or
  `.../texmf-local/tex/latex/gastex/gastex.sty`

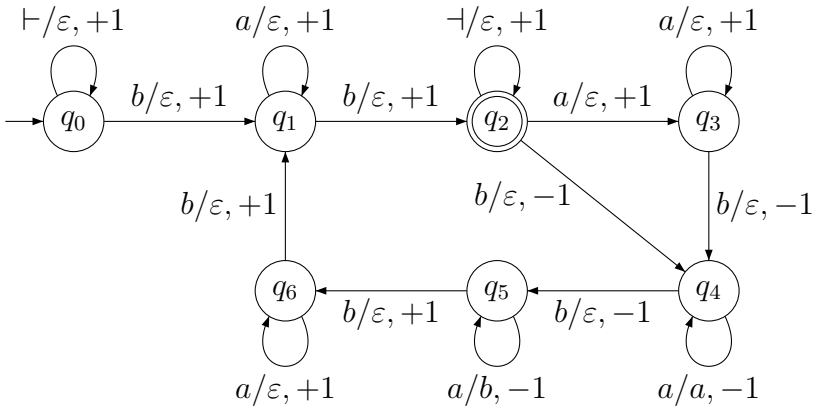
- `gastex.pro` which contains all the postscript procedures used to actually draw the pictures. This file could be in your working folder but it is best placed where `.pro` files are, e.g.,

  `.../texmf-dist/dvips/gastex/gastex.pro`
  or
  `.../texmf-local/dvips/gastex/gastex.pro`

This documentation file simply contains a few simple examples on how to make figures with GasTeX. It should be compiled with

```
pdflatex --shell-escape gastex-doc.tex
```
or
```
pdflatex --enable-write18 gastex-doc.tex
```

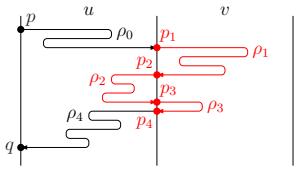
The first example below is a 2-way deterministic finite state transducer. It consists of a `gpicture` environment which contains the GasTeX commands for nodes and transitions.



The second one is in Figure 1. The pictures have been defined at the beginning of the LaTeX document, with the `name` and `ignore` optional parameters given to the `gpicture` environment. These pictures are generated but not inserted immediately. Instead, the `\gusepicture` command allows to include each named picture, possibly multiple times at different places.

All pictures defined in `gpicture` environments are compiled and stored in a file called `filename-pics.pdf`, one picture per page. These pictures could be included in any LaTeX file, possibly another LaTeX file which need not use the GasTeX package, simply by using `\includegraphics` as follows:

```
\includegraphics[page=2,scale=0.6]{gastex-doc-pics.pdf}
```



This is convenient for instance when sending the LaTeX file to `Arxiv` or to an editor (journal, proceedings) which does not allow the `--shell-escape` option when compiling with `pdflatex`. Actually, GasTeX does this automatically for you. When loading the package, set the `recompilepics` option to `false` as follows:

```
\usepackage[pdflatex,recompilepics=false]{gastex}
```

then you may compile without the `--shell-escape` option

```
pdflatex gastex-doc.tex
```

and GasTeX automatically calls `\includegraphics` to include the pictures that have been previously generated and stored in the file `gastex-doc-pics.pdf`.

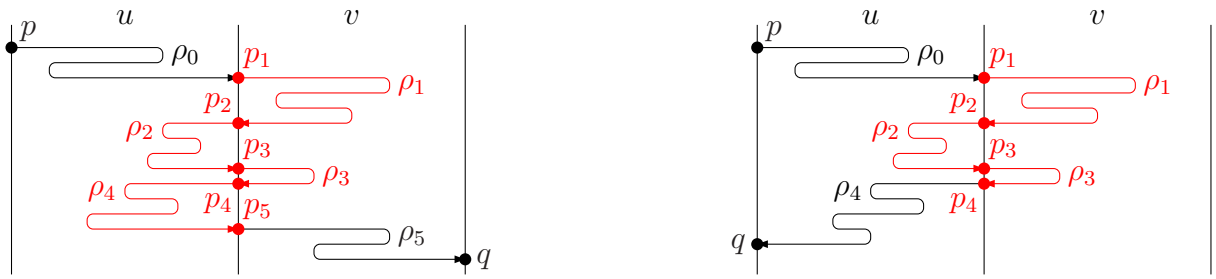


Figure 1: Decomposition of a left-right run and a left-left run over the product $w = uv$.