ecgdraw package*

Marco Scavino† and Ezio Aimé‡

July 1, 2016

Abstract

This package was born to create fake elettrocardiograms, thanks to TikZ package and \LaTeX{} bundle.

Contents

1 Introduction 1

2 Use 1

2.1 Waves 2

2.2 Options 2

2.2.1 Grid 2

2.3 Break ECG path 3

2.4 ECG title 3

2.5 Wave database 3

1 Introduction

To work correctly ecgdraw package are needed

• TikZ package,

• \LaTeX{} bundle.

2 Use

\texttt{ecg} The package defined \texttt{ecg} environment with a optional argument \[\langle\text{options}\rangle]\n
\begin{ecg}[\langle\text{options}\rangle] \text{ECG path} \end{ecg}

where \langle\text{options}\rangle are TikZ keys. Inside the environment it’s possible to draw a ECG thanks the \texttt{\ECG} macro

\texttt{\ECG}[\langle\text{TikZ options}\rangle] (\langle\text{vertical position}\rangle) \{\langle\text{ECG waves}\rangle\}

\*Version v.1.0; last revision 2016/06/29.
†e-mail: scavino dot marco93 at gmail dot com
‡e-mail: ezio dot aime at fastwebnet dot it
The macro have an optional argument \{\textit{\textit{options}}\}, that accepts Tikz options, an optional argument delimited by brace \{\textit{\textit{vertical position}}\}, vertical position of the path, and a mandatory argument \{\textit{\textit{ECG waves}}\} which contain the list of ECG waves abbreviation.

Each abbreviation is made of different part:
\begin{verbatim}
\ECG \{ (options) \ \{wave name\} \ \{other\} \}
\end{verbatim}

\textit{(options)} are given to the single wave, \textit{(wave name)} is the abbreviation of the wave, while \textit{(other)} depends on the types of wave.

\section*{2.1 Waves}

Different wave types are possible:

\begin{itemize}
  \item \textbf{p} \textit{p} wave needs \textit{\textit{polarity}} (allowed value \texttt{p, n}), wave height \textit{\textit{tenths of millivolts}} (between 0.1-0.3 mV) and time \textit{\textit{milliseconds}}.
    \begin{verbatim}
p \{polarity\} 0 \{}\text{tenths of millivolts}\} \{milliseconds\}
\end{verbatim}
  \item \textit{Bifasich wave with d and b polarity is needed a second wave}
    \begin{verbatim}
p \{polarity\} \{first tenths millivolts\} \{second tenths millivolts\} \{milliseconds\}
\end{verbatim}
  \item \textbf{q, r, s} \textit{Waves for QRS complex. They take as first argument wave height in millivolts and as second argument the duration in milliseconds.}
    \begin{verbatim}
q/r/s \{\text{\textit{wave height Q/R/S}}\} \{milliseconds\}
\end{verbatim}
  \item \textbf{i} \textit{Isoelectric wave, take only one argument, which is time in \textit{milliseconds}.}
    \begin{verbatim}
i \{milliseconds\}
\end{verbatim}
  \item \textbf{t} \textit{First argument is \textit{polarity}, positive \texttt{p} or negative \texttt{n}, second argument is \textit{tenth of milliVolts}, as optional argument a correction if wave isn’t symmetrical and last argument \textit{milliseconds}.}
    \begin{verbatim}
t \{polarity\} \{tenth of milliVolts\} \{[correction]\} \{milliseconds\}
\end{verbatim}
  \item ! Allow to use a wave defined through \newECG macro.
    \begin{verbatim}
! \{wave name\}
\end{verbatim}
  \item ? Insert a label left to the path. Optional argument (default value 1 cm) set horizontal shift.
    \begin{verbatim}
? \{\text{\textit{horizontal shift}}\} \{text\}
\end{verbatim}
\end{itemize}

\section*{2.2 Options}

\subsection*{2.2.1 Grid}

\texttt{ecg} environment accept different options to modify grid dimension.

\begin{itemize}
  \item \texttt{grid top} Accept a dimension as value. Grid is enlarged toward top of the set value.
  \item \texttt{grid bottom} Similar to \texttt{grid top}, but grid is enlarged toward bottom.
\end{itemize}
2.3 Break ECG path

Sometimes ECG are too much wide and cannot fit the textwidth. So it’s possible to allow \LaTeX{} to break ECG using the `breaklines` key.

`breaklines` This key allow automate wrap ECG pattern. New line has an indent of `breakindent` value (default 1 cm).

`breakindent`

2.4 ECG title

It’s possible to insert a ECG title by `ECG title` and set title align by `ECG title align` key (value `right`, `left`, `center`).

2.5 Wave database

`\newECG` macro add a custom wave

```
\newECG {⟨wave name⟩} {⟨wave code⟩}
```

It’s possible to call ⟨wave name⟩ inside \ECG using the key !.