The panda package

Estimating the blackness of fonts

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https://github.com/samcarter/panda

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1 Introduction

Imagine the following problem: there is a hungry panda sitting next to you and just today, you happen to not have any bamboo with you. Now you are a LaTeX user and the only limits are your own imagination, so of course you try to draw a couple of bamboo sticks with LaTeX. Here dear panda, have three bamboo sticks: lll. The panda likes them and wants to make more. **However the panda uses a different font and the bamboo sticks suddenly look a lot less tasty, they look just too thin:** lll**.**

The panda package provides estimates for the stroke width of fonts and how black the fonts look on the page. Creators of symbols etc. can use these estimates to adjust their drawings to better blend in with the surrounding text.

Yummy bamboo sticks: lll

The results won't be a perfect match for all fonts and strokes can also look differently compared to the surrounding text depending on the PDF viewer and zoom level, but the results should be good enough to ensure that the symbols don't stand out immediately.

Note that this package was developed and tested with texts in Latin scripts – results might be less satisfactory if used with other scripts.

This package is work in progress, therefore I would be happy to hear your feedback and ideas how to improve the package. The development version of the source code can be found at https://github.com/samcarter/panda, including an issue tracker. If you seek any other assistance (not bug reports/feature requests), I suggest asking at https://topanswers.xyz/tex.

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2 Clever Panda

The Clever Panda approach is inspired by a brilliant answer by @Skillmon[1], which uses the difference between the height of a full stop and 1 pt to estimate a proxy for the stroke width of the current font.

The Clever Panda uses a simpler approach of directly employing a fraction the full stop height and combines this with a manually curated list of exceptions.

Compared to the Busy Panda approach, described in the next section, this approach should be faster and isn't limited to what fonts in a loop-up table.

2.1 Usage (simple case)

After loading the package, the command `\CleverPanda{}` will expand to a length, which can be used as stroke width for drawing symbols etc.

Basic usage

```
\documentclass{article}
\usepackage{CleverPanda}
\begin{document}
  cmr: \rule{ \CleverPanda{} }{8pt}

  \fontfamily{ugq}\selectfont
  ugq: \rule{ \CleverPanda{} }{8pt}
\end{document}
```

cmr: |
ugq: |

There are two options for customisation: the `scale=...` package option sets a default scaling value. For example, `scale=10` means that `\CleverPanda{}` returns a length ten times as long as it normally would. The scaling factor can also be set locally in the mandatory argument, e.g. `\CleverPanda{42}`.

Options

```
\documentclass{article}
\usepackage[scale=10]{CleverPanda}
\begin{document}
  cmr: \rule{ \CleverPanda{} }{8pt}

  cmr: \rule{ \CleverPanda{42} }{8pt}
\end{document}
```

cmr: 
cmr: 

2.2 Special Case (TikZ)

The `\CleverPanda{}` command works well, as long as the height of the full stop is available when the macro is used. Unfortunately, that's not always the case.

[1] see https://topanswers.xyz/tex?q=8139#a7747

One notable problem case are Ti*k*Z options, e.g. while setting line widths. As a workaround, one can use the command `\CleverPandaSet` before the Ti*k*Z picture and then `\CleverPandaGet{}` in the Ti*k*Z options to access the stroke width:

Ti*k*Z

```
\documentclass{article}
\usepackage{CleverPanda}
\usepackage{tikz}
\newlength{\IHeight}

\newcommand{\tikzbamboo}{%
  \setlength{\IHeight}{\fontcharht\font`I}%
  \CleverPandaSet
  \begin{tikzpicture}[baseline]
    \draw[line width=\CleverPandaGet{}]
         (0,0) -- (0,\IHeight);
  \end{tikzpicture}%
}

\begin{document}
  cmr:  \tikzbamboo

  \fontfamily{ugq}\selectfont
  ugq: \tikzbamboo
\end{document}
```

cmr: I

ugq: I

3 Busy Panda

The approach of the Busy Panda is different. To get an estimate of how black text in a particular font looks like, the Busy Panda uses a sample PDF with:

```
Lorem ipsum dolor sit amet, consectetur adip
```

After converting the PDF into a pixel graphic, the average blackness of the pixels can be calculated. After repeating this for different fonts (including their bold versions), the Busy Panda now contains a look-up table with the average blackness for about 8800 fonts, normalised to the average blackness of Computer Modern Roman. Tests with different sample texts and image resolutions indicate that the error of this method is about 10%. While not perfect, this is usually accurate enough to make symbols blend in with the surrounding text.

Compared to the Clever Panda approach from the previous section, this approach gives more accurate results, in particular for very heavy fonts, and is more versatile to use.

3.1 Usage

The basic usage is simple: after loading the package, the command `\BusyPanda{}` provides a normalised estimate of the blackness of the current font:

Basic usage

```
\documentclass{article}
\usepackage{BusyPanda}
\begin{document}
  cmr: \BusyPanda{}

  \fontfamily{ugq}\selectfont
  ugq: \BusyPanda{}
\end{document}
```

cmr: 1
ugq: 2.40491

There are two options for customisation: the `scale=...` package option sets a default scaling value. For example, `scale=10` means that `\BusyPanda{}` no longer returns 1 for Computer Modern Roman, but 10. The scaling factor can also be set locally in the mandatory argument, e.g. `\BusyPanda{42}`.

Options

```
\documentclass{article}
\usepackage[scale=10]{BusyPanda}
\begin{document}
  cmr: \BusyPanda{}

  cmr: \BusyPanda{42}
\end{document}
```

cmr: 10
cmr: 42

3.2 Creating symbols

There is still a hungry panda sitting next to you, so let's create some extra yummy bamboo sticks:

Feeding the panda

```
\documentclass{article}
\usepackage{BusyPanda}
\newlength{\IHeight}

\newcommand{\bamboo}{%
  \setlength{\IHeight}{\fontcharht\font`I}%
  \rule{%
    \BusyPanda{0.125}\IHeight
  }{%
    \IHeight
  }%
}

\begin{document}
Normal bamboo: \bamboo

\fontfamily{ugq}\selectfont
Extra yummy bamboo: \bamboo
\end{document}
```

Normal bamboo: I
Extra yummy bamboo: I

In the example above, `\BusyPanda{}` is used in combination with the height of the letter I. This ensures that stroke width will scale with the size of the text.

3.3 Unsupported fonts

Given the seemingly infinite number of fonts out there, this package will never be able to support them all – but more can be added with your help!

If the font you are using isn't yet supported (`\BusyPanda{}` will return 1, like for Computer Modern Roman and – if compiled with LuaLaTeX – a warning can be found in the .log file), then please get the test document from:

`https://github.com/samcarter/panda/blob/main/BusyPanda_unsupportedFonts.tex`

You only need to change the font name in the second line and compile with either `pdflatex` or `lualatex`. Then open an issue at `https://github.com/samcarter/panda/issues` and upload the compiled PDF there.

4 Examples

Font Family	Clever Panda	Busy Panda
AccanthisADFStdNoThree-LF	Lorem	Lipsum	Lorem	Lipsum
Alegreya-OsF	Lorem	Lipsum	Lorem	Lipsum
Alegreya-TLF	Lorem	Lipsum	Lorem	Lipsum
AnonymousPro	Lorem	Lipsum	Lorem	Lipsum
antp	Lorem	Lipsum	Lorem	Lipsum
antt	Lorem	Lipsum	Lorem	Lipsum
anttc	Lorem	Lipsum	Lorem	Lipsum
anttl	Lorem	Lipsum	Lorem	Lipsum
anttlc	Lorem	Lipsum	Lorem	Lipsum
artemisia	Lorem	Lipsum	Lorem	Lipsum
augie	Lorem	Lipsum	Lorem	Lipsum
auncl	Lorem	Lipsum	Lorem	Lipsum
bch	Lorem	Lipsum	Lorem	Lipsum
bodoni	Lorem	Lipsum	Lorem	Lipsum
Cabin-TLF	Lorem	Lipsum	Lorem	Lipsum
Caladea-TLF	Lorem	Lipsum	Lorem	Lipsum
cantarell-OsF	Lorem	Lipsum	Lorem	Lipsum
ccr	Lorem	Lipsum	Lorem	Lipsum
Cinzel-LF	Lorem	Lipsum	Lorem	Lipsum
CinzelDecorative-LF	Lorem	Lipsum	Lorem	Lipsum
ClearSans-TLF	Lorem	Lipsum	Lorem	Lipsum
clm	Lorem	Lipsum	Lorem	Lipsum
clmd	Lorem	Lipsum	Lorem	Lipsum
clmqs	Lorem	Lipsum	Lorem	Lipsum
clms	Lorem	Lipsum	Lorem	Lipsum
clmt	Lorem	Lipsum	Lorem	Lipsum
clmv	Lorem	Lipsum	Lorem	Lipsum
cmbr	Lorem	Lipsum	Lorem	Lipsum
cmdh	Lorem	Lipsum	Lorem	Lipsum
cmin	Lorem	Lipsum	Lorem	Lipsum
cmr	Lorem	Lipsum	Lorem	Lipsum
cmss	Lorem	Lipsum	Lorem	Lipsum
cmtt	Lorem	Lipsum	Lorem	Lipsum
cmvtt	Lorem	Lipsum	Lorem	Lipsum

Font Family	Clever Panda	Busy Panda
comfortaa	Lorem ǀ Lipsum	Lorem ǀ Lipsum
Crlt-TLF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
cyklop	**Lorem ǀ Lipsum**	**Lorem ǀ Lipsum**
DejaVuSans-TLF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
DejaVuSansMono-TLF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
DejaVuSerif-TLF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
droidsans	Lorem ǀ Lipsum	Lorem ǀ Lipsum
droidsansmono	Lorem ǀ Lipsum	Lorem ǀ Lipsum
droidserif	Lorem ǀ Lipsum	Lorem ǀ Lipsum
EBGaramond-OsF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
erewhon-OsF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
fav	Lorem ǀ Lipsum	Lorem ǀ Lipsum
fbb-LF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
FiraSans-TLF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
frc	Lorem ǀ Lipsum	Lorem ǀ Lipsum
fve	Lorem ǀ Lipsum	Lorem ǀ Lipsum
fvm	Lorem ǀ Lipsum	Lorem ǀ Lipsum
fvs	Lorem ǀ Lipsum	Lorem ǀ Lipsum
GilliusADF-LF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
GilliusADFNoTwo-LF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
Heuristica-TLF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
iwona	Lorem ǀ Lipsum	Lorem ǀ Lipsum
iwonac	Lorem ǀ Lipsum	Lorem ǀ Lipsum
iwonal	Lorem ǀ Lipsum	Lorem ǀ Lipsum
iwonalc	Lorem ǀ Lipsum	Lorem ǀ Lipsum
jkp	Lorem ǀ Lipsum	Lorem ǀ Lipsum
jkp	Lorem ǀ Lipsum	Lorem ǀ Lipsum
jkpl	Lorem ǀ Lipsum	Lorem ǀ Lipsum
jkpss	Lorem ǀ Lipsum	Lorem ǀ Lipsum
jkpss	Lorem ǀ Lipsum	Lorem ǀ Lipsum
jkptt	Lorem ǀ Lipsum	Lorem ǀ Lipsum
jkpx	Lorem ǀ Lipsum	Lorem ǀ Lipsum
kurier	Lorem ǀ Lipsum	Lorem ǀ Lipsum
kurierc	Lorem ǀ Lipsum	Lorem ǀ Lipsum
kurierl	Lorem ǀ Lipsum	Lorem ǀ Lipsum
kurierlc	Lorem ǀ Lipsum	Lorem ǀ Lipsum
lato-OsF	Lorem ǀ Lipsum	Lorem ǀ Lipsum

Font Family	Clever Panda	Busy Panda
Ubstr-LF	Lorem	Lipsum	Lorem	Lipsum
LibreBskvl-LF	Lorem	Lipsum	Lorem	Lipsum
LibreCsln-TLF	Lorem	Lipsum	Lorem	Lipsum
LinuxBiolinumT-OsF	Lorem	Lipsum	Lorem	Lipsum
LinuxLibertineDisplayT-OsF	Lorem	Lipsum	Lorem	Lipsum
LinuxLibertineMonoT-TLF	Lorem	Lipsum	Lorem	Lipsum
LinuxLibertineT-OsF	Lorem	Lipsum	Lorem	Lipsum
Merriwthr-OsF	Lorem	Lipsum	Lorem	Lipsum
MerriwthrSans-TLF	Lorem	Lipsum	Lorem	Lipsum
MintSpirit-LF	Lorem	Lipsum	Lorem	Lipsum
nanumgt	Lorem	Lipsum	Lorem	Lipsum
nanummj	Lorem	Lipsum	Lorem	Lipsum
neohellenic	Lorem	Lipsum	Lorem	Lipsum
opensans-TLF	Lorem	Lipsum	Lorem	Lipsum
Ovrlck-LF	Lorem	Lipsum	Lorem	Lipsum
Ovrlck-LF	Lorem	Lipsum	Lorem	Lipsum
pag	Lorem	Lipsum	Lorem	Lipsum
pbk	Lorem	Lipsum	Lorem	Lipsum
pcr	Lorem	Lipsum	Lorem	Lipsum
phv	Lorem	Lipsum	Lorem	Lipsum
PlyfrDisplay-OsF	Lorem	Lipsum	Lorem	Lipsum
pnc	Lorem	Lipsum	Lorem	Lipsum
ppl	Lorem	Lipsum	Lorem	Lipsum
ptm	Lorem	Lipsum	Lorem	Lipsum
PTMono-TLF	Lorem	Lipsum	Lorem	Lipsum
PTSans-TLF	Lorem	Lipsum	Lorem	Lipsum
PTSansCaption-TLF	Lorem	Lipsum	Lorem	Lipsum
PTSansNarrow-TLF	Lorem	Lipsum	Lorem	Lipsum
PTSerif-TLF	Lorem	Lipsum	Lorem	Lipsum
PTSerifCaption-TLF	Lorem	Lipsum	Lorem	Lipsum
put	Lorem	Lipsum	Lorem	Lipsum
pzc	*Lorem*	*Lipsum*	*Lorem*	*Lipsum*
qag	Lorem	Lipsum	Lorem	Lipsum
qbk	Lorem	Lipsum	Lorem	Lipsum
qcr	Lorem	Lipsum	Lorem	Lipsum
qcs	Lorem	Lipsum	Lorem	Lipsum
qhv	Lorem	Lipsum	Lorem	Lipsum

Font Family	Clever Panda	Busy Panda
qhvc	Lorem ǀ Lipsum	Lorem ǀ Lipsum
qpl	Lorem ǀ Lipsum	Lorem ǀ Lipsum
qtm	Lorem ǀ Lipsum	Lorem ǀ Lipsum
Quattro-LF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
QuattroSans-LF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
Roboto-TLF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
RobotoSlab-TLF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
SourceCodePro-TLF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
SourceSansPro-TLF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
SQRC	Lorem ǀ Lipsum	Lorem ǀ Lipsum
stix	Lorem ǀ Lipsum	Lorem ǀ Lipsum
ua1	Lorem ǀ Lipsum	Lorem ǀ Lipsum
uaq	Lorem ǀ Lipsum	Lorem ǀ Lipsum
udidot	Lorem ǀ Lipsum	Lorem ǀ Lipsum
ugm	Lorem ǀ Lipsum	Lorem ǀ Lipsum
ugq	**Lorem ǀ Lipsum**	**Lorem ǀ Lipsum**
ul9	Lorem ǀ Lipsum	Lorem ǀ Lipsum
ulg	Lorem ǀ Lipsum	Lorem ǀ Lipsum
UniversalisADFStd-LF	Lorem ǀ Lipsum	Lorem ǀ Lipsum
uop	Lorem ǀ Lipsum	Lorem ǀ Lipsum
ybd	Lorem ǀ Lipsum	Lorem ǀ Lipsum
ybv	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yes	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yfraf	Lorem ǀ Lipſum	Lorem ǀ Lipſum
yly	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yrd	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yvl	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yvld	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yv2	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yv3	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yvo	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yv0d	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yvt	Lorem ǀ Lipsum	Lorem ǀ Lipsum
yvtd	Lorem ǀ Lipsum	Lorem ǀ Lipsum
zgmx	Lorem ǀ Lipsum	Lorem ǀ Lipsum
zi4	Lorem ǀ Lipsum	Lorem ǀ Lipsum