# The luacolor package

# Heiko Oberdiek\* <heiko.oberdiek at googlemail.com>

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#### ${\bf Abstract}$

Package luacolor implements color support based on LuaTeX's node attributes.

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 $<sup>{\</sup>rm ^*Please\ report\ any\ issues\ at\ https://github.com/ho-tex/oberdiek/issues}$ 

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	[2009/04/10 v1.1]	1.
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	[2010/12/13 v1.3]	1
	$[2011/03/29 \text{ v}1.4] \dots \dots$	1.
	[2011/04/22  v1.5]	1.
	$[2011/04/23 \text{ v}1.6] \dots \dots$	1.
	[2011/10/22 v1.7]	1.
	[2011/11/01 v1.8]	10
	$[2016/05/13 \text{ v}1.9] \dots \dots$	1
	[2016/05/16  v1.10]	1
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## 1 Documentation

#### 1.1 Introduction

This package uses a LuaTEX's attribute register to to annotate nodes with color information. If a color is set, then the attribute register is set to this color and all nodes created in its scope (current group) are annotated with this attribute. Now the color property behaves much the same way as the font property.

## 1.2 Usage

Package color is loaded automatically by this package luacolor. If you need a special driver option or you prefer package xcolor, then load it before package luacolor, for example:

\usepackage[dvipdfmx]{xcolor}

The package luacolor is loaded without options:

\usepackage{luacolor}

It is able to detect PDF mode and DVI drivers are differentiated by its color specials. Therefore the package do need driver options.

Then it redefines the color setting commands to set attributes instead of whatsits for color.

At last the attribute annotations of the nodes in the output box must be analyzed to insert the necessary color whatsits. Currently LuaTeX lacks an appropriate callback function. Therefore package atbegshi is used to get control before a box is shipped out.

#### $\label{luacolorProcessBox} \ \{\langle box \rangle\}$

Macro  $\label{luacolorProcessBox}$  processes the box  $\langle box \rangle$  in the previously described manner. It is automatically called for pages, but not for XForm objects. Before passing a box to  $\pdfxform$ , call  $\label{luacolorProcessBox}$  first.

#### 1.3 Limitations

Ligatures with different colored components: Package luacolor sees the ligature after the paragraph building and page breaking, when a page is to be shipped out. Therefore it cannot break ligatures, because the components might occupy different space. Therefore it is the respondibility of the ligature forming process to deal with different colored glyphs that form a ligature. The user can avoid the problem entirely by explicitly breaking the ligature at the places where the color changes.

# 2 Implementation

1 (\*package)

#### 2.1 Catcodes and identification

```
2 \begingroup\catcode61\catcode48\catcode32=10\relax%
       3 \catcode13=5 % ^^M
                           \endlinechar=13 %
                             \catcode123=1 % {
                           \catcode125=2 % }
                             \catcode64=11 % @
                           \def\x{\endgroup
                                      9
  10
                                                 \endlinechar=\the\endlinechar\relax
                                                 \catcode13=\the\catcode13\relax
  11
                                                 \color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\t
  12
                                                 \color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=
  13
                                                 \colored{catcode61=\the\catcode61\relax}
  14
                                                 \colored{catcode64} \to \colored{catcode64}
  15
                                                 \color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=\color=
  16
                                                \color=\the\color=125\relax
  17
  18
                                     }%
  19 }%
  20 \x\del{1}\del{20} \x\del{20} \align{20} \cdot{20} \cdot{20}\del{20} \cdot{20} \cd
 21 \cdot 613=5 \% ^M
 22 \endlinechar=13 %
23 \catcode35=6 % #
 24 \catcode64=11 % @
 25 \catcode123=1 % {
 26 \catcode125=2 % }
  27 \def\TMP@EnsureCode#1#2{%
                           \edef\LuaCol@AtEnd{%
  29
                                     \LuaCol@AtEnd
                                      \color= \time \color= \time \color= 
  30
  31 }%
 32 \ \text{catcode} = 1 = 2 \le x
 33 }
 34 \TMP@EnsureCode{34}{12}% "
 35 \TMP@EnsureCode{39}{12}% '
 36 \TMP@EnsureCode{40}{12}\% (
 37 \TMP@EnsureCode{41}{12}%)
  38 \TMP@EnsureCode\{42\}\{12\}\% *
 39 \TMP@EnsureCode{43}{12}% +
  40 \TMP@EnsureCode{44}{12}%,
  41 \TMP@EnsureCode{45}{12}% -
  42 \TMP@EnsureCode{46}{12}%.
  43 \TMP@EnsureCode{47}{12}% /
  44 \TMP@EnsureCode{58}{12}%:
  45 \TMP@EnsureCode{60}{12}% <
  46 \TMP@EnsureCode{62}{12}% >
  47 \TMP@EnsureCode{91}{12}% [
 48 \TMP@EnsureCode{93}{12}% ]
  49 \TMP@EnsureCode\{95\}\{12\}\% _ (other!)
  50 \TMP@EnsureCode{96}{12}\%
  51 \edf\LuaCol@AtEnd\LuaCol@AtEnd\noexpand\endinput\}
                   Package identification.
  52 \NeedsTeXFormat{LaTeX2e}
  53 \ProvidesPackage{luacolor}%
54 [2016/05/16 v1.10 Color support via LuaTeX's attributes (HO)]
```

#### 2.2Check for LuaTeX

```
Without LuaTeX there is no point in using this package.
```

- 55 \RequirePackage{infwarerr}[2010/04/08]%
- $56 \ensuremath{\mbox{\sc NequirePackage\{ifluatex\}[2010/03/01]\%}$
- 57 \RequirePackage{ifpdf}[2011/01/30]%
- 58 \RequirePackage{ltxcmds}[2011/04/18]%
- 59 \RequirePackage{color}
- 60 \ifluatex
- 61 \ifx\newattribute\@undefined
- 62 \ltx@ifpackageloaded{luatexbase-attr}{%
- \RequirePackage{luatex}[2010/03/09]% 64
- 65 }%
- 66 \fi
- 67 \else
- 68 \@PackageError{luacolor}{%
- This package may only be run using LuaTeX% 69
- 70 }\@ehc
- \expandafter\LuaCol@AtEnd
- 72 \fi%

#### \LuaCol@directlua

- 73 \ifnum\luatexversion<36 %
- 74 \def\LuaCol@directlua{\directlua0 }%
- 75 \else
- 76 \let\LuaCol@directlua\directlua
- 77 \fi

#### Check for disabled colors 2.3

- 78 \ifcolors@
- 79 \else
- \@PackageWarningNoLine{luacolor}{%
- Colors are disabled by option `monochrome'%
- 82
- 83 \def\set@color{}%
- 84 \def\reset@color{}%
- 85 \def\set@page@color{}%
- $86 \def\define@color#1#2{}%$
- 87 \expandafter\LuaCol@AtEnd
- 88 \fi%

#### Load module and check version 2.4

- 89 \LuaCol@directlua{%
- 90 require("oberdiek.luacolor\ifnum\luatexversion<65 -pre065\fi")%
- 91 }
- 92 \begingroup
- 93 \edef\x{\LuaCol@directlua{tex.write("2016/05/16 v1.10")}}%
- $\left( \frac{y}{w} \right)$ 94
- $\LuaCol@directlua\{\%$ 95
- if oberdiek.luacolor.getversion then % 96
- oberdiek.luacolor.getversion()% 97
- 98 end%
- }% 99
- 100 }%
- $101 \left( ifx \right) y$
- 102 \else
- \@PackageError{luacolor}{% 103
- Wrong version of lua module.\MessageBreak 104
- Package version: \x\MessageBreak 105

```
106 Lua module: \y
107 }\@ehc
108 \fi
109 \endgroup
```

#### 2.5 Find driver

```
110 \setminus ifpdf
111 \else
112 \begingroup
113
      \def\current@color{}%
      \def\reset@color{}%
114
115
      \setbox\z@=\hbox{%
116
        \begingroup
117
         \set@color
118
        \endgroup
      }%
119
      \edef\reserved@a{%
120
        \LuaCol@directlua{%
121
         oberdiek.luacolor.dvidetect()%
122
       }%
123
124
      }%
      \ifx\reserved@a\@empty
125
       \@PackageError{luacolor}{%
126
127
         DVI driver detection failed because of\MessageBreak
128
         unrecognized color \string\special
129
        \\\ehc
130
        \endgroup
        \verb|\expandafter| expandafter \\ | LuaCol@AtEnd| \\
131
132
        \@PackageInfoNoLine{luacolor}{%
133
         Type of color \string\special: \reserved@a
134
135
      \fi%
136
137
    \endgroup
138 \fi
```

#### 2.6 Attribute setting

#### \LuaCol@Attribute

```
139 \ltx@IfUndefined{newluatexattribute}{%
            140 \newattribute\LuaCol@Attribute
            141 }{%
            142 \newluatexattribute\LuaCol@Attribute
            144 \ltx@IfUndefined{setluatexattribute}{%
            145 \let\LuaCol@setattribute\setattribute
            146 }{%
            147 \let\LuaCol@setattribute\setluatexattribute
            148 }
            149 \LuaCol@directlua{%
            150 \quad oberdiek.luacolor.set attribute (\verb|\number|| allocation number) \%
            151 }
\set@color
            152 \protected\def\set@color{%
                 \LuaCol@setattribute\LuaCol@Attribute{%
            154
                  \LuaCol@directlua{%
                    oberdiek.luacolor.get("\luaescapestring{\current@color}")\%
            155
                  }%
            156
            157 }%
            158 }
```

\reset@color

#### 2.7 Whatsit insertion

#### \luacolorProcessBox

```
160 \def\luacolorProcessBox#1{%
161 \LuaCol@directlua{%
162 oberdiek.luacolor.process(\number#1)%
163 }%
164 }

165 \RequirePackage{atbegshi}[2011/01/30]
166 \AtBeginShipout{%
167 \luacolorProcessBox\AtBeginShipoutBox
168 }
Set default color.
169 \set@color
```

## 2.8 \pdfxform support

```
170 \ifpdf
    \ifx\pdfxform\@undefined
171
      \let\pdfxform\saveboxresource
172
173
    \label{likelihood} $$ \prod_{x\in \mathbb{R}} {\operatorname{defined} pdfxform}_{x} $$
174
175
      \ifnum\luatexversion>36 %
176
       \displaystyle \operatorname{directlua} \{\%
         {\tt tex.enable primitives('',\{\%
177
          'pdfxform','pdflastxform','pdfrefxform'%
178
         ኑ)%
179
       }%
180
      \fi
181
182
    }{}%
    \ltx@IfUndefined{protected}{%
183
      \ifnum\luatexversion>36 %
184
       185
      \fi
186
    }{}%
187
    \ltx@IfUndefined{pdfxform}{%
188
      189
    }{%
190
      \let\LuaCol@org@pdfxform\pdfxform
191
      \begingroup\expandafter\expandafter\expandafter\endgroup
192
      \expandafter\ifx\csname protected\endcsname\relax
193
       \@PackageWarning{luacolor}{\string\protected\space not found}%
194
195
       \expandafter\protected
196
197
      \def\pdfxform{%
198
199
       \begingroup
       \afterassignment\LuaCol@pdfxform
200
201
       \count@=%
202
      }%
      \def\LuaCol@pdfxform{%
203
       \luacolorProcessBox\count@
204
205
       \LuaCol@org@pdfxform\count@
       \endgroup
206
207
      }%
208 }%
209 \fi
210 \LuaCol@AtEnd%
```

```
211 (/package)
```

### 2.9 Lua module

```
212 (*lua)
```

Box zero contains a \hbox with the color \special. That is analyzed to get the prefix for the color setting \special.

213 module("oberdiek.luacolor", package.seeall)

```
getversion()
```

```
214 function getversion()
215 tex.write("2016/05/16 v1.10")
216 end
```

#### 2.9.1 Driver detection

```
217 local ifpdf
            218 if tonumber(tex.outputmode or tex.pdfoutput) > 0 then
            219 ifpdf = true
            220 else
            221 ifpdf = false
            222 end
            223 local prefix
            224 local prefixes = {
            225 dvips = "color ",
            226 dvipdfm = "pdf:sc "
            227 truetex = "textcolor:",
            228 pctexps = "ps::",
            229 }
            230 local patterns = {
                                   = "dvips",
            231 ["^color "]
            232 ["^pdf: *begincolor "] = "dvipdfm",
            233 ["^pdf: *bcolor "] = "dvipdfm",
            234 ["^pdf: *bc "]
                                    = "dvipdfm",
            235 ["^pdf: *setcolor "] = "dvipdfm",
            236 ["^pdf: *scolor "] = "dvipdfm",
            237 ["^pdf: *sc "]
                                    = "dvipdfm",
            238 ["^textcolor:"]
                                    = "truetex",
            239 ["^ps::"]
                                   = "pctexps",
            240 }
     info()
            241 local function info(msg, term)
            242 local target = "log"
            243 if term then
                target = "term and log"
            244
            245 end
            246 texio.write_nl(target, "Package luacolor info: " .. msg .. ".")
            247 texio.write_nl(target, "")
            248 end
dvidetect()
            249 function dvidetect()
            250 local v = tex.box[0]
            251 assert(v.id == node.id("hlist"))
            252 (!pre065) for v in node.traverse_id(node.id("whatsit"), v.head) do
            253 (pre065) for v in node.traverse id(node.id("whatsit"), v.list) do
                 if v and v.subtype == node.subtype("special") then
            255
                    local data = v.data
            256
                    for pattern, driver in pairs(patterns) do
            257
                    if string.find(data, pattern) then
                     prefix = prefixes[driver]
            258
                       tex.write(driver)
            259
```

```
260
                         return
               261
                        end
               262
                       end
                      info("\\special{" .. data .. "}", true)
               ^{263}
               264
                      return
               265
                     end
               266 end
               267 info("Missing \\special", true)
               268 end
               2.9.2 Color strings
               269 \log map = {
               270 n = 0,
               271 }
        get()
               272 function get(color)
               273 tex.write("" .. getvalue(color))
               274 \; \mathrm{end}
   getvalue()
               275 function getvalue(color)
               276 local n = map[color]
               277 if not n then
               278
                   n = map.n + 1
               279
                    map.n = n
                    map[n] = color
               280
                   map[color] = n
               281
               282 end
               283 return n
               284 end
               2.9.3 Attribute register
setattribute()
               285 local attribute
               286 function setattribute(attr)
               287 attribute = attr
               288 end
getattribute()
               289 function getattribute()
               290 return attribute
               291 end
               2.9.4 Whatsit insertion
               292 local LIST = 1
               293 local LIST LEADERS = 2
               294 local COLOR = 3
               295 local RULE = node.id("rule")
               296 local node_types = {
               297 [node.id("hlist")] = LIST,
               298 [node.id("vlist")] = LIST,
               299 [node.id("rule")] = COLOR,
               300 [node.id("glyph")] = COLOR,
               301 [node.id("disc")] = COLOR,
               302 \quad [node.id("whatsit")] = {
                   [node.subtype("special")] = COLOR,
               303
                    [node.subtype("pdf_literal")] = COLOR,
               305 -- TODO (DPC) [node.subtype("pdf_refximage")] = COLOR,
```

```
306 },
             307 [node.id("glue")] =
             308
                  function(n)
                     if n.subtype >= 100 then -- leaders
             309
             310
                      if n.leader.id == RULE then
             311
                        return COLOR
             312
                       return LIST_LEADERS
             313
             314
                      end
             315
                     end
             316
                   end.
            317 }
get_type()
             318 local function get_type(n)
             319 local ret = node_types[n.id]
             320 if type(ret) == 'table' then
             321
                  ret = ret[n.subtype]
             322
                  end
             323 if type(ret) == 'function' then
             324
                 ret = ret(n)
             325 end
             326 return ret
            327 end
            328 local mode = 2 -- luatex.pdfliteral.direct
             329 local WHATSIT = node.id("whatsit")
             330 local SPECIAL = node.subtype("special")
             331 local PDFLITERAL = node.subtype("pdf_literal")
             332 local DRY_FALSE = false
             333 \log DRY\_TRUE = true
 traverse()
            334 local function traverse(list, color, dry)
             335 if not list then
             336
                  return color
             337
                  end
             338 if get_type(list) ~= LIST then
                   texio.write_nl("!!! Error: Wrong list type: " .. node.type(list.id))
             340
                  return color
             341 end
             342 \(\debug\)\texio.write_nl("traverse: " .. node.type(list.id))
             343 \langle !pre065 \rangle local head = list.head
             344 \langle pre065 \rangle local head = list.list
             345 for n in node.traverse(head) do
             346 \(\debug\)\texio.write_nl(" node: ".. node.type(n.id))
                   local t = get_type(n)
             347
                   if t == LIST then
             348
                    color = traverse(n, color, dry)
             349
             350
                   elseif t == LIST\_LEADERS then
             351
                    local color_after = traverse(n.leader, color, DRY_TRUE)
             352
                    if color == color\_after then
             353
                      traverse(n.leader, color, DRY_FALSE or dry)
             354
                      traverse(n.leader, '', DRY_FALSE or dry)
             355
             356 % The color status is unknown here, because the leader box
             357 % will or will not be set.
                      color = "
             358
             359
                     end
                   elseif t == COLOR then
             360
             361
                    local v = node.has_attribute(n, attribute)
             362
                    if v then
                      local newColor = map[v]
             363
```

```
if newColor ~= color then
          364
                     color = newColor
          365
                     if dry == DRY_FALSE then
          366
                       local newNode
          367
          368
                       if ifpdf then
          369
                        newNode = node.new(WHATSIT, PDFLITERAL)
          370
                        newNode.mode = mode
                        {\tt newNode.data} = {\tt color}
          371
          372
                       else
                        newNode = node.new(WHATSIT, SPECIAL)
          373
                        newNode.data = prefix .. color
          374
                       end
          375
          376 (*!pre065)
                       head = node.insert_before(head, n, newNode)
          377
          378 (/!pre065)
          379 (*pre065)
          380
                       if head == n then
                        newNode.next = head
          381
                        local old_prev = head.prev
          382
          383
                        head.prev = newNode
                        head = newNode
          384
                        head.prev = old_prev
          385
          386
                        head = node.insert_before(head, n, newNode)
          387
          388
                       end
          389 (/pre065)
          390
                     end
          391
                    end
          392
                   end
          393
                 end
          394 end
          395 \langle !pre065 \rangle list.head = head
          396 \langle pre065 \rangle list.list = head
          397 return color
          398 end
process()
          399 function process(box)
          400 local color = ""
          401 local list = tex.getbox(box)
          402 traverse(list, color, DRY_FALSE)
          403 end
          404 (/lua)
          3
                Test
          405 (*test1)
          406 \documentclass{article}
          407 \usepackage{color}
          408 (/test1)
          3.1 Catcode checks for loading
          409 (*test1)
          410 \catcode^{=1 \%}
          411 \catcode`\}=2 %
          412 \catcode`\#=6 %
          413 \catcode`\@=11 %
          414 \expandafter\ifx\csname count@\endcsname\relax
```

415 \countdef\count@=255 %

416 \fi

```
417 \expandafter\ifx\csname \text{Ogobble} endcsname \text{relax}
                    \ \left( \frac{1}{2} \right)
419 \fi
420 \expandafter\ifx\csname @firstofone\endcsname\relax
                 \long\def\@firstofone#1{#1}%
422 \fi
423 \expandafter\ifx\csname loop\endcsname\relax
424 \expandafter\@firstofone
425 \else
                   \expandafter\@gobble
426
427 \fi
428 {%
                    429
                           \left( \frac{\#1}{\%} \right)
430
                          \iterate
431
432
                   }%
                    \def\iterate{%
433
                          \body
434
                                 \let\next\iterate
435
436
                           \else
                                 \let\next\relax
437
                           \fi
438
439
                           \next
                    }%
440
                    \let\repeat=\fi
441
442 }%
443 \def\RestoreCatcodes{}
444 \count@=0 %
445 \loop
                    \verb|\edgned| RestoreCatcodes{||} %
446
                          \RestoreCatcodes
447
                          \verb|\catcode| the \catcode| count@=\the \cat
448
449 }%
450 \index(0.0010) \%
451 \advance\count@ 1 %
452 \repeat
454 \def\RangeCatcodeInvalid#1#2{\%
455 \setminus count@=#1 \setminus elax
456 \loop
                         \catcode\count@=15 %
457
                    \index(0) = \frac{2}{r}
458
                         \advance\count@ 1 %
459
460 \repeat
461 }
462 \def\RangeCatcodeCheck#1#2#3{%
                    \count@=#1\relax
464
                    \loop
465
                           466
                           \else
                                 \ensuremath{\tt errmessage} \%
467
                                      Character \the\count@\space
468
                                      with wrong catcode \theta \subset \
469
470
                                      instead of \number#3%
                               }%
471
472
473
                    474
                           \advance\count@ 1 %
475
                    \repeat
476 }
477 \ensuremath{\mbox{def\space}}
478 \verb|\command\endsname\end| LoadCommand\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsname\endsn
```

```
\def\LoadCommand{\input luacolor.sty\relax}%
479
480 \fi
481 \def\Test{%
    \RangeCatcodeInvalid{0}{47}%
482
    \RangeCatcodeInvalid{58}{64}%
483
    \RangeCatcodeInvalid{91}{96}%
485
    \RangeCatcodeInvalid{123}{255}%
    \color=12 \%
486
    \color= \color= 0 \%
487
    \catcode`\%=14 %
488
    \LoadCommand
489
    \RangeCatcodeCheck{0}{36}{15}%
490
    \RangeCatcodeCheck{37}{37}{14}%
491
492 \RangeCatcodeCheck{38}{47}{15}%
493 \RangeCatcodeCheck{48}{57}{12}%
    \RangeCatcodeCheck{58}{63}{15}%
495
   \RangeCatcodeCheck{64}{64}{12}%
    \RangeCatcodeCheck{65}{90}{11}%
496
    \RangeCatcodeCheck{91}{91}{15}%
497
498
    \RangeCatcodeCheck{92}{92}{0}%
499
    \RangeCatcodeCheck{93}{96}{15}%
    \RangeCatcodeCheck{97}{122}{11}%
500
    \RangeCatcodeCheck{123}{255}{15}%
501
    \RestoreCatcodes
502
503 }
504 \Test
505 \csname @@end\endcsname
506 \end
507 (/test1)
3.2 Driver detection
508 (*test2)
509 \NeedsTeXFormat{LaTeX2e}
510 \ifcsname driver\endcsname
511 \quad \texttt{\expandafter\PassOptionsToPackage\expandafter\{\driver\}\{color\}\%}
512 \pdfoutput=0 %
513 \fi
514 \documentclass{minimal}
515 \usepackage{luacolor}[2016/05/16]
516 \csname @@end\endcsname
517 \end
518 (/test2)
519 (*test3)
520 \NeedsTeXFormat{LaTeX2e}
521 \documentclass{minimal}
522 \usepackage{luacolor}[2016/05/16]
523 \usepackage{qstest}
524 \IncludeTests{*}
525 \LogTests{log}{*}{*}
526 \makeatletter
527 \@@end
```

### 4 Installation

#### 4.1 Download

528 (/test3)

**Package.** This package is available on CTAN<sup>1</sup>:

CTAN:macros/latex/contrib/oberdiek/luacolor.dtx The source file.

<sup>1</sup>http://ctan.org/pkg/luacolor

**Bundle.** All the packages of the bundle 'oberdiek' are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

#### CTAN:install/macros/latex/contrib/oberdiek.tds.zip

TDS refers to the standard "A Directory Structure for TEX Files" (CTAN:tds/tds.pdf). Directories with texmf in their name are usually organized this way.

#### 4.2 Bundle installation

**Unpacking.** Unpack the oberdiek.tds.zip in the TDS tree (also known as texmf tree) of your choice. Example (linux):

```
unzip oberdiek.tds.zip -d ~/texmf
```

Script installation. Check the directory TDS:scripts/oberdiek/ for scripts that need further installation steps. Package attachfile2 comes with the Perl script pdfatfi.pl that should be installed in such a way that it can be called as pdfatfi. Example (linux):

```
chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/
```

### 4.3 Package installation

Unpacking. The .dtx file is a self-extracting docstrip archive. The files are extracted by running the .dtx through plain T<sub>F</sub>X:

```
tex luacolor.dtx
```

**TDS.** Now the different files must be moved into the different directories in your installation TDS tree (also known as texmf tree):

```
luacolor.sty
                             → tex/latex/oberdiek/luacolor.sty
oberdiek.luacolor.lua
                             → scripts/oberdiek/oberdiek.luacolor.lua
luacolor.lua
                             \rightarrow scripts/oberdiek/luacolor.lua
oberdiek.luacolor-pre065.lua \rightarrow scripts/oberdiek/oberdiek.luacolor-pre065.lua
                         \rightarrow scripts/oberdiek/luacolor-pre065.lua
luacolor-pre065.lua
luacolor.pdf
                             → doc/latex/oberdiek/luacolor.pdf
                             → doc/latex/oberdiek/test/luacolor-test1.tex
test/luacolor-test1.tex
test/luacolor-test2.tex
                             → doc/latex/oberdiek/test/luacolor-test2.tex
test/luacolor-test3.tex
                             → doc/latex/oberdiek/test/luacolor-test3.tex
luacolor.dtx
                             → source/latex/oberdiek/luacolor.dtx
```

If you have a docstrip.cfg that configures and enables docstrip's TDS installing feature, then some files can already be in the right place, see the documentation of docstrip.

#### 4.4 Refresh file name databases

If your TEX distribution (teTEX, mikTEX, ...) relies on file name databases, you must refresh these. For example, teTEX users run texhash or mktexlsr.

#### 4.5 Some details for the interested

Unpacking with IATEX. The .dtx chooses its action depending on the format:

plain T<sub>E</sub>X: Run docstrip and extract the files.

LATEX: Generate the documentation.

If you insist on using LATEX for docstrip (really, docstrip does not need LATEX), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{luacolor.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation. You can use both the .dtx or the .drv to generate the documentation. The process can be configured by the configuration file ltxdoc.cfg. For instance, put this line into this file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdfLaTeX:

```
pdflatex luacolor.dtx
makeindex -s gind.ist luacolor.idx
pdflatex luacolor.dtx
makeindex -s gind.ist luacolor.idx
pdflatex luacolor.dtx
```

# 5 Catalogue

The following XML file can be used as source for the TEX Catalogue. The elements caption and description are imported from the original XML file from the Catalogue. The name of the XML file in the Catalogue is luacolor.xml.

```
529 (*catalogue)
530 <?xml version='1.0' encoding='us-ascii'?>
531 <!DOCTYPE entry SYSTEM 'catalogue.dtd'>
532 <entry datestamp='$Date$' modifier='$Author$' id='luacolor'>
533 <name>luacolor</name>
534 <caption>Color support based on LuaTeX's node attributes.</caption>
535 <authorref id='auth:oberdiek'/>
536 <copyright owner='Heiko Oberdiek' year='2007,2009-2011'/>
537 cense type='lppl1.3'/>
538 <version number='1.10'/>
539
    <description>
       This package implements color support based on LuaTeX's node
540
541
       attributes.
542
     The package is part of the xref refid='oberdiek'>oberdiek bundle.
543
544 </description>
545 <documentation details='Package documentation'
       href='ctan:/macros/latex/contrib/oberdiek/luacolor.pdf'/>
546
547 <ctan file='true' path='/macros/latex/contrib/oberdiek/luacolor.dtx'/>
548 <miktex location='oberdiek'/>
549 <texlive location='oberdiek'/>
550 <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip'/>
551 </entry>
552 (/catalogue)
```

# 6 History

# [2007/12/12 v1.0]

• First public version.

# [2009/04/10 v1.1]

• Fixes for changed syntax of \directlua in LuaTeX 0.36.

# [2010/03/09 v1.2]

• Adaptation for package luatex 2010/03/09 v0.4.

# [2010/12/13 v1.3]

- Support for \pdfxform added.
- Loaded package luatexbase-attr recognized.
- Update for LuaTeX: 'list' fields renamed to 'head' in v0.65.0.

# [2011/03/29 v1.4]

• Avoid whatsit insertion if option monochrome is used (thanks Manuel Pégourié-Gonnard).

# [2011/04/22 v1.5]

- Bug fix by Manuel Pégourié-Gonnard: A typo prevented the detection of whatsits and applying color changes for \pdfliteral and \special nodes that might contain typesetting material.
- Bug fix by Manuel Pégourié-Gonnard: Now colors are also applied to leader boxes.
- Unnecessary color settings are removed for leaders boxes, if after the leader box the color has not changed. The costs are a little runtime, leader boxes are processed twice.
- Additional whatsits that are colored: pdf\_refximage.
- Workaround for bug with node.insert\_before removed for the version after LuaTEX 0.65, because bug was fixed in 0.27. (Thanks Manuel Pégourié-Gonnard.)

# [2011/04/23 v1.6]

- Bug fix for nested leader boxes.
- Bug fix for leader boxes that change color, but are not set because of missing place.
- Version check for Lua module added.

# [2011/10/22 v1.7]

• Lua functions getattribute and getvalue added to tell other external Lua functions the attribute register number for coloring.

# [2011/11/01 v1.8]

• Use of node.subtype instead of magic numbers.

# [2016/05/13 v1.9]

- More use of node.subtype instead of magic numbers.
- luatex 85 updates

# [2016/05/16 v1.10]

• Documentation updates.

# 7 Index

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