




 Matlab toolbox, User's Guide*
version 0.0.29

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Abstract

The  Matlab toolbox contains some basic tools used in my other toolboxes.

* \LaTeX manual, revision 0.0.29.a, compiled with Matlab 2019a, and toolbox `fc-tools[0.0.29]`.

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1 graphics module

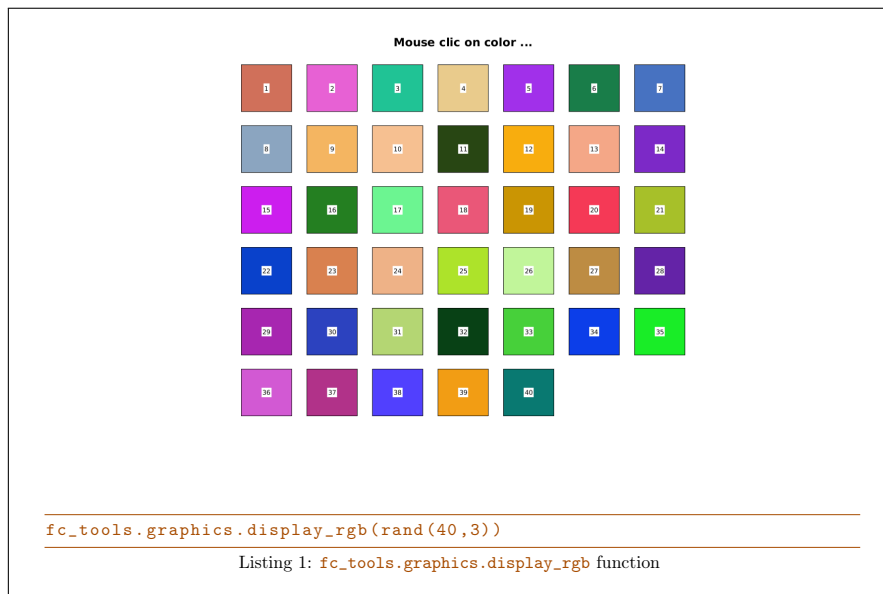
1.1 main functions

1.1.1 `fc_tools.graphics.display_rgb` function

The `fc_tools.graphics.display_rgb` displays colors of a n -by-3 RGB colors array with their names if available.

Syntaxe

```
fc_tools.graphics.display_rgb(rgb)
fc_tools.graphics.display_rgb(rgb, names)
```



1.1.2 `fc_tools.graphics.selectColors` function

The `fc_tools.graphics.selectColors` function returns colors that are maximally perceptually distinct without using the Image Processing Toolbox.

This function is inspired by the function `select_colors` (or `distinguishable_colors`) of *Timothy E. Holy* which uses the Image Processing Toolbox of Matlab.

Syntaxe

```
colors=fc_tools.graphics.selectColors(N)
colors=fc_tools.graphics.selectColors(N, ...
    key, value)
```

Description

`colors=fc_tools.graphics.selectColors(N)` Returns N colors that are maximally perceptually distinct as a N -by-3 RGB colors array.

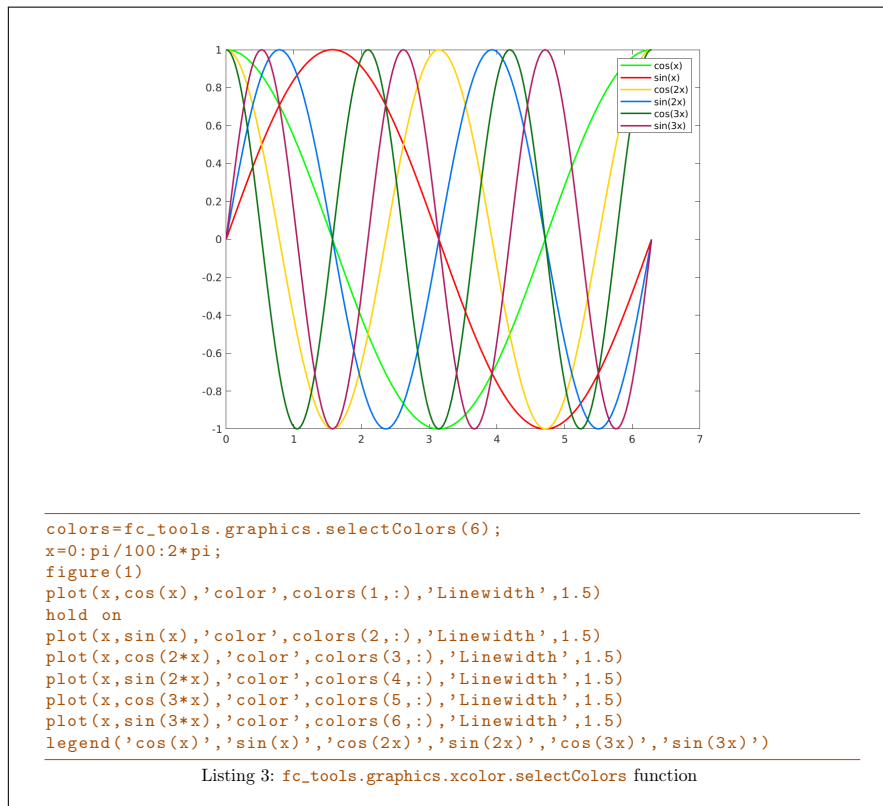
`colors=fc_tools.graphics.selectColors(N, Name, Value)` specifies function options using one or more `Name,Value` pair arguments. Options are

- `'background'` : the N colors selected will be as far as possible from the colors specified by this options as a n -by-3 RGB colors array. Default is `[1 1 1; 0 0 0; 0.8 0.8 0.8;1,0,1]`
- `'func'` : To specify an other function for converting RGB colors to LAB colors. Default is local `RGB2LAB` function.

The image contains two side-by-side plots, each with a title 'Mouse clic on color ...'. The left plot shows a 4x4 grid of 16 color swatches. The first 14 swatches are colored, and the last two are white. The colors are: Row 1: yellow, red, cyan, magenta; Row 2: blue, green, purple, orange; Row 3: brown, pink, grey, light blue; Row 4: dark blue, light green, dark red, light purple. The right plot shows a 4x4 grid of 16 color swatches. The first 14 swatches are colored, and the last two are white. The colors are: Row 1: blue, yellow, red, dark blue; Row 2: magenta, green, cyan, light blue; Row 3: brown, light green, purple, dark green; Row 4: light purple, light green.

```
colors1=fc_tools.graphics.selectColors(14);
figure(1)
fc_tools.graphics.display_rgb(colors1)
colors2=fc_tools.graphics.selectColors(14,'background',[1 1 1]);
figure(2)
fc_tools.graphics.display_rgb(colors2)
```

Listing 2: `fc_tools.graphics.xcolor.selectColors` function



1.1.3 `fc_tools.graphics.DisplayFigures` function

The `fc_tools.graphics.DisplayFigures` function regularly distributes the figures on the screen.

Syntaxe

```

fc_tools.graphics.DisplayFigures()
fc_tools.graphics.DisplayFigures(n)
fc_tools.graphics.DisplayFigures('nfig',n)

```

Without argument, all figures are regularly distributed on the screen. Otherwise, empty figures with numbers 1 to n are created and regularly distributed on the screen.

1.1.4 `fc_tools.graphics.SaveAllFigsAsFiles` function

The `fc_tools.graphics.SaveAllFigsAsFiles` saves all figures as files.

Syntaxe

```

fc_tools.graphics.SaveAllFigsAsFiles(basename)

```

```
fc_tools.graphics.SaveAllFigsAsFiles(file, ...
    key, value, ...)
```

Description

`fc_tools.graphics.SaveAllFigsAsFiles(basename)` save each figure in the file

```
[basename, '_fig', fignumber]
```

of the current directory where `fignumber` is the number of the figure to be saved.

`fc_tools.graphics.SaveAllFigsAsFiles(file, key, value, ...)` specifies function options using one or more `Name,Value` pair arguments. Options are

- `'format'` : to specify the file format. `Value` could be `'eps'` (default), `'pdf'`, `'png'` or `'pdflatex'`.
- `'dir'` : to specify the directory (default `'.'`). the directory is created if it does not exist.
- `'verbose'` : if `true`, prints file names. Default is `false`.
- `'tag'` : if `true` each figure is saved in the file:

```
[basename, '_fig', fignumber, '_', software, version]
```

where `software` is Matlab and `version` is its release. Default is `false`.

- `'size'` : to specify size of the image. Default is `[800,600]`.

1.2 xcolor submodule

1.2.1 `fc_tools.graphics.xcolor.svg` function

The `fc_tools.graphics.xcolor.svg` function returns names and RGB values of the 149 SVG colors.

Syntaxe

```
[name, rgb]=fc_tools.graphics.xcolor.svg()
```

`name` is cell array of string (color names) and `rgb` is 149-by-3 array (rgb values) such that the color `name{i}` has `rgb(i,:)` for rgb values.

1.2.2 `fc_tools.graphics.xcolor.X11` function

The `fc_tools.graphics.xcolor.X11` function returns names and RGB values of the 317 X11 colors.

Syntaxe

```
[name,rgb]=fc_tools.graphics.xcolor.X11()
```

`name` is cell array of string (color names) and `rgb` is 317-by-3 array (rgb values) such that the color `name{i}` has `rgb(i,:)` for rgb values.

1.2.3 `fc_tools.graphics.xcolor.fullX11` function

The `fc_tools.graphics.xcolor.fullX11` function returns names and RGB values of the 738 X11 colors.

Syntaxe

```
[name,rgb]=fc_tools.graphics.xcolor.fullX11()
```

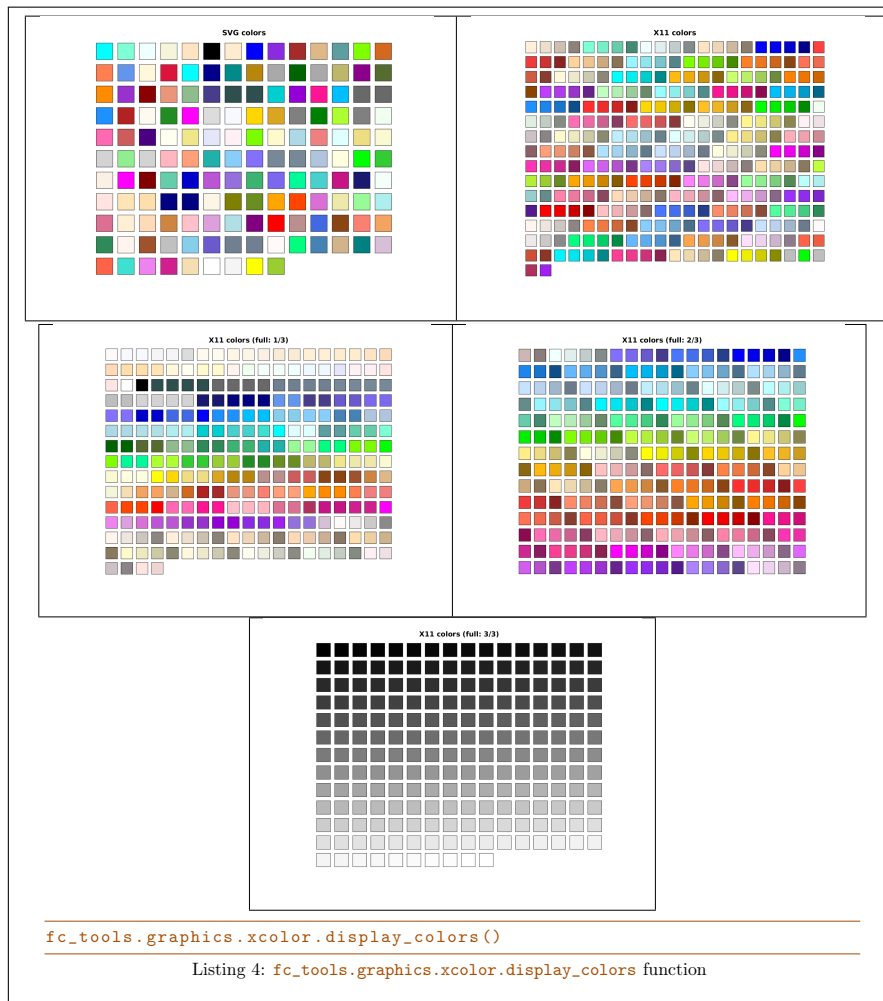
`name` is cell array of string (color names) and `rgb` is 738-by-3 array (rgb values) such that the color `name{i}` has `rgb(i,:)` for rgb values.

1.2.4 `fc_tools.graphics.xcolor.display_colors` function

The `fc_tools.graphics.xcolor.display_colors` function displays SVG colors, X11 colors and (full)X11 colors.

Syntaxe

```
fc_tools.graphics.xcolor.display_colors()
```



1.3 gptoolbox submodule

This submodule contains some files of the **gptoolbox** from *Alec Jacobson* (see <https://github.com/alecjacobson/gptoolbox>)

1.4 crop submodule

This submodule contains the function **crop** from *Andrew Bliss*.

1.5 vfield3 submodule

This submodule contains the function **vfield3** from *M MA* (see <https://www.mathworks.com/matlabcentral/fileexchange/8653-vfield3>)

2 utils module

- `fc_tools.utils.deleteCellOptions` deletes specified key/value pairs in a cell array of key/value pairs.
- `fc_tools.utils.isfunHandle` test if the input argument is a function handle.
- `fc_tools.utils.funHandleName` test if the input argument is a function handle.
- `fc_tools.utils.fun2str ...`

3 sys module

- `fc_tools.sys.getComputerName()` returns the name of the computer as a string.
- `fc_tools.sys.getUserName()` returns the name (login) of the current user as a string.
- `fc_tools.sys.getRAM()` returns available memory (RAM) in GB of the computer.
- `fc_tools.sys.getCPUinfo()` returns CPU(s) informations as a structure.
- `fc_tools.sys.getOSinfo()` returns OS informations as a structure.
- `fc_tools.sys.isfolder()` return true if a folder exists.
- `fc_tools.sys.isfileexists()` return true if a file exists.

In Listing 5, some examples are provided.

Listing 5: : example using `fc_tools.sys` functions

```
fprintf('RAM: %.2fGB\n', fc_tools.sys.getRAM())
CPU= fc_tools.sys.getCPUinfo()
OS=fc_tools.sys.getOSinfo()
```

Output

```
RAM : 31.30 GB

CPU =

struct with fields:

    name: 'Intel(R) Core(TM) i7-4800MQ CPU @ 2.70GHz'
  nthreadspercore: 2
    ncoreperproc: 4
        nprocs: 1

OS =

struct with fields:

  distributor: 'Ubuntu'
  description: 'Ubuntu 18.04.3 LTS'
    release: '18.04'
   codename: 'bionic'
     arch: 'x86_64'
  shortname: 'Ubuntu'
```

Informations for git maintainers of the Matlab toolbox

git informations on the toolboxes used to build this manual

```
-----  
name : fc-tools  
tag : 0.0.29  
commit : a3251e64e77572bb3916e665ae01baade6fc5f1a  
date : 2019-12-15  
time : 11-23-10  
status : 0  
-----
```

git informations on the L^AT_EX package used to build this manual

```
-----  
name : fctools  
tag :  
commit : 7ad9c7de44262e116aa101aee74c5e5aee6ef61  
date : 2019-10-30  
time : 13:57:21  
status : 1  
-----
```

Using the remote configuration repository:

```
url      ssh://lagagit/MCS/Cuvelier/Matlab/fc-config  
commit  92aa60b16e7fa7b9cc1293ed00b83b2842fcbcca
```