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# **fbpy Documentation**

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# GENERAL DESCRIPTION

The *fbpy* module is an API for drawing in the framebuffer on Linux machines. It was conceived as part of an audio player project based on the raspberry pi computer and wolfson pi audio interface. I needed a low-level graphics library for visualizing audio data (scope, phase,...). I also wanted to gain some programming skills, like writing c libs for python and some kernel stuff. So this module is by no means an attempt to make a better graphics lib with fancy hardware acceleration or anything or making something original. I think it is useable though and by examining the source, it might serve as a form of documentation if you want to make something like this yourself. That is why I publish it. Oh, and of course because I support open source hardware *and* software, the ‘firmware’ of my audio player should be available as source :)

## 1.1 Website

<http://transistorlove.wordpress.com>





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# MODULE DOCUMENTATION

**class** `fb.Colors`

Some prefab colors, to make life easier.

Food for Pixelstyle. e.g.:

**class** `fb.Surface` (*\*args*)

This is the main class, it generates a drawing surface.

On first invocation, it will generate a surface which encompasses the entire screen automatically *and* it will open the framebuffer device. The *classmethod* `close` will close it. Subsequent instances will need arguments defining size and position.

**static** `addpoly` (*\*args*, *\*\*kwargs*)

just a test for the moment

`addpoly(<x array>,<y array>)`

**static** `arc` (*<tuple>*, *<radius 1>*, *<radius 2>*, *<start seg>*, *<end seg>*, *<no seg>*)

couple of examples here:

```
>>> import fbpy.fb as fb

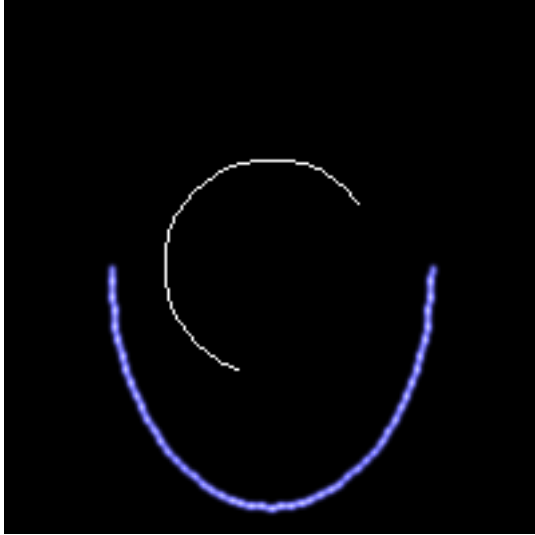
>>> main = fb.Surface()

>>> sub = fb.Surface((0,0), (200,200))

>>> sub.clear()
0
>>> sub.pixelstyle = fb.Pixelstyles.faint

>>> sub.arc((100,100), 60, 90, 0, 50, 100)
0
>>> sub.pixelstyle = fb.Pixelstyles.sharp

>>> sub.arc((100,100), 40, 40, 30, 90, 100)
0
>>> sub.grabsilent("./source/images/arc.png")
0
```



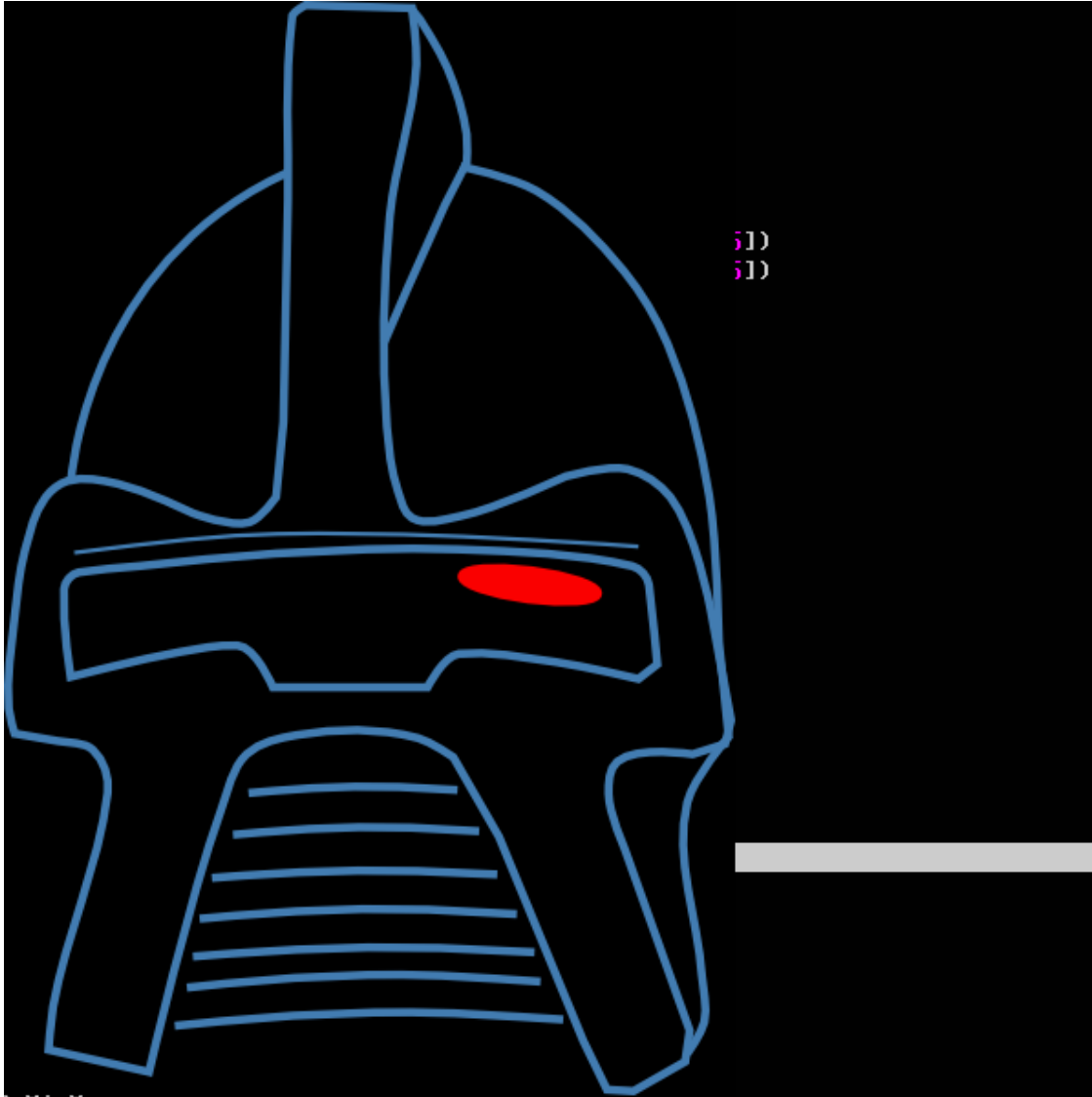
**blit** (<filename>)  
will put the PNG <filename> in the current surface

```
>>> import fbpy.fb as fb

>>> main = fb.Surface()

>>> sub = fb.Surface((100,100),(600,600))

>>> sub.blit("../examples/cylon.png")
0
>>> sub.grabsilent("../source/images/gottherobot.png")
0
```



**static circle** (<tuple>, <radius>, <segments>)

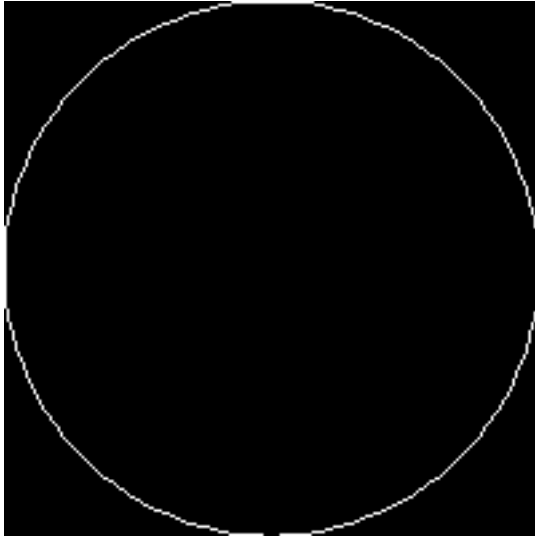
Will draw a ...

```
>>> import fbpy.fb as fb

>>> main = fb.Surface()

>>> sub = fb.Surface((0,0), (200,200))

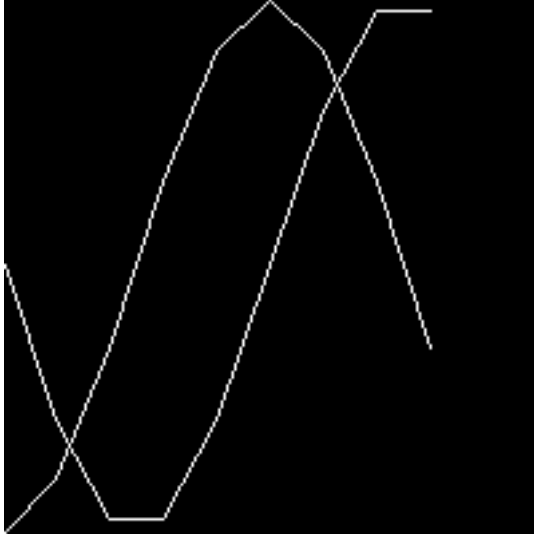
>>> sub.clear()
0
>>> sub.circle((100,100),0.5, 100)
0
>>> sub.grabsilent("./source/images/circle.png")
0
```



**clear()**  
will make blackscreen

**drawpolys()**  
Draw a bunch of polygons

```
>>> import fbpy.fb as fb
>>> import numpy as np
>>> main = fb.Surface()
>>> main.clear()
>>> sub = fb.Surface((100,100),(200,200))
>>> sub.clear()
0
>>> x1 = np.arange(0,1,0.1)
>>> y1 = 0.5*np.sin(x1*2*np.pi)+0.5
>>> x2 = np.arange(0,1,0.1)
>>> y2 = 0.5*np.cos(x2*2*np.pi)+0.5
>>> sub.addpoly(x1,y1)
0
>>> sub.addpoly(x2,y2)
0
>>> sub.drawpolys()
0
>>> sub.trafo.rotate(0.1)
0
>>> sub.drawpolys()
0
>>> sub.grabsilent("./source/images/polys.png")
0
```

**get\_raw()**

returns an raw bitmap array of the current window, use set\_raw to put the bitmap back.

```
sprite = main.get_raw()
main.set_raw(sprite)
```

**grab(<filename>)**

grabs current frame into file <filename>.png

**grabsequence(<filename>)**

grabs current frame into file with filename <filename#>

where # is an automatic counter. the output will be e.g.: screenshot0001.png, screenshot0002.png, ...

you can use e.g.

```
nerd@wonka: ~/tmp$ avconv -i <filename>%04d.png -c:v huffyuv <yourmoviename>.avi
```

to convert the sequence to a movie. You can also use ofcourse something like

```
nerd@wonka: ~/tmp$ avconv -f fbdev -r 10 -i /dev/fb0 -c:v huffyuv /dev/shm/movi.avi 2> /dev/
```

**grabsilent(<filename>)**

grabs current buffer into file <filename>.png

so, if you don't use update, you'll never actually *see* the drawing. Handy for doctest stuff of other apps where you *only* wanna make pics..

**static graticule(<tuple>, <tuple>, <fb.color>, <fb.color>)**

draws scope-like graticule @ first tuple of size second tuple (width/height). color = subs, color2 main

returns 0

```
>>> import fbpy.fb as fb

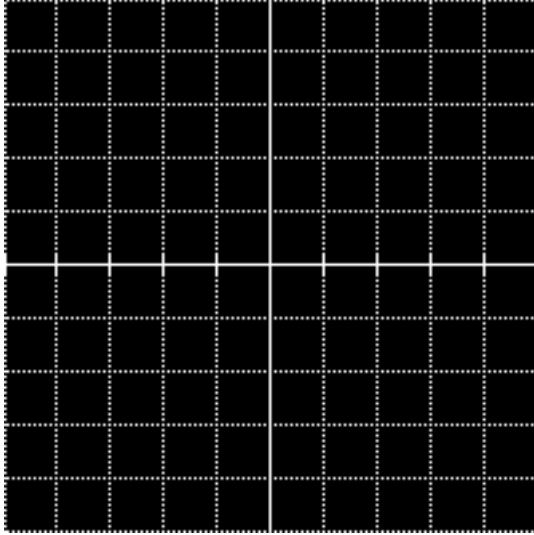
>>> main = fb.Surface()

>>> sub2 = fb.Surface((0,0), (200,200))

>>> sub2.clear() == 0
True
>>> sub2.pixelstyle.color = fb.Color(200,200,200,00)
```

```
>>> sub2.fillrect((0,0),(200,200)) == 0
True
>>> sub2.pixelstyle.color = fb.Colors.white

>>> sub2.graticule((0.0,0.0),(1.0,1.0)) == 0
True
>>> sub2.grabsilent("./source/images/graticule.png") == 0
True
```

**informdriver()**

pass relevant class info to fbutils driver, this is how one ‘instance’ of the driver can serve multiple Surface instances

```
>>> import fbpy.fb as fb

>>> main = fb.Surface()

>>> main.informdriver()
0
```

**static line** (<tuple crd from>, <tuple crd to>)

or

**static poly** (<xdata numpy array>, <ydata numpy array>)

x, y will be the points, have to be the same length and type

style = 0, 1, 2 0: solid line 1: dashed line 2: dotted line

```
>>> import fbpy.fb as fb

>>> import numpy as np

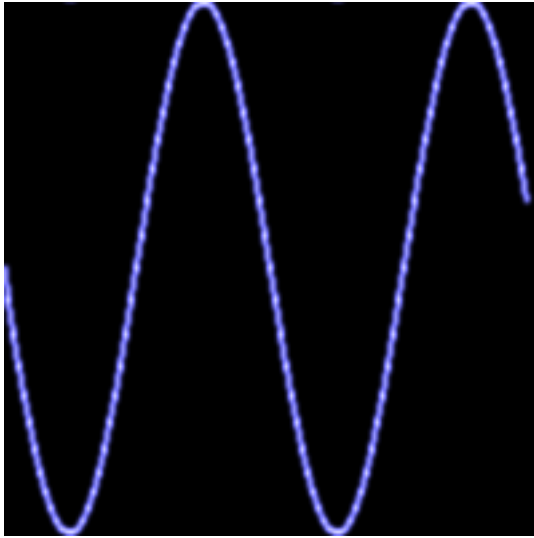
>>> x = np.arange(0, 1, 0.01)

>>> y = 0.5*np.sin(x*2*2*np.pi) + 0.5

>>> main = fb.Surface()

>>> subwin = fb.Surface((0,0),(200,200))
```

```
>>> subwin.clear()
0
>>> subwin.pixelstyle = fb.Pixelstyles.faint
0
>>> subwin.poly(x, y)
0
>>> subwin.grabsilent("./source/images/poly.png")
0
```



**static printxy** (<tuple>, <string>, <size>)

Will print text in string at position defined by tuple (x, y).

Size can be 1 or 2, where 2 prints triple sized LCD-like format

returns 0

```
>>> import fbpy.fb as fb
0
>>> main = fb.Surface()
0
>>> sub = fb.Surface((0,0), (800,100))
0
>>> sub.clear()
0
>>> sub.printxy((10,10), "Hello world!", 2)
0
>>> sub.printxy((10,38), "or a bit smaller...", 1)
0
>>> sub.pixelstyle.color = fb.Color(20,20,20,100)
0
>>> sub.pixelstyle.blur = 2
0
>>> sub.pixelstyle.blurradius = 4
0
>>> sub.pixelstyle.sigma = 1
0
>>> sub.printxy((10,76), "where R them goggles...", 1)
0
>>> sub.grabsilent("./source/images/printxy.png")
0
```



```
Hello world!  
or a bit smaller...  
  
where R then goggles...
```

**static rect** (<tuple>, <tuple>, <fb color>, <style>)

Will draw a rectangle @ first tuple, width and height as in second tuple

**set\_dotstyle** (<dotstyle>, <blur radius>)

dotstyle 0 : fast plot dotstyle 1 : plot with soft alpha dotstyle 2 : plot with blur + soft alpha

blur radius: well,  $2 \sigma^2$  it is

**set\_raw** (sprite)

puts the bitmap array into the buffer, see get\_raw.

**snow** ()

show some noise...

```
>>> import fbpy.fb as fb
```

```
>>> main = fb.Surface()
```

```
>>> sub = fb.Surface((0,0),(200,200))
```

```
>>> sub.clear()
```

```
0
```

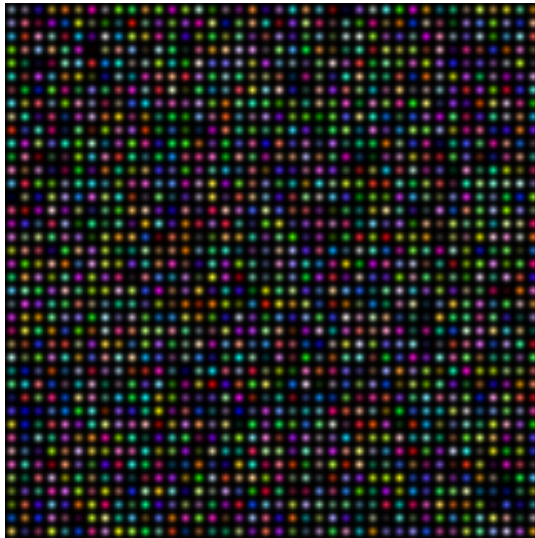
```
>>> sub.pixelstyle = fb.Pixelstyles.faint
```

```
>>> sub.snow()
```

```
0
```

```
>>> sub.grabsilent("./source/images/snow.png")
```

```
0
```



**something** ()

```
>>> print "Hello from a doctest.."
```

```
Hello from a doctest..
```



**update()**

draws the buffered geometries. So, you need this before you actually see anything

**class fb.Trafo**

Handle two dim lintrafos for your surface.

that is: Stretch and or Rotate

yih.

Work-flow.

You start with making an instance:

```
T = Trafo()
```

Upon instantiation you get an unity transform by default. Then decide what should happen to it.. E.g. you want to rotate and then stretch it. Well, you'll define two Operators:

```
R = Trafo()
S = Trafo()
R.rotate(0.1)           #where 0.1 is the angle in RAD
S.stretch(1.05, 1.05)   #ehhhr, 5% in horiz and vert
```

Now you can iterate:

```
T *= R
T *= S
```

Each surface has a built in trafo `fb.Surface.trafo`, which is unity or identity by default. The state of this operator is passed to the fb driver.

Here is a full example:

```
>>> import fbpy.fb as fb

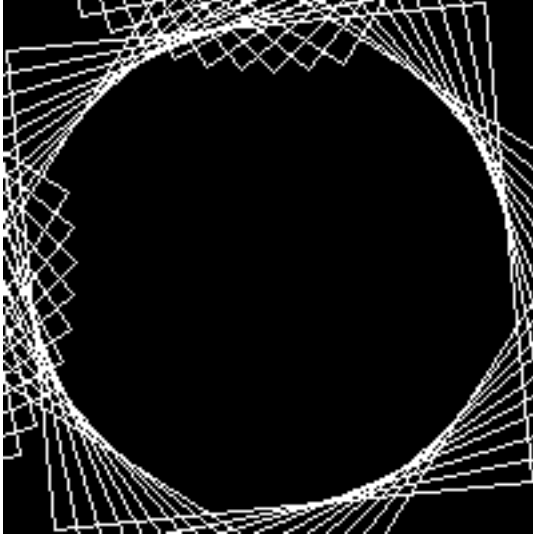
>>> main = fb.Surface()

>>> sub = fb.Surface((100,100),(200,200))

>>> R = fb.Trafo()

>>> R.rotate(0.1)

>>> sub.clear()
0
>>> for i in range(10):
...     sub.trafo*=R
...     sub.rect((10,10),(190,190))
0
0
0
0
0
0
0
0
0
0
0
>>> sub.grabsilent("./source/images/rotate.png")
0
```



```
sub.trafo.identity() #reset the transform
```

**class** `fb.Uniton(*args, **kwargs)`

The Uniton is a special case of the Vulgion and ensures inheritance of certain properties of the primeordial instance for all consecutive instances.

# INDICES AND TABLES

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# PYTHON MODULE INDEX

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