

John Romero Programming Proverbs

- 3. “Keep your code absolutely simple. Keep looking at your functions and figure out how you can simplify further.”
- John Romero, “The Early Days of Id Software - John Romero @ WeAreDevelopers Conference 2017”

Overview of TouchGUI

- [documentation](http://floppsie.comp.glam.ac.uk/touchgui/homepage.html) <http://floppsie.comp.glam.ac.uk/touchgui/homepage.html>
- you can obtain a copy of the source code for touchgui by:

```
$ cd  
$ mkdir -p Sandpit  
$ cd Sandpit  
$ git clone https://github.com/gaiusm/touchgui
```

Overview of TouchGUI

- touchgui is a simple tablet based gui for Python/Pygame
 - it allows tiles to be created from images, colours or glyphs
 - each tile has a number of callbacks which are called whenever a tap or double tap occurs

Overview of TouchGUI

- a tile maybe in one of the following four states: images for the tile when in the frozen, active, activated or pressed state
 - the frozen state is when the tile cannot be pressed
 - (the application might choose to disable the tile)

- the active state is when the tile can be pressed by the user
 - the activated state is when the mouse pointer is hovering over the tile (but not pressed)
 - finally the pressed state is when the button is tapped.

Touchgui in the labs

- touchgui is installed in the J109 labs
 - you need to explicitly alter the PYTHONPATH
- you can do this on the command line and run your touchmap by:
 - (this assumes you have already downloaded and configured touchmap from previous weeks)

Touchgui in the labs

```
$ cd  
$ cd Sandpit/build-touchmap  
$ PYTHONPATH=.../touchmap-0.1:../touchgui python ../touchmap-0.1/touchmap.py
```

- the PYTHONPATH environment variable is set to search the current directory (the first .)
 - then search ../touchmap-0.1 and lastly search ../touchgui for any python modules (before searching the system installed libraries)
 - note the path separator :

- after setting the PYTHONPATH the python interpreter is executed which inherits this PYTHONPATH and starts interpreting ../touchmap-0.1/touchmap.py

Touchgui in the labs

- using a suitable file manager examine the contents of touchgui
- in particular examine the library of creative common images
- maybe make a note of icons you might find useful for your touchmap implementation

Single glyph button example using touchgui

```
#!/usr/bin/env python

import pygame, touchgui, touchguipalate, touchguiconf, math, os
from pygame.locals import *

# display_width, display_height = 1920, 1080
display_width, display_height = 800, 600
display_width, display_height = 1920, 1080
full_screen = False
full_screen = True
toggle_delay = 250
```


Single glyph button example using touchgui

```
def event_test (event):  
    if (event.type == KEYDOWN) and (event.key == K_ESCAPE):  
        myquit (None)  
  
def myquit (name = None, tap = 1):  
    print "quit called"  
    pygame.display.update () # need this to see the button pressed before we quit  
    pygame.time.delay (toggle_delay * 2) # delay program so we see the button change  
    pygame.quit () # now shutdown pygame  
    quit () # and shutdown python  
  
def myreturn (name, tap):  
    print "return called"
```

Single glyph button example using touchgui

- the function `myquit` is a callback which is called when the off button is pressed
 - both parameters are optional
 - a single parameter is allowed and then `tap` will be assigned to 1

Single glyph button example using touchgui

```
def imagedir (name):  
    return os.path.join (touchguiconf.touchguidir, name)  
  
def button_list (name):  
    return [touchgui.image_gui (imagedir ("images/PNG/White/2x/%s.png") \  
        % (name)).white2grey (.5),  
            touchgui.image_gui (imagedir ("images/PNG/White/2x/%s.png") \  
        % (name)).white2grey (.1),  
            touchgui.image_gui (imagedir ("images/PNG/White/2x/%s.png") \  
        % (name)),  
            touchgui.image_gui (imagedir ("images/PNG/White/2x/%s.png") \  
        % (name)).white2rgb (.1, .2, .4)]
```

note the \ is a line continuation character

Single glyph button example using touchgui

- `button_list` is a function which returns a list of four images
- the four images in order represent the four states
 - frozen, active, activated or pressed state
- `button_list` takes a single white image and produces four images
 - darkgrey using `white2grey (.5)` representing frozen
 - lightgrey using `white2grey (.1)` representing active
 - brilliant white representing activated
 - dark blue `white2rgb (.1, .2, .4)` representing pressed

Single glyph button example using touchgui

```
#  
# buttons - create two buttons and return them as a list.  
#  
def buttons ():  
    return [touchgui.image_tile (button_list ("power"),  
                                touchgui.posX (0.95), touchgui.posY (1.0),  
                                100, 100, myquit),  
           touchgui.image_tile (button_list ("return"),  
                                touchgui.posX (0.0), touchgui.posY (1.0),  
                                100, 100, myreturn)]
```

Single glyph button example using touchgui

```
def main ():
    pygame.init ()
    if full_screen:
        gameDisplay = pygame.display.set_mode ((display_width, display_height), \
                                                FULLSCREEN)
    else:
        gameDisplay = pygame.display.set_mode ((display_width, display_height))

    pygame.display.set_caption ("Simple Test")
    touchgui.set_display (gameDisplay, display_width, display_height)

    forms = buttons ()
    gameDisplay.fill (touchguipalate.black)
    touchgui.select (forms, event_test)

main ()
```

Single glyph button example using touchgui

- `touchgui.select` can take 2 parameters (it can also take more - in future weeks this will be covered)
- the second parameter allows you to test pygame events
- the first parameter is a list of buttons on the touch device
 - only buttons in this list can be activated (mouse over) and/or tapped

Single glyph button example using touchgui

- `touchgui.image_tile` takes 6 parameters
 - `button_list` is the list of the four state images
 - `touchgui.posX` and `touchgui.posY` converts a floating point value in the range `0.0..1.0` onto the X or Y resolution of the screen (or window)
 - parameters 4 and 5 are the x and y image size
 - parameter 6 is the call back if tapped or double tapped