Graphline, plot data extraction.

Here is a simple method of extracting plot data from an image file.

- Extract any dot data
- linear or log for either axis
- crude line thinning for thick traces to centreline
- autoscales but can be fooled into different scaling
- can probably handle looped plot (where it goes back on itself)
- permissive licence, copyrighted to enable wide use, just use it

I evolved this method because I often found that software designed to do the same thing would not work on plots where I needed the data. This may be may not work for you because there is no one solution.

This is a technical person's solution where you will need a reasonable degree of computer literacy and some understanding of knowing what you are doing. You might need to find or install software packages. What has to be done and figure out a way to do it.

Requirements

- Image file editor which can do detail select and image cropping.
- Copy of Lua 5.1 (5.2 will probably work)
- Lua script graphline.lua
- Imagemagick

Basic idea

- Crop the image exactly to the measured area
- Select the single plot line, eg. By exact colour
- Turn all other parts of the image white eg. Invert selection, fill selected with white
- Save result as .PNG
- Using a plain text editor edit the X and Y extremes values into the Lua script
  Log axis is implemented but you will have fun working out the XY parameters
- Invoke Lua on the script and PNG image, capturing output to text file
  lua graphline.lua myimage.png
  lua graphline.lua myimage.png > myoutput.txt

The text file contains the plot line as X and Y data.

Warning

The script is designed for Microsoft OS but would be simple to port to a different OS, or run under Wine on 'nix.
- Script invokes Imagemagick
- Script deletes (erases) an intermediate file
- Script has no knowledge of directory structures etc.

Program call and delete could be commented out, do operations by hand.

Tutorial.

This image
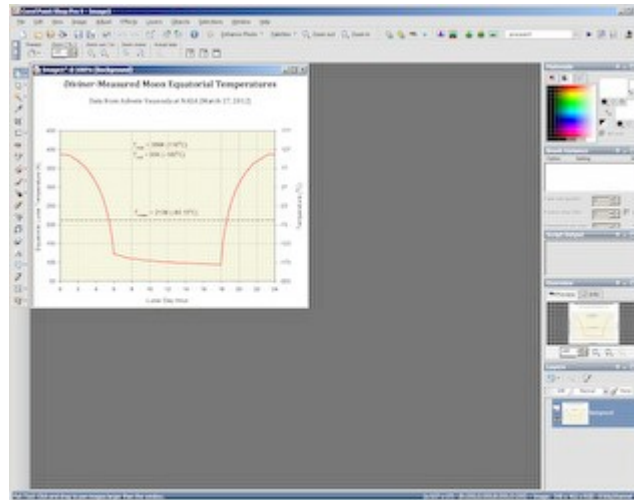http://tallbloke.files.wordpress.com/2012/03/diviner_moon_temperatures.png
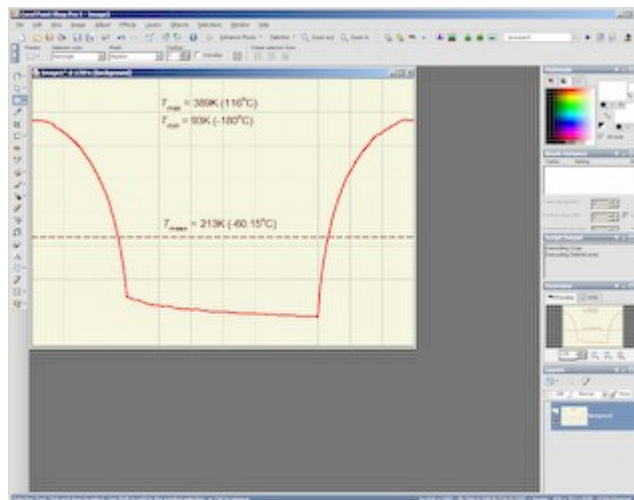

Illustration 1: Open image with image editor

Illustration 3: Crop image on selected

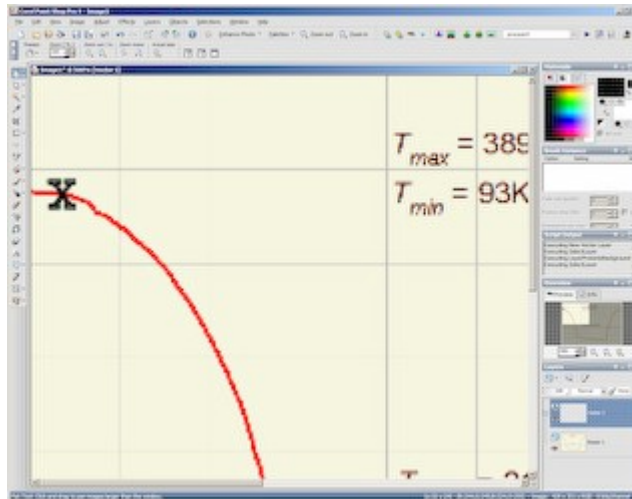*Illustration 2: Magnify, select central plot area*

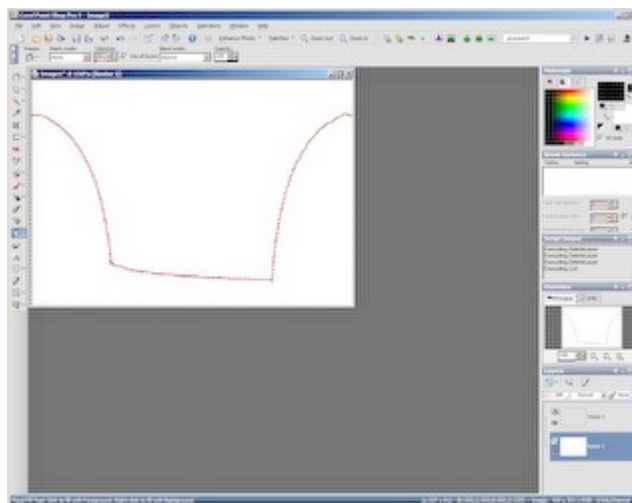*Illustration 4: Select RGB value on wanted line*

Illustration 5: Invert selection and fill with white

Save as a new image of type PNG.
(but could be done directly as PBM, avoiding a need for Imagemagick)

Demo named diviner.png

```
-- data offsets and size, is outer extremity of input file
-- START USER EDIT SECTION OF FILE
local xmin=0
local xmax=24
local ymin=50
local ymax=450
local xlog=false
local ylog=false

local separator=',' --  text output file field separator
-- output is to screen/console, redirect to file or whatever
-- END USER EDIT
```

Illustration 6: User edit part of graphline.lua, a plain text file

Open the Lua script file using a plain text editor. Look at the original plot you are digitising and edit in the values for X and Y minimum and maximum where you cropped the image.
This must be accurate, defines the computed X and Y limits.
If the plot has log axis set to true but the values for the axis will be the decadal log value. (have fun)
Save the text file.

Run the script (command / console programs)
lua graphline.lua diviner.png

If you want to capture the output that might be
lua graphline.lua diviner.png > diviner.txt

All being well it worked, have a look at the data.

Result

A good test is plot the data and semi-transparent overlay the original image, align, it should match well. (software to do this I have to leave to the reader)

Diviner-Measured Moon Equatorial Temperatures

Data from Ashwin Vasavada at NASA (March 27, 2012)

Diviner lunar equatorial graph data extract, overlayed published plot
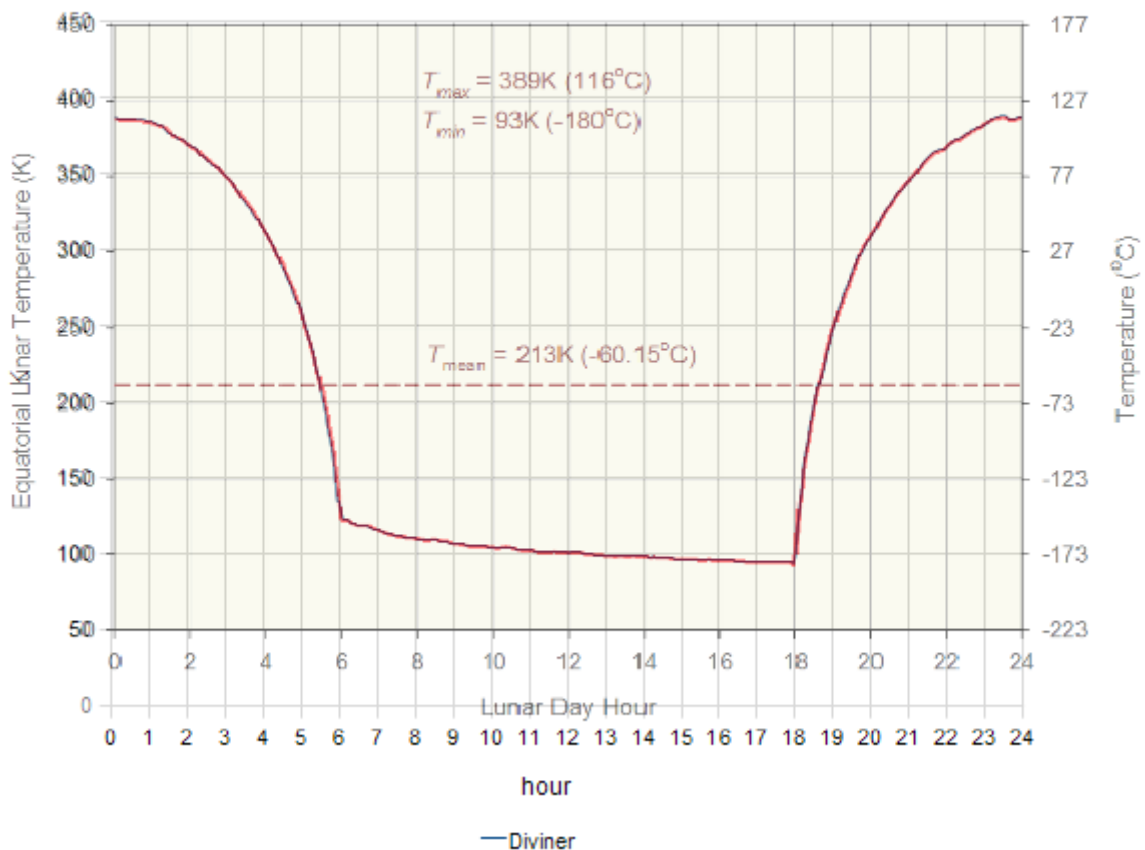
Author: Tim Channon

Email: tc@gpsl.net but beware severe email filtering, no response maybe try again.

Comments and enhancements are welcome. Note though that this is just a quick and casual work, put out to help others.

Lua: small, useful. Might already be on 'nix boxes. http://www.lua.org/
Imagemagick, dominant graphics cmd line /console package. http://www.imagemagick.org/
Both permissive licenced free and very good / mature.