NAME

plotmtv - fast multi-purpose plotting program for X11-windows

SYNOPSIS

plotmtv

[-mult] [-P*printer*] [-printcmd *print_command*] [-colorps]
[-3d] [-v] [-d] [-l] [-scale *scale*]
[-noframe] [-nodate] [-noxplot] [-plotall] [-print]
[-pbg *background_color*] [-pfg *foreground_color*]
[-geom *geometry*] [-rv] [-bg *background_color*] [-fg *foreground_color*]
[-o *postscript-file*]
data-file1 data-file2 ...

DESCRIPTION

plotmtv is a fast and convenient X11 program for visualization of scientific data. The program reads in data in the MTVDAT format and plots each dataset in the *data-file* in turn. Each plot comes with a simple but functional Graphical User Interface (GUI), which allows users to zoom in or pan to areas of interest on the plot, or to toggle between 2D and 3D plots. The plots may then be sent directly to a grayscale or color PostScript printer for hard-copy output.

plotmtv's capabilities include 2D line and scatter plots (x-vs-y), contour plots, 3D surface, line and scatter plots as well as vector plots. The program has been extended recently to include probability plots, barcharts and histograms. See the *MTV Plot Data Format* for details on the data-formats used to specify data for the above-mentioned plot-types.

The Graphical User Interface for **plotmtv** is quite limited, consisting of several toggle buttons for setting commonly used plot options, and an interactive zoom and pan capability via the mouse. The GUI also allows toggling between 2D and 3D plots, rotating 3D plots, and some (limited) customization of the resultant plots. Through the GUI, one can also print the plot using the "Print" button, or save the Postscript plot to a file using the "Print to File" button.

If more than one data-file or data-set is specified, a small "page" widget will appear in the lower left corner of the **plotmtv** plot window. The "page" widget allows one to page between different plots, using the same window, by clicking on the Up or Down buttons.

The X11 plot in **plotmtv** can also be controlled from the keyboard, i.e., by pressing specific keys on the keyboard while the mouse is within the X11 plot window. Pressing on "n" (next) and "p" (previous) pages between different plots, while pressing the "q" key is a fast way of exiting the program. For the 3D plot, the viewing vector can be changed using the "h", "j", "k", "l" and "o" keys on the keyboard; the plot on the screen can be rotated sideways using the "h" or "l" keys, rotated up or down using the "j" and "k" keys, and drawn with the original viewing vector using "o". The "a", "s", "d" and "f" keys will produce 90° rotations. "z" will plot the image projected on the x-y plane (z=constant), "y" will plot the image projected on the x-z plane (y=constant), and "x" will plot the image projected on the y-z plane (x=constant).

Key	**Action**
p	page to the previous plot
n	page to the next plot
q	end program
h	rotate right 10° (3D plot only)
j	rotate down 10° (3D plot only)
k	rotate up 10° (3D plot only)
l	rotate left 10° (3D plot only)
a	rotate right 90° (3D plot only)
s	rotate down 90° (3D plot only)
d	rotate up 90° (3D plot only)

f	rotate left 90° (3D plot only)
o	return to original view (3D plot only)
z	project on x-y plane (3D plot only)
x	project on y-z plane (3D plot only)
y	project on x-z plane (3D plot only)

DATA FORMAT

plotmtv uses the MTVDAT data format, which is too long to describe in this document. The data format is described fully in *The MTV Plot Data Format* document.

OPTIONS

–mult
Brings up an X-window with multiple plots. This is a useful way of comparing different plots on the same page.

–P*printer*
Specifies the printer to which to send the PostScript plot. The default uses the printer name from the environment variable $PRINTER.

Note: **plotmtv** will send a PostScript file to the specified printer *only* if the size of the file is less than 1000Kbytes. This maximum file size is due to the limitations of the UNIX **lpr**(1) command.

–printcmd *print_command*
Specifies the *print_command* to be executed in sending a PostScript plot to the printer. The default is the UNIX "lpr -h" command. The *print_command* may also be set using the environment variable $MTV_PRINTER_CMD, i.e., 'setenv MTV_PRINTER_CMD "lpr -h"'.

–colorps

–color

–pscolor
Instructs the PostScript renderer to include colors in the PostScript description of the plot. By default, **plotmtv** produces gray-scale PostScript plots. The color PostScript file produced with this option may be printed out on a color PostScript printer. Be aware however that the same file will not print out correctly on a black-and-white PostScript printer. The color PostScript mode may also be set by setting the $MTV_PSCOLOR environment variable, i.e., "setenv MTV_PSCOLOR ON".

–3d Plots in 3D instead of the default 2D.

–v Makes **plotmtv** more talkative.

–d Makes **plotmtv** extremely loquacious.

–l Prints the PostScript plot in landscape mode (rotated 90°).

–noframe
Prints the PostScript plot without a bounding box frame. The bounding box frame is drawn only when the plot is printed with a scale value less than 1. Specifying this option turns off the frame.

–nodate
Prints the PostScript plot without a time/date stamp.

–noxplot

–noplot
Stops the program from starting up the X11 graphics routines. The normal mode of operation is start up **plotmtv** from an X-terminal or X-display and interact with the graphics using the Graphical User Interface. However, the **-noxplot** option is also provided to allow the plots to be directly drawn in PostScript, thus bypassing the X11 plotting routines. This is particularly useful for

batch-mode operation, where multiple plots can be sent to a printer without user intervention.

–plotall
Plots all the datasets found in a single plot. Useful for combining data from different files.

–print
Sends the PostScript plot to the printer automatically. Usually this is used together with the **-noxplot** option to produce PostScript plots in batch, i.e., "plotmtv -noxplot -print datafile".

–scale *scale*
Sets a plot scale factor. This is used only for PostScript plotting.

–pfg *foreground_color*

–pbg *background_color*
Sets the foreground and background colors in the **plotmtv** X11 Plot Window.

–display *host:display.screen*
Opens a window on the given host and display

–geom *geometry*

–rv

–fg *foreground-color*

–bg *background-color*

data-file1 data-file2...
Specifies the MTVDAT data-file(s).

ENVIRONMENT VARIABLES

PRINTER	printer name for hardcopy (e.g., "hpps")
MTV_PRINTER_CMD	name of the UNIX print command (e.g., "lpr -h")
MTV_PSCOLOR	for color PostScript (e.g., "ON")
MTV_WRB_COLORMAP	uses a different color map for contours (e.g., "ON")
MTV_USE_ISOLATIN_FONT	is used to turn off the ISOLATIN PostScript Plot (e.g., "OFF")
MT_PSFONT1	specifies the size of the top-label PostScript font (e.g. "25")
MT_PSFONT2	specifies the size of the axis-label PostScript font (e.g. "20")
MT_PSFONT3	specifies the size of the axis-ticks PostScript font (e.g. "15")
MT_PSFONT4	specifies the size of the side-label PostScript font (e.g. "12")
MT_PSFONT5	specifies the size of the annotations PostScript font (e.g. "12")
MT_PSFONT6	specifies the size of the date-stamp PostScript font (e.g. "10")
MT_PSFONT7	specifies the size of the contour-label PostScript font (e.g. "8")

HISTORY

plotmtv is based on the **DRAWPLOT**, **CONTOUR** and **PDRAW** programs from U.C. Berkeley (yes, I'm responsible for those too!). **plotmtv** essentially combines all the capabilities of the three packages into one single package.

BUGS/LIMITATIONS

The GUI is very limited. The 3D viewing stuff is quite limited too; hidden-surface removal is implemented as a simple painter's algorithm, so large 3D polygons don't get plotted (with hidden-surfaces) correctly. Also there are no perspective plots yet (and probably never will be)...

plotmtv uses some level 2 PostScript commands. This sometimes causes plots to disappear if plotted on older PostScript-level-1 printers. If this happens, try setting the environment variable "MTV_USE_ISOLATIN_FONT" to False, i.e. "% setenv MTV_USE_ISOLATIN_FONT False".

AUTHOR

Kenny K.H. Toh (ktoh@td2cad.intel.com)

FILES

dataplot.ps	default PostScript file

SEE ALSO

The MTV Plot Data Format