The GNU FoTeX Package

Dr. Ravi S. Manohar

Dept. of Physics, BNN College, Bhiwandi, Dist Thane.

ravimanohar504@gmail.com

1.Introduction and Motivation :

People mostly find help from online to edit and compile documents using LATEX and TEX which uses the TeX typesetting program for formatting its output in the form of Portable Document Format (pdf) or Digital Visual Interface (dvi) (Ref. No. 1). To incorporate results in the form of graph or plots in the Latex documentation, mostly, people do the steps as Compiling Fortran Code through Linux console or Terminal which generates data output files (The Linux console is a system console supported by the Linux kernel.) followed by Generate plots or figures using application like GNU plotter again through the Linux console and at the end, edit and compile Latex document using some editor eg. KILE or through Linux console. In this paper, we are proposing a dynamic tool to do all the above work on one click. The name we have given to this dynamic editor cum compiler as FoTeX means "Fortran to Tex". This package at present is on pedestrian level which comes with UNIX, GNU and LATEX scripts to do the all the task mentioned above. For time being we have given the graphical interface to FoTeX shell script using Python program. Python is a widely used general-purpose, high-level programming language.

The Python language provides constructs intended to enable clear programs on both a small and large scale. To work on Python usual link is http://stackoverflow.com/questions/14007557/installing-wxpython-onubuntu-12-04.FoTeX is designed specifically for the use with compilers which support Fortran 77. There are some combo packages which offers similar work but partially Ref [2] There exist many advance tools which do multiple tasking in computational work eg. MATLAB Ref. [3], Mathematica etc. FoTeX is a new idea inspired from KILE (http://kile.sourceforge.net/) which will be all in one smart and dynamic package to do multiple tasks. This package will be very useful in the computational work specifically people working in the area like High Energy Physics.

2. Fotex FIRST STAGE Plane.

Fotex will have graphical interface through Python program script which allow to open shell script of the FoTeX. Flow chart in fig. [1] shows present FoTeX working process.

2.1. Shell Script:

fig. [1] Present FoTeX working process
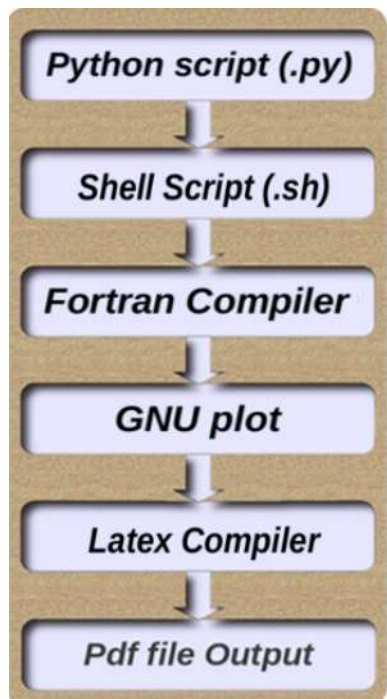
Shells are terminal interactive. It means shell accept command from us (via keyboard) and execute them. But if you use command one by one (sequence of 'n' number of commands) , the you can store this sequence of command to text file and tell the shell to execute this text file instead of entering the commands. Present FoTeX script structure is:

#!/bin/bash

rm path/file.pdf path/datafile.dat

f77 file.f && ./a.out

&& gnuplot> load 'gnu-plot.gp' && pdflatex file.tex

xdg-open file.f; xdg-open output.pdf . . .

The very first line "rm ...." will remove all previous data files generated by Fortran code and previously generated pdf output. The next line "f77 file.f && ./a.out" runes Fortran code on system's Fortran compiler (f77). This can be modified according to the version of system compiler. Next to that, it is "&& gnuplot> load 'gnu-plot.gp'" which call gnuplot and run gnu plot file which has extension .gp. It generate ".tex" files for the corresponding

datafile.dat. Next to that "&& pdflatex file.tex " generate final output pdf file. The last line is to view needed files.

2.2. Gnu-plot and LaTeX file:

Gnu-plot (.gp) and LaTeX (.tex) files are pre edited for general-purpose which can be modified as per requirement. At the end, user can save the Latex file which contain the plots or figures of the data produce by Fortran code and can proceed for the final documentation. The future FoTeX package will be design in such a way that, it will interact user to give following information. a) Total Number and Name of data files the Fortran code is producing. b) X and Y coordinate (Z for 3D) label to each data file. c) Captions for all data files. With these information, FoTeX will automatically and accordingly edit Gnu-plot (.gp) (for a and b) and the LaTeX (.tex) file (for c). As present FoTeX do not have above intercation mode, user has to write this information in the Gnu-plot (.gp) (for a and b) and the LaTeX (.tex) file (for c).

2.3 At the user end

figure 2: FoTeX working Flowchart
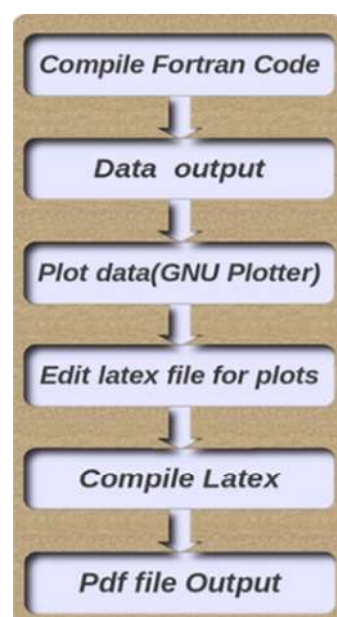
FoTeX will give the needed output results of input Fortran file. Figure [2] shows the present FoTeX five working steps which is on one click. It shows FoTeX fetch the Fortran file and compile the Fortran program first and it will produce the data of whatever user mentioned in his program. After generating the Data it will compile the GNUPLOT and produce varies plot in tex format and then it compile the LaTeX file and generates pdf file at the end. If there is error in Fortran code, all the rest process will be terminate and user will not see and output (pdf or other data files). At present user has to go manually to the terminal to solve the error. Present FoTeX works only if all the files (.f, .gp, .sh and .tex) are error free. Furture FoTeX will be more advance against these errors.

3. FoTeX SECOND STAGE plane.

The future FoTeX package will contains the facility like KILE-LaTeX editor. Apart from that, it will interact with the usre as mentioned at the end section 2.2. This will display all needed file as shown in figure [3] in a single window. Most powerful window in this will be a Linux console which will fix error in the same windows. In figure [3], the highlighted buttons are the Linux console and the FoTeX-Latex. Here you need only one hit on the FoTeX-Latex. If there is no error while compiling program user will see the following files in one window
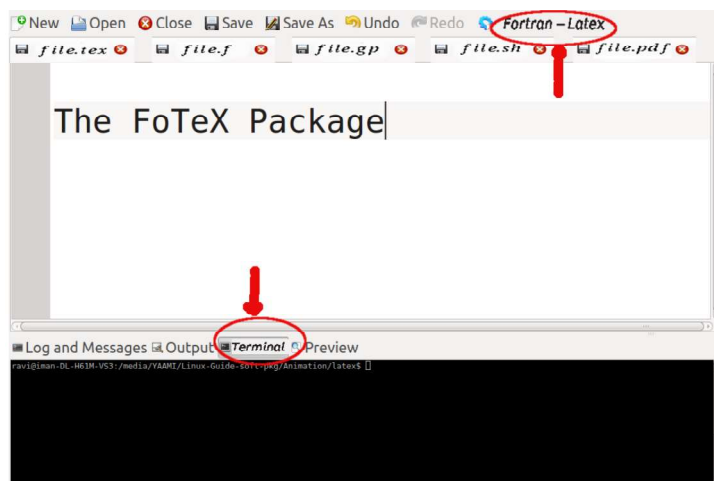
Latex (file.tex),

Fortran (file.f),

Gnuplot (file.gp),

Shell Script (file.sh)

Pdf output (file.pdf)

figure 3: Future FoTeX Window

FoTeX Linux console dialogue box will give a warning and errors. You can directly identify the error in your program and you can modify and save it accordingly all in the same window.

This is new way of working program not laboriously but very smartly. The main goal of this package is "one hit get multi-task output".

Works cited:

1. A Review of Scientific WorkPlace 5.5 by James W Hardin & Joseph M Hilbe
   The American Statistician, Feb. 2006, Vol. 60.NO.1   93   (DOI: 10.1198/000313006x93159)

2. http://www.winteracter.com/ and http://sourceforge.net/projects/fortranforge/ .
   MATALAB 5ht Edition by Stormy Attaway, eBook ISBN: 9780128163450 , Paperback ISBN: 9780128154793.