

*Using a computer software
for
teaching Math and Statistics*

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Abstract:

From the motivation to make a material for teaching Math & Stat, some of useful software are introduced. We mainly tried as follow;

(1) e-math (2) ketpic (3) wintpic.

We hope that student understand, corporating mathematical expression or equation, visual computer display and explicit graph based on Compter Algebra Sytem.

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Conference and Journal:

"Future Generation Computer Systems", Copyright 2008 Elsevier B.V.

International Workshop on Computer Graphics and Geometric Modeling

- Krakow (Poland), June 23-25 2008.

Technical Session on Computer Graphics and Geometric Modeling

- TSCG, Kuala Lumpur (Malaysia), August 27-30 2007.

Making materials for teaching

- Preparation for Material(Syllabus)

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Various method to produce graphs

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 - Ketpic: By aid of CAS, the calculation is easy. Not WYSWYG.
 - wintpic: WYSWYG(What You See is What You Get)

Software gnuplot

gnuplot is a command-line program that can generate two- and three-dimensional plots of functions and data. The program runs on all major computers and operating systems (Linux, UNIX, Microsoft Windows, Mac OS X...). It is a program with a fairly long history, dating back to 1986. This software is not distributed under GPL license, opting for its own open source license instead. gnuplot can produce output directly on screen, or in many formats of graphics files, including PNG, EPS, SVG, JPEG and many others. It is also capable of producing LaTeX code that can be included directly in LaTeX documents, making use of LaTeX's fonts and powerful formulae abilities.

The program can be used both interactively and in batch mode using scripts. For an example script and its output, see [logarithmic spiral.png](#). The program is well supported and documented. Extensive help can also be found on the Internet. gnuplot is used as the plotting engine of GNU Octave, Maxima and gretl, and it can be used from various scripting languages, including Perl (via CPAN), Python (via Gnuplot-py and SAGE), Ruby (via rgnuplot) and Smalltalk (Squeak and GNU Smalltalk). gnuplot is programmed in C. (From Wikipedia, the free encyclopedia)

Wintpic:Japanese, win95

Wintpic Create special command (tpic form) for Tex Drawing: The figers is created by WYSWYG and easy to handel.

After drawing the figure, the output is TeX file(tpic form).

The usage is descrived as

```
\input{filename(tpic file)}  
\includegraphics[scale=.8]{etc08.eps}
```

in the tex source.

e-math(Japanese)

This free soft can be downward from:

<http://emath.s40.xrea.com/>

e-math is first for Highschool math and its Latex style file consists with many components.

There are a plenty of material, tutorial. The quality is high but it is not English words. Not so difficult for Japanese but the foreigner. It is possible to make an English material. Using the perl programming automatically by "emathP.sty".

To draw a graph, there are many command to support and manual are explained in details.

Mathematica is a computer program used widely in scientific, engineering and mathematical fields. It is mainly known as a computer algebra system, but it has various other features for technical computing. It was originally conceived by Stephen Wolfram and developed by a team of mathematicians and programmers that he assembled and led. It is developed by Wolfram Research of Champaign, Illinois. (From Wikipedia, the free encyclopedia)

Maple is a general-purpose commercial computer algebra system. It was first developed in 1980 by the Symbolic Computation Group at the University of Waterloo in Waterloo, Ontario, Canada. Since 1988, it has been developed and sold commercially by Waterloo Maple Inc. (also known as Maplesoft), a Canadian company also based in Waterloo, Ontario. The current version is Maple 12 which was released in May 2008. Its main competitor is Mathematica. (From Wikipedia, the free encyclopedia)

The interface is similar to Maple, however Maple has an advantage over Mathematica in the graph drawing.

It requires a big memory and capacity of hard disk compared with Maple.

The basic design for solving problems of Physics and Mathematics almost all makes possible to reach its solution.

The license of cost is required and even for the education it must be charged. Its additional software applications are sold.

Scilab: Software of Computer Algebra System

We can download from <http://www.scilab.org/>

The open source platform for numerical computation

Scilab: INRIA (France) Release of Scilab 5.0: Distributed under the CeCILL license (GNU GPL compatible), Scilab 5.0, available for Windows and Linux, inaugurates the new generation of Scilab software.

”Recently migrated my project from Matlab to SciLab due to the high cost of a Matlab license. As a student I worked solely with Matlab, and in a fairly large scope project have found no areas in which SciLab was inferior to Matlab. I foresee myself working primarily in SciLab for projects that require mathematical programming.”

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A macro package of creating tpic form with help of Computer Algebra System.

Developed for educations in Math & Stat using CAS: **Maple**, **Mathematica**, **Scilab**.

Adding several command to draw figures in 2 dim, 3 dim. "ridgeline method", "wireframe for Hidden line".

<http://www.kisarazu.ac.jp/masa/math/>

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- Scilab — lib(ketpiclib)

From now we show some examples and demonstrations.