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Scientific WorkPlace 5.5 build 2953

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Poulsbo, WA 98370-7370. USD 845/810 (standard), USD 735/700 (aca-
demic), USD 260/225 (student).
<http://www.mackichan.com/>

In (Karlsson 2006), the programs L_AT_EX and **Scientific WorkPlace** (SWP) are compared. Before I get to the shortcomings of the reviewers view of the SWP I want to express my admiration of the L_AT_EX program. I sincerely hope that it will continue to evolve, I am very fond of the concept of free software, since free software give the general public access to modern tools and they also challenge commercial software to competition.

I should mention that I am the Swedish distributor of the Scientific series of MacKichan, US, and the CAS program **MuPAD**, SciFace Software, Germany. I will not discuss the pros and cons of L_AT_EX, but I will correct some of the misunderstandings that occur in the above mentioned review of the SWP program. I also will mention some nice features of SWP that are not mentioned by the reviewer.

This article is organized in accord with the review: the sections are the same, a short citation followed by my comments.

Introduction

The reviewer gives a description of how to create the formula

$$\Phi(x | \mu, \sigma) = \int_{-\infty}^x \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}} dx$$

using both L_AT_EX and SWP, only by clicking the mouse.

There is nothing wrong with the description given, but it is not the recommended method when using the SWP. Instead it would be much easier to keep your fingers on the keyboard. E.g., to create an integral sign, \int , just simply press¹ CTRL+int (or CTRL+i), for \iint type

¹CTRL+int: keep the key CTRL down and press in succession the keys i n t.

CTRL+iint and CTRL+mu for μ . SWP do understand T_EX and most T_EX macros and objects are more easily obtained from the keyboard.

Manuals and help

“... it would have been useful to have the manuals included as searchable PDFfiles and available from the help menu.”

In the CD there is a folder called **Manuals**. This folder contains all the manuals in PDF format. They are compiled with the `hyperref` package. Hence `labels` and `refs` are translated into anchors and links and the text is searchable exactly like any other PDF text. To give an example of the abilities of the SWP: First copy the folder **Manuals** to the folder **SWP55**. Under **Tools (External Lookup Settings...)** make the necessary instructions (see Figure 1) to install a link to the manual *Doing Mathematics* (Hardy and Walker 2005). Then, from inside the SWP, call this manual and make a search for e.g., the word *Heaviside*. It does not take many seconds to get a couple of hits.

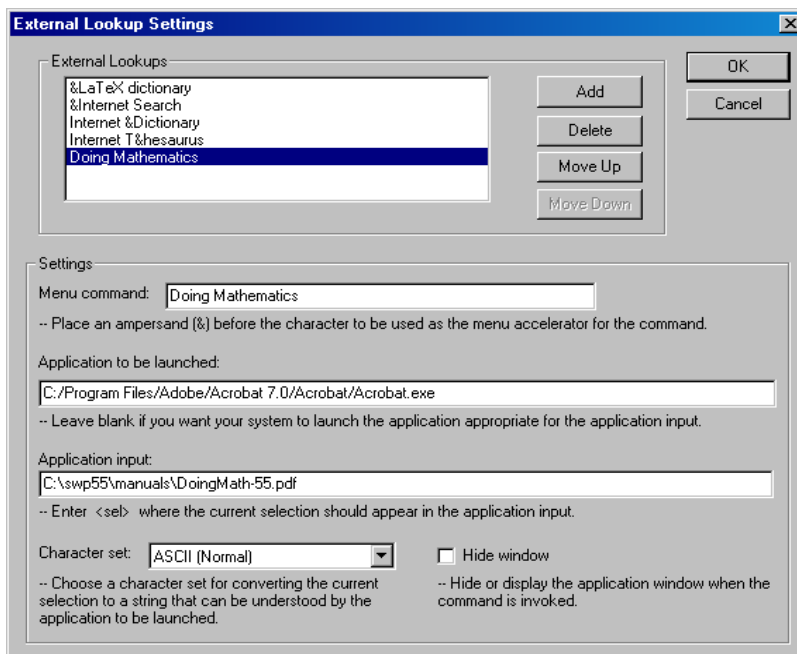


Figure 1: How to install external documents.

There is no description of calls to external files in the manuals (but in **Help**). This possibility was added in build 2890 of Version 5.5 – long after the manuals were created. The latest build of the program may be found on <http://www.mackichan.com/> under **Patches&Updates**. Build 2890 also meets the wish “*but L_AT_EX has a built-in thesaurus function, which is missing in SWP*”.

For Swedish users it may be of interest to add links to SAOB (Svenska Akademiens OrdBok) and NE (Nationalencyklopedin). The first is published free on the Internet and the second is free for all employees at e.g., universities.

Word processing

“For example, changing the page margins in LyX is easily done via menu entries, but in SWP one has to insert L^AT_EX code in a special Preamble box to obtain the same result.”

The manuals clearly describe how to change the page layout with e.g., the `geometry` package. But before doing that, see if you are not satisfied with the options given by T_EX through `Options and Packages`, `Class options` and `Modify...`

Here is a short description of how to change the page layout with the `geometry` package. Whether it is easy or not will be the reader’s judgement.

First, you add the `geometry` package (Figure 2a), second, you click modify, third (Figure 2b), you make your choices (here A4) and then you click Go Native, fourth (Figure 2c), you enter your dimensions and lastly you click OK three times.

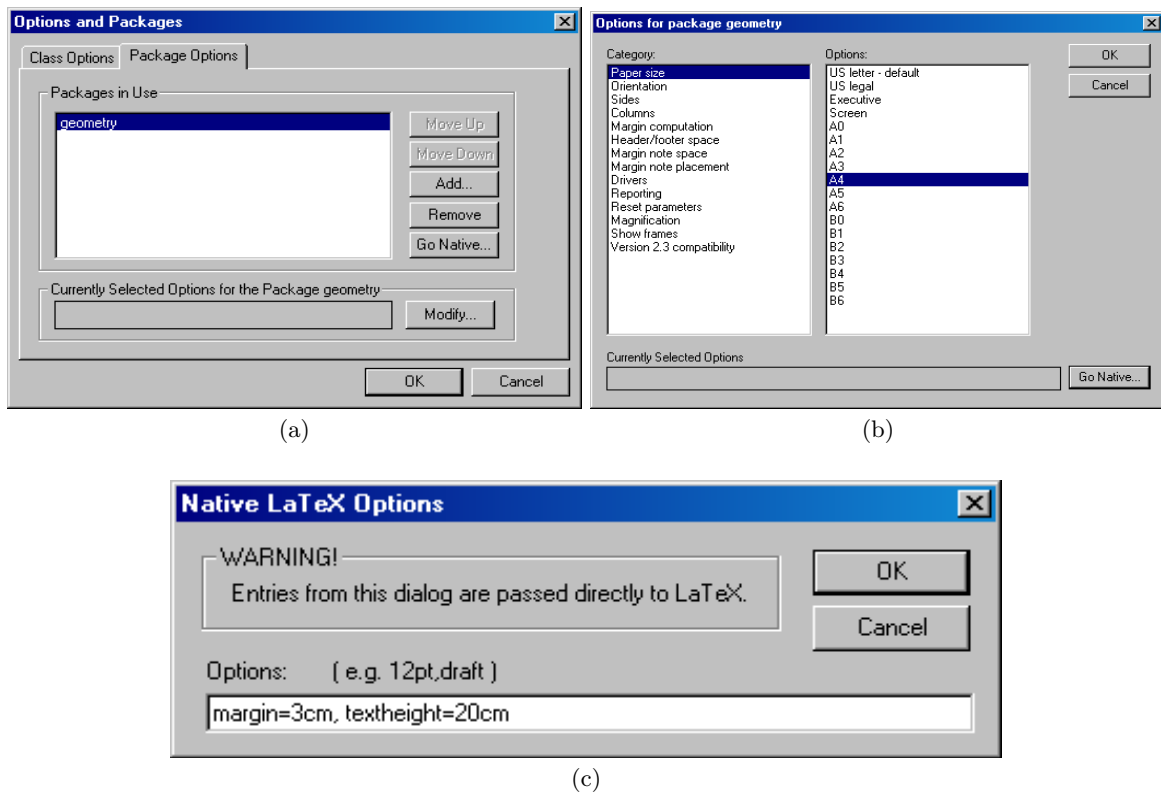


Figure 2: How to add a package.

If you want to use the `Help` system: search for `margin` or `geometry package` (if you already know about this package) and pick the topic of your choice. E.g., the full documentation of the `geometry` package is there.

“Another nice function of LyX missing in SWP is that you cannot write two spaces after each other by hitting `<Space>` or insert extra lines by hitting `<Enter>`, ...”

This is only a matter of choosing the “right” options available in the SWP. Under **Tools** choose **User setup...** the tab **Edit** and click **Spaces...** and you may choose your preferred freedom of action. With action **Enter additional space** you may create any number of consecutive spaces, here are as an example six of them , just press the space bar the proper number of times. This is however not good practice, since not all spaces, created with \TeX , are of the same width. Use instead **Insert, Spacing...** for a specific space horizontal/vertical.

If you need a new line, press **SHIFT+Enter**. But if you have a vertical space before this forced new line, then \TeX will notify you of an error. There is one situation though, where this command is useful and it is when you have long headlines, to avoid unintentional hyphenation. But there are other, better and more general methods, to handle this situation. The described command is seldom recommended by a person with experience in \TeX .

“The SWP file format is a variant of \LaTeX , but inserts special commands that are not understood by other \LaTeX editors.”

The native format for SWP files is the \LaTeX format with **one** special package, `tcilatex`, loaded. This package contains macros for pictures and some other useful stuff. If you do not intend to use the full force of the SWP then this package is not needed. The package is free for anyone to use.

In version 5.5 it is possible to work entirely in the strict portable format of \LaTeX , if so needed, for example when you write an article for this journal.

Mathematics

“However, the integral sign is never seen on the screen, but first in the compiled document.”

One of the nice features with the SWP is that you may mix ordinary text with complicated \LaTeX code. To be able to do that you need a special construct to encapsulate the \LaTeX code. For this purpose there is, in the SWP, the object **\TeX field** which may appear in two forms – **Encapsulated** and **non Encapsulated**.² These fields may be saved (as all other text) as fragments³ and afterwards called for by the **CTRL+** method.

The encapsulated field never change, on screen, and you only see its gray box. The second type of field, non encapsulated, is something else. The first time you create it you only see the gray box but if you close the document and reopen it then SWP will interpret the contents and monitor it on the screen. But beware, if your code is not interpretable, at edit time, you may end up with a lot of gray boxes. Both fields are opened by a double-click and you enter text like you do with any other editor.

On page 5 there is an example of \LaTeX code, the code for a general m by n matrix, that is interpreted at edit time (you will need the package `amsmath` for this mathematical object to be translated and compiled correctly in **Scientific WorkPlace** and **Scientific Word**).

²There is also a **HTML** field but I will not discuss it here.

³A fragment is a piece of text and/or \LaTeX code that is saved as a small file. To retrieve the contents of this file you type **CTRL+filename**.

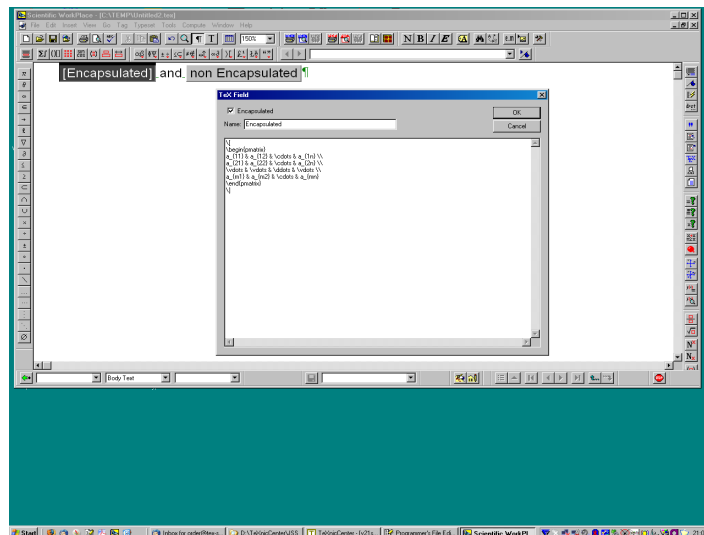
```

\[
\begin{pmatrix}
a_{11} & a_{12} & \cdots & a_{1n} \\
a_{21} & a_{22} & \cdots & a_{2n} \\
\vdots & \vdots & \ddots & \vdots \\
a_{m1} & a_{m2} & \cdots & a_{mn}
\end{pmatrix}
\]

```

Figure 3: L^AT_EX code for a m by n matrix

This L^AT_EX code is put into an [Encapsulated] and a non Encapsulated field (notice the extra pair of brackets for Encapsulated). In figure 4 the [Encapsulated] T_EX field has been opened for illustration.

Figure 4: How to use T_EX fields.

Give the T_EX fields names that describe their contents, for example, [general m by n matrix] and general m by n matrix. To be able to use your constructs over and over again save them as two fragments – epmatrix and pmatrix. In the following quote I only needed to make one CTRL+epmatrix and one CTRL+pmatrix.

If you close your document and reopen it then SWP will leave [general m by n matrix] as it is but translate general m by n matrix into

$$\begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{pmatrix}$$

as wished.

The reason for the encapsulated field is that it may also contain a complicated T_EX structure, e.g., a picture created by the PKF and Tikz package, which is only possible to interpret at compilation time.

Concluding remarks

“Further, it should be easier to include and use external L^AT_EX classes and styles.”

I agree to a certain extent. It is not hard to add additional packages to the SWP. Just add the package where it should be placed (usually under the folder `contrib`) and import it to the SWP document in the usual way (if needed, use the button `Go Native...`). All the necessary steps are clearly found in the manuals, but more important, they are also available in the `Help` system (search for `add`).

What might cause some labor is if you want to tailor the package in full to the SWP system – that is to create a nice shell (`.shl`), a nice style (`.cst`) and to perform some other tailoring. You need a lot of knowledge about the system to be able to do that.

On the MacKichan site you may find over 200 document shells, many for journals, so almost whatever style you need you most probably will find it within the system. Most of them are automatically installed during the installation.

A program not mentioned in the review

A program that is not mentioned in the review is the **ExamBuilder**: This program makes it possible to code generic exams (in mathematics, statistics, physics and so on) which may be given either over the internet or on paper. The **ExamBuilder** also grades the exams and may, if instructed so, also show the solutions.

With the **ExamBuilder** it is also possible to generate random numbers and use a kind of branching statement depending on the generated numbers.

At <http://www.tex-sales.se/ExamBuilder/ReklamExamBuilder-1.pdf> you find one of my advertisements in Sweden. It is in Swedish but from the overall structure you will get a hint of how versatile this program is – and I have still not revealed all its abilities.

The **ExamBuilder** is included in the programs **Scientific WorkPlace** and **Scientific Notebook** and is strangely not described in a booklet but only in the `Help`, as a tutorial. T_EX-Försäljning AB has as a courtesy to its customers created a pdf file of this tutorial and it may be found at <http://www.tex-sales.se/ExamBuilder/ExamBuilderManual.pdf>.

A feature not covered in the review

One of the great advantages with the SWP is how well it handles (almost) all kind of graphics (such as WMF, EMF, EPS, PS, PNG, BMP, AVI and so on). In the SWP you just click the `Import Picture` icon, choose your extension and browse among the picture files until you find what you look for. Inside the program you may add a caption, a key, determine the layout and so on.

This works behind the scene both for $\text{T}_{\text{E}}\text{X}$ and $\text{pdfT}_{\text{E}}\text{X}$. All boring and difficult technicalities are handled by SWP and the operating system.

Contrast that with native $\text{T}_{\text{E}}\text{X}$ who does not handle graphics at all and native $\text{pdfT}_{\text{E}}\text{X}$ that handles only PDF, JPG and PNG. $\text{T}_{\text{E}}\text{X}$ systems like $\text{T}_{\text{E}}\text{XnicCenter}$ do also includes graphics in the format postscript. But to my knowledge that is all.

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