

Technical Writing and Presentation

Ahmed Rashed

Aerospace Engineering Department
Faculty of Engineering, Cairo University

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Outline

- Technical Writing
- Vector Graphics using Inkscape
- References

Word Processors

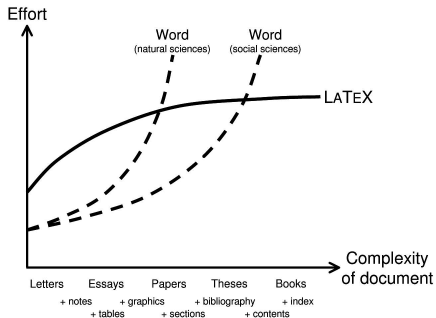
Usually there are two categories of word processing software packages

- ▶ What You See Is What You Get (WYSIWYG)
- ▶ What You See Is What You Mean (WYSIWYM)

WYSIWYG	WYSIWYM
Microsoft Word LibreOffice Writer AbiWord Calligra Words	\LaTeX LyX

Roughly, you can compare \LaTeX to Word as you compare Matlab to Excel

L^AT_EX vs Microsoft Word



Tech. Writing

L^AT_EX

L_YX

Beamer

Inkscape

References

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 - L^AT_EX
 - LyX
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L^AT_EX is a document markup language.

- ▶ Simply you can think of it as similar to HTML*
- ▶ In order to create a document in L^AT_EX, a .tex file must be created using some text editor
- ▶ The .tex file is then compiled to produce the document
- ▶ L^AT_EX can generate several document formats including “pdf”

*(HyperText Markup Language)

Although being free is an advantage, but it is a drawback at the same time

- ▶ Slow download server
- ▶ No clean official documentation
- ▶ Several alternatives to do the same thing

However; L^AT_EX is very mature and widely used by professional/enterprise publishers

- ▶ Also it has a big user community
 - ▶ when you encounter a problem, google it. Most likely you will find others had encountered it and found a solution

Ahmed Rashed



LyX

Inkscape

References

Document classes

`slides` Large sans-serif font.
Used at the very beginning of a document:
`\documentclass{class}`. Use `\begin{document}` to start
contents and `\end{document}` to end the document.

Common document class options	
10pt/11pt/12pt	Font size.
letterpaper/a4paper	Paper size.
twocolumn	Use two columns.
twoside	Set margins for two-sided.
landscape	Landscape orientation. Must use dvips -t landscape.

Packages

`fullpage` Use 1 inch margins.
`anysize` Set margins: `\marginsize{1}{r}{1}{b}`.
`multicol` Use n columns: `\begin{multicols}{n}`.
`latexsym` Use L^AT_EX symbol font.
`graphicx` Show image: `\includegraphics[width=x]{file}`.
`url` Insert URL: `\url{http://...}`.
 Use before `\begin{document}`. Usage: `\usepackage{package}`.

`\author{text}` Author of document.
`\title{text}` Title of document.
`\date{text}` Date.

These commands go before `\begin{document}`. The declaration `\maketitle` goes at the top of the document.

<code>\pagestyle{empty}</code>	Empty header, footer and no page numbers.
<code>\tableofcontents</code>	Add a table of contents here.

Document structure

Use `\setcounter{secnumdepth}{x}` suppresses heading numbers of depth $> x$, where `chapter` has depth 0. Use a `*`, as in `\section*{title}`, to not number a particular item—these items will also not appear in the table of contents.

<code>\begin{comment}</code>	Comment (not printed). Requires verbatim package.
<code>\begin{quote}</code>	Indented quotation block.
<code>\begin{quotation}</code>	Like quote with indented paragraphs.
<code>\begin{verse}</code>	Quotation block for verse.

<code>\begin{enumerate}</code>	Numbered list.
<code>\begin{itemize}</code>	Bulleted list.
<code>\begin{description}</code>	Description list.
<code>\item text</code>	Add an item.
<code>\item[x] text</code>	Use <i>x</i> instead of normal bullet or number. Required for descriptions.

<code>\label{marker}</code>	Set a marker for cross-reference, often of the form <code>\label{sec:item}</code> .
<code>\ref{marker}</code>	Give section/body number of marker.
<code>\pageref{marker}</code>	Give page number of marker.
<code>\footnote{text}</code>	Print footnote at bottom of page.

`\begin{table}[place]` Add numbered table.
`\begin{figure}[place]` Add numbered figure.
`\begin{equation}[place]` Add numbered equation.
`\caption{text}` Caption for the body.
The *place* is a list valid placements for the body. `t=top`,
`b=here`, `b=bottom`, `p=separate page`, `!=place` even if ugly.
Captions and label markers should be within the environment.

Text properties

Font face	Declaration	Effect
<code>\texttt{test}</code>	<code>{\rmfamily test}</code>	Roman family
<code>\textsf{test}</code>	<code>{\sffamily test}</code>	Sans serif family
<code>\textt{test}</code>	<code>{\tfamily test}</code>	Typewriter family
<code>\textbf{test}</code>	<code>{\bfseries test}</code>	Medium series
<code>\textit{test}</code>	<code>{\itseries test}</code>	Bold series
<code>\textup{test}</code>	<code>{\upshape test}</code>	Upright shape
<code>\textiti{test}</code>	<code>{\itshape test}</code>	<i>Italic shape</i>
<code>\textsl{test}</code>	<code>{\slshape test}</code>	<i>Slanted shape</i>
<code>\textsc{test}</code>	<code>{\scshape test}</code>	SMALL CAPS SHAPE
<code>\emph{test}</code>	<code>{\em test}</code>	<i>Emphasized</i>
<code>\textnormal{test}</code>	<code>{\normalfont test}</code>	Document font
<code>\underline{test}</code>		Underline

The command `(ttft)` form handles spacing better than the declaration `(ttft)` form.

<code>\tiny</code>	<code>tiny</code>	<code>\Large</code>	Large
<code>\scriptsize</code>	<code>scriptsize</code>	<code>\LARGE</code>	LARGE
<code>\footnotesize</code>	<code>footnotesize</code>		
<code>\small</code>	<code>small</code>	<code>\huge</code>	huge
<code>\normalsize</code>	<code>normalsize</code>		
<code>\large</code>	<code>large</code>	<code>\Huge</code>	Huge

These are declarations and should be used in the form `{\small ...}`, or without braces to affect the entire document.

Verbatim text

<code>\begin{verbatim}</code>	Verbatim environment.
<code>\begin{verbatim*}</code>	Spaces are shown as <code>_</code> .
<code>\verb!text!</code>	Text between the delimiting characters (in this case <code>!</code>) is verbatim.

<i>Environment</i>	<i>Declaration</i>
<code>\begin{center}</code>	<code>\centering</code>
<code>\begin{flushleft}</code>	<code>\raggedright</code>
<code>\begin{flushright}</code>	<code>\raggedleft</code>

`\linespread{x}` changes the line spacing by the multiplier x .

Text-mode symbols

Symbols

<code>&</code>	<code>\&</code>	<code>•</code>	<code>\bullet</code>	<code>...</code>	<code>\ldots</code>	<code>•</code>	<code>\textbullet</code>
<code>\$</code>	<code>\\$</code>	<code>°</code>	<code>\^{\circ}</code>	<code> </code>	<code>\textbar</code>	<code>\</code>	<code>\textbackslash</code>
<code>%</code>	<code>\%</code>	<code>°</code>	<code>\^{\circ}</code>	<code>#</code>	<code>\#</code>	<code>§</code>	<code>\S</code>

Accents

ô \ 'o	ô \ 'o	ô \ 'o	ô \ 'o	ô \ 'o
ô \ .o	ô \ "o	ô \ c o	ô \ v o	ô \ H
ô \ c c	ô \ d o	ô \ b o	ô \ t oo	ô \ oe
(E \ OE	æ \ ae	Æ \ AE	â \ aa	Â \ AA
o \ o	ô \ o	i \ i	L \ L	i \ i
i \ i	i \ i	i \ i		

Delimiters

6 6	12 6 6	{ \{	[[((< \textless
7 7	10 7 7	} \}]]))	> \textgreater

Dashes

<i>Name</i>	<i>Source</i>	<i>Example</i>	<i>Usage</i>
hyphen	-	X-ray	In words.
en-dash	--	1-5	Between numbers
em-dash	---	Yes—or no?	Punctuation.

Line and page breaks

```

\\      Begin new line without new paragraph.
\\*     Prohibit pagebreak after linebreak.
\kill  Don't print current line.
\pagebreak Start new page.
\noindent Do not indent current line.

```

Miscellaneous

<code>\today</code>	February 25, 2014.
<code>\$\sim\$</code>	Prints ~ instead of <code>\~{}</code> , which makes ~.
<code>-\$</code>	Space, disallow linebreak (W.J. Clinton).
<code>\\$.</code>	Indicate that the . ends a sentence when following an uppercase letter.
<code>\hspace{l}</code>	Horizontal space of length l (Ex: $l = 20\text{pt}$).
<code>\vspace{l}</code>	Vertical space of length l .
<code>\rule{w}{h}</code>	Line of width w and height h .

Tabular environments

tabbing environment

`\=` Set tab stop. `\>` Go to tab stop.

Tab stops can be set on "invisible" lines with `\x111` at the end of the line. Normally `\\` is used to separate lines.



- ▶ To write C/C++ code, any text editor can be used
 - ▶ But using a good IDE can greatly ease your job
- ▶ L^AT_EX is similar
 - ▶ Any text editor is OK, but a dedicated L^AT_EX editor/IDE is strongly recommended
- ▶ A dedicated L^AT_EX editor/IDE
 - ▶ can highlight and auto complete L^AT_EX keywords
 - ▶ has several L^AT_EX templates for several types of documents
 - ▶ facilitates compiling and debugging
 - ▶ ...
- ▶ Sample L^AT_EX editors are:
 - Texstudio; cross-platform
 - Kile; for Linux
 - and many others



Thanks to the “Arabi”* package, Arabic and Farsi languages are supported with the “Babel” package.

- ▶ However, since arabic users are few, “Arabi” package is not mature enough and some minor bugs do exist
 - ▶ Googling about these bugs, usually you find the same of similar bugs do exist in other languages, and hence you can infer solutions/workarounds

*Thanks to GOD at first of course

Keep Concentrating



Due to its WYSIWYM nature, I feel more concentrating while using **L^AT_EX** as compared to **Ms-Word**.



- ▶ Install L^AT_EX implementation. Notable implementations are:
 - ▶ **MiK_TE_X** Windows only^{*}
 - ▶ **T_EX Live** cross-platform[†]
- ▶ Install T_EX/L^AT_EX editor/IDE. Notable examples include:
 - ▶ **Texstudio** cross-platform[†]
 - ▶ **Kile** for Linux
 - ▶ ...

^{*}Download the full MiK_TE_X. This is done using the “**Net Installer**”. First, download the full MiK_TE_X. After download completes, run the downloaded installer and install the full MiK_TE_X.

[†]Available for MS-Windows, Mac OS and Linux



Usually .tex files often reference other files (images, bibliography databases, ...).

- ▶ Hence, if you want to copy a L^AT_EX document to another computer, you have to copy all the referenced files as well

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 - LyX
 - Beamer
- Vector Graphics using Inkscape
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LyX is a graphical front-end to L^AT_EX.

- ▶ You can think of the LyX-L^AT_EX relationship as similar to the Visual Studio-C++ compiler relationship
- ▶ Unlike L^AT_EX, LyX comes with tidy and very good documentation
- ▶ Also it has a big community, i.e.,
 - ▶ it is mature enough
 - ▶ when you encounter a problem, google it. Most likely you will find others had encountered it and found a solution

Keep your concentration



Due to its WYSIWYM nature, I feel very concentrating while using **LyX** as compared to **Ms-Word**.

Arabic Support



Arabic is supported in LyX.



The following installation sequence is recommended:

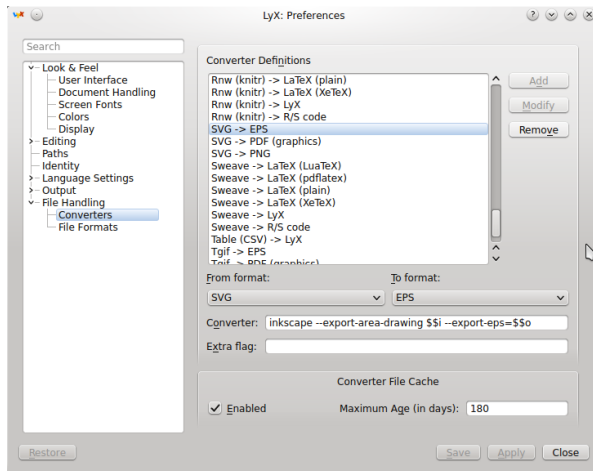
1. Install Inkscape
 - ▶ Confirm path to inkscape.exe is added to the “PATH” environment variable
2. Install the full MiKTeX (or T_EX Live)
3. Install LyX

Configuring Converters I

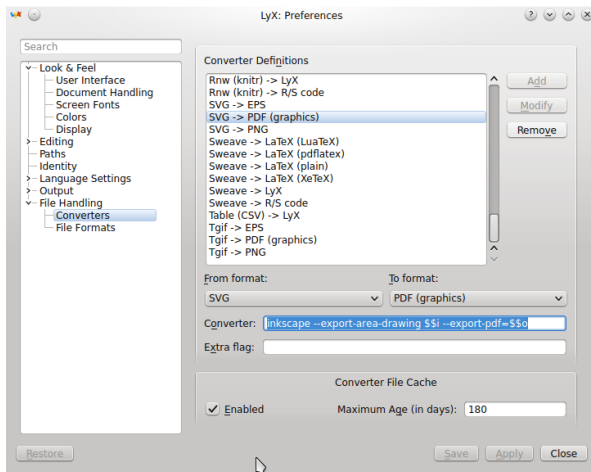
SVG is the file format used by the Inkscape graphing SW. Therefore, confirm that LyX uses Inkscape* to convert SVG files as follows:

- ▶ Tools > Preferences > File Handling > Converters >†
 - ▶ SVG -> EPS > Converter > inkscape \$\$i
--export-area-drawing --export-type="eps"
 - ▶ SVG -> PDF > Converter > inkscape \$\$i
--export-area-drawing --export-type="pdf"
 - ▶ SVG -> PNG > Converter > inkscape \$\$i
--export-type="png"
 - ▶ GIF -> PNG > Converter > magick convert '\$\$i[0]'
\$\$o‡

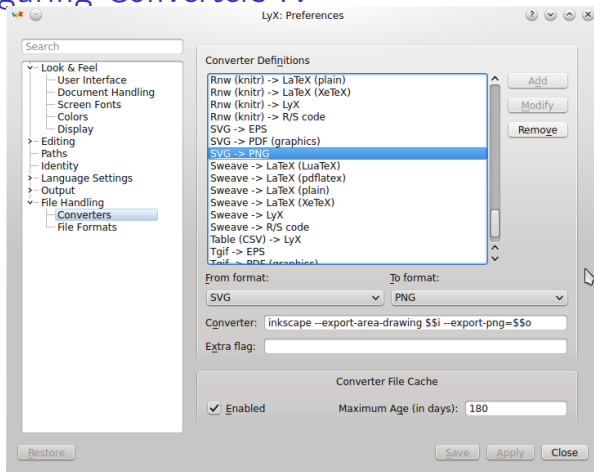
Configuring Converters II



Configuring Converters III



Configuring Converters IV



*Make sure that the Inkscape is installed, and the path of “inkscape.exe” is added to “path” environment variable. You can test this by executing “inkscape” from the command prompt.

†Note that Inkscape CLI has changed since version 1.0
[https://wiki.inkscape.org/wiki/index.php/Using_the_Command_Line#Changes_from_0.92]



- ▶ **Explore** style-list, menus and toolbars.
- ▶ **Help menu** includes *very good* manuals.
 - ▶ Manuals themselves are LyX documents
 - ▶ So they are essentially very good LyX examples
 - ▶ You may begin with:
 - ▶ Introduction
 - ▶ Tutorial
- ▶ **C:\Program Files (x86)\LyX 2.3\Resources** folder contains wide variety of very good examples



Similar to L^AT_EX documents, .lyx files often reference other files (images, bibliography databases, ...).

- ▶ Hence, if you want to copy a LyX document to another computer, you have to copy all the referenced files as well

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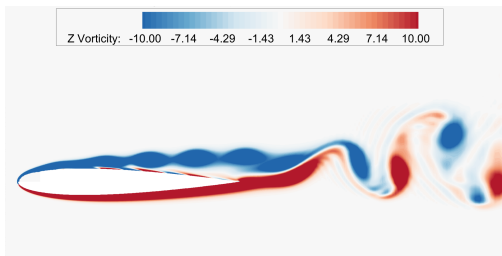
Beamer is a L^AT_EX class for creating **professional** presentation slides.

- ▶ Beamer can also be easily used within LyX

Including Videos

Use the multimedia package. For example, the following animation is produced using:

```
\movie[externalviewer]{\includegraphics[width=0.7\textwidth]{
```



Including Gif Animations



- Refer to <https://tex.stackexchange.com/questions/240243/getting-gif-and-or-moving-images-into-a-latex-presentation> for details



Beamer-Article is a L^AT_EX class that renders Beamer slides on a standard sized paper* to create *professional* presentation handouts.

- ▶ Frame titles are used as paragraph titles
- ▶ Slide layout/colors are not rendered
- ▶ Sectioning is kept
- ▶ Beamer-Article can be easily used within LyX

*like A4 or letter

Keep your concentration



Due to its WYSIWYM nature, I feel very very very concentrating while using **LyX-Beamer** as compared to **Ms-Power Point**.

Installing Beamer



- ▶ Beamer class is usually installed by default with MiK_TE_X, T_EXLive
- ▶ Also templates for both Beamer-presentation and Beamer-article are included by default with LyX



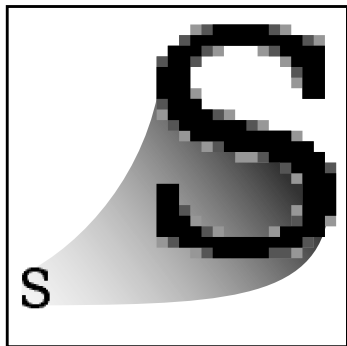
- ▶ From **LyX**
 - Help** > Specific Manuals > Beamer Presentations
 - Explore** the styles list and Insert menu*
- ▶ **Beamer User Guide** explain creating Beamer presentations in plain L^AT_EX and LyX as well
- ▶ For **customization** of Beamer presentations, check the “BEAMER appearance cheat sheet” at <http://science.thilucmic.fr>
- ▶ For various **themes** of Beamer presentation, check <http://www.hartwork.org/beamer-theme-matrix/>
- ▶ Also a very good variety of presentations are attached to this course

*Styles will be available after you set the current document type to Beamer. This is done from the menu command “Document>Settings>Document Class>Beamer”

Outline

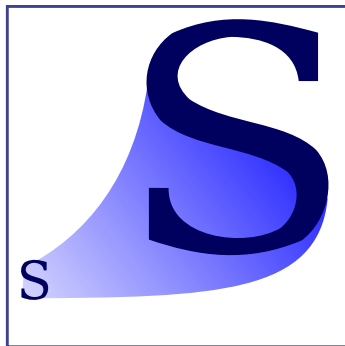
- Technical Writing
- Vector Graphics using Inkscape
- References

Raster vs Vector Graphics I



Raster

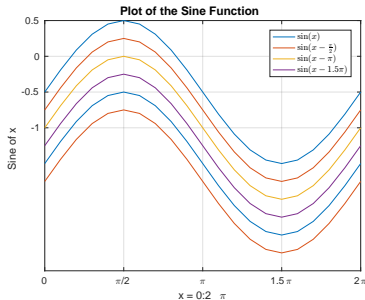
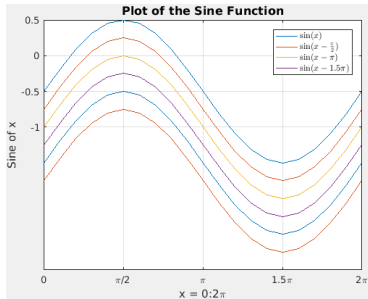
.bmp .jpeg .png



Vector

.emf .svg .pdf .eps

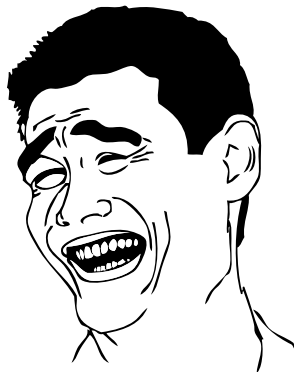
Raster vs Vector Graphics II



Raster vs Vector Graphics III



Raster vs Vector Graphics IV



Graphics Formats

Raster		Vector	
.bmp	Uncompressed	.pdf	Compressed
.png	Loose-less compression	.eps	
.jpg	Lossy compression	.emf	Compatible with MS office
		.svg	
⋮		⋮	

Vector Graphics Editors



- | | |
|--|--|
| <ul style="list-style-type: none">▶ Adobe Illustrator (<i>de facto</i> standard; bloated)▶ Corel Draw (bloated)▶ Inkscape (light, open source, free, | <p>cross-platform and popular; my favorite)</p> <ul style="list-style-type: none">▶ LibreOffice Draw▶ ... |
|--|--|



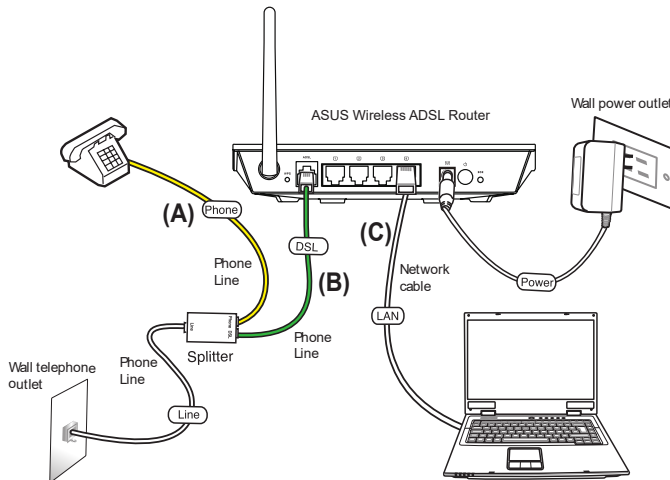
- ▶ Free
- ▶ Open source
- ▶ Cross platform
- ▶ Has a big community, i.e.,
 - ▶ it is mature enough
 - ▶ when you encounter a problem, google it. Most likely you will find others had encountered it and found a solution
- ▶ Much much powerful than MS-Word or MS-Power point sketching capabilities
- ▶ Has several plugins that greatly expand its capabilities



- ▶ Inkscape is based on bezier curves
 - ▶ Defines a curve using four information, start, end, start tangent and end tangent
- ▶ Additionally, you can draw and edit:

▶ straight lines	▶ \LaTeX formulas
▶ circles/arcs/ellipses	▶ function curves
▶ text	▶ ...

Import Graphics from pdf



- You can import vector graphics from pdf files, and even edit them

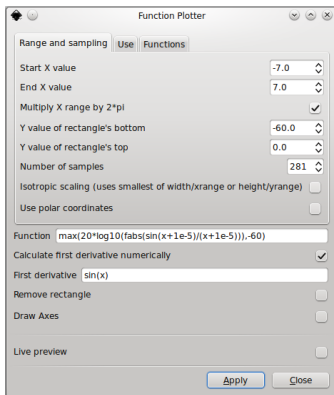
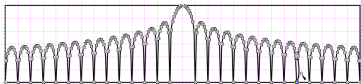
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 - Interesting Plug-ins
 - Learning Inkscape
- References

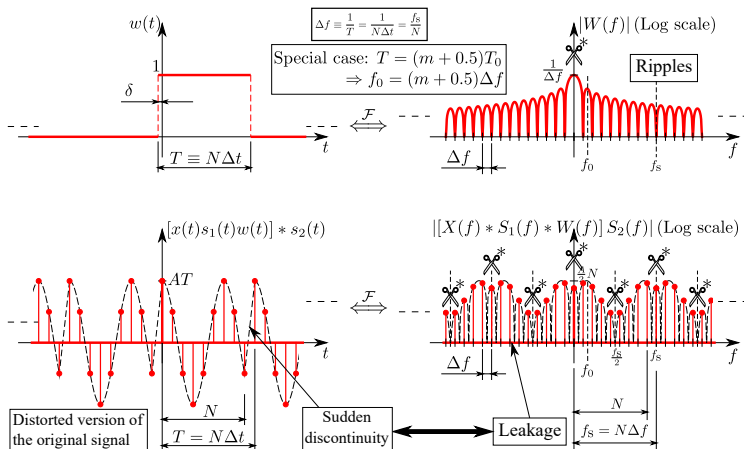
Function Plotter

Function Plotter is a built in plugin.

- ▶ It uses Bézier curves, same as Inkscape
- ▶ It calculates the function derivative and use it to adjust the curve slope
 - ▶ It produces very smooth curves using much less points than Matlab
 - ▶ You can still modify the end/control points



It allows you to write/edit \LaTeX formulas inside Inkscape



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- ▶ **Explore** menus and toolbars
- ▶ **Official manual** [1] is very good and detailed
 - ▶ Chapters 1 includes 10 examples
 - ▶ The first 3 examples are enough for a good start
 - ▶ Chapters 5 explains editing
 - ▶ Surf it fast
- ▶ **Help menu** includes tutorials, FAQ, ...
- ▶ <http://inkscape.tutorials.org/>

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 T. Bah, *Inkscape*. Prentice Hall, 2011. [Online].
Available: http://www.ebook.de/de/product/14765413/tavmjong_bah_inkscape.html