

# OPEN SOURCE SOFTWARE TOOLS FOR RESEARCHERS

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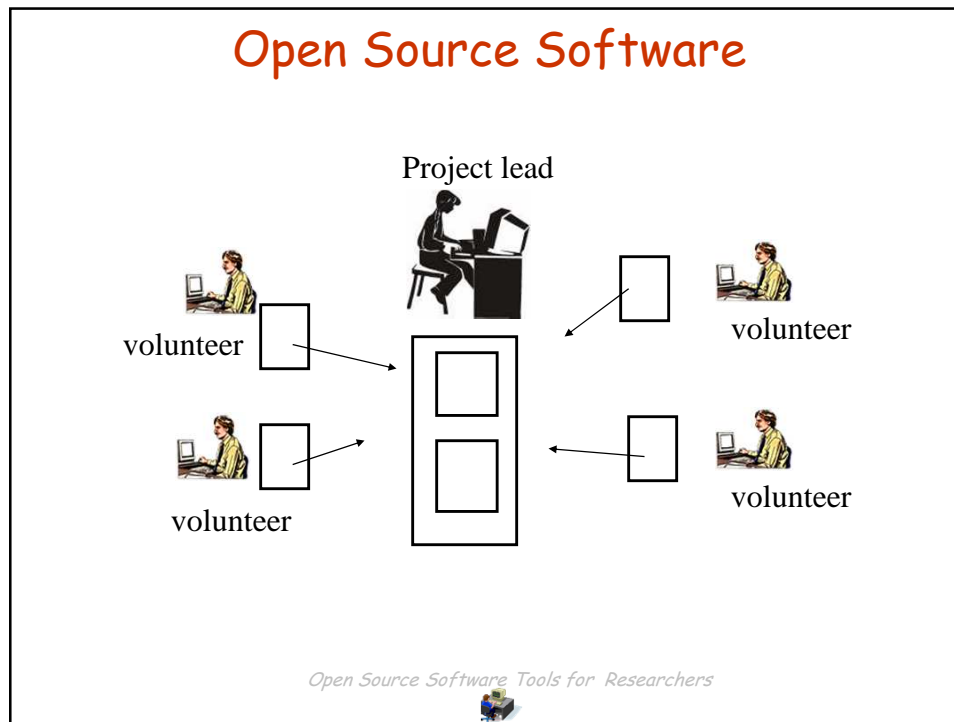
## What is open source software?

**Open source** refers to a program or software in which the source code is available to the general public for use and/or modification from its original design free of charge.



Open source code is typically created as a collaborative effort in which programmers improve upon the code and share the changes within the community.

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## Some Terms.....

- **Open Source software**
  - Free to users and programmers
  - Source code is available
  - Copylefted, GNU General Public License
  - Source code can be modified
  - Source code can be redistribute
  - Developed by collaborative effort
- **Shareware software**
  - Free to download and try, suppose to pay if you use it
  - Source code is not available
  - No collaborations or community
- **Free ware**
  - Free to users
  - Source code is not available
  - No collaborations or community. Mostly used for product advertisement and endorsement
- **Proprietary software**
  - Not Free
  - Copyrighted, Modification, Sharing and redistribution restricted
  - Owned by individual or company

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## Advantages of FOSS

- Security
- Quality
- Customizability
- Freedom
- Less resource intensive
- Interoperability
- Auditability
- Support of community



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## Software

- Computer software is a collection of programmes and related data that provides the instructions for telling a computer what to do and how to do it.

### **System Software**

**UNIX, Linux, Ubuntu**, Microsoft Windows, Mac Os

### **Programming software**

Visual Studio, Turbo C/Pascal, **Python, Lazarus, Java**

### **Application software**

Word processing, Spreadsheet, Graphic editors, CAD, GIS, Image processing, Modeling etc.

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## Open Source OS



- **Linux** – One of the most popular Unix like OS.



- **Ubuntu** – Linux based operating system.

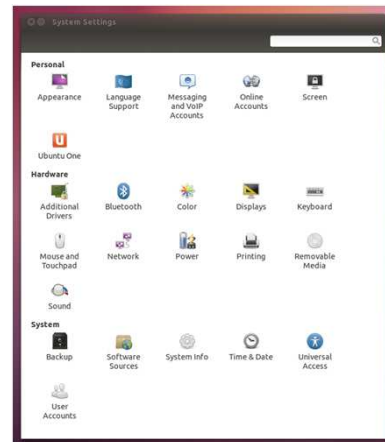


- **Android OS** – Linux based OS for smart phones and Tablets.

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## Ubuntu Screenshots



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## Requirements of a Researcher

- Data collection
- Data storage/Management
- Data Analysis
- Data visualization and Mapping
- Modeling
- Documentation
- Image editing
- Management of references/ Bibliography

Many power full open source software are available to fulfill these requirements

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## FOSS for Data Collection

**Open Data kit (ODK)** - set of tools which help and manage mobile data collection solutions. Can be used to

- **Collect** the data on a mobile device and send it to a server.
- **Aggregate** the collected data on a server and extract it in useful formats.



<http://opendatakit.org/>

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## FOSS for Data storage & Management

- Free data storage facility is provided by many sites, which can be used to store any kind of data (Picture files, Documents, Pdfs etc). Some popular sites are
  - DropBox – 2 GB free storage
  - Google Drive – 5 GB free storage
  - SkyDrive – 5 GB free storage
  - MediaFire – 10 GB free storage

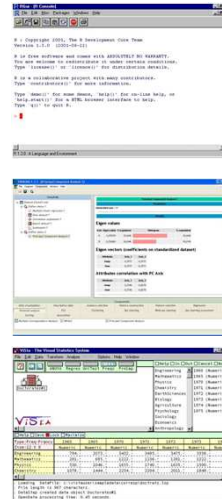
**25 KB is required to store one A4 Page word document without graphics. (5GB can store more than 20,000 A4 pages)**
- MySQL** - is an open-source relational database management system (RDBMS);
- Postgres** - is an object-relational database management system (ORDBMS).

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## FOSS for Data Analysis

- McAnova
- R(2.5)
- Tanagra
- ViSta



<http://freestatistics.altervista.org/?p=stat>

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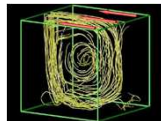
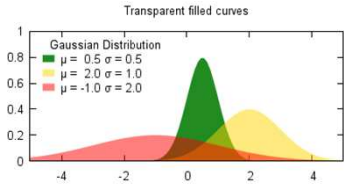


## Screen Shot Tanagra

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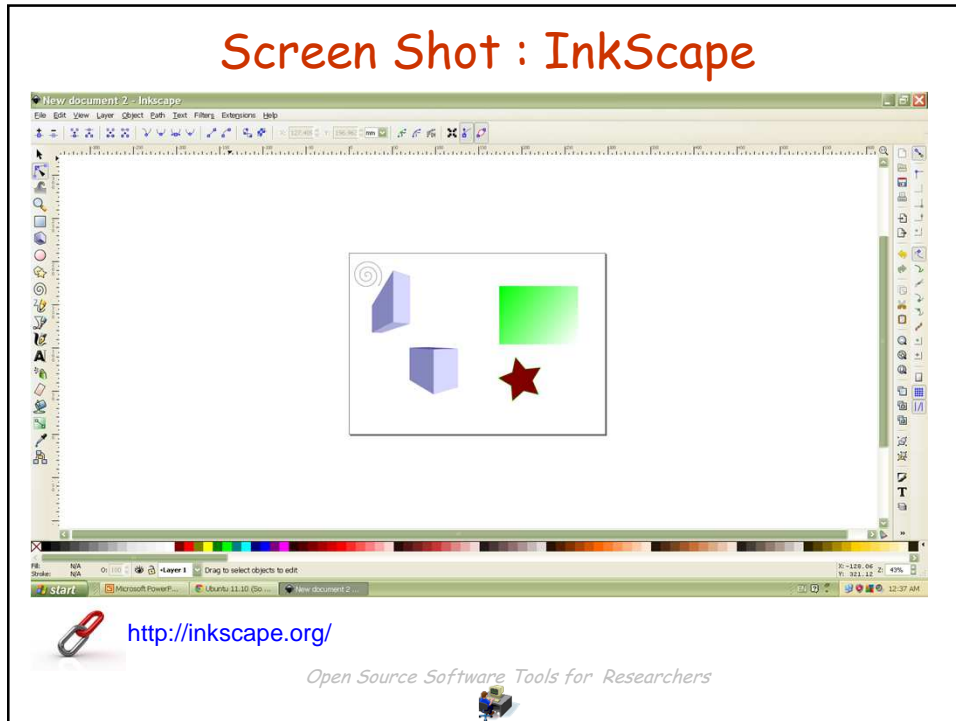
## FOSS for Data Visualization

- IBM OpenDx – Scientists & Engineers  
<http://www.opendx.org/>
- Tulip – Information visualization framework  
<http://tulip.labri.fr/TulipDrupal/>
- GGobi – Statistician  
<http://www.ggobi.org/>
- IDL- Programmers
- Gnuplot – Command line 2D/3D plots
- Inkscape – vector graphics software.
- Dia – For drawing structured diagrams

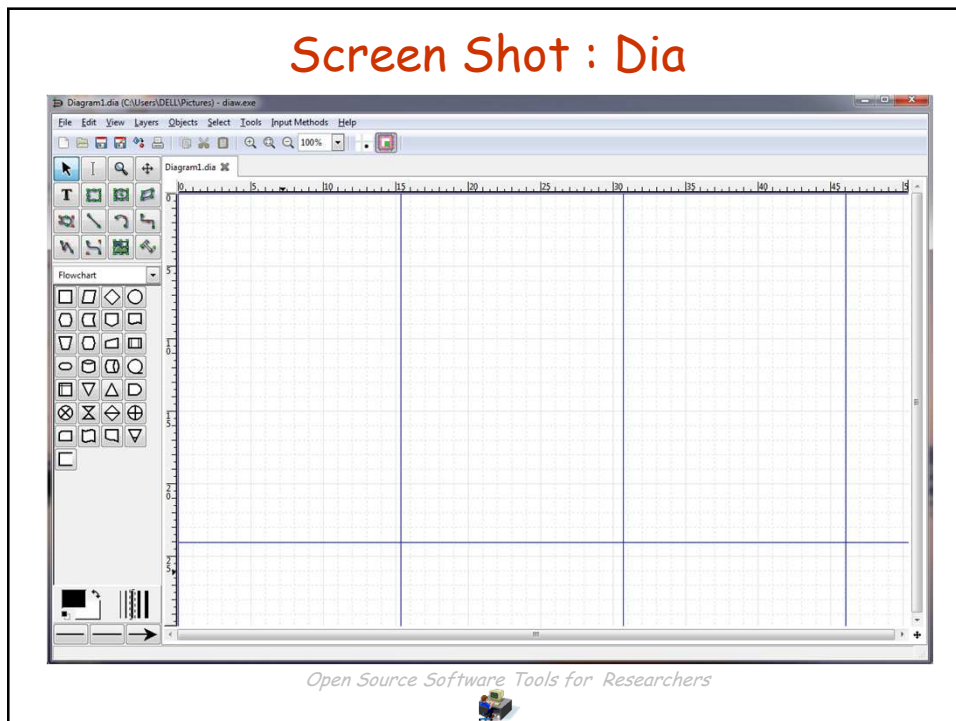



*Use of Open Source Software in Research*

## Screen Shot : Inkscape

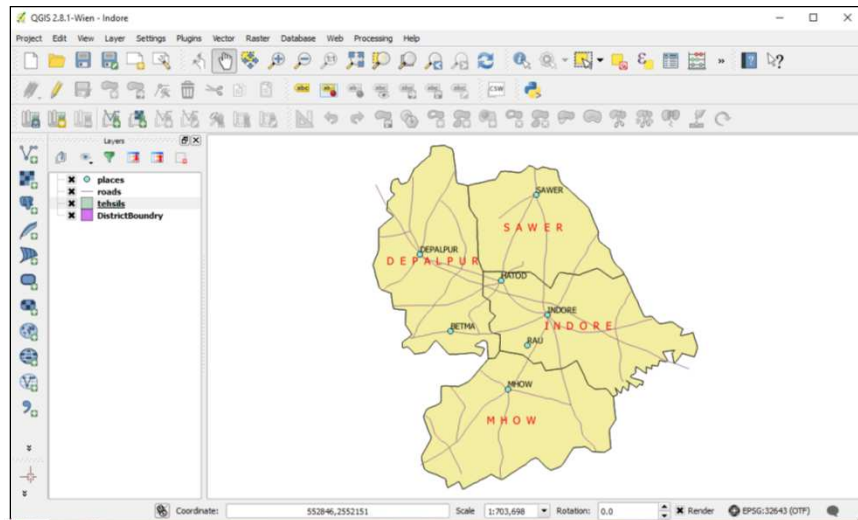


## Screen Shot : Dia





## FOSS for Map Creation and Spatial Analysis



<http://www.qgis.org/en/site/>

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## FOSS alternatives of MatLab

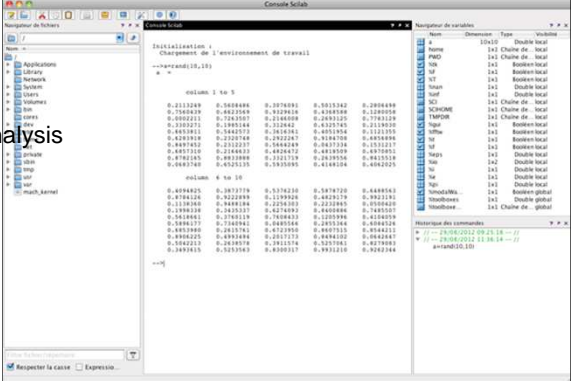
- **SciLab** — numerical computational package. It can be used for signal processing, statistical analysis, image enhancement, fluid dynamics simulations, numerical optimization, and modeling, simulation of explicit and implicit dynamical systems and symbolic manipulations.
- **GNU Octave** — is a high-level interpreted programming language, primarily intended for numerical computations.
- **Sage** — is mathematical software with features covering many aspects of mathematics,
- **FreeMat** — numerical computing environment and programming language licensed under GNU GPL, similar to MATLAB and GNU Octave. In addition to supporting many MATLAB functions and some IDL functionality

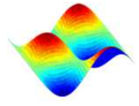
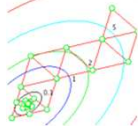
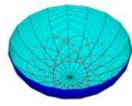

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## Features of SciLab




Maths & Simulation  
 2-D & 3-D Visualization  
 Optimization  
 Statistics  
 Control System Design & Analysis  
 Signal Processing  
 Application Development





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## FOSS for Documentation

- LibreOffice - Office productivity software suite.  It can export the files to Pdf format.
- LaTeX - LaTeX is a high-quality typesetting system, with features designed for the production of technical and scientific documentation. LaTeX is the de facto standard for the communication and publication of scientific documents.
- PDFCreator – Potrable document file creator. 
- Google Docs – Web based application for documents and spreadsheets. 

 <https://www.libreoffice.org>  
 <http://www.pdfforge.org/pdfcreator>

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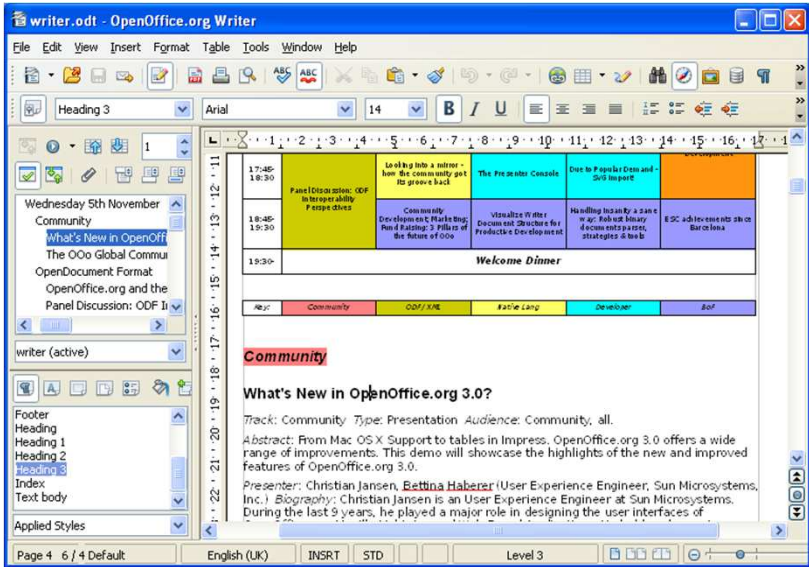
## OpenOffice/LibreOffice

-  **Writer** : word processor
-  **Calc** : spreadsheet
-  **Impress** : Multimedia presentation
-  **Base** : Database
-  **Draw** : Drawing (Simple to 3D)
-  **Math** :Mathematical equations (Direct typing/ GUI)

<http://www.openoffice.org/product/index.html>  
[http://www.openoffice.org/documentation/conceptualguide/conceptual\\_guide\\_OOo\\_3\\_ebook.pdf](http://www.openoffice.org/documentation/conceptualguide/conceptual_guide_OOo_3_ebook.pdf)

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## Screenshot OpenOffice (Write)



The screenshot shows the OpenOffice Writer interface. The main document content includes a table of contents for a community event and a section titled "What's New in OpenOffice.org 3.0?".

17:45-18:30	Panel Discussion: ODF interoperability Freeze slides	Leading into a mirror-how the community got its groove back	The Presenter Cancels	Out to Popular Open and - SUI Impact	
18:45-19:30	Community Development: Making the Panel Planning 3 Pillars of the Future of Oo	Visualize Titles	Document Developer for Products Development	Handling local by a same way: Roll out Many documents, strategies & tools	ESC address issues like Barcelona
Welcome Dinner					
19:30					

**Community**

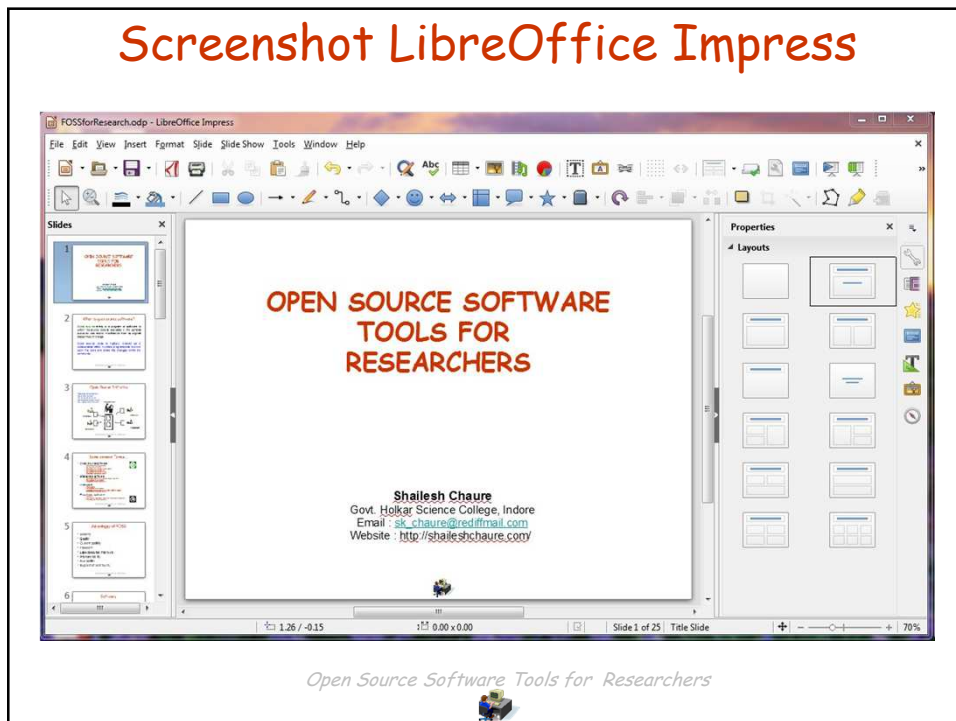
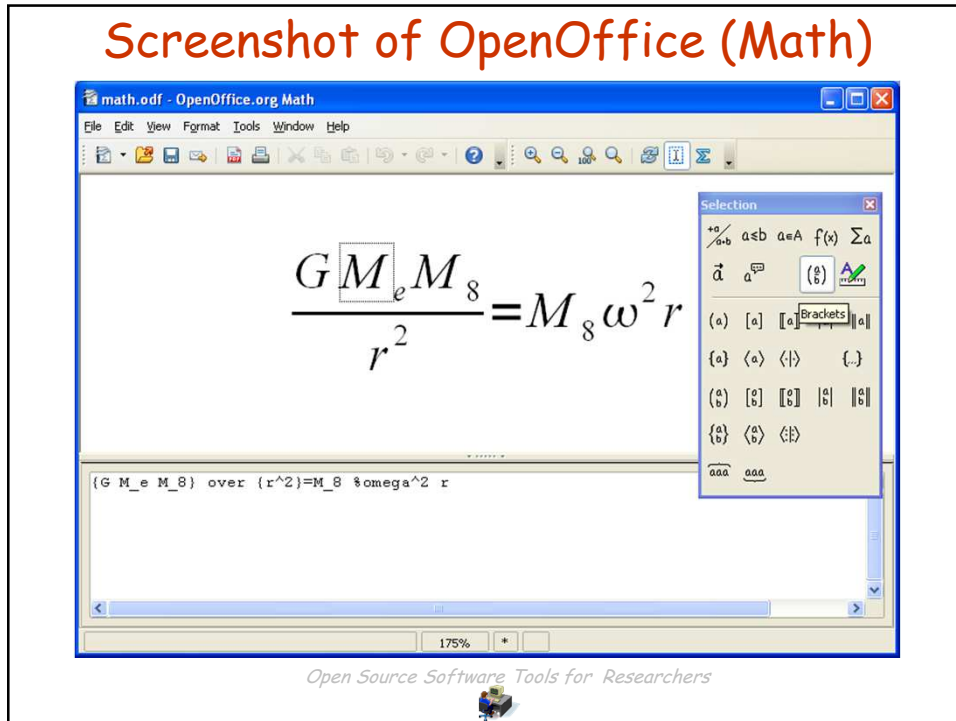
**What's New in OpenOffice.org 3.0?**

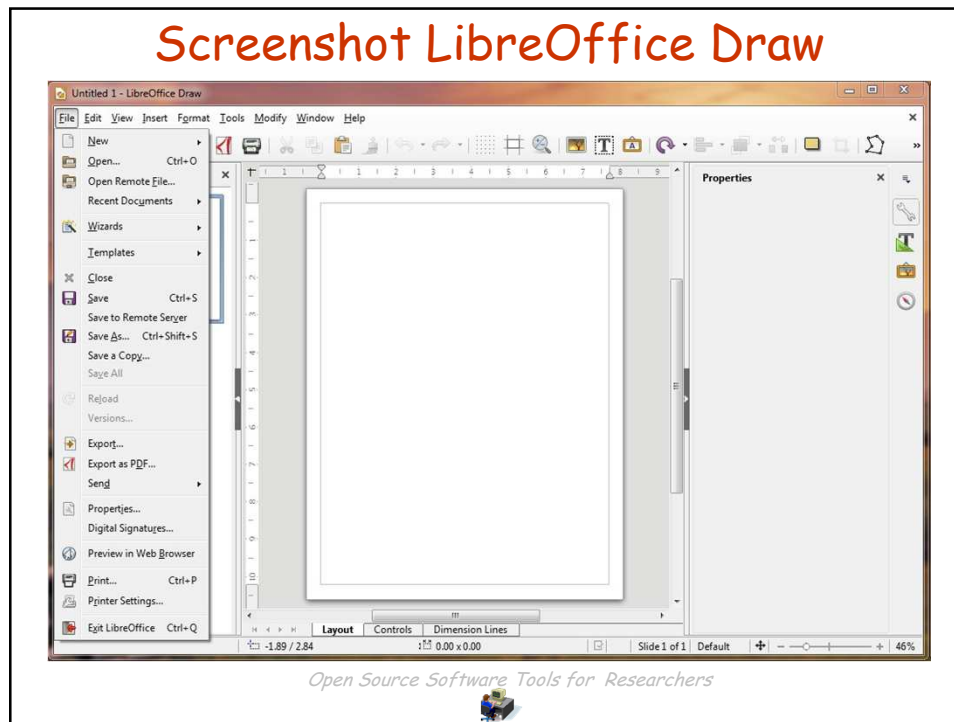
Track: Community Type: Presentation Audience: Community, all.

Abstract: From Mac OS X Support to tables in Impress, OpenOffice.org 3.0 offers a wide range of improvements. This demo will showcase the highlights of the new and improved features of OpenOffice.org 3.0.

Presenter: Christian Jansen, Bettina Haberer (User Experience Engineer, Sun Microsystems, Inc.) Biography: Christian Jansen is an User Experience Engineer at Sun Microsystems. During the last 9 years, he played a major role in designing the user interfaces of

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## FOSS for Image Editing

- **Gimp** - image editor for scientist, graphic designer, photographer and illustrator.
- **Gimpshop** - good alternative of photoshop.
- **PicMonkey** – Web based image editor.
- **LightZone** – digital darkroom software.

 <http://www.gimp.org/downloads/>  
<https://www.gimpshop.com/>

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## GIMP Screenshot



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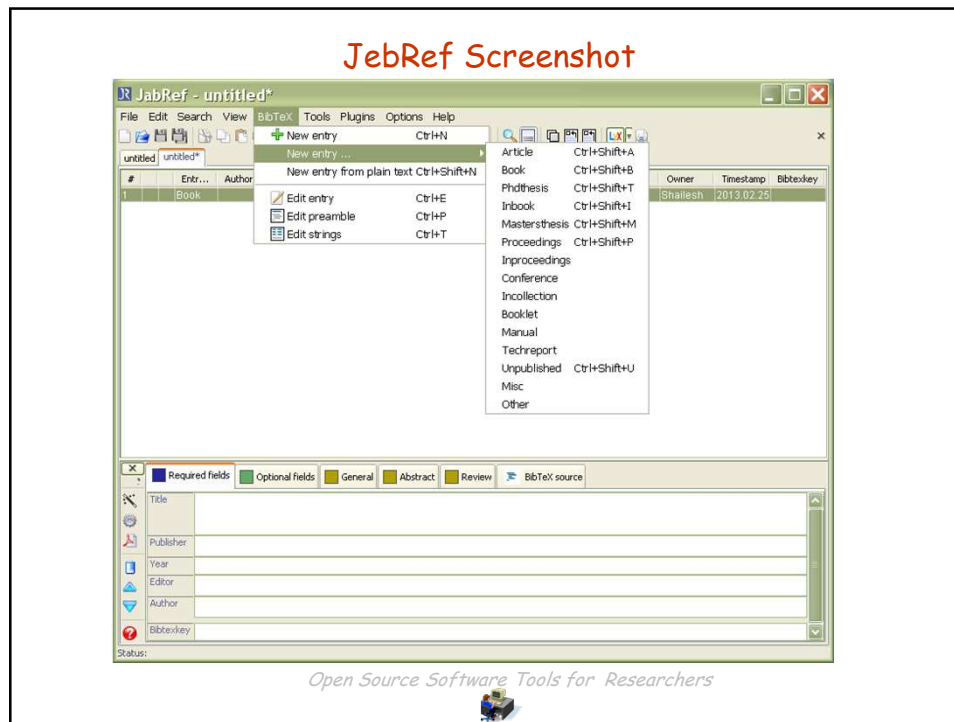
## FOSS for Reference Management

- **JabRef** – Bibliography reference manager
- **Bibus** – Multi-user bibliography and reference manager
- **Zotero** - Acts like a personal research assistant to search material online and stores any file, site and sync.




<http://jabref.sourceforge.net/>  
<http://bibus-biblio.sourceforge.net/wiki/index.php/Installation>  
<http://www.zotero.org/>

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## Limitations of FOSS

- **Learning curve** – Linux learning takes some time. Learning linux is definitely worth your time. 
- **Equivalent programmes** – FOSS equivalent software are not available for many applications.
- **More technical ability needed** – if you plan to use OS. Using application software is simple.
- **Not all hardware compatible** – support for new hardware may not be available.

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## Remote Desktop Software

- **Ultra VNC** - This is a free tool developed for systems based on Windows to remotely access other systems. You can completely work on another remote system once the connection is established.
- **Chrome Remote Desktop** - This free tool is available as an extension for Google Chrome browser, accessible on any operating system running it. The add-on lets users remotely access any desktop and its contents right from their browser.



(<https://support.google.com/chrome/answer/1649523?hl=en>)

- **AMMY Admin** - The tool, unlike heavy remote desktop software, comes in as a tiny application, under 1MB. You can also perform actions like file transfers and live chat in addition to remotely connecting to the other system.



(<http://www.ammy.com/en/>)

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Keep on learning, working & sharing.

Thank you!



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