

# ArcheOS v. 4, the new release of the Archaeological Operating System



A.Bezzi, L.Bezzi, D.Francisci, F.Furnari, R.Gietl



acronym of **ARCHEological Operating System**

GNU/Linux live distribution built for archaeological purposes

Actually the 4<sup>th</sup> version Caesar is based on Debian 6.0

Released by Arc-Team s.n.c. under GPL license

Freely download from <http://www.archeos.eu/>

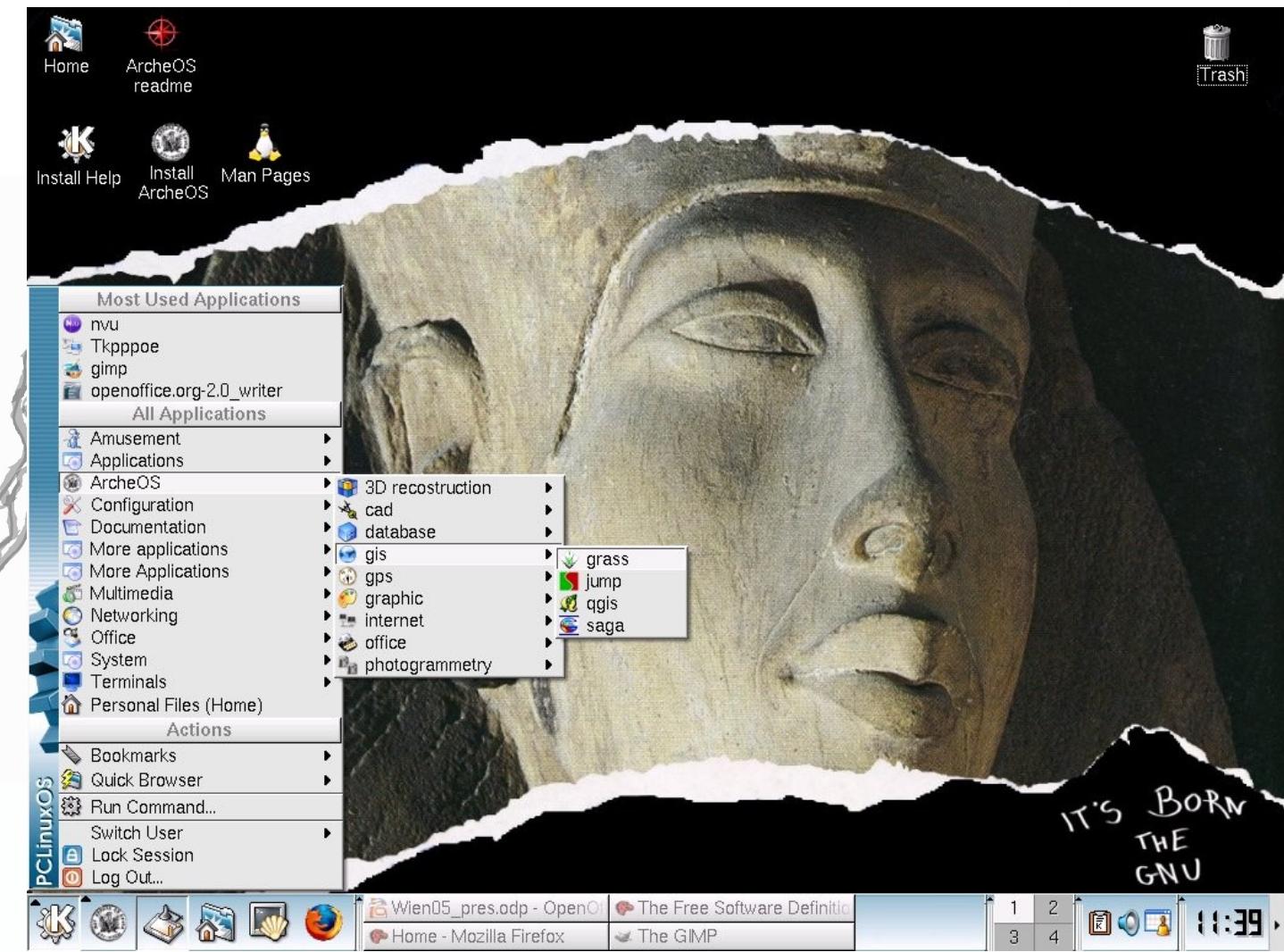
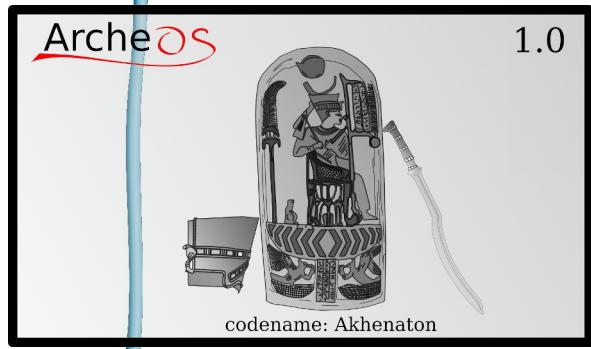


### VERSION 1: AKHENATON

Year 2005

Based on:  
PCLinuxOS 0.92

desktop manager:  
KDE 3

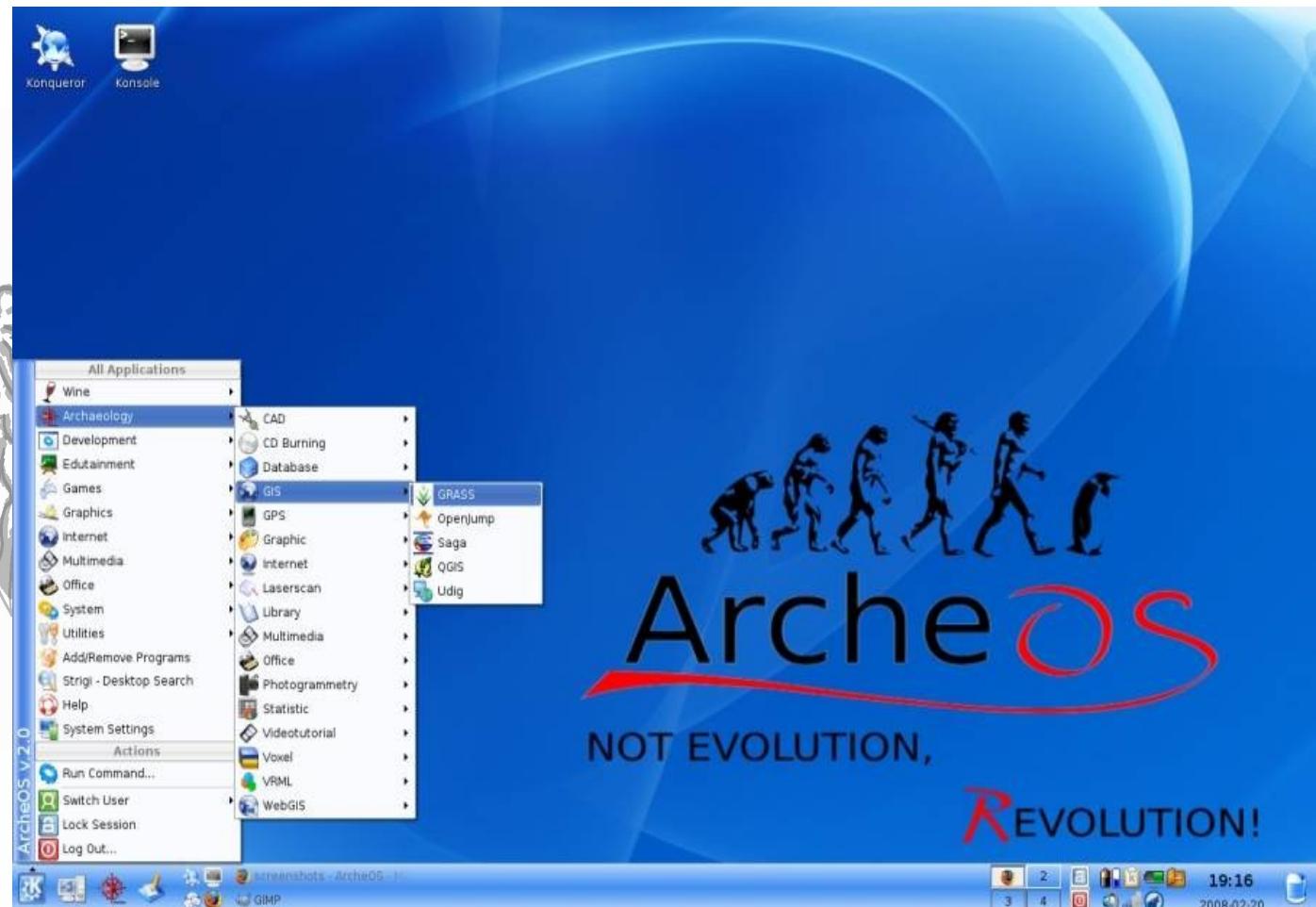
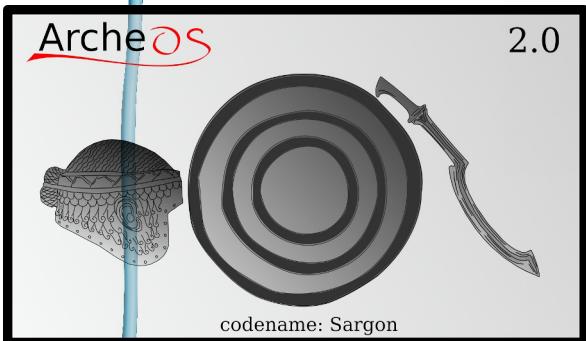


### VERSION 2: SARGON

Year 2007

Based on:  
KUBUNTU 7.10

desktop manager:  
KDE 3

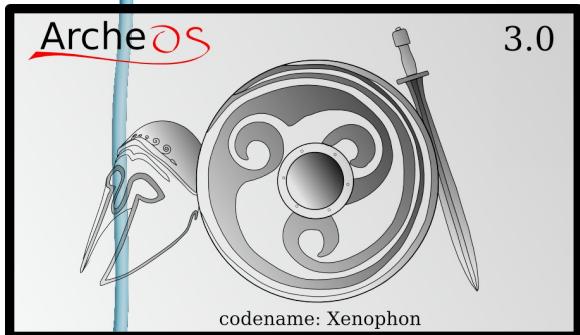


### VERSION 3: XENOPHON

Year 2009

Based on:  
KUBUNTU 9.04

desktop manager:  
KDE 4

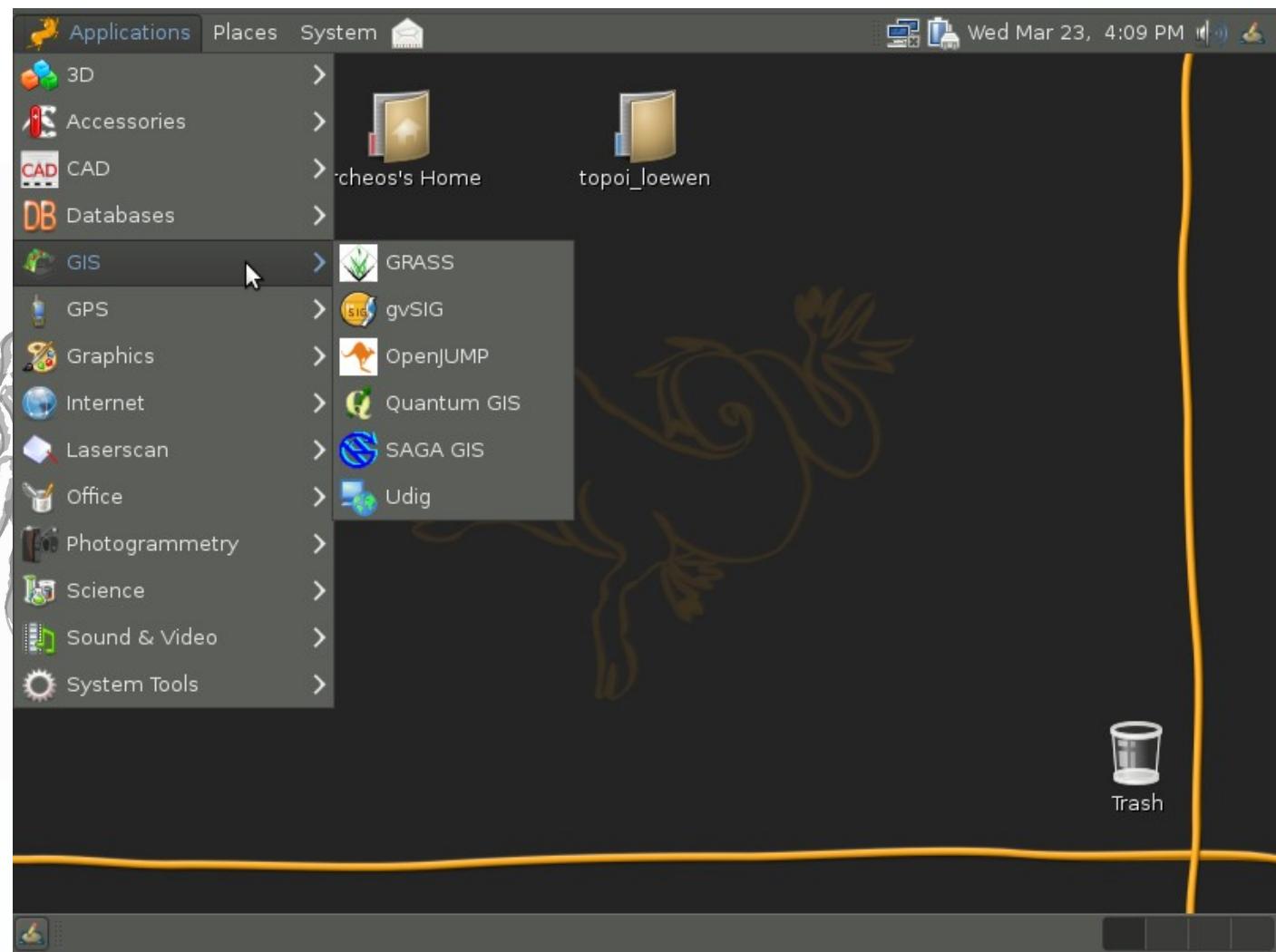
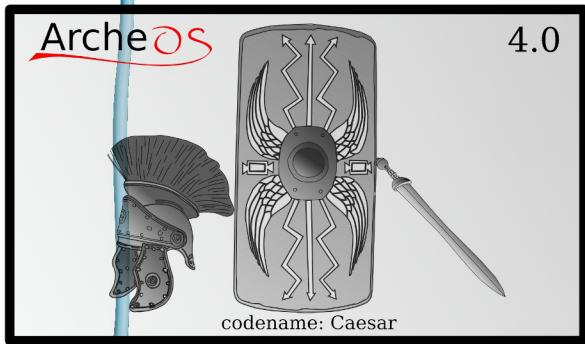


### VERSIONE 4: CAESAR

Year 2011

Based on:  
DEBIAN Squeeze

desktop manager:  
GNOME 2.30.2



Download the ISO image

Burn it into a DVD

Try it live without make changes on your computer (in live-mode it use only RAM memory)

If you choose to install it, you can set up a DUAL BOOT configuration (e.g. Windows + ArcheOS)

Then you can SHARE IT  
Increase the COMMUNITY

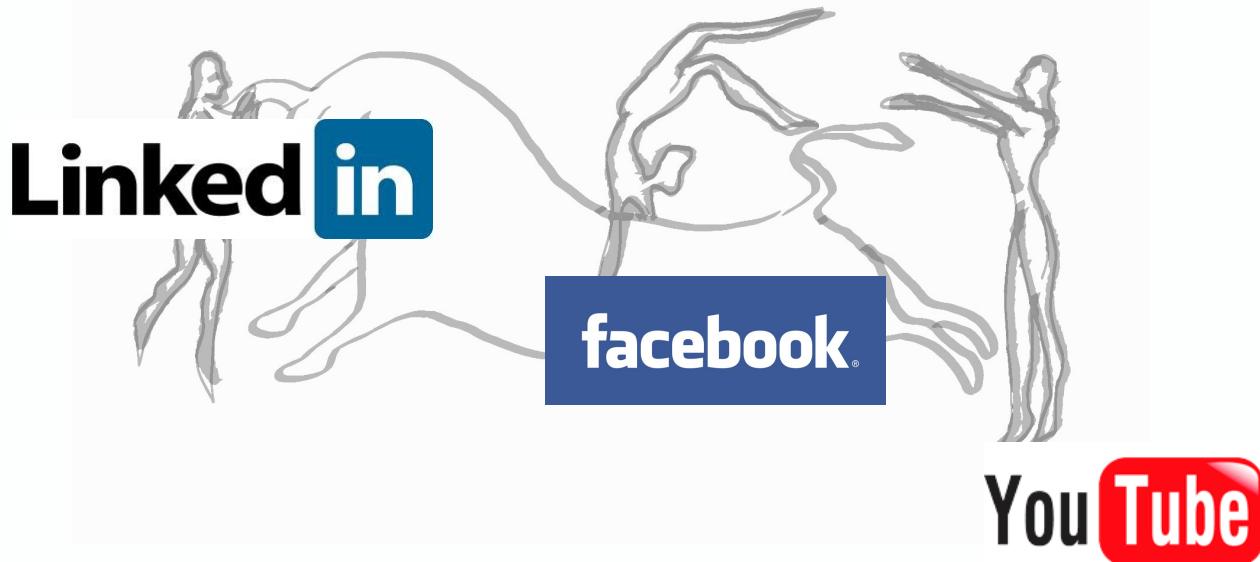


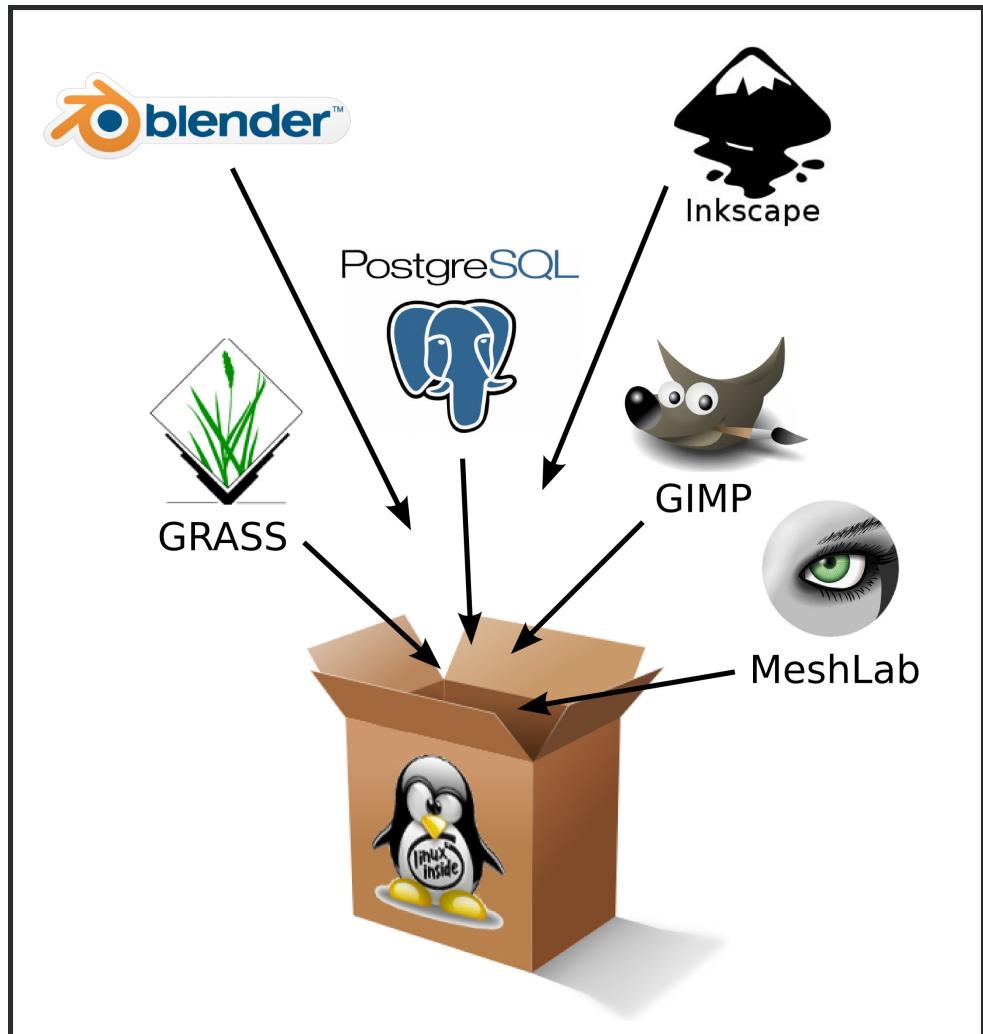


Web site: <http://www.archeos.eu/>

Mailing list: [-archeos-dev@lists.linux.it](mailto:-archeos-dev@lists.linux.it)  
[-archeos@lists.linux.it](mailto:-archeos@lists.linux.it)

Tutorial project: <http://vai.uibk.ac.at/dadp/>





Debian Based

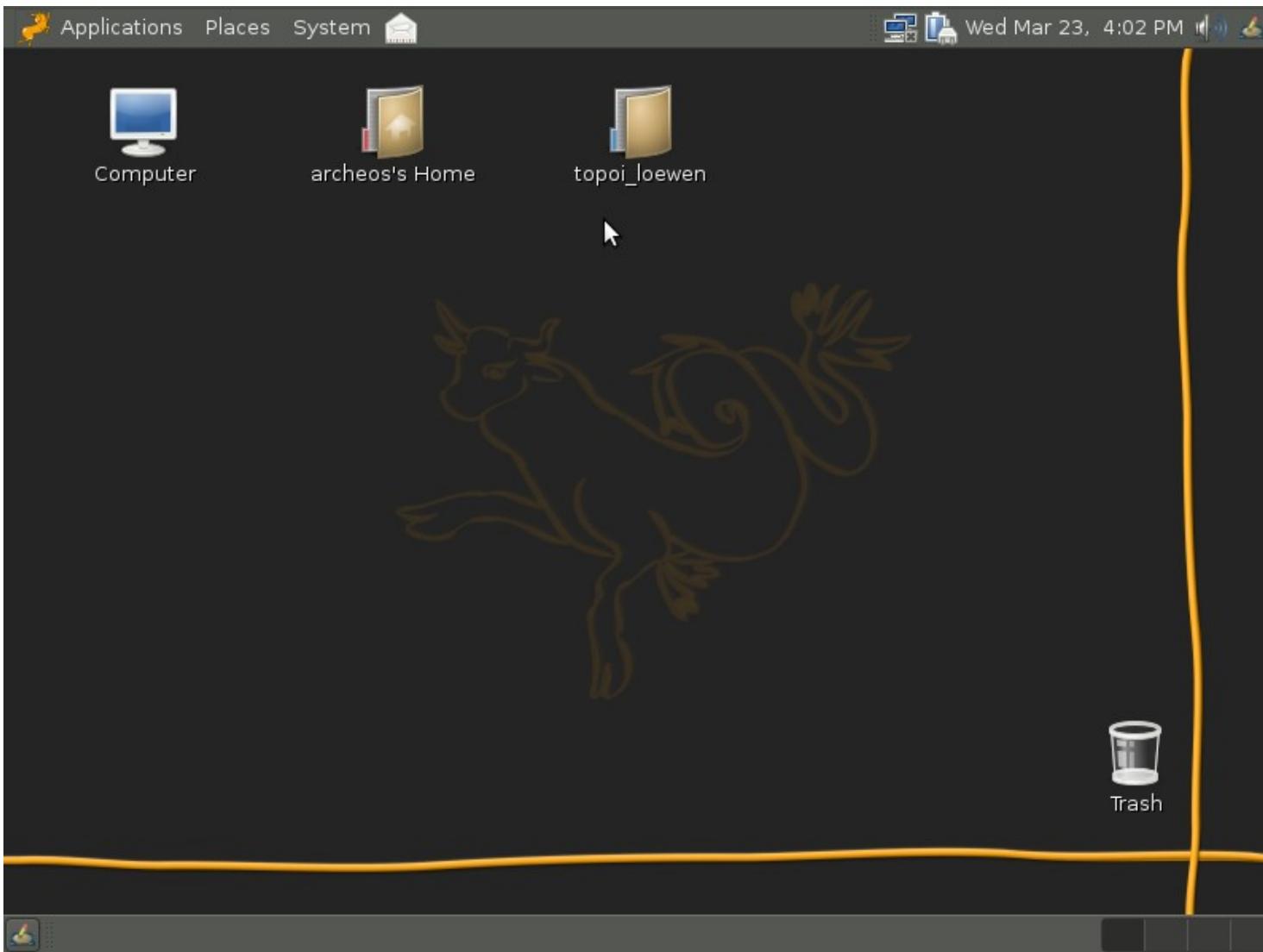
GNOME Desktop

Different software ordered in section:



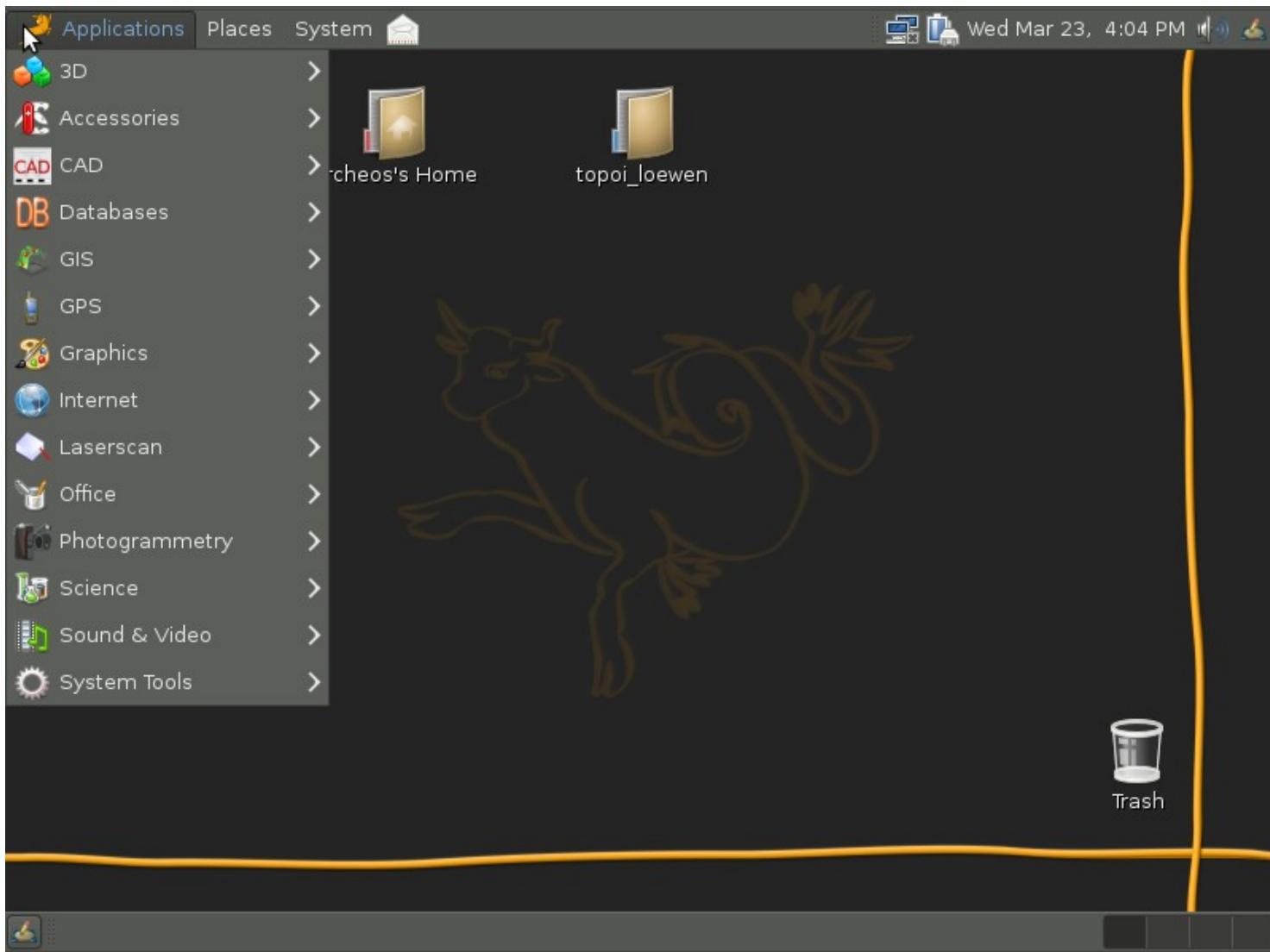
- 3D
- CAD
- DATABASE
- GIS
- GPS
- GRAPHICS
- INTERNET
- LASERSCAN
- OFFICE
- PHOTOGRAMMETRY
- SCIENCE

### Archeos Desktop

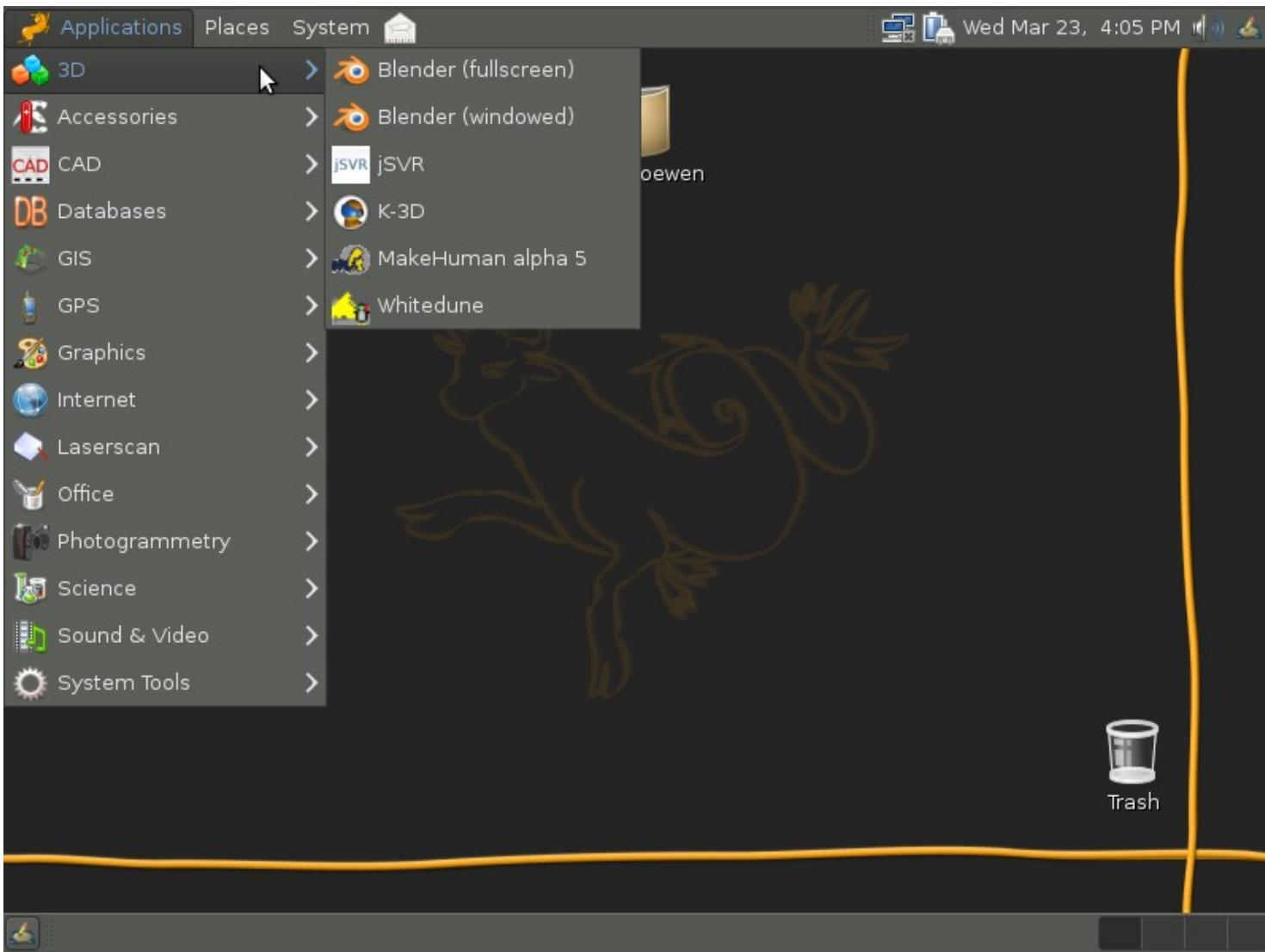




### Archeos Menu



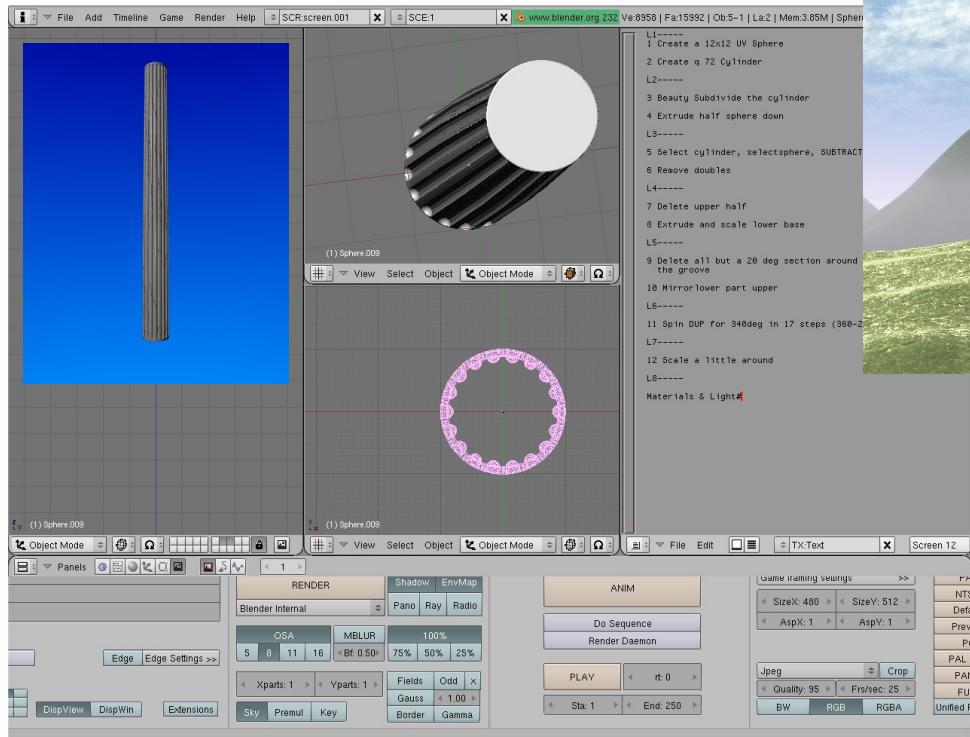
### 3D Menu



## 3D Menu

### BLENDER

is the free open source 3D content creation suite, available for all major operating systems under the GNU General Public License.



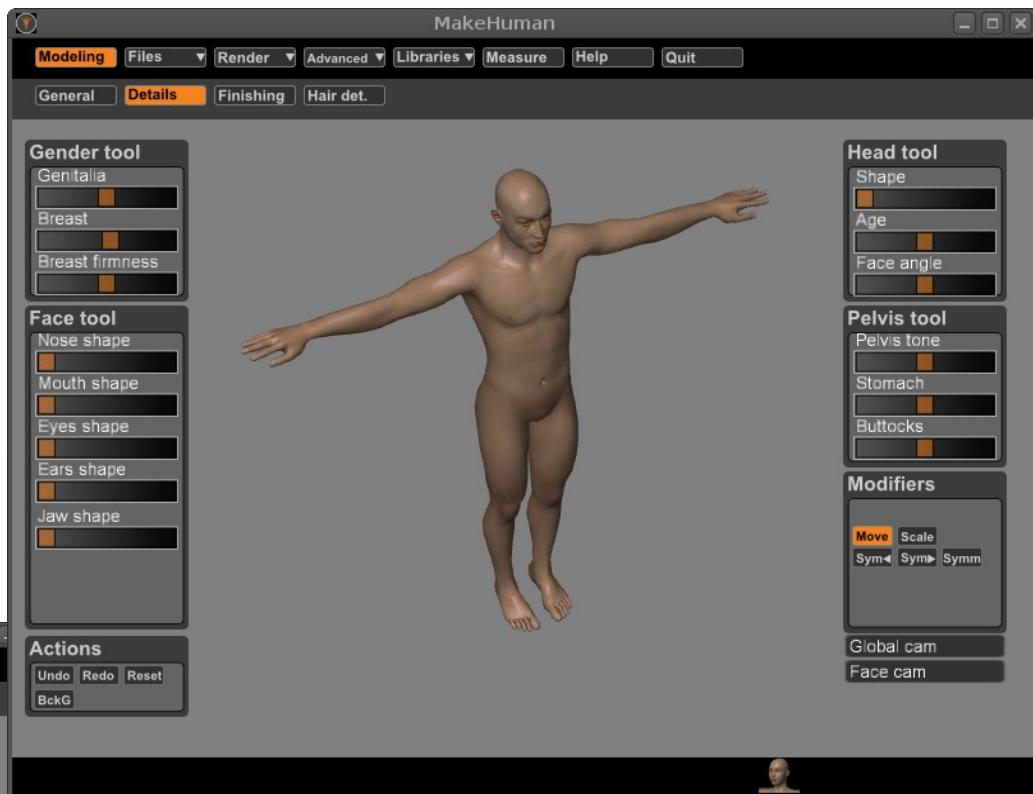
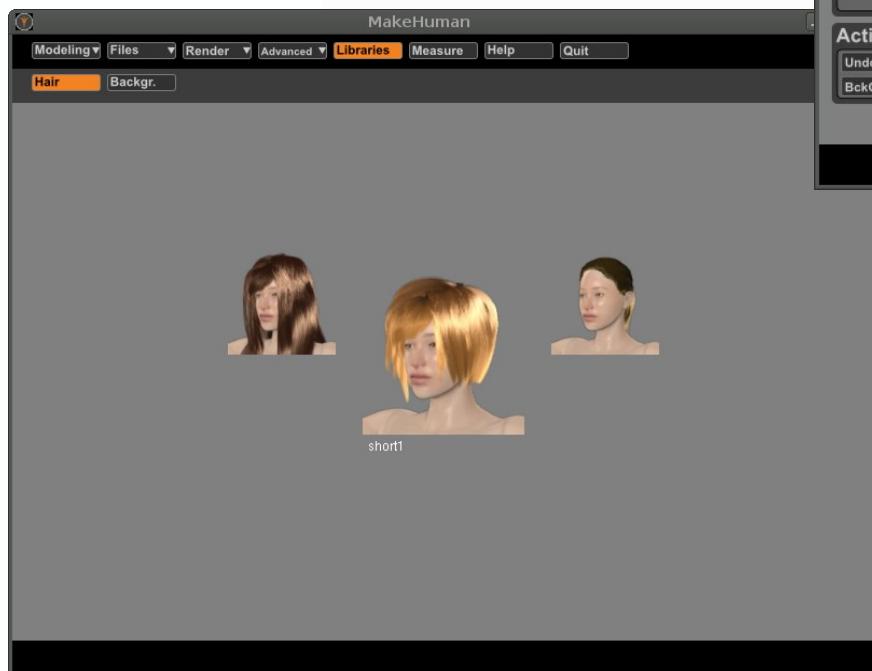
Screenshots kindly offered by **S. Selleri** (2004)



<http://www.blender.org/>

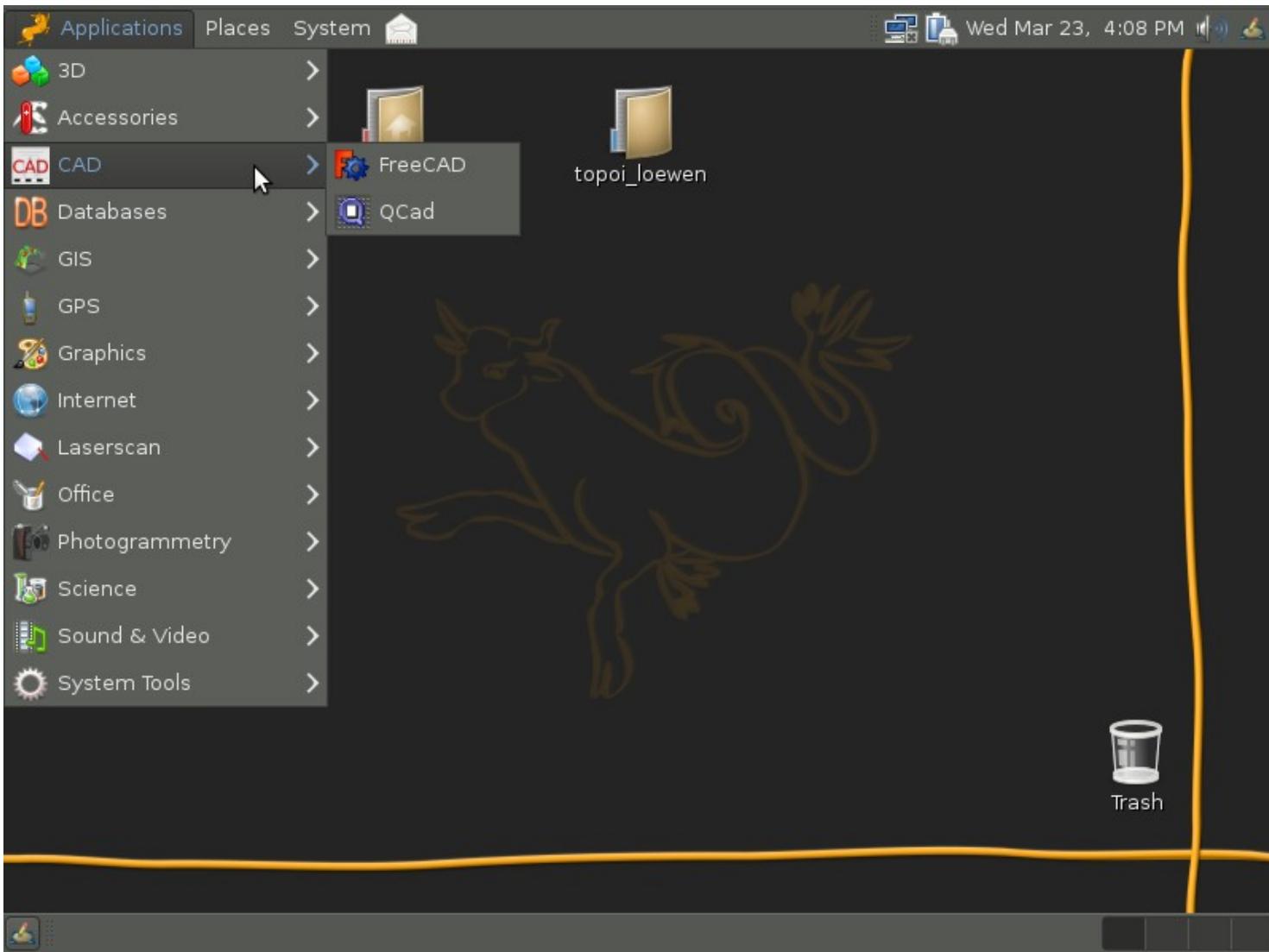
### MAKEHUMAN

is an open source (so it's completely free), innovative and professional software for the modelling of 3-Dimensional humanoid characters.



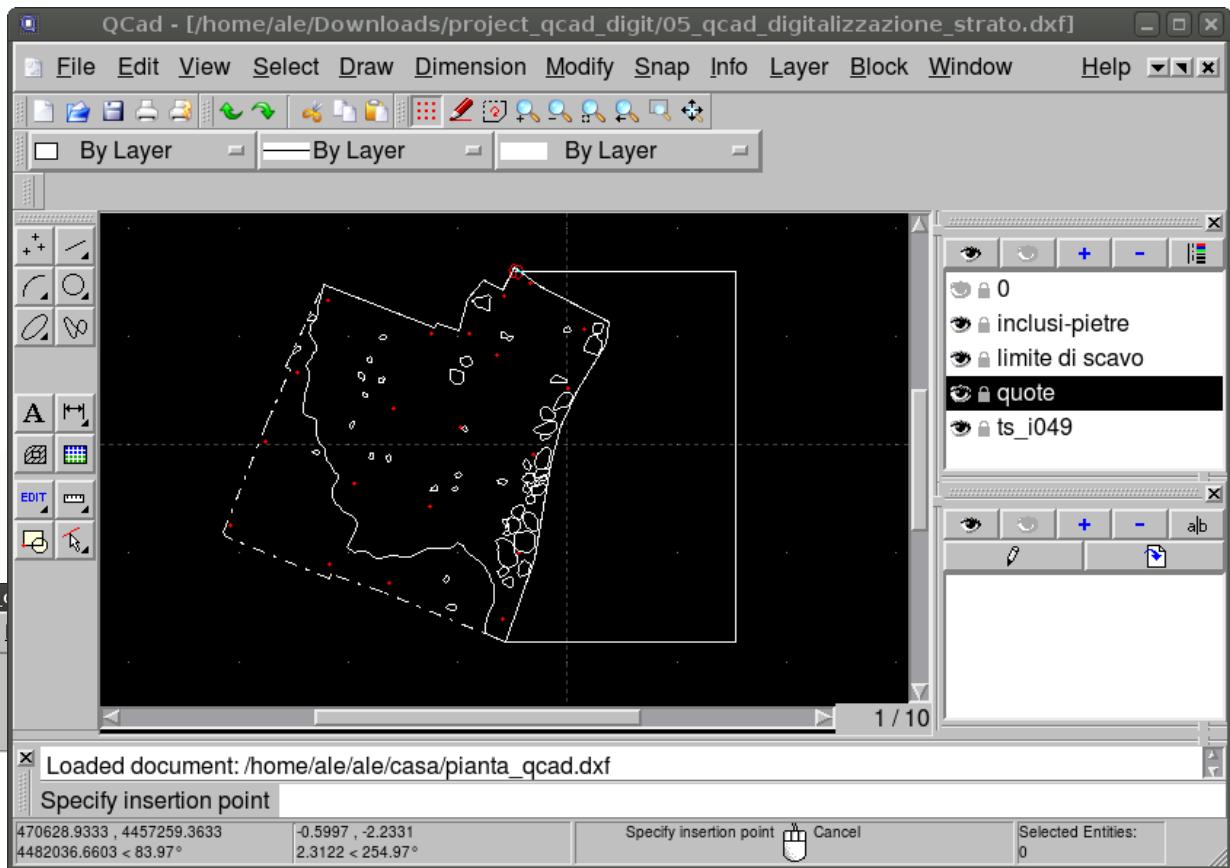
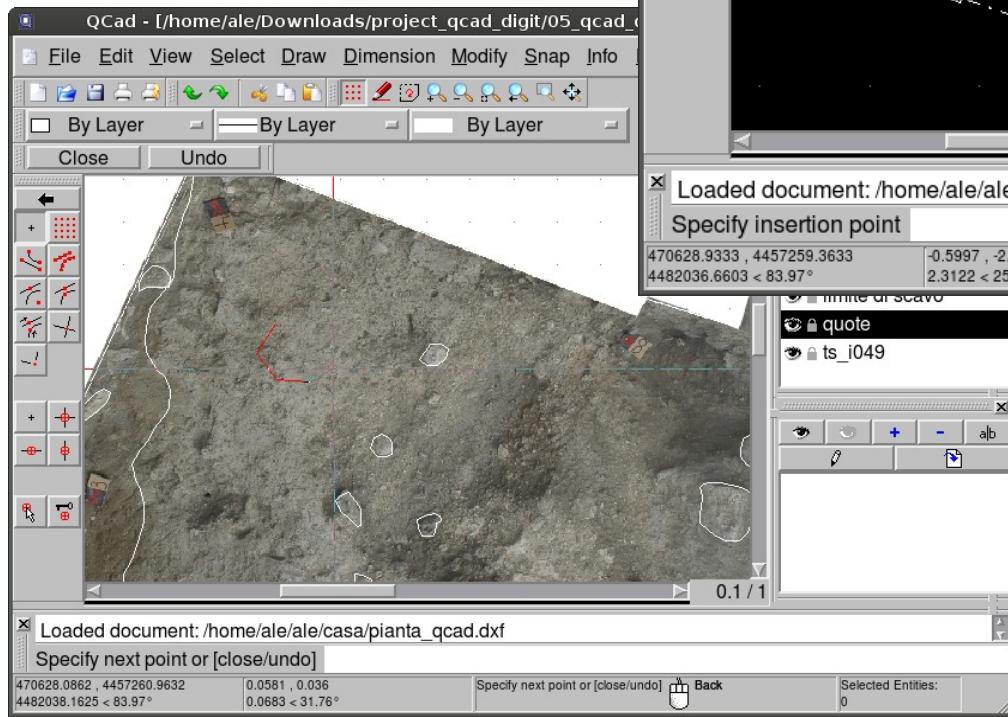
<http://www.makehuman.org/>

### CAD Menu



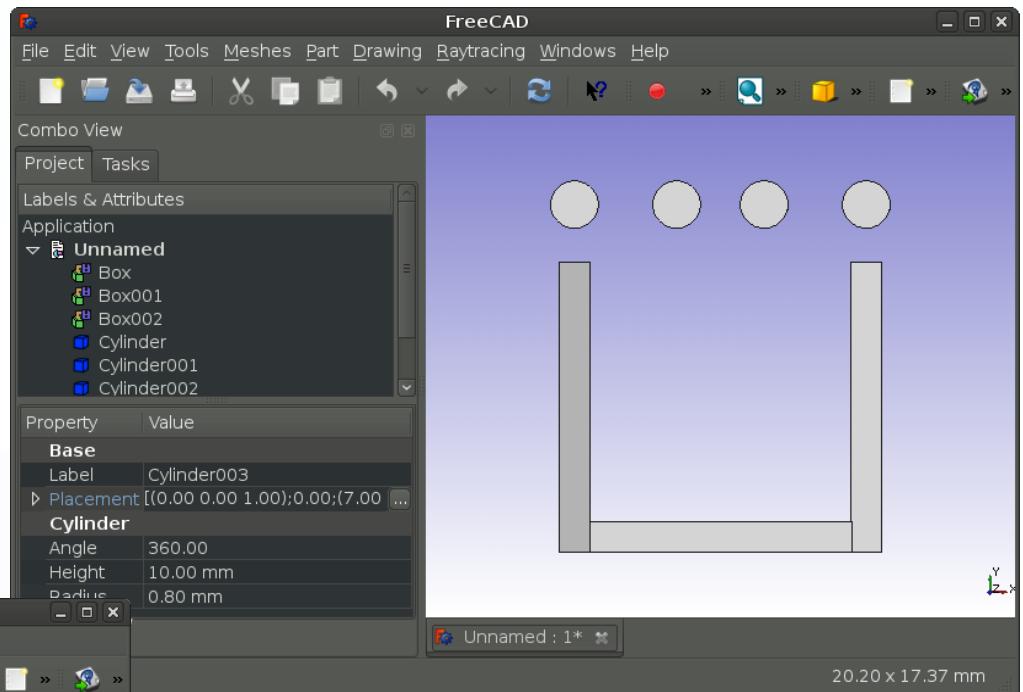
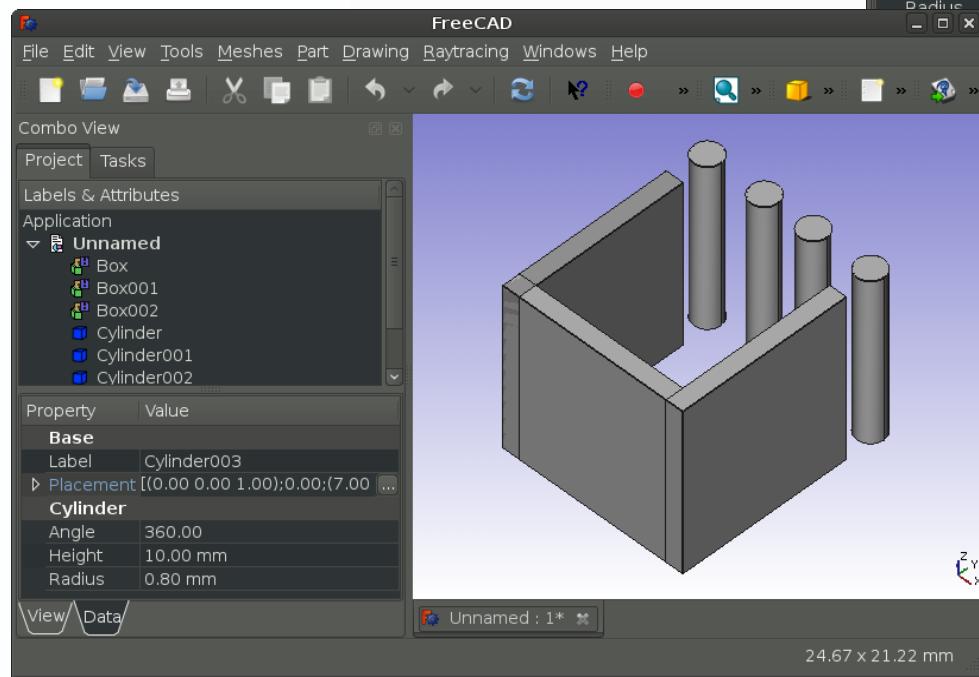
### QCAD

is an application for computer aided drafting in two dimensions (2d).



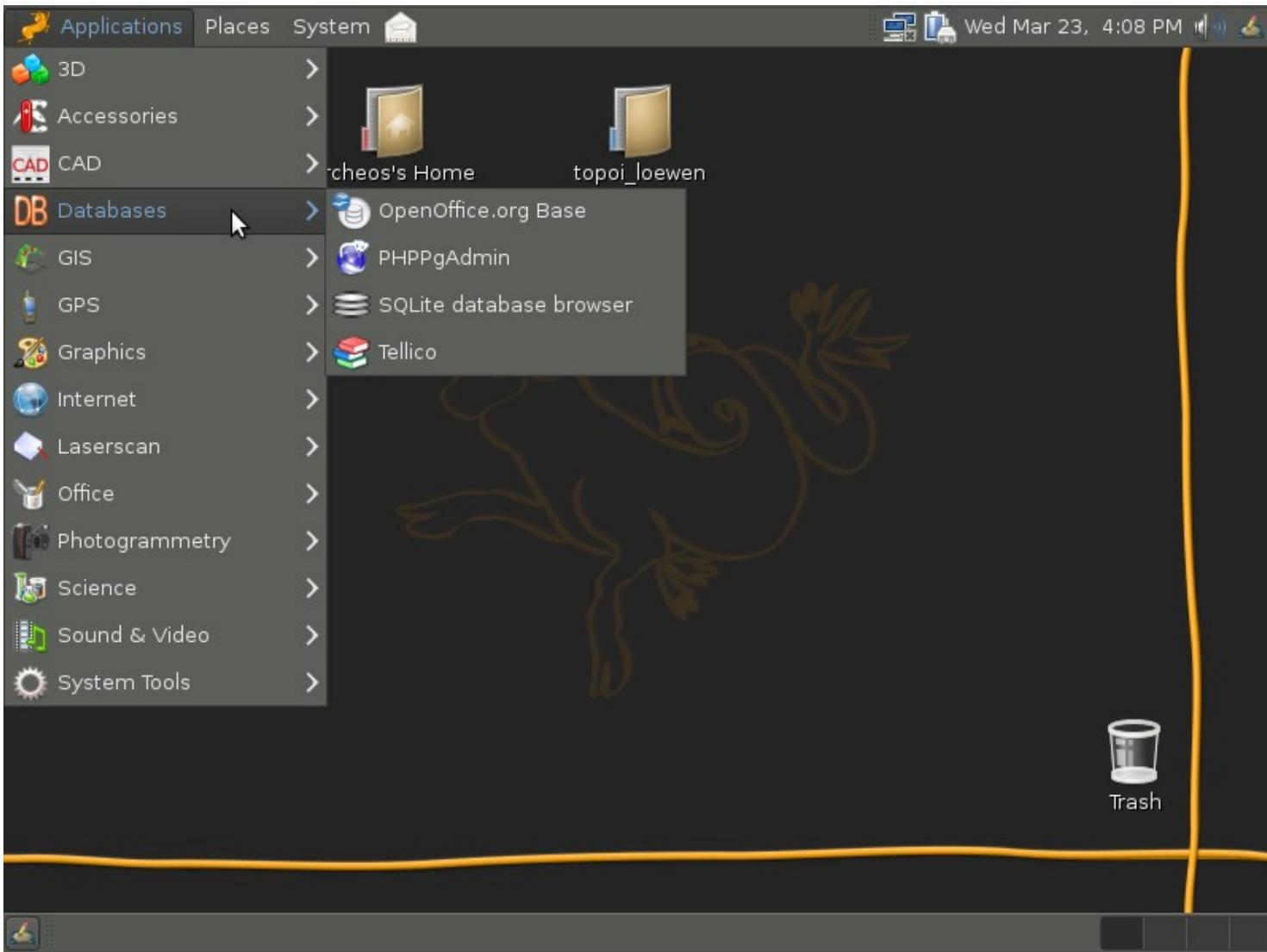
### FREECAD

is an Open Source 3D CAD/CAE program, based on OpenCascade, QT and Python.



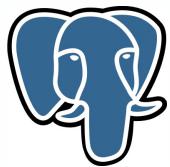
<http://sourceforge.net/projects/free-cad/>

## Database Menu

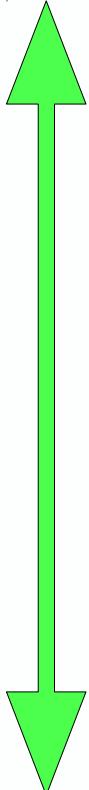


**OpenOffice Base**  
is a fully featured  
desktop database  
management  
system

The screenshot displays two windows of the OpenOffice.org suite. The left window, titled 'schedaUS - OpenOffice.org Base', shows the Database interface with a sidebar for 'Database' (Tabelle, Ricerche, Formulari, Rapporti) and a central area for 'Attività' (Crea formulario, Usa procedura). The right window, titled 'scheda-fronte(sola lettura) - OpenOffice.org Writer', shows a document with a table for 'N. CATALOGO GENERALE' and 'N. CATALOGO INTERNAZIONALE'. The table includes fields for LOCALITA' (ROVER (CLOZ)), ANNO (2005), AREA, SAGGIO (A), SETTORE/I (est), QUADRATO/I, QUOTE, and UNITA' STRATIGR. (33). It also includes sections for PIANTE (plan\_33.dxf, A-AI), PROSPETTI (nord), FOTO (imm\_21), and TABELLE MATERIALI (RA, N). Below the table, there are sections for DEFINIZIONE E POSIZIONE, CRITERI DI DISTINZIONE, and MODO DI FORMAZIONE. The bottom of the window shows a table for GEOLOGICI, ORGANICI, and ARTIFICIALI components, listing calcare, scapoli lapidei, ossa frustuli carboniosi, and frammenti ceramici bronzo. The bottom section also includes CONSISTENZA (compatta), COLORE, MISURE, STATO DI CONSERVAZIONE (discreto), and DESCRIZIONE (Strato tabulare costituito da scapoli lapidei e calci di dimensioni centimetriche e decimetriche e di forme differenti. Si pone su un allettamento di limo-argilloso steso in maniera uniforme e planare).



PostgreSQL is a powerful, open source object-relational database system



**PgAdmin**

The screenshot shows the PgAdmin III interface. On the left is the 'Esploratore degli oggetti' (Object Explorer) tree view, which includes sections for Cataloghi, Schemi, Tabelle, and other database objects. In the center, there's a table editor window titled 'Edit Data - mtb\_lotto14 (localhost:5433) - mtb\_lotto14 - scheda\_ug'. The table has columns like id, Nome, OID, Proprietario, and pg\_default. A SQL query pane at the bottom shows the creation of the 'scheda\_ug' table.



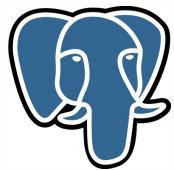
PostGIS adds support for geographic objects to the PostgreSQL object-relational database

**Open Office BASE**

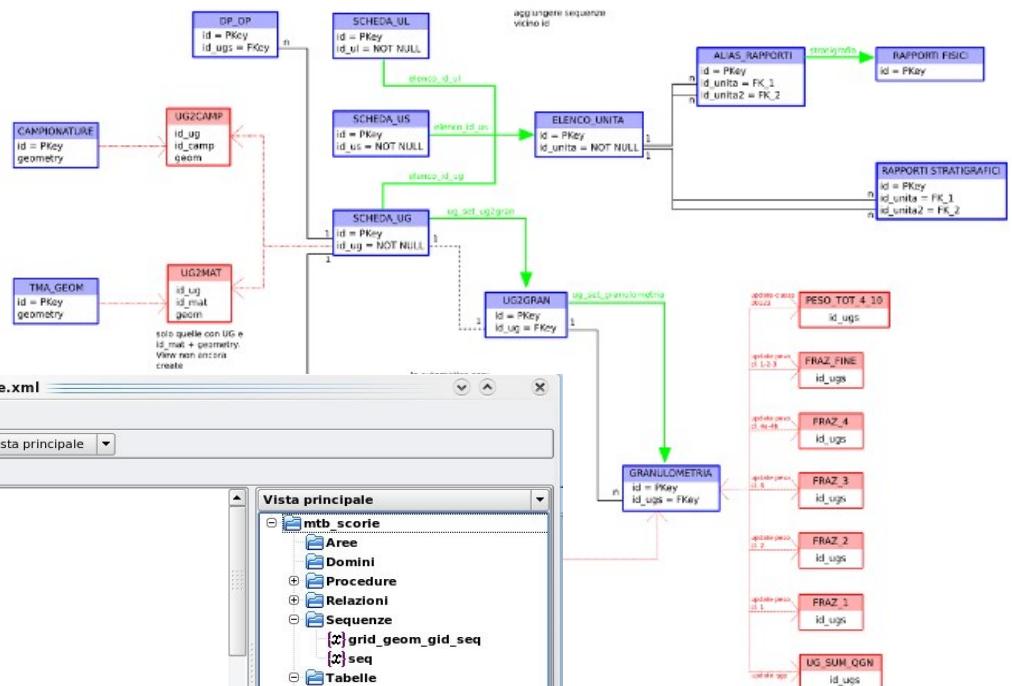
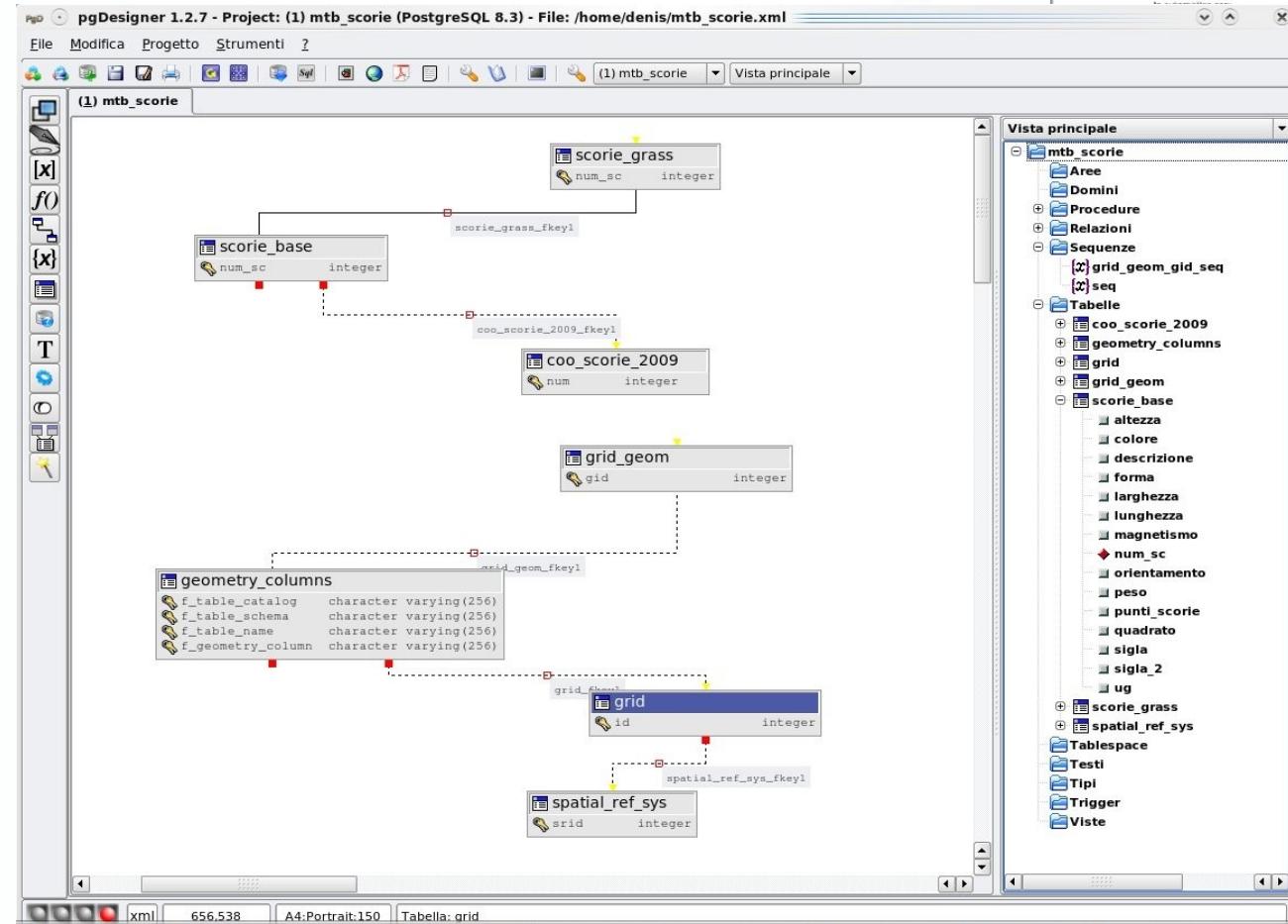
The screenshot shows the OpenOffice.org Base interface. On the left is a form for 'Analisi granulometrica' (Granulometry Analysis). The main area displays a table with data for various classes (CL. 10 to CL. 01) including values for peso\_lab (gr), peso\_scavo (gr), freq. (%), qgn (gr/mm), and qgp (%). The table also lists codes for classes (e.g., 10, 09, 08, 07, 06, 05, 04b, 04a, 04, 03e, 03d, 03c, 03b, 03a, 03, 02d, 02c, 02b, 02a, 01b, 01a, 01, 00123).

**PhpPgAdmin**

The screenshot shows the PhpPgAdmin interface. At the top, it says 'PostgreSQL 8.3.12 in esecuzione su localhost:5433 - Utente "postgres" connesso il 13 Ott 2011 - 4:12PM'. Below is a table titled 'Visualizza' (View) with columns for Azioni (Actions), sigla (code), num\_sc (number of pieces), descrizione (description), lunghezza (length), larghezza (width), and altezza (height). A detailed view of a specific row (M-VB-44) is shown below the table, listing dimensions and descriptions for individual pieces.



### PgDesigner



Software for  
building the  
structure of the  
database  
postgres

SQLite  


SQLite is the most widely deployed SQL database engine in the world

```
denis : spatialite
File Modifica Visualizza Scorrimento Segnalibri Impostazioni
denis@acer:~$ spatialite /home/denis/progetti/lana/database
SpatiaLite version ...: 2.4.0 Supported Extensions:
- 'VirtualShape' [direct Shapefile access]
- 'VirtualDbf' [direct DBF access]
- 'VirtualText' [direct CSV/TXT access]
- 'VirtualNetwork' [Dijkstra shortest path]
- 'RTree' [Spatial Index - R*Tree]
- 'MbrCache' [Spatial Index - MBR cache]
- 'VirtualFDO' [FDO-OGR interoperability]
- 'SpatiaLite' [Spatial SQL - OGC]
PROJ.4 version .....: Rel. 4.6.0, 21 Dec 2007
GEOS version .....: 3.0.0-CAPI-1.4.1
SQLite version .....: 3.7.0.1
Enter ".help" for instructions
spatialite> 
```

**SQLite Database Browser - /home/denis/progetti/lana/database/lana\_veneto.db**

File Edit View Help

Database Structure Browse Data Execute SQL

Name	Object	Type	Schema
+ geometry_columns	table		CREATE TABLE geometry_col...
+ geometry_columns_auth	table		CREATE TABLE geometry_col...
+ lv_mat_classe_morfo	table		CREATE TABLE "lv_mat_class...
+ lv_mat_dati	table		CREATE TABLE "lv_mat_dati"...
+ lv_sito	table		CREATE TABLE "lv_sito" ("id"...
id	field	INTEGER PRIMARY KEY	
regione	field	CHARACTER VARYING (50)	
provincia	field	CHARACTER VARYING (10)	
cont_amb	field	CHARACTER VARYING (50)	
cont_arch_gen	field	CHARACTER VARYING (50)	
cont_arch_spec	field	CHARACTER VARYING (50)	
mod_rinv	field	CHARACTER VARYING (50)	
+ materiali	table		CREATE TABLE materiali (
+ sito	table		CREATE TABLE SITO (
+ spatial_ref_sys	table		CREATE TABLE spatial_ref_sy...
+ trs	table		CREATE TABLE trs (id integer...

**SQLite Database Browser - /home/denis/progetti/lana/database/lana\_veneto.db**

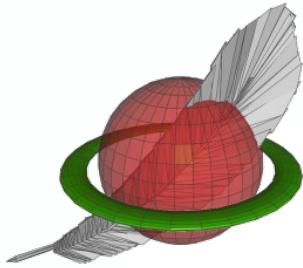
File Edit View Help

Database Structure Browse Data Execute SQL

Table: materiali New Record Delete Record

	<b>Id</b>	<b>sito</b>	<b>num_mat</b>	<b>num_inv</b>	<b>provincia</b>	<b>comune</b>	<b>loc_rinv</b>
1	115	"PD001"		1			
2	116	"PD001"	"UD1009"				
3	117	"PD001"		111			
4	118	"PD001"	"PD9817"				
5	215	"PD001"	"PD0101"	"IR4896"			

< 1 - 5 of 5 > Go to: 0



### Spatialite-GIS

RefSys: 23032 [ED50 / UTM] Scale 1:1873624 X: 525533.145 Y: 4984439

```
spatialite-gui [a GUI tool for SQLite/SpatiaLite]
Files
SELECT ROWID, "PK_UID", "index", "quad", "geom"
FROM "griglia_G"
ORDER BY ROWID
```

	ROWID	PK_UID	index	quad	geom
13	13	13	13	A13	BLOB sz=132 GEOMETRY
14	14	14	14	A14	BLOB sz=132 GEOMETRY
15	15	15	15	B14	BLOB sz=132 GEOMETRY
16	16	16	16	B13	BLOB sz=132 GEOMETRY
17	17	17	17	B12	BLOB sz=132 GEOMETRY
18	18	18	18	B11	BLOB sz=132 GEOMETRY
19	19	19	19	B10	BLOB sz=132 GEOMETRY
20	20	20	20	B9	BLOB sz=132 GEOMETRY
21	21	21	21	B8	BLOB sz=132 GEOMETRY

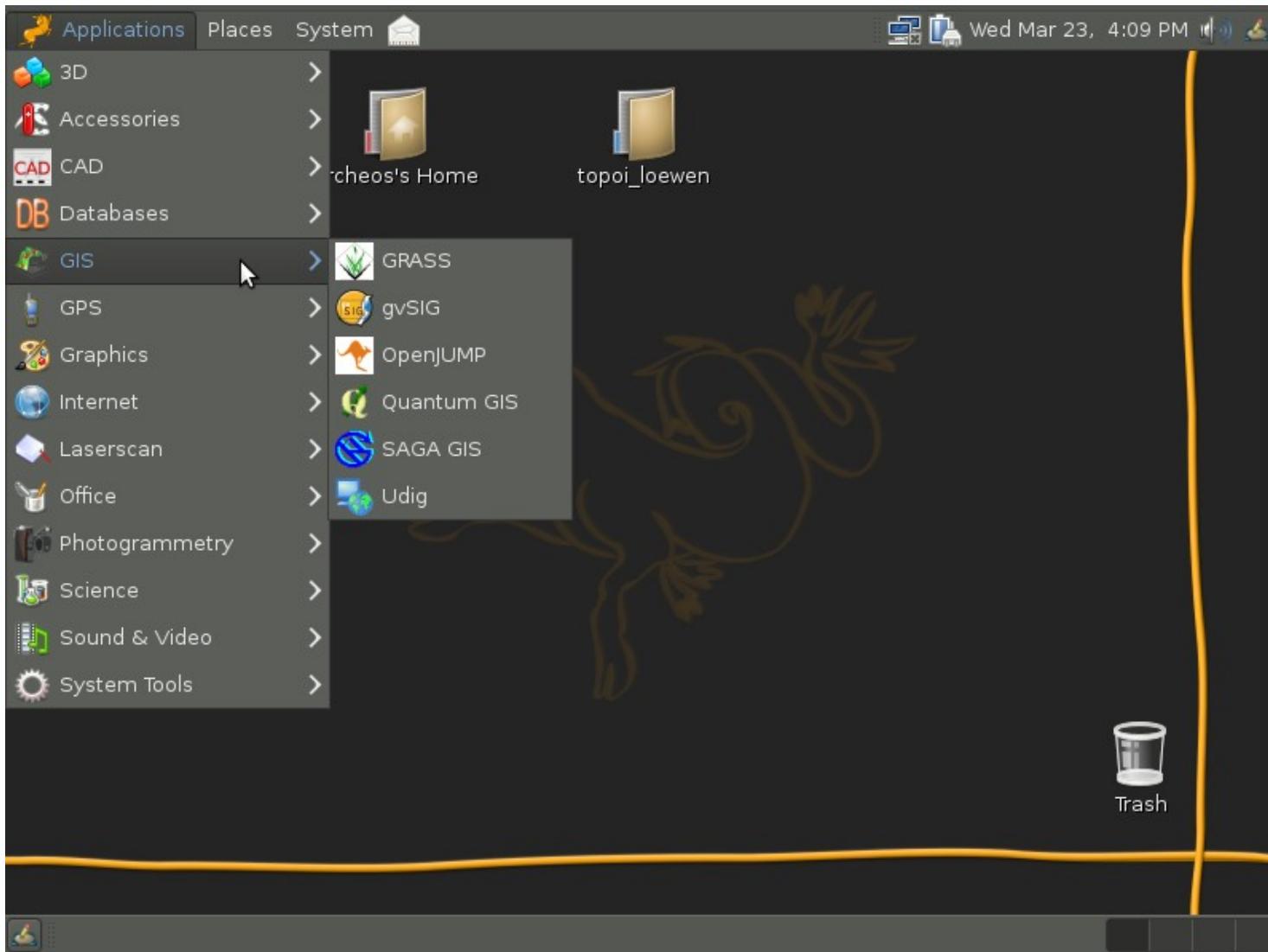
current block: 1 / 235 [235 rows]

ti/montebelluna/analisi\_griglia\_3239/quadrettatura\_3239.sqlite

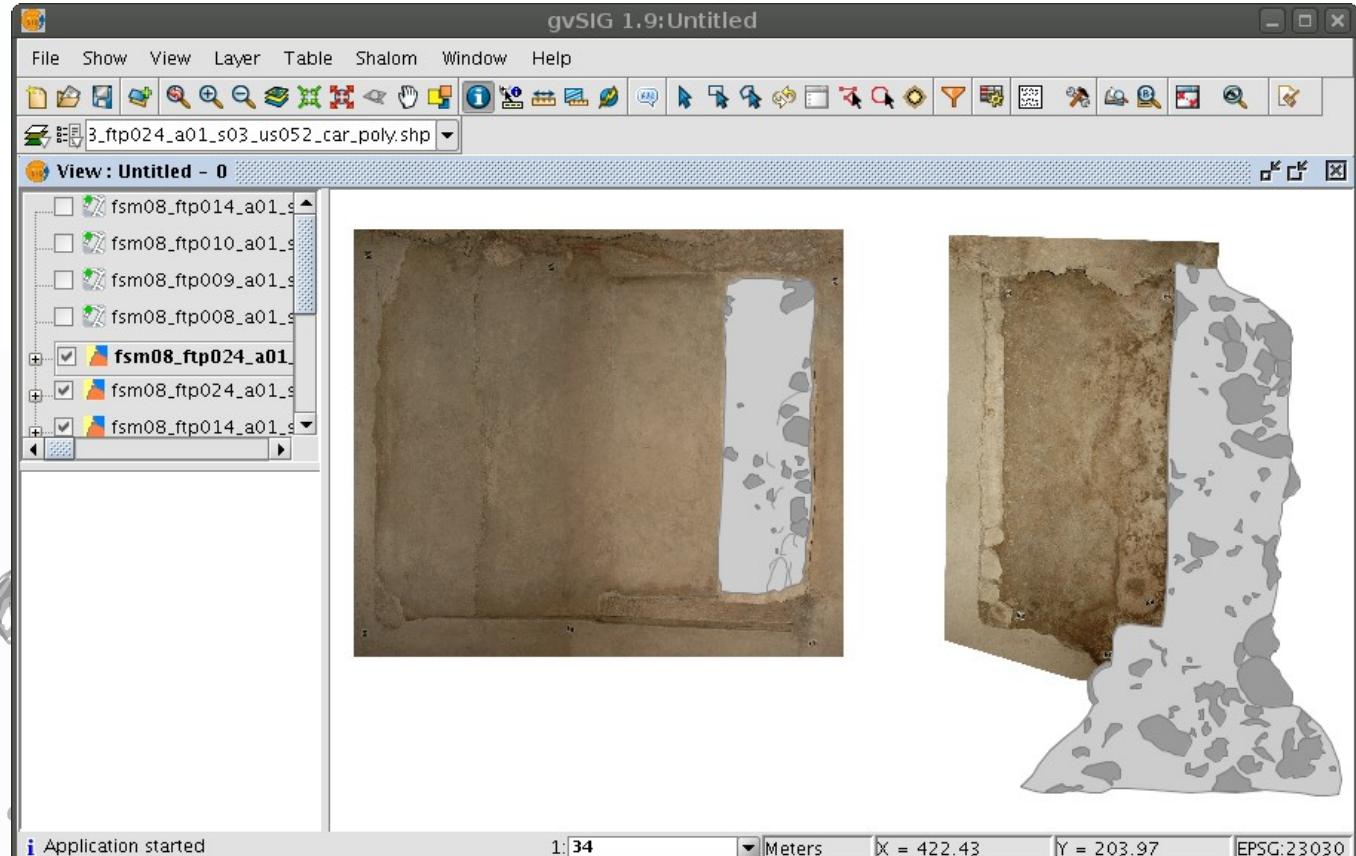
Spatialite-GUI

The SpatiaLite extension  
enables SQLite to support  
spatial data

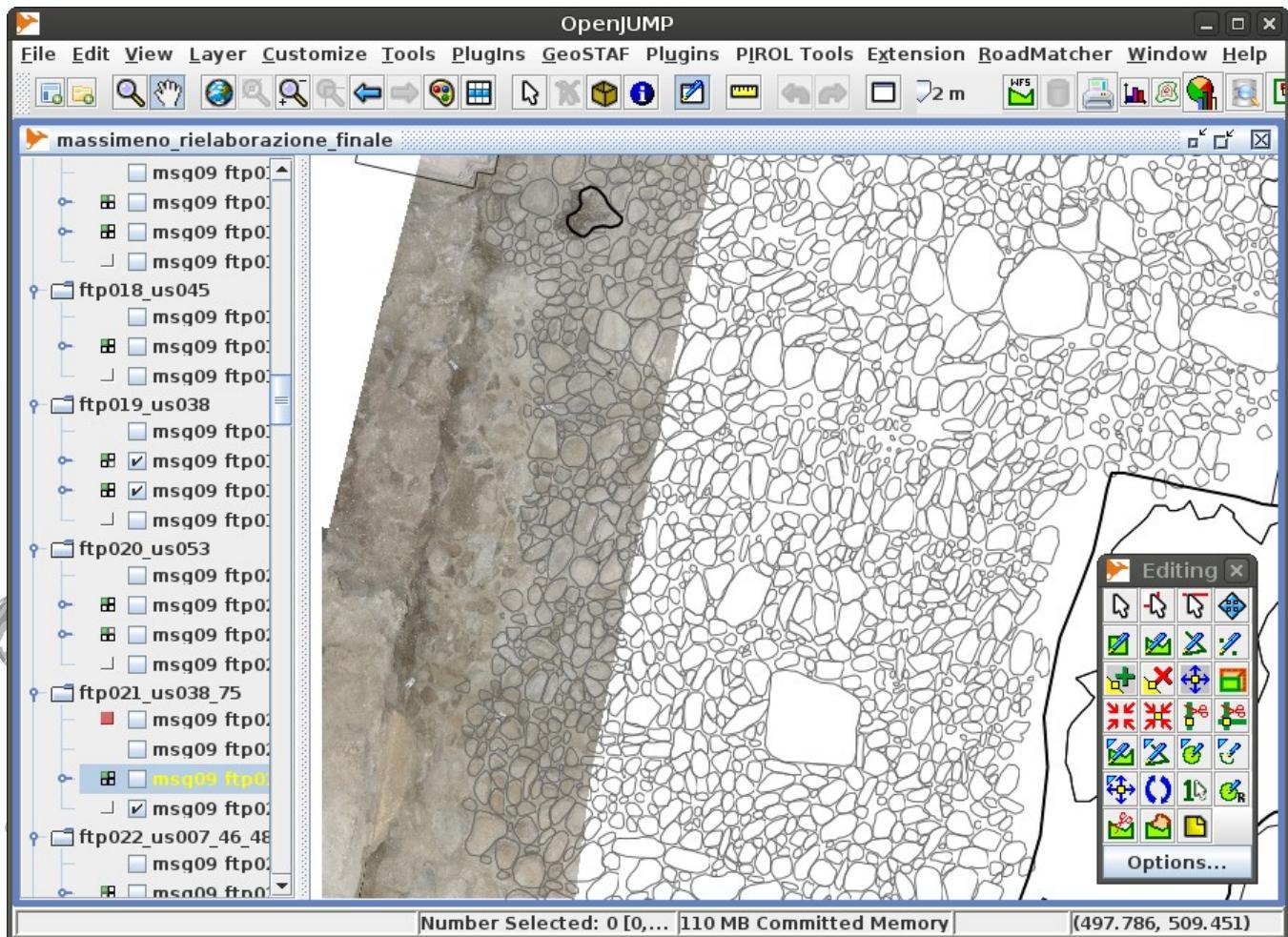
## GIS Menu



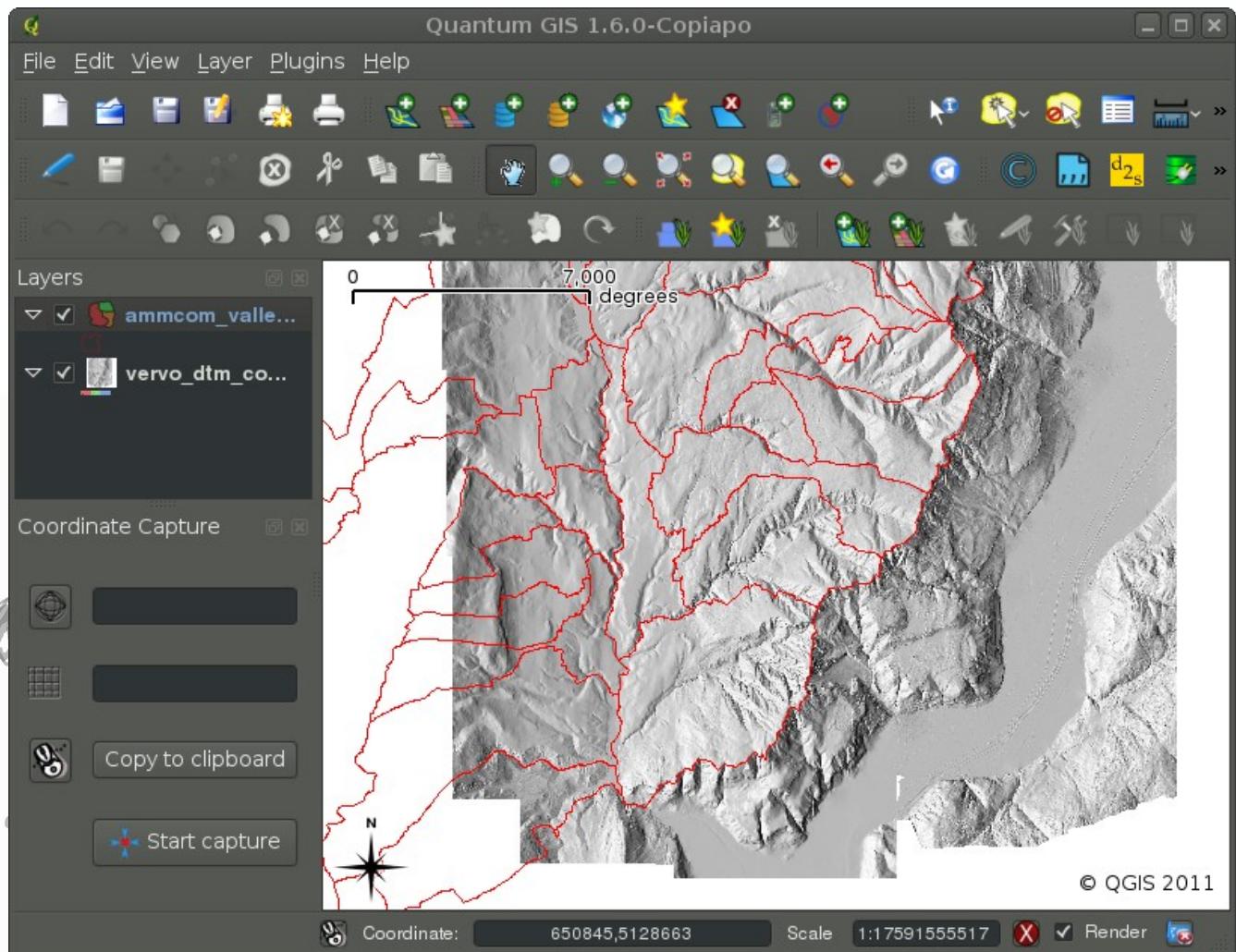
**GvSIG**  
is a Geographic  
Information System  
(GIS), a desktop  
application  
designed for  
capturing, storing,  
handling, analysing  
and deploying any  
kind of referenced  
geographic  
information.



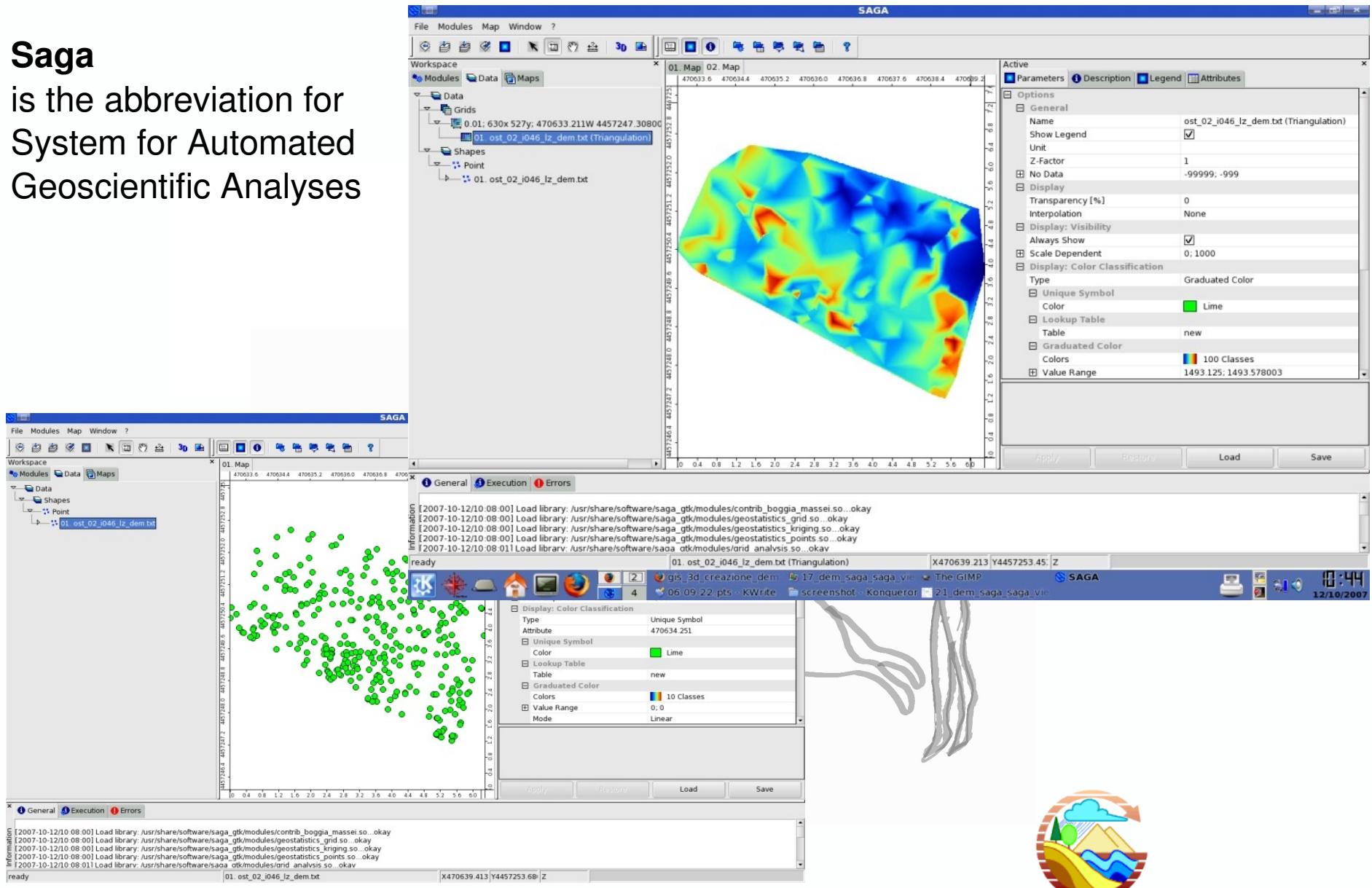
**OpenJUMP**  
is an open source  
Geographic  
Information System  
(GIS) written in the  
Java programming  
language.



**Quantum GIS**  
(QGIS) is a user friendly Open Source Geographic Information System (GIS) licensed under the GNU General Public License.

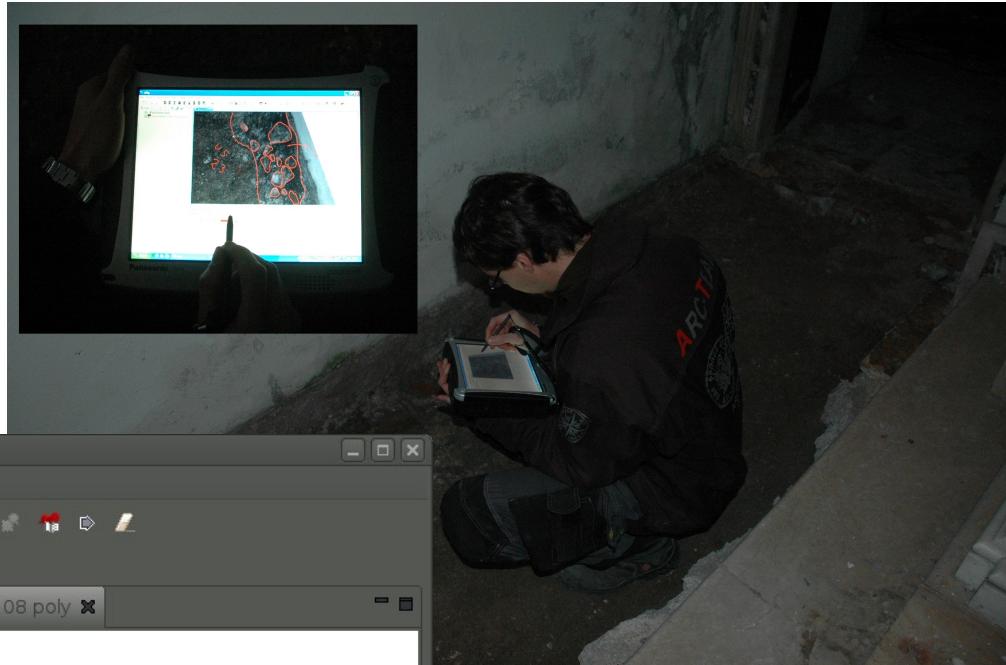
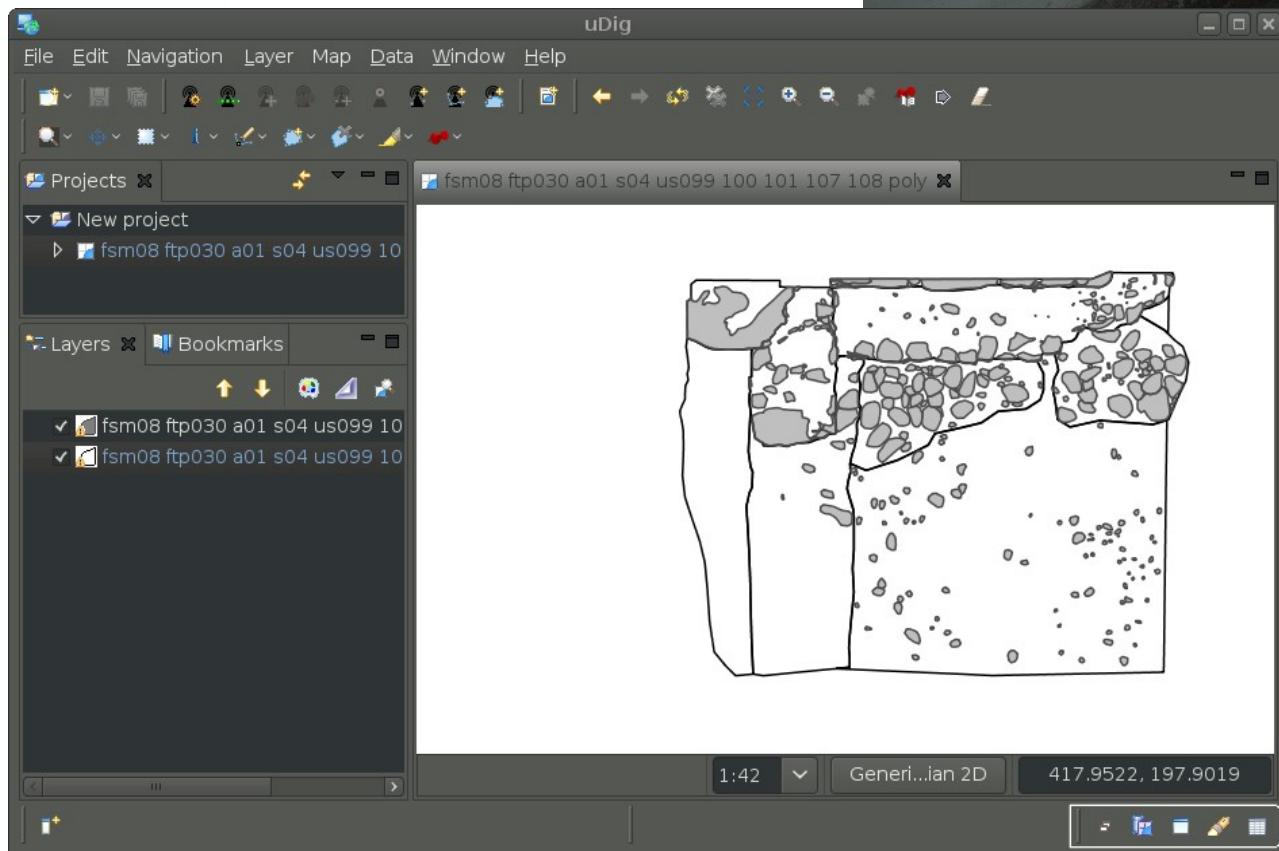


**Saga**  
is the abbreviation for  
System for Automated  
Geoscientific Analyses



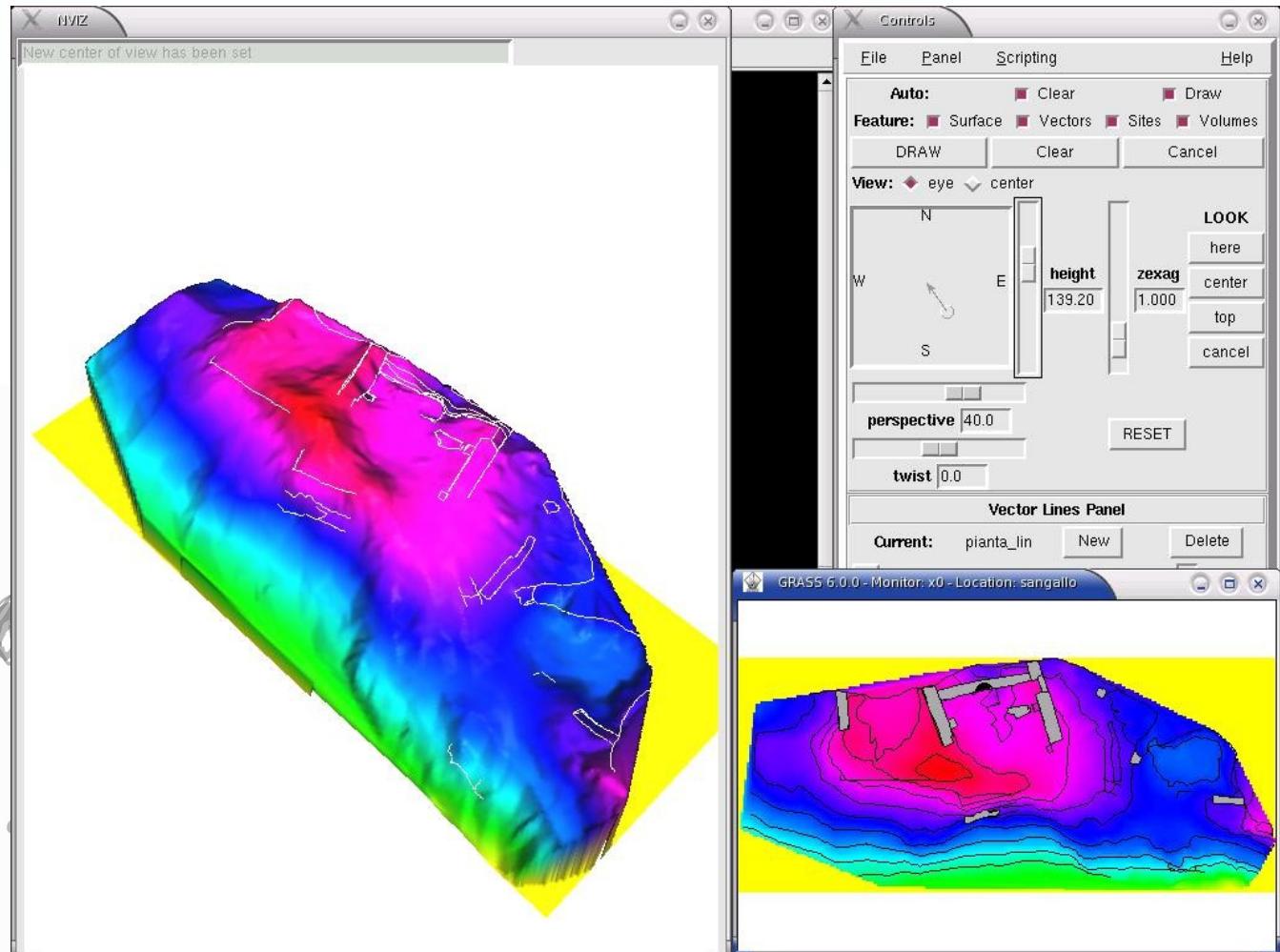
### Udig / BeeGIS

is an open source (LGPL)  
desktop application framework,  
built with Eclipse Rich Client  
(RCP) technology.

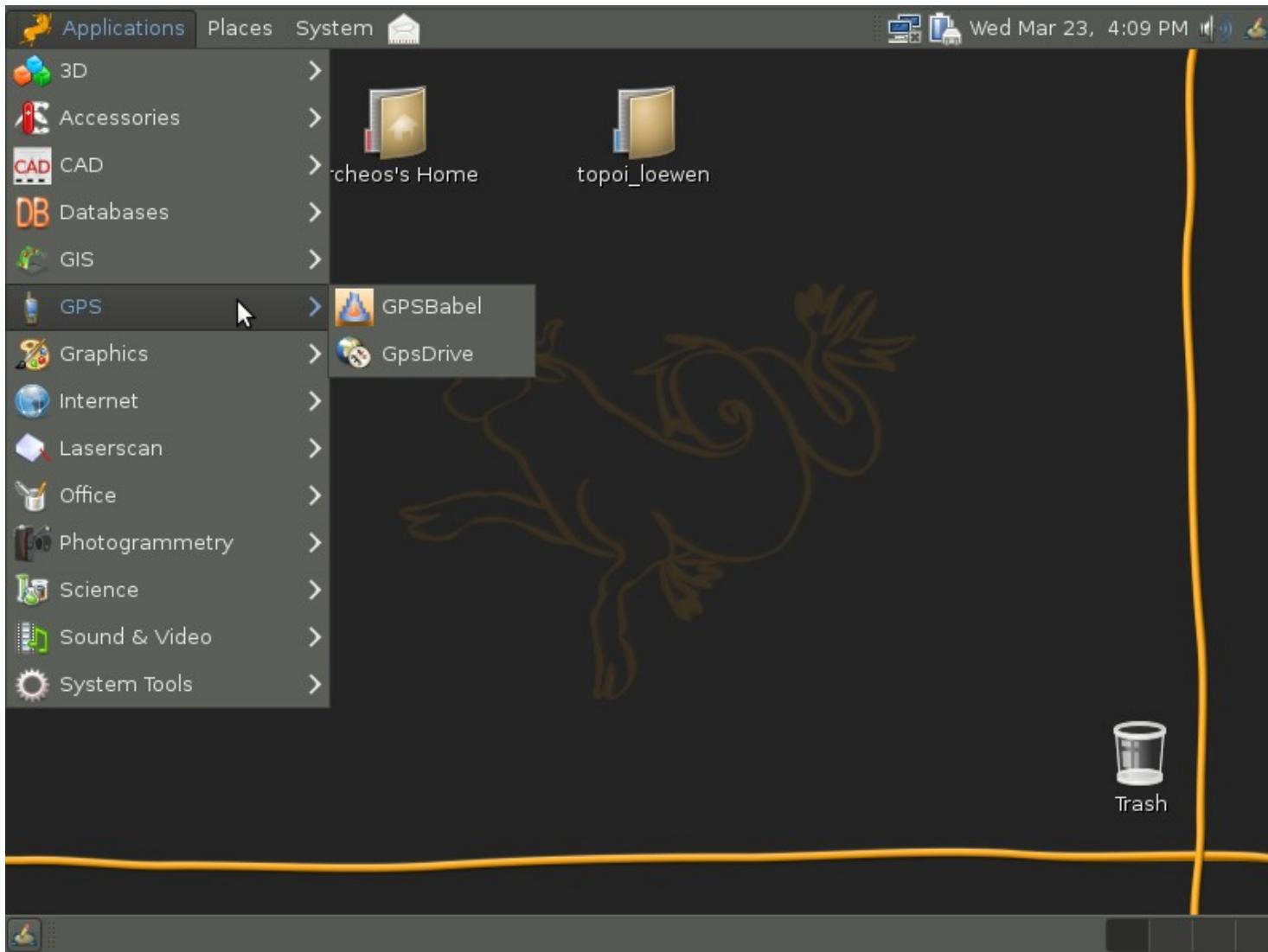


<http://www.begis.org/>  
<http://udig.refractions.net/>

**GRASS**  
is a free  
Geographic  
Information System  
(GIS) software  
used for geospatial  
data management  
and analysis,  
image processing,  
graphics/maps  
production, spatial  
modelling, and  
visualization.

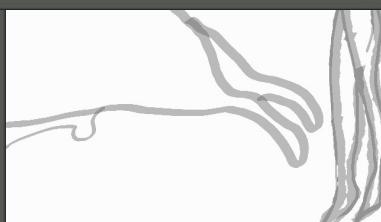
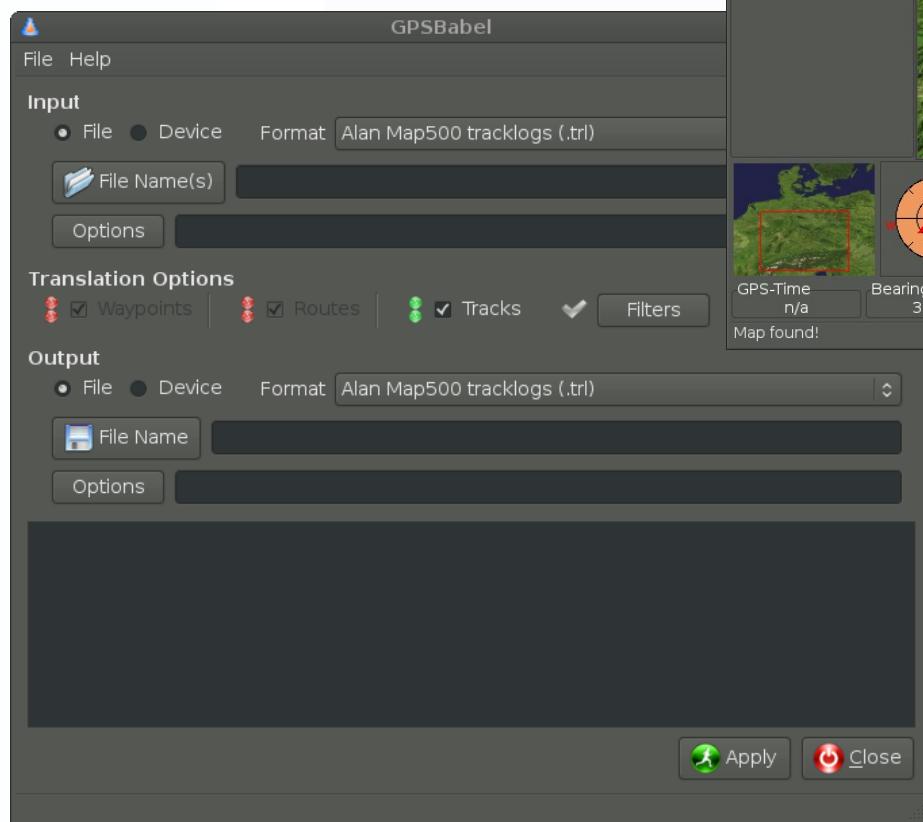
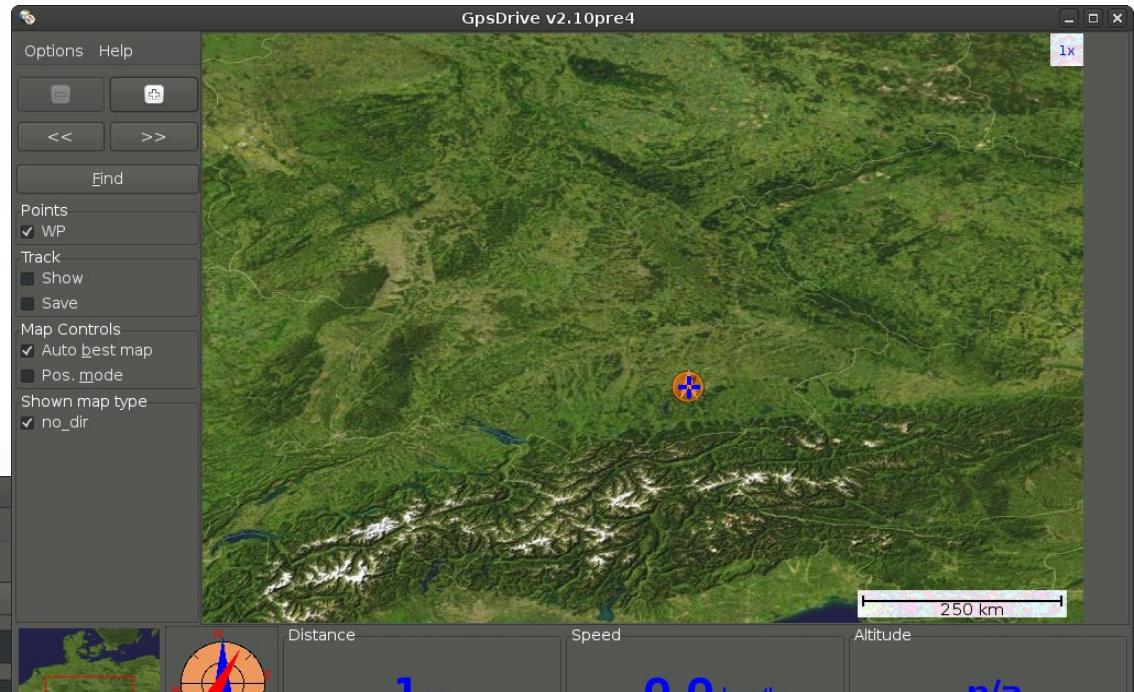


### GPS Menu



### GPSDrive

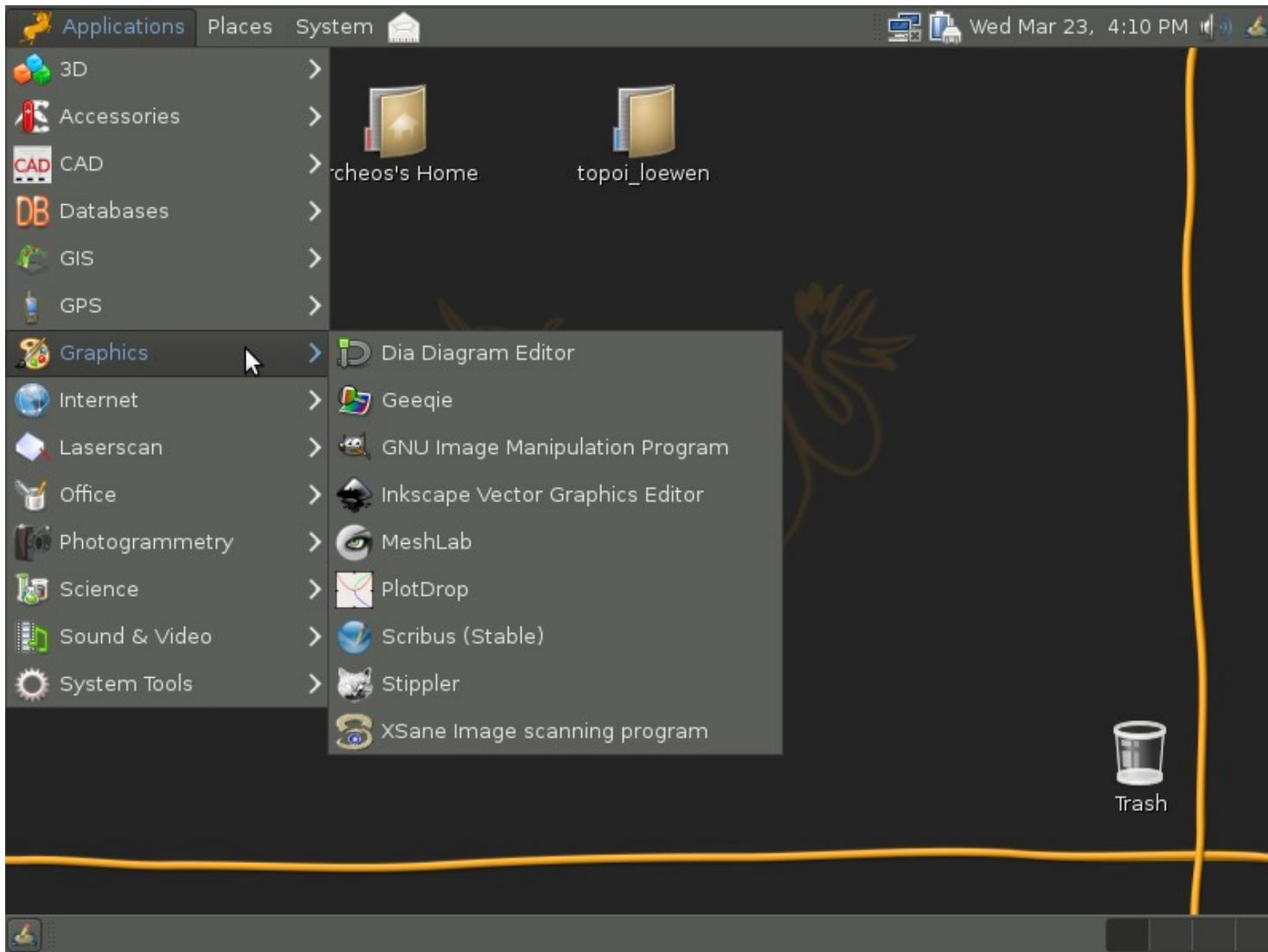
displays your position provided from your GPS receiver on a zoomable map.



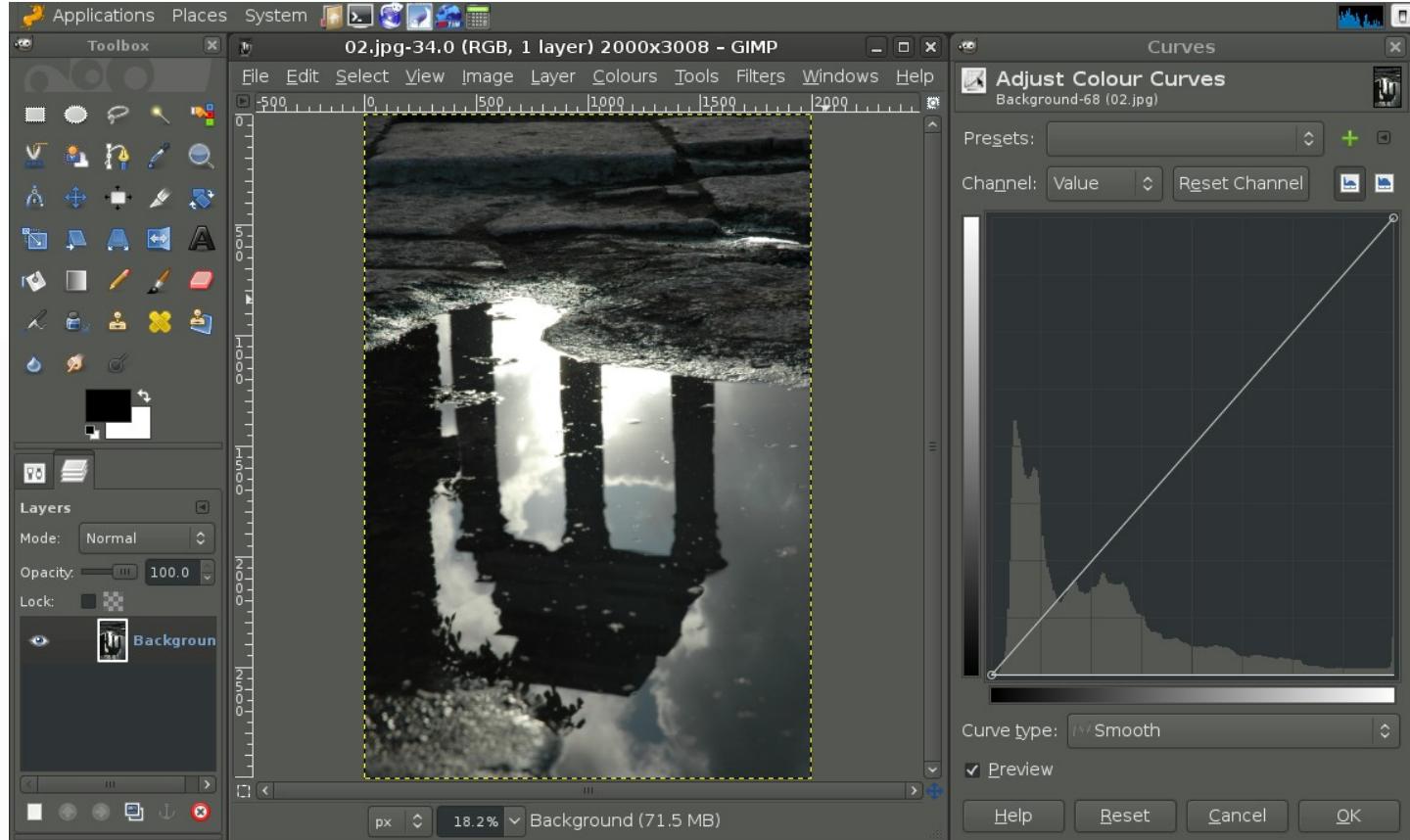
### GPSBabel

converts waypoints, tracks, and routes between popular GPS receivers and mapping programs.

## Graphic Menu



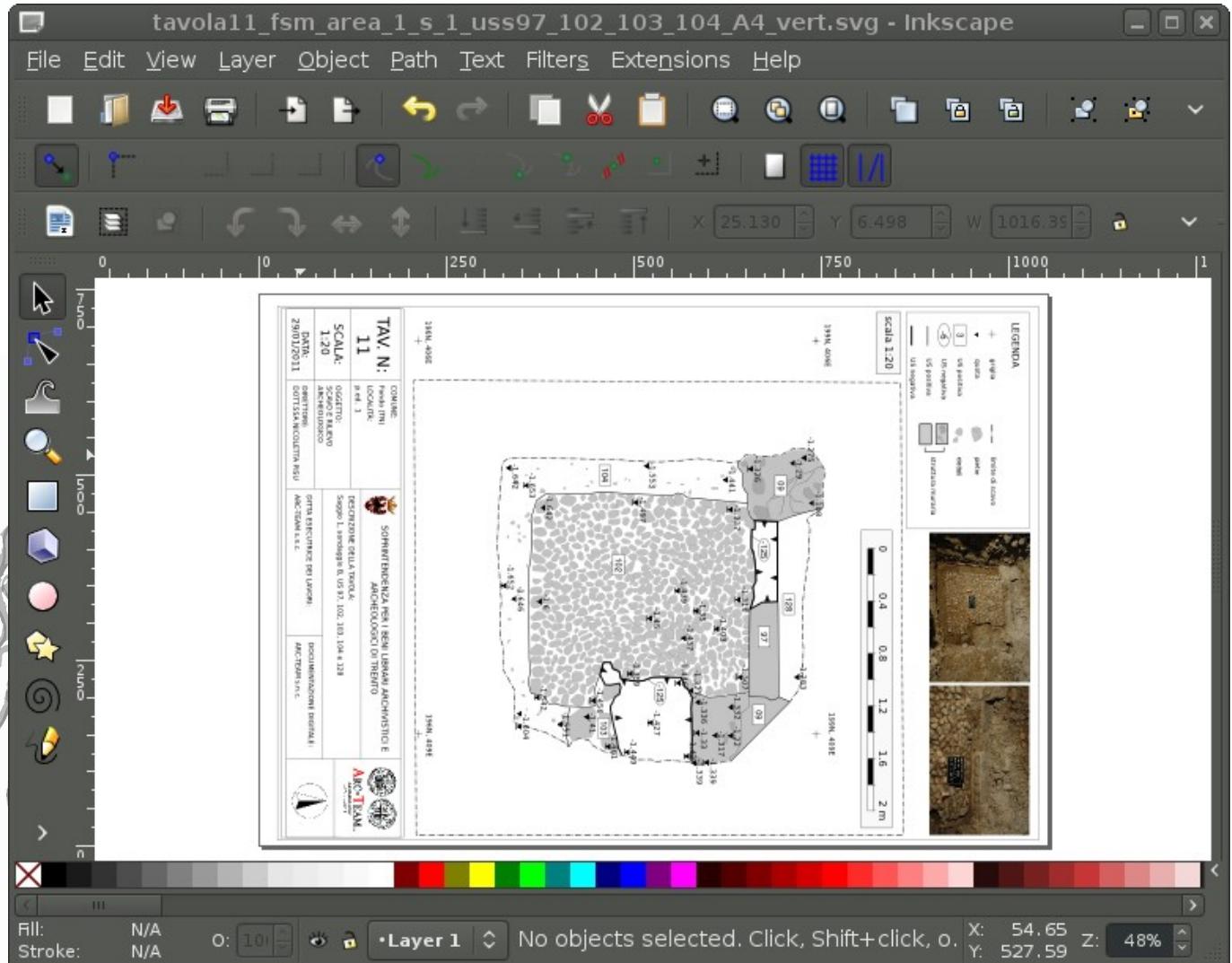
**GIMP** is the GNU Image Manipulation Program. It is a freely distributed piece of software for such tasks as photo retouching, image composition and image authoring.



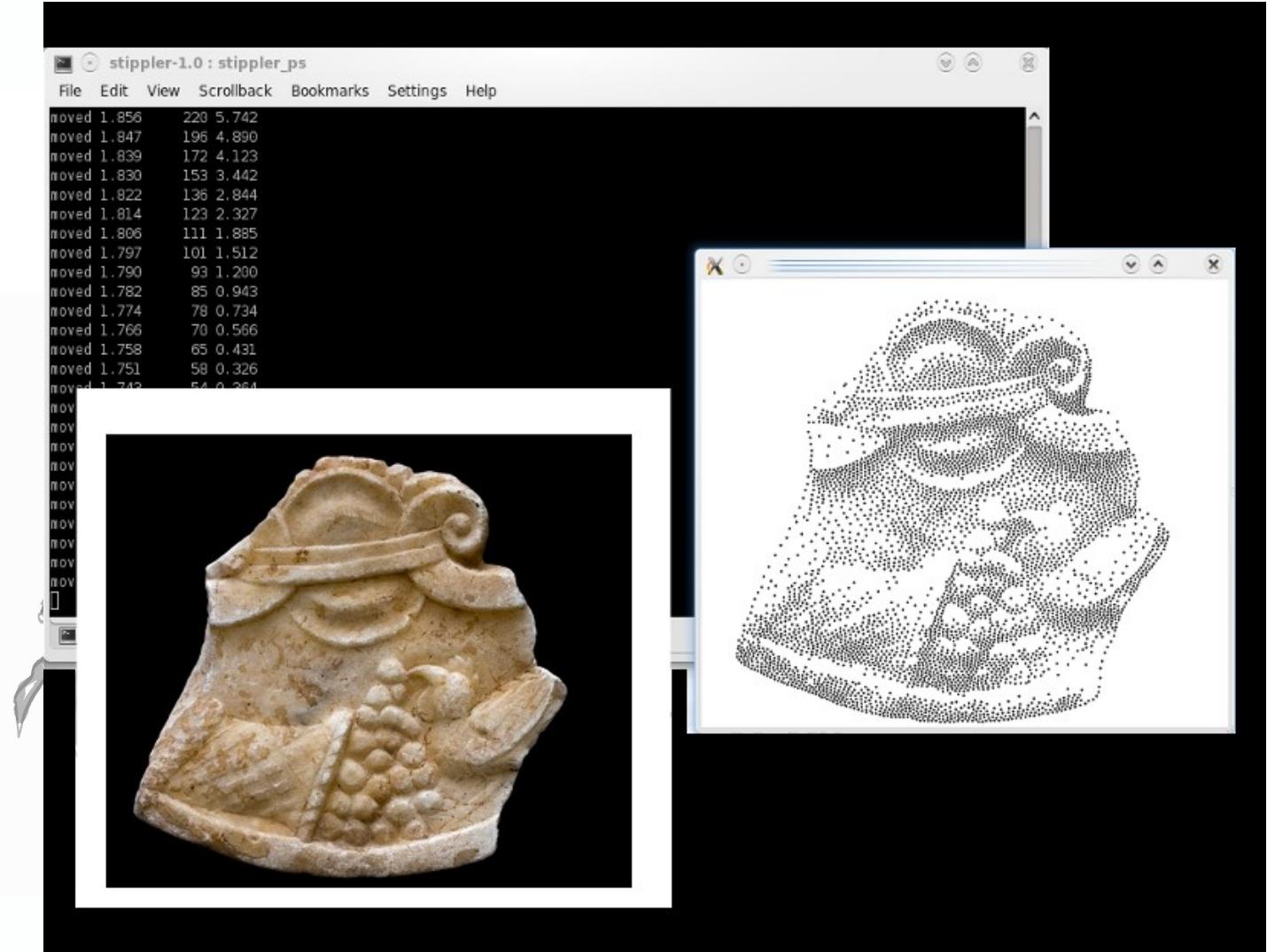
InkScape  
is An Open  
Source vector  
graphics  
editor, using  
the W3C  
standard  
Scalable  
Vector  
Graphics  
(SVG) file  
format.

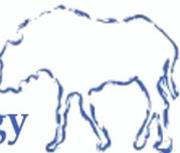


<http://inkscape.org/>

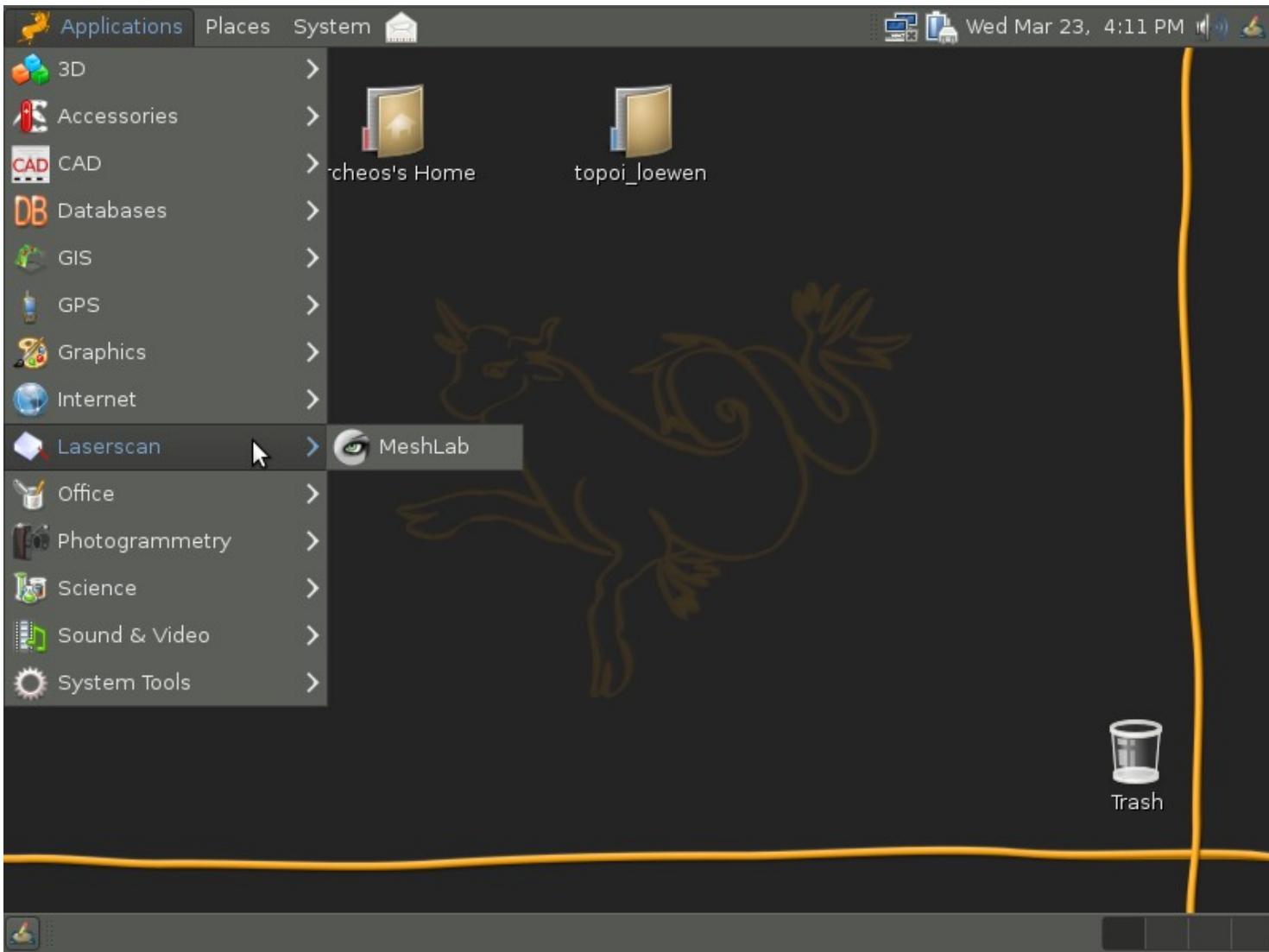


**Stippler**  
is software for  
turning  
greyscale  
images into  
"stippled"  
images.

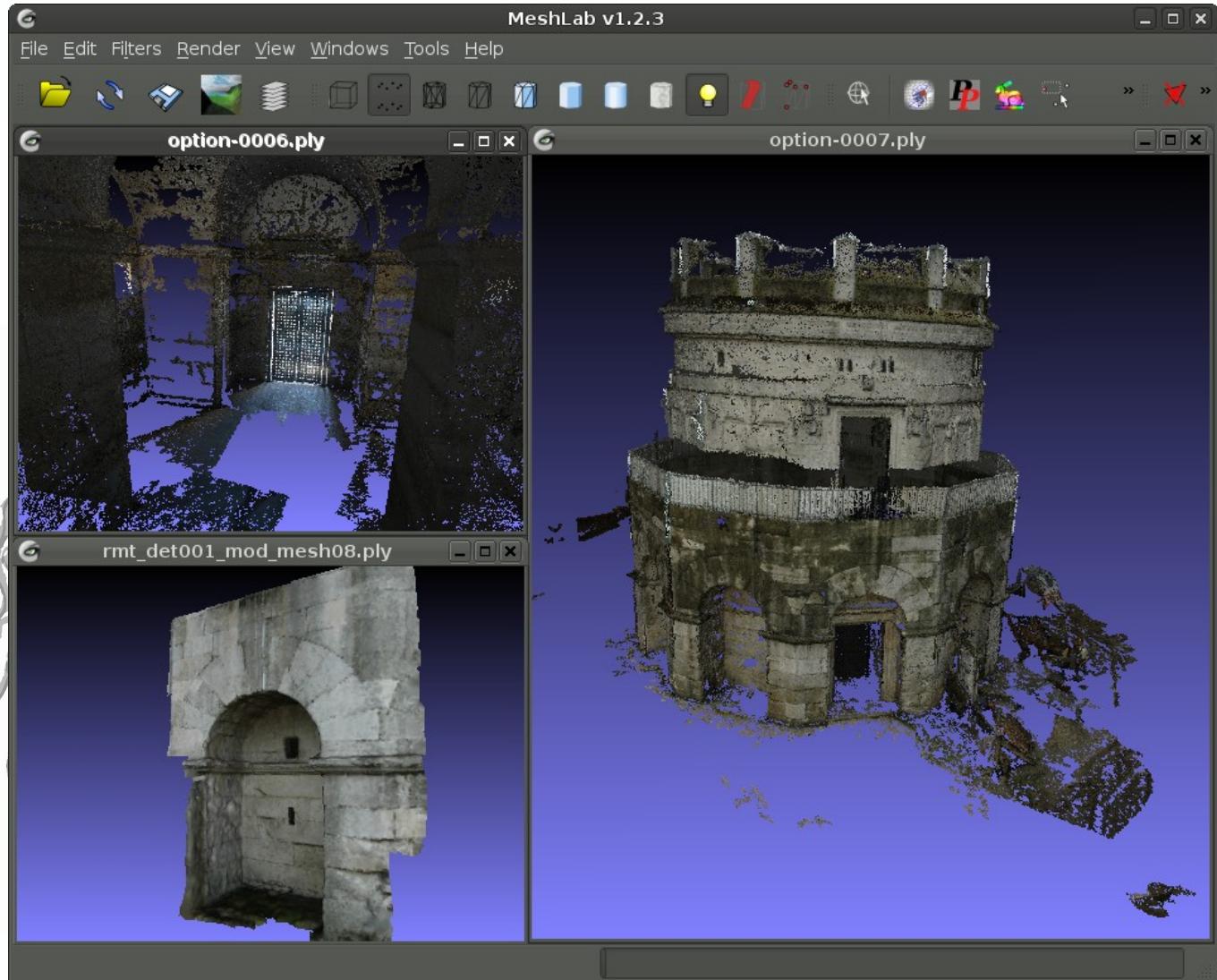




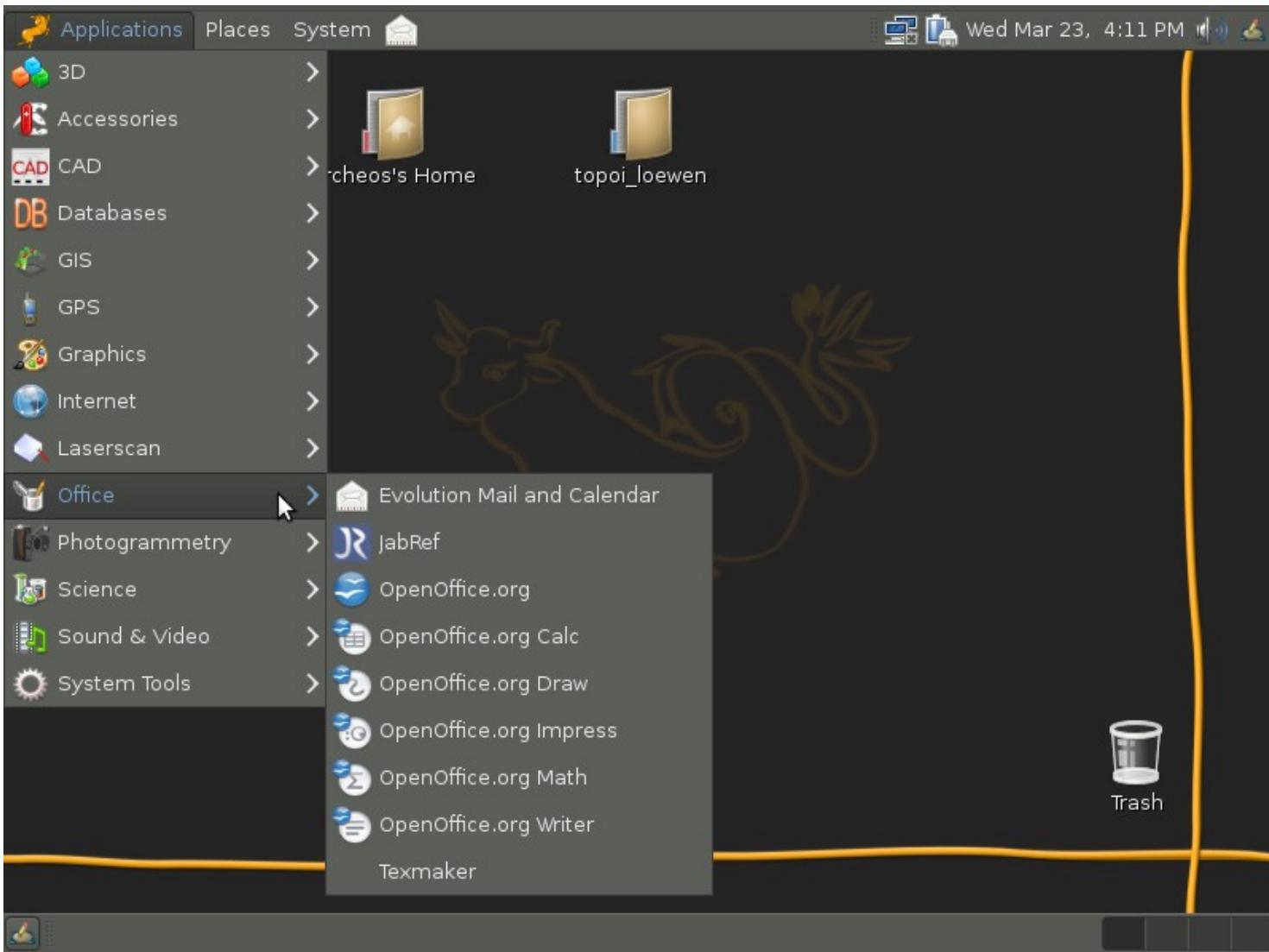
### Laserscan Menu



**MeshLab**  
is an open  
source, portable,  
and extensible  
system for the  
processing and  
editing of  
unstructured 3D  
triangular  
meshes.

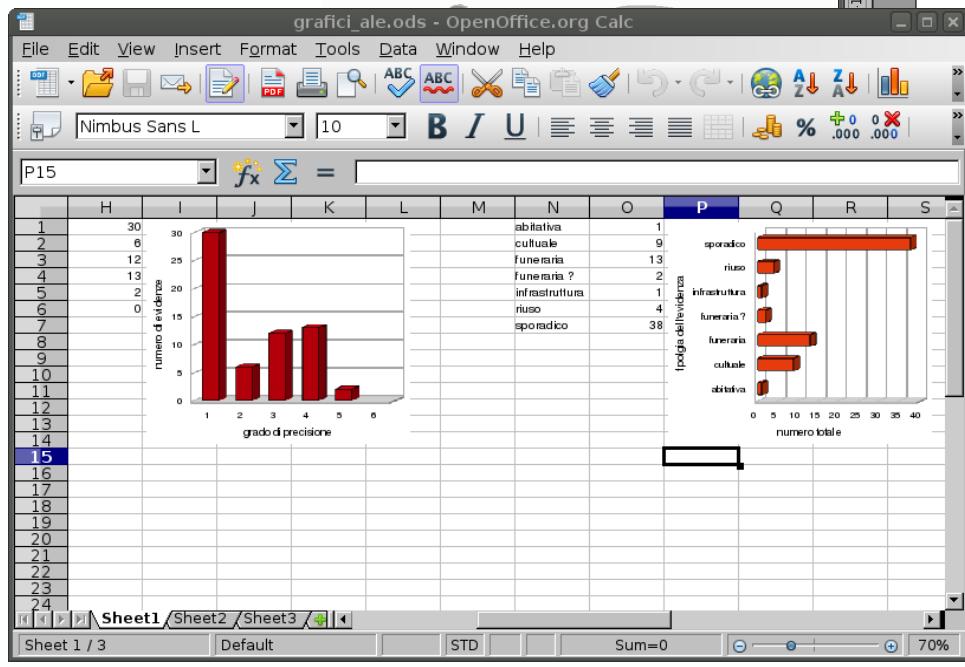


### Office Menu



### OpenOffice

- Writer
- Impress
- Calc
- Math
- Draw



abstract\_ppt\_foss2011.odt - OpenOffice.org Writer

File Edit View Insert Format Table Tools Window Help

Nimbus Roman No9 L 13 B I U

Le recenti tecnologie di *Structure from Motion* (SfM) e *Image-Based Modelling* (IBM) hanno aperto nuove possibilità nel campo della documentazione archeologica consentendo a tutti una facile ed accurata registrazione della realtà tridimensionale. Nella precedente edizione del workshop l'intervento "Computer Vision e Structure From Motion, nuove metodologie per la documentazione archeologica tridimensionale: un approccio aperto" ha mostrato gli innumerevoli vantaggi di questa metodologia (costi ridotti della parte hardware, versatilità di utilizzo, trasportabilità dell'attrezzatura, ...), ma ha anche individuato alcune problematiche: l'utilizzo del feature detector chiuso SIFT e la necessità di una semplificazione delle operazioni che portano al risultato finale.

Una soluzione possibile alle problematiche riscontrate si trova nel software *Python Photogrammetry Toolbox* (PPT). Questo programma si compone di una serie di script scritti in python che automatizzano alcuni passaggi del processo di lavoro operato dai software FLOSS Bundler e CMVS/PMVS. L'intero procedimento viene risolto attraverso due comandi eseguibili da interfaccia grafica o direttamente da terminale. Nonostante l'automatizzazione del processo, l'utente mantiene la possibilità di intervenire sul risultato attraverso la scelta di due parametri iniziali: la risoluzione delle immagini e il feature detector. Attraverso il primo parametro è possibile ridimensionare uniformemente la grandezza delle fotografie originali, fattore che determina una riduzione dei tempi di elaborazione e della densità della nuvola di punti prodotta. Anche la scelta del feature detector influenza sul risultato finale, in quanto gli algoritmi di riconoscimento funzionano in maniera differente. PPT è in grado di lavorare sia con il già citato SIFT, utilizzabile liberamente solo per scopi di ricerca, sia con VLFeat, rilasciato sotto licenza GPL. Per quanto osservato, sebbene l'utilizzo di VLFeat comporti



### Texmaker is a free, modern and cross-platform LaTeX editor

Document : /home/denis/archeoFOSS/workshop2008/atti/proceedings/proceedings2008.tex

File Edit Tools LaTeX Math Wizard Bibliography User View Options Help

part label tiny B I U  $\frac{x}{y}$   $\frac{x}{y}$   $\frac{x}{y}$   $\sqrt{x}$  left ( )

**Structure**

proceedings2008.tex

- proceedings2008.tex
- LABELS
  - {\@startsection{sub...}
  - {indice}
  - {premessa}
  - {introduzione}
  - {RELAZIONI ORALI} (...)
  - {pesce/testo\_pesce}
  - {stanco/testo\_stanco}
  - {demetrescu/testo\_d...}
  - {lorenzini/testo\_lore...}
  - {cantoro/testo\_cant...}
  - {bogdani/testo\_bogd...}
  - {pisu/testo\_pisu}
  - {fentress/testo\_fentr...}
  - {mazzoleni/testo\_m...}
  - {palombini\_cia/testo...}
  - {degennaro/testo\_d...}
  - {SESSIONE POSTER} (...)
  - {frassine/testo\_frassi...}
  - {dascoli/testo\_dascoli}
  - {forlin/testo\_forlin}
- + Relation symbols
- ⇒ Arrow symbols
- ∨ Miscellaneous symbols
- { } Delimiters
- λ Greek letters
- ∞ Most used symbols
- ps Pstricks Commands
- mp MetaPost Commands

proceedings2008.tex

```

1 \documentclass[a4paper,10pt,openright]{editor}
2 \usepackage[utf8]{inputenc}
3 \usepackage[english,italian]{babel}
4 \usepackage{url}
5 \usepackage{indentfirst}
6 \usepackage{textcomp} %per il simbolo del grado (°)
7 \font\greek=lfb10
8
9 % grafica
10 \usepackage[]{}{graphicx}
11 \usepackage{wrapfig}
12 \usepackage[margin=10pt,font=small,labelfont=bf]{caption}
13 \usepackage{sidecap}%per dida a lato della figura
14 \usepackage{subfig}%per affiancare figure e tabelle
15
16 %Paragrafi. Siccome la class editor fa i titoli dei \paragraph solo in corsivo li modifco in modo che li faccia bold, come da istruzioni in http://help-csli.stanford.edu/tex/latex-sections.shtml#section
17 \makeatletter
18 \def\paragraph{\@startsection
  {paragraph}{4}{\z@}{3.25ex plus 1ex minus .2ex}{-1em}
  {\normalsize\bf}}
19 \def\subsection{\@startsection{subsection}{2}{\z@}{-3.25ex plus -1ex minus
  -.2ex}{1.5ex plus .2ex}{\normalsize\bf}}
20 \makeatother

```

Messages / Log File

System Ready Normal Mode 1 2 3

Arc-Team s.n.c. open research (sharing results)

Alessandro BEZZI\*, Luca BEZZI\*, Rupert GIETL\*

**SOMMARIO.** Con questo contributo si intendono presentare alcuni progetti aperti, svolti da Arc-Team s.n.c. tra la fine del 2007 e l'inizio del 2008, in modo da condividere i risultati ottenuti (in un'ottica di "open research") e creare-ampliare una comunità di utenti e sviluppatori che da una parte si avvale liberamente dei risultati raggiunti e dall'altra contribuisca attivamente al miglioramento dei progetti stessi.

Tra le ricerche presentate vi saranno quelle riguardanti la condivisione di strumenti, di know-how e di dati.

**ABSTRACT.** With this contribute we would like to present some of Arc-Team's open projects, to share the results we achieved, using an "open research" point of view. The idea is to create/improve a users and developers community to share ideas and experiences and to reach better results. Different researches will be presented, regarding the sharing of instruments, know-how and data.

#### 1. Premessa

Ormai da diversi anni Arc-Team s.n.c. promuove l'utilizzo di software libero (*Free e Open Source*) all'interno del mondo archeologico. Grazie all'esperienza maturata sul campo è stato possibile sviluppare uno strumento come ArcheOS, che con la versione 2.0 è in grado di offrire una stabile e potente piattaforma software, capace di soddisfare le differenti esigenze della disciplina archeologica (dallo scavo d'emergenza alla ricerca più speculativa).

ArcheOS è però solo uno dei progetti "aperti" che Arc-Team s.n.c. conduce nell'ambito della sua attività. Di seguito verranno presentati alcuni di questi progetti, riguardanti la condivisione di strumenti, di conoscenza e di dati.

#### 2. Condivisione di strumenti (software)

##### 2.1. ArcheOS

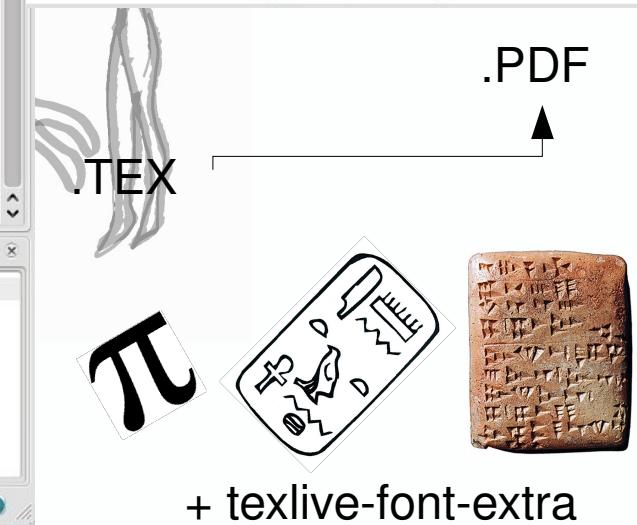
Il progetto ArcheOS<sup>1</sup> (acronimo di *Archaeological Operating System*) ha come obiettivo la creazione di un sistema operativo libero (GNU/Linux) interamente dedicato alla ricerca archeologica.

Allo stato attuale ArcheOS v. 2.0, è basato su Ubuntu Gutsy (v.7.10) ed è corredata da software *Free e Open Source* accuratamente testato e selezionato per soddisfare le principali necessità di un qualsiasi progetto archeologico (dalla fase di studio fino a quelle di pubblicazione).

Dal punto di vista tecnico ArcheOS rappresenta una distribuzione *live*. Questa caratteristica rende l'intero sistema particolarmente adatto ai principianti, in

<sup>1</sup>Arc-Team s.n.c.

<sup>2</sup>Per il sistema ArcheOS si rimanda agli articoli: Bezz et alii 2005 e Bezz et alii 2007.





JabRef is an open source bibliography reference manager.

**JabRef**

File Edit View BibTeX Tools Web search Options Help

Search biblio\_demetrescu.bib

#	Entry...	Author	Title	Y...	Journal
1	Incoll...	Beccetti	La marrana dell'acqua Mariana	1974	
2	Book	Lais	Il rivo dell'acqua Mariana, second...	1920	
3	Book	Lais	Il rivo dell'acqua Mariana	1913	
4	Book	Lock	Using computers in archaeology. ...	2003	
5	Book	Mancini	Le mura aureliane di Roma: atlant...	2001	
6	Incoll...	Motta	La decadenza degli acquedotti an...	1986	
7	Book	Shanks and Tilley	Re-constructing Archaeology. The...	1987	
8	Book	Turkle	Life on the Screen. Identity in the ...	1995	
9	Other		P.R.G.1908, Relazione presentata ...	1908	

Required fields    Optional fields    General    Abstract    Review

**Book**

Title	Le mura aureliane di Roma: atlante di un palinsesto murario
Publisher	Roma
Year	2001
Editor	
Author	R. Mancini
Bibtexkey	MANCINI2001

Status: Opened database '/home/denis/archeoFOSS/workshop2008/atti/proceedings/demetrescu/biblio\_demetrescu.bib'

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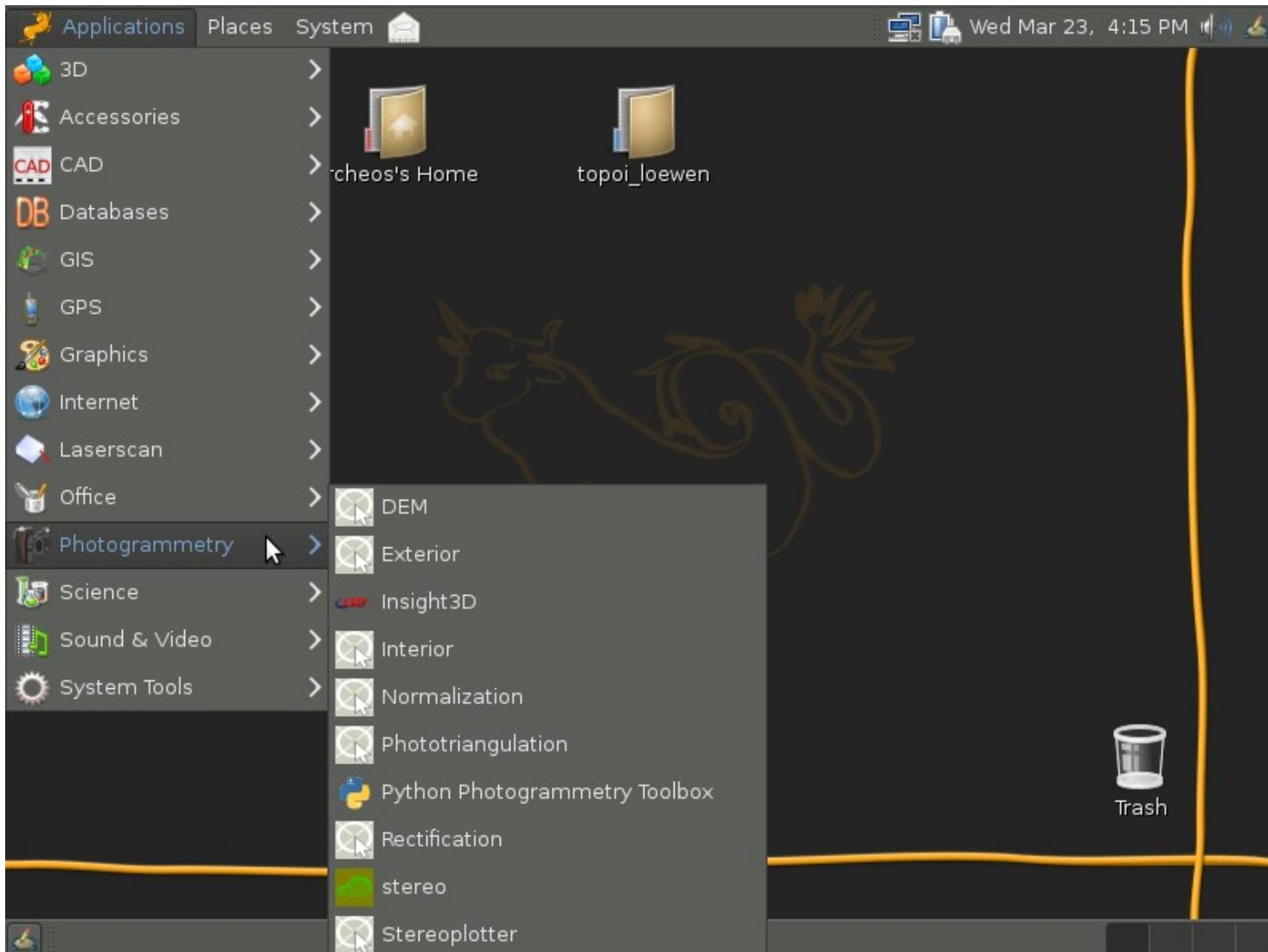
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    editor="G. Arrigo and P. Parboni",
    booktitle="Le acque di Roma: dalle scaturigini attraversando l'urbe al mare",
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}

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    title="La decadenza degli acquedotti antichi e la conduzione dell'Acqua Mariana",
    booktitle="Il Trionfo dell'Acqua. Acque e Acquedotti a Roma, IV sec. a.C. - XX sec. (catalogo della Mostra)"}

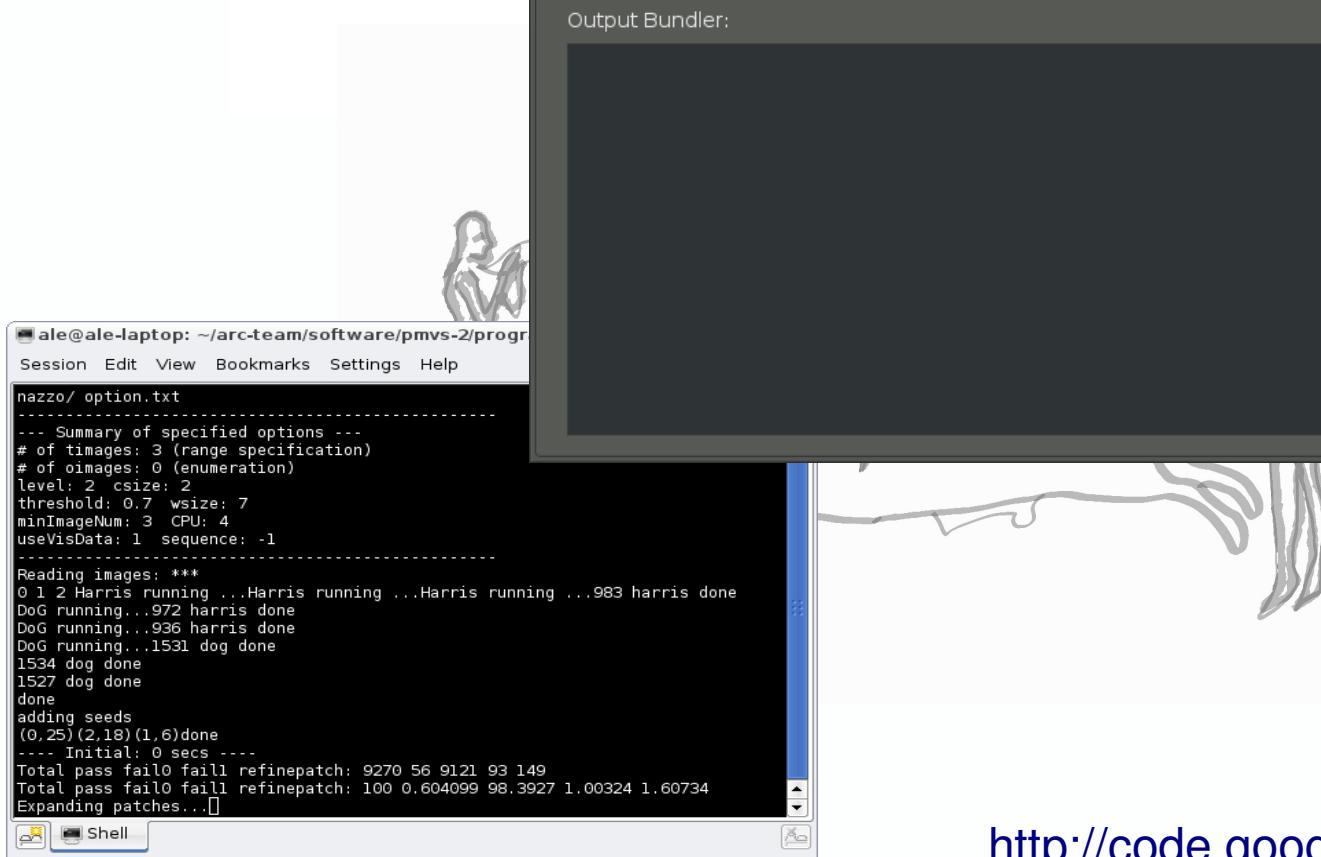
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## Photogrammetry Menu



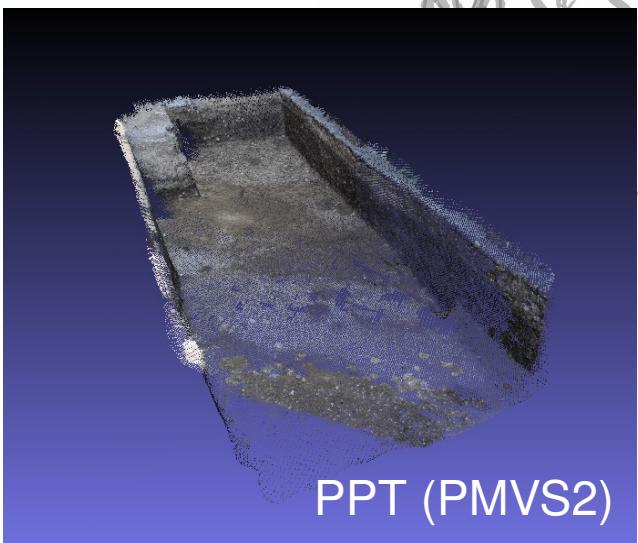
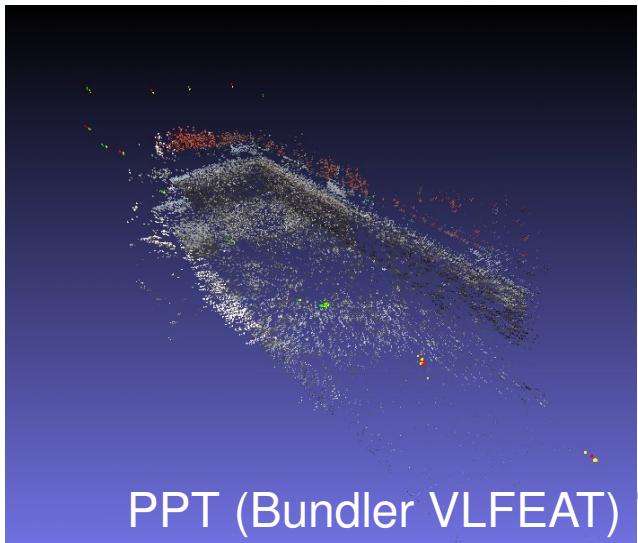
### Python Photogrammetry Toolbox

A free solution to  
record three-  
dimensional data

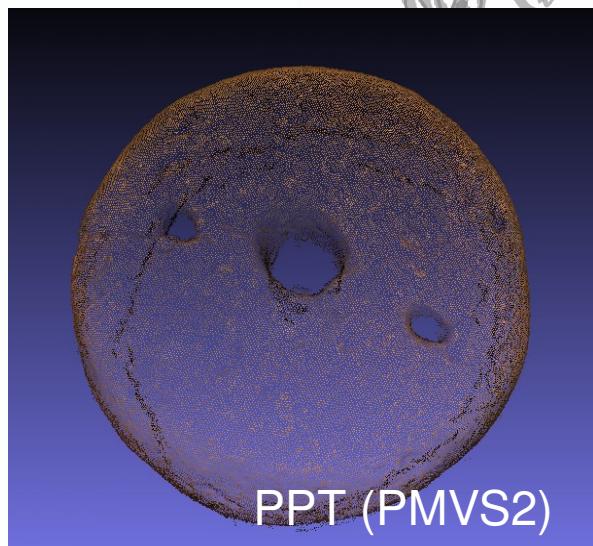
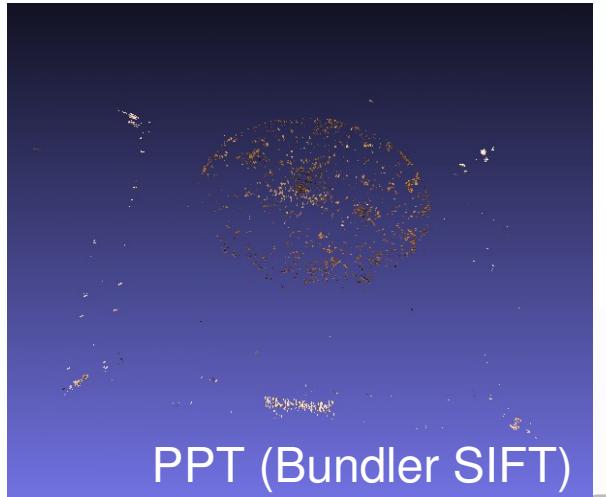


<http://code.google.com/p/osm-bundler/>

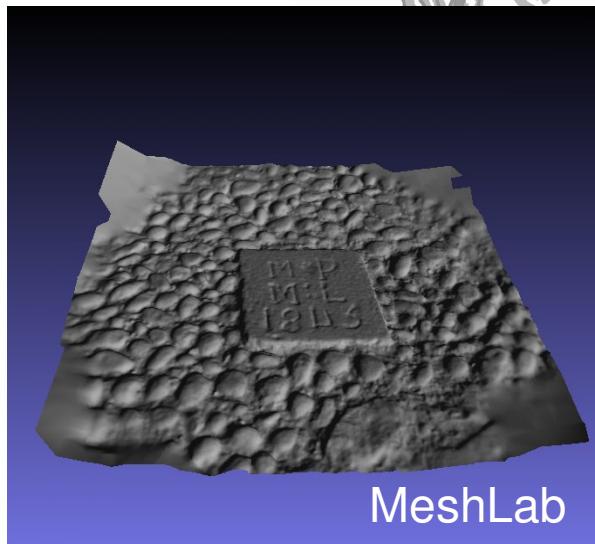
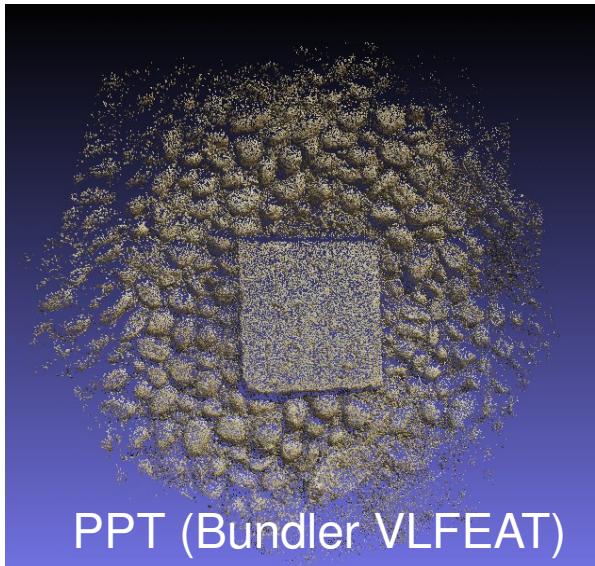
### Python Photogrammetry Toolbox



### Python Photogrammetry Toolbox

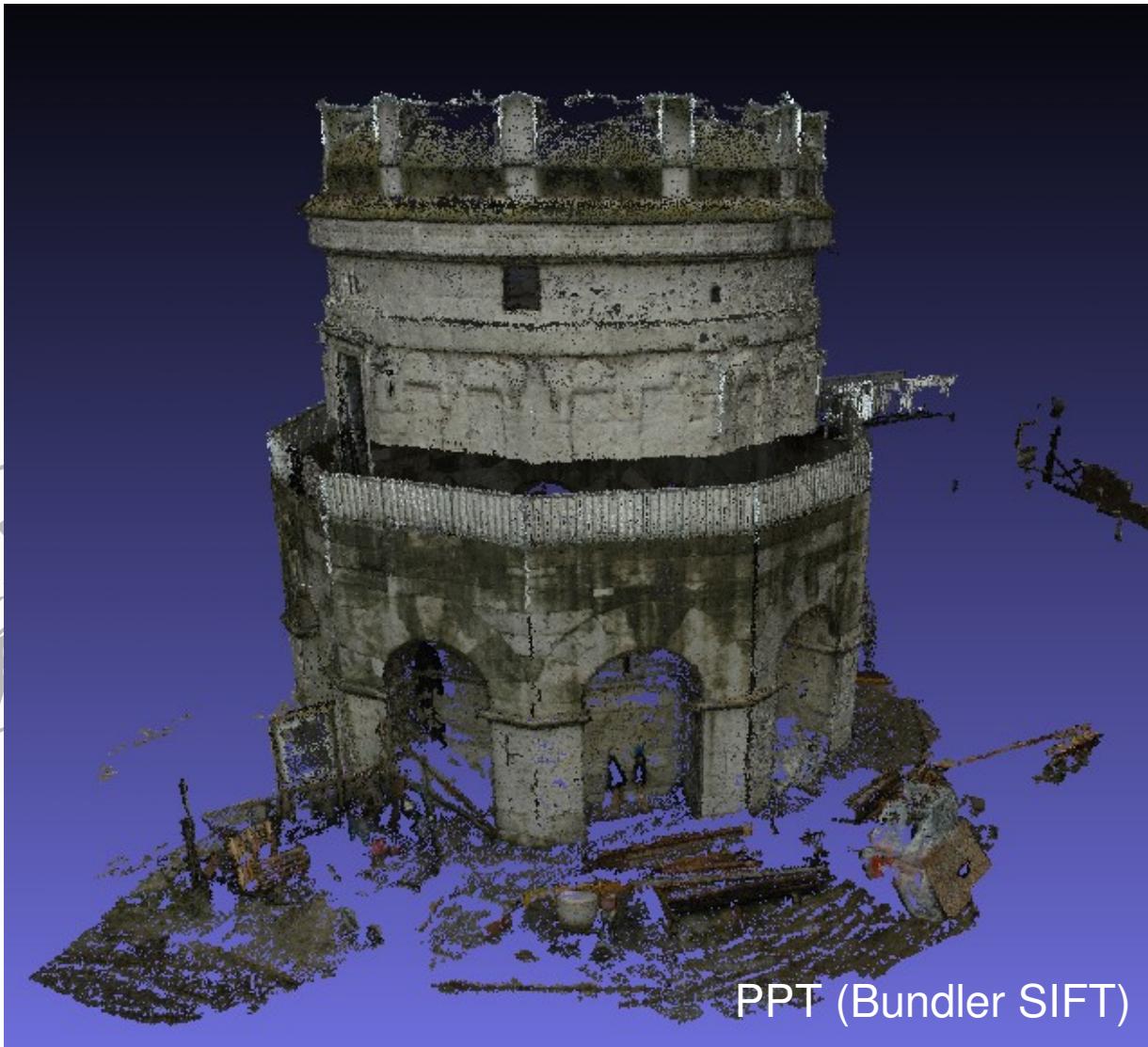
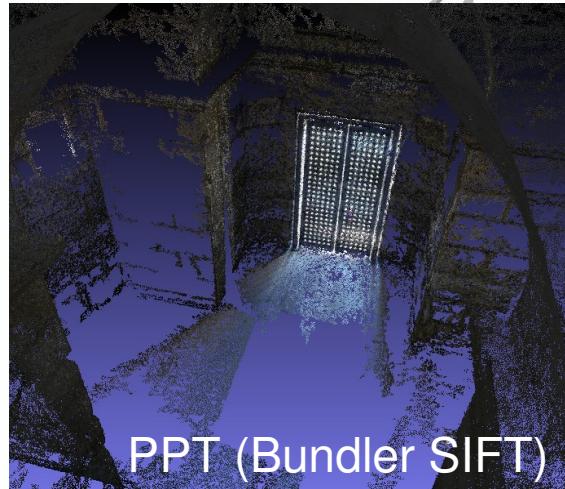
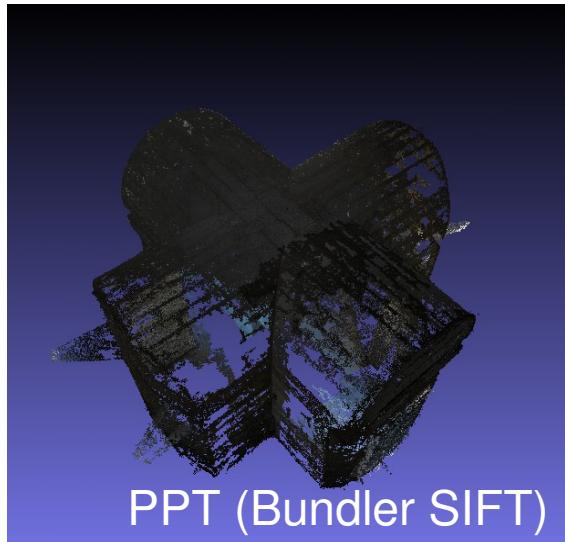


### Python Photogrammetry Toolbox



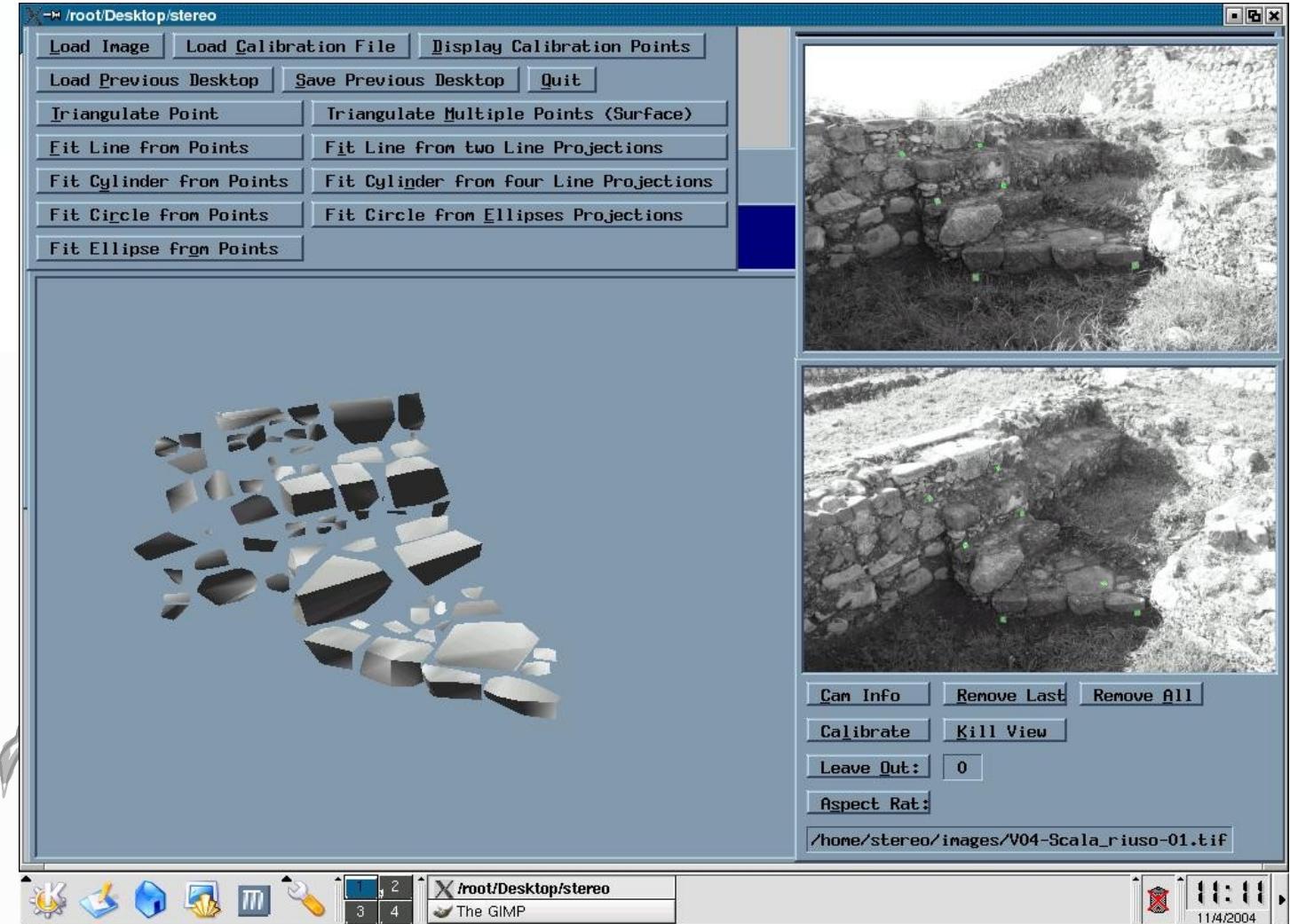
MeshLab

### Python Photogrammetry Toolbox



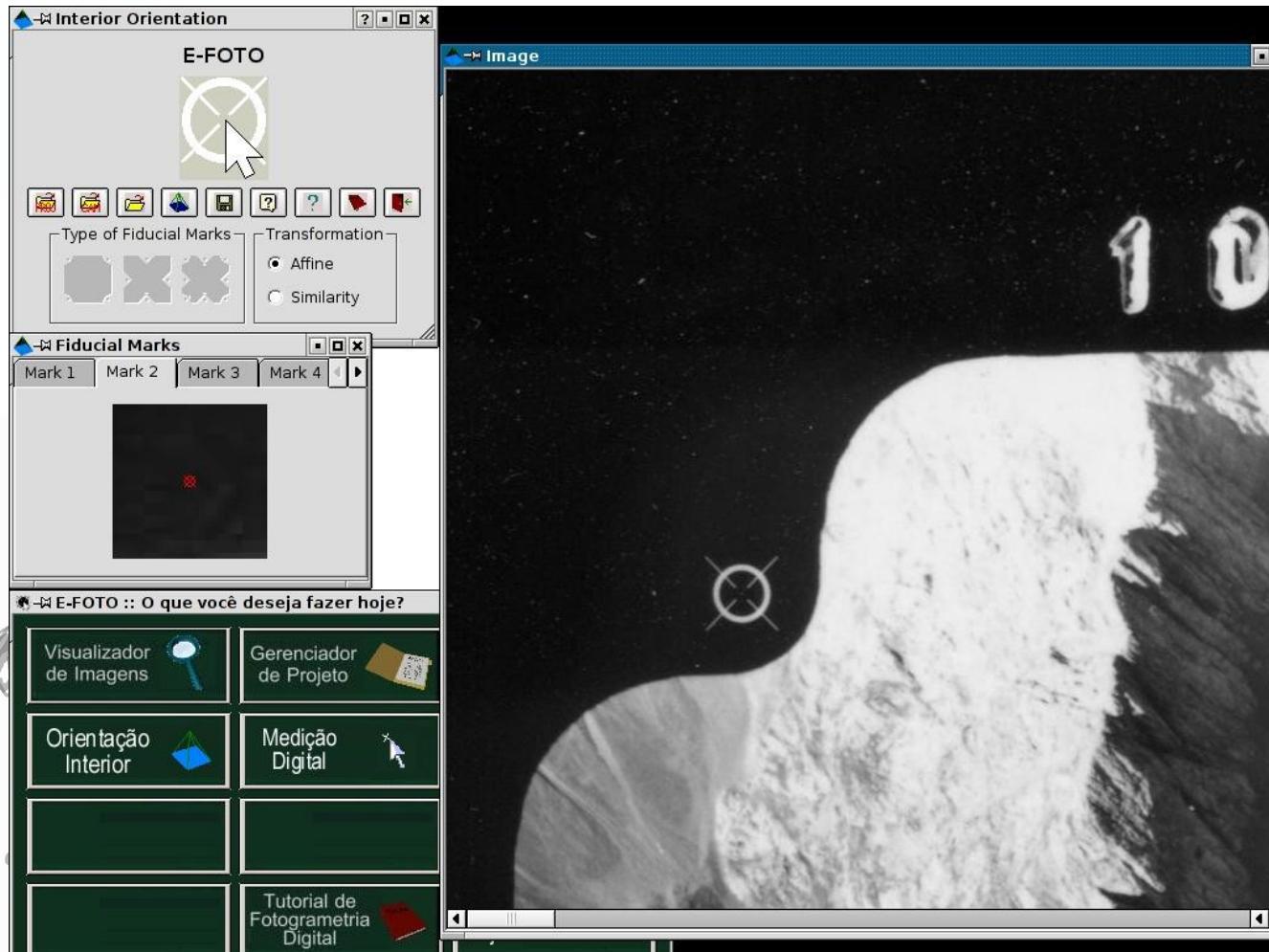
### Stereo

is a software that allows the user to obtain dimensional data of 3D objects or surfaces within stereo photographs or images.



### e-foto

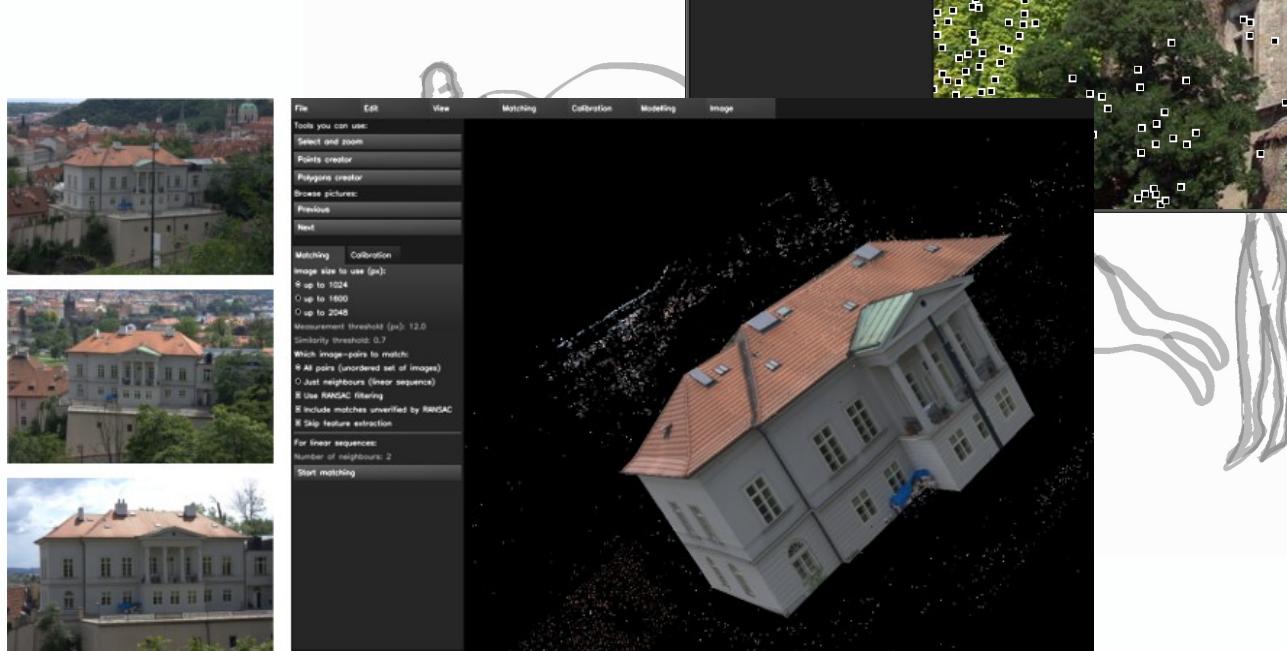
a simple set of software that could help students understand the principles behind Photogrammetry.



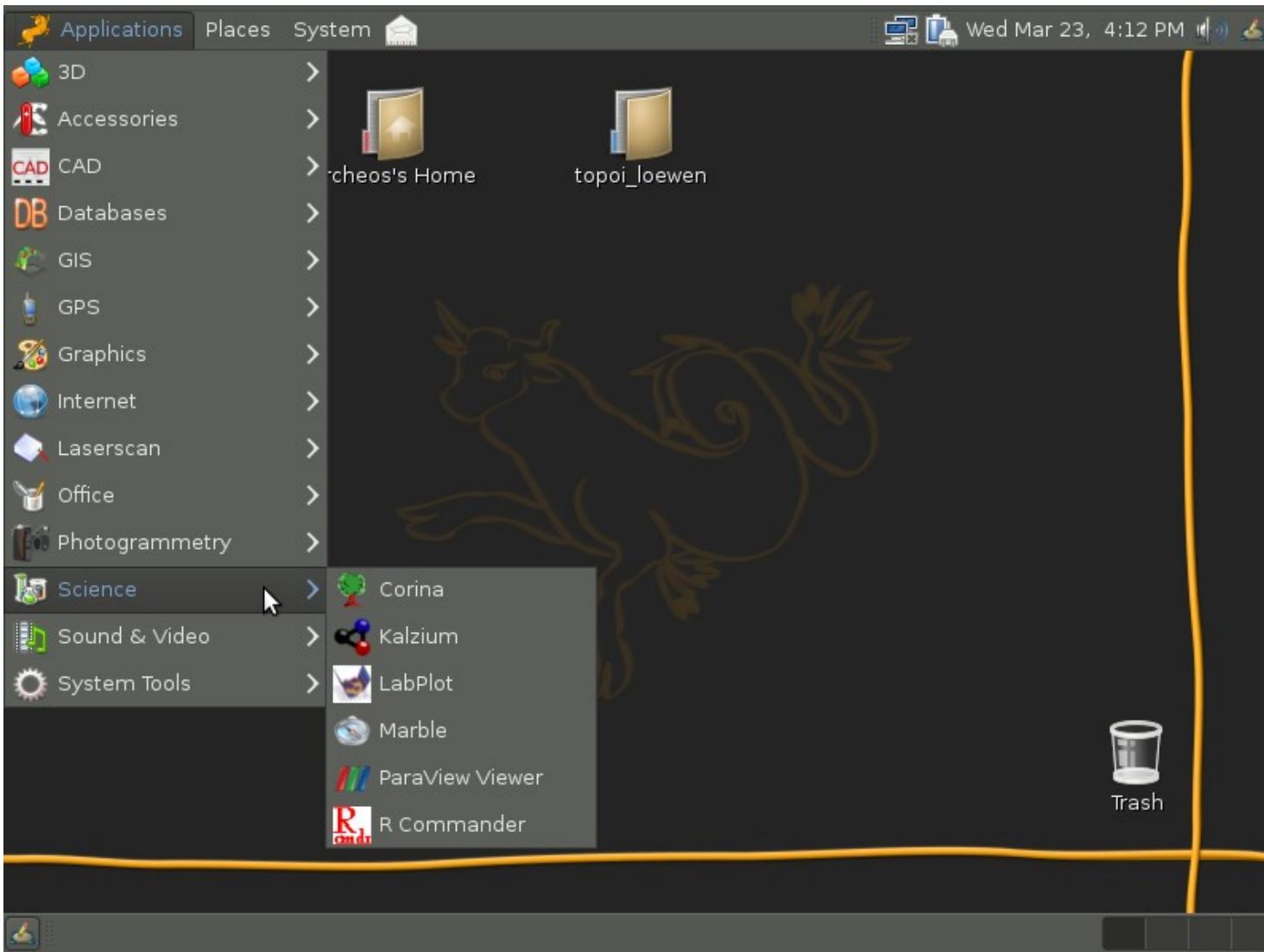
-foto

<http://www.efoto.eng.uerj.br/doku.php?id=en:start>

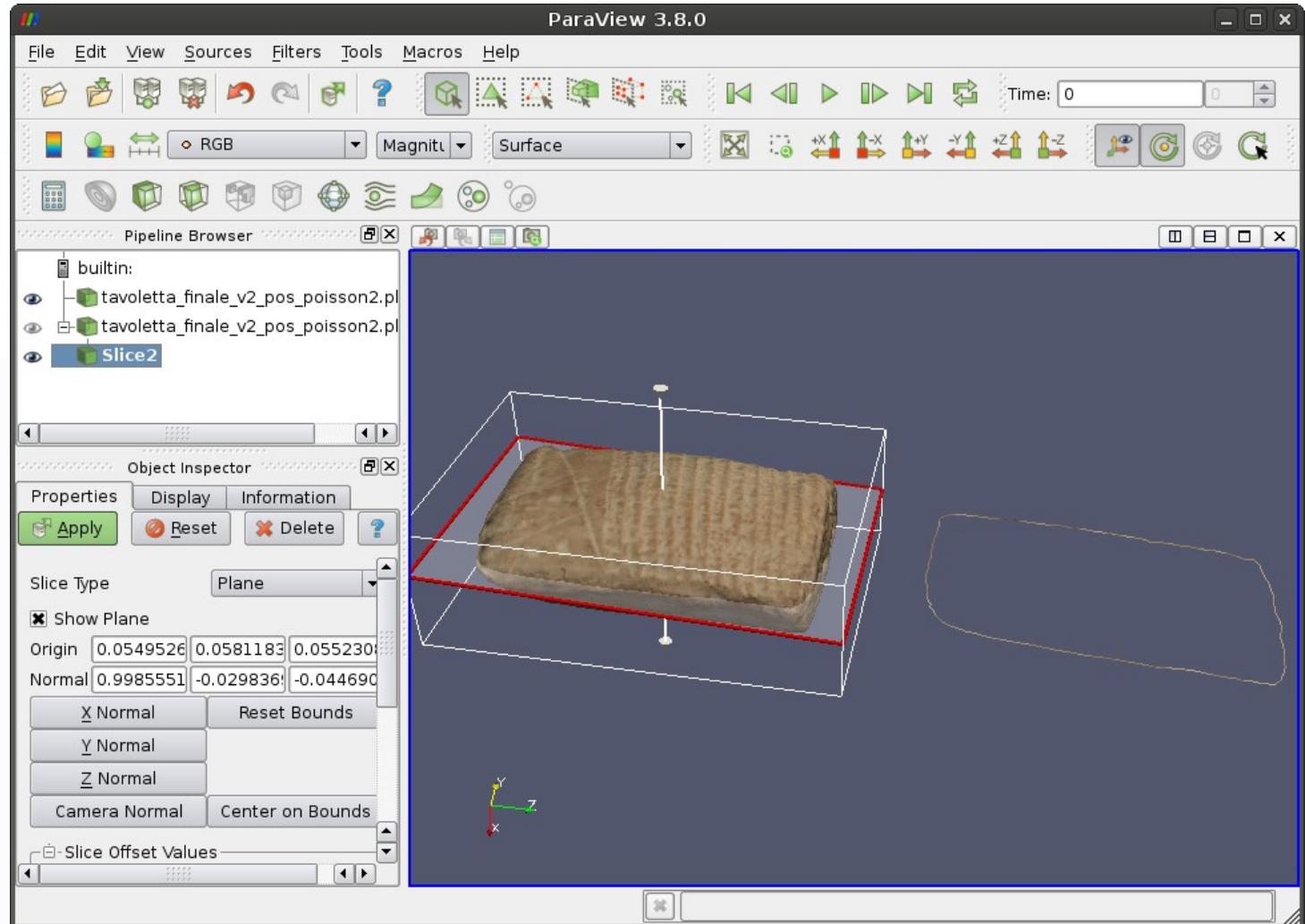
**insight3D**  
lets you create  
3D models from  
photographs.



## Science Menu



**Paraview**  
is an open-  
source, multi-  
platform data  
analysis and  
visualization  
application.

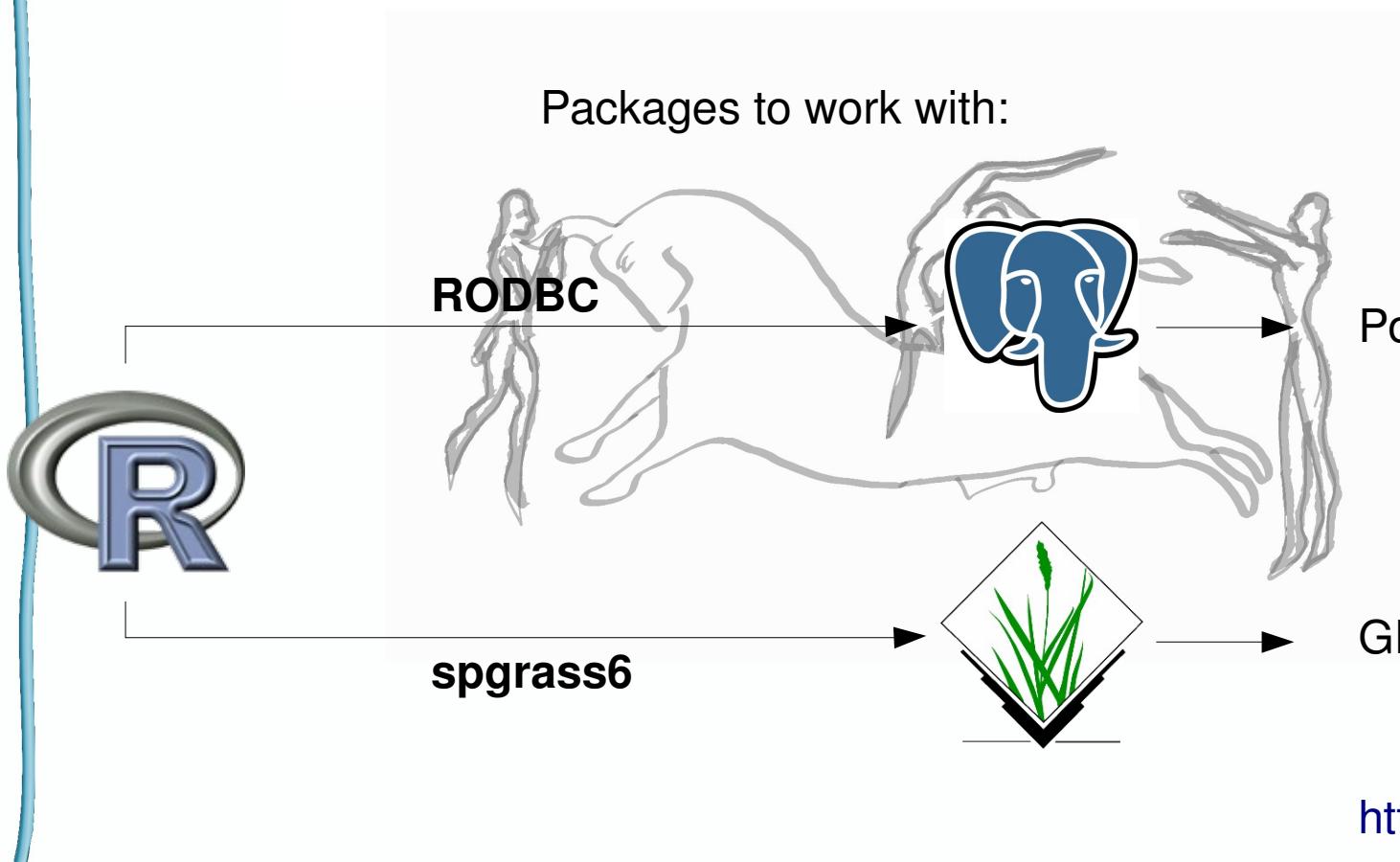


<http://www.paraview.org/>



**R** = a powerful free software environment for statistical computing and graphics. Not a software but a programming language

In ArcheOS it is possible to add new packages to work with other software and to calculate different kind of analysis





### Rcmdr – R Commander

**statistica : R**

**ug3167**

**ug3133**

**R Commander**

**Rcmdr Set di dati: ug3167**

**Finestra dei comandi**

```
plot(ug3133$frequenza, type="h")
abline(h=0, col="gray")
barplot(table(ug3133$classe), xlab="classe", ylab="Frequency")
Hist(ug3133$frequenza, scale="percent", breaks="Sturges", col="darkgray")
fix(ug3133)
qnorm(c(1), mean=0, sd=1, lower.tail=TRUE)
t.test(ug3133$frequenza, alternative='two.sided', mu=0.0, conf.level=.95)
showData(ug3167, placement='<20+200', font=getRcmdr('logFont'), maxwidth=80,
         maxheight=30, suppress.X11.warnings=FALSE)
```

**Finestra dei risultati**

```
> qnorm(c(1), mean=0, sd=1, lower.tail=TRUE)
[1] Inf

> t.test(ug3133$frequenza, alternative='two.sided', mu=0.0, conf.level=.95)

One Sample t-test

data: ug3133$frequenza
t = 3.7625, df = 18, p-value = 0.001426
alternative hypothesis: true mean is not equal to 0
95 percent confidence interval:
 2.324750 8.203671
sample estimates:
mean of x
 5.26421

> showData(ug3167, placement='<20+200', font=getRcmdr('logFont'), maxwidth=80,
+           maxheight=30, suppress.X11.warnings=FALSE)
```

**Messaggi**

```
[8] NOTA: Il set di dati ug3133 ha 19 righe e 2 colonne.
[9] NOTA: Il set di dati ug3167 ha 19 righe e 2 colonne.
```

6.66 / 5.24 0.00 x 0.00 Pagina 6 / 6 Predefinito 78%

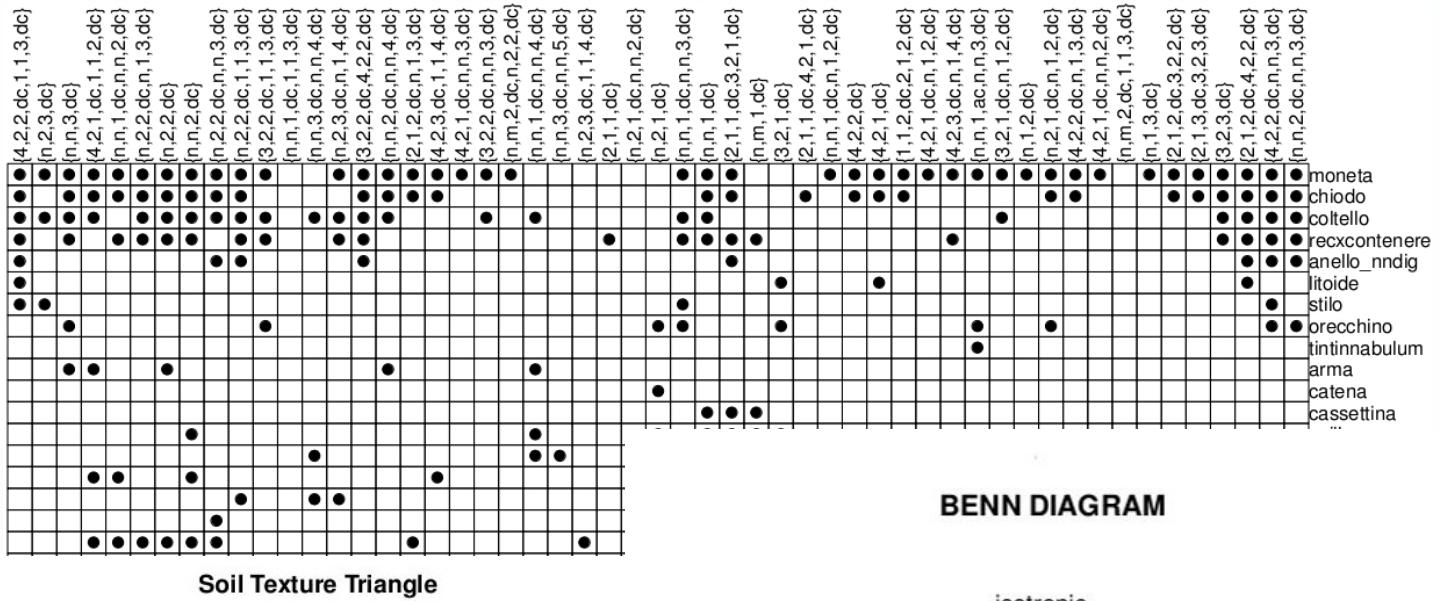
classe	frequenza
01a	15.92
01b	5.97
02a	6.54
02b	7.11
02c	5.68
02d	7.39
03a	2.27
03b	1.71
03c	1.71
03d	1.14
03e	1.14
04a	1.89
04b	1.51
05	0.99
06	2.01
07	3.79
08	19.86
09	8.50
10	4.88

classe	frequenza
01a	4.19
01b	10.65
02a	12.94
02b	15.22
02c	18.04
02d	16.59
03a	4.64
03b	2.74
03c	3.20
03d	1.83
03e	1.37
04a	3.35
04b	2.21
05	0.5
06	1.60
07	0.0
08	0.0
09	0.0
10	0.0

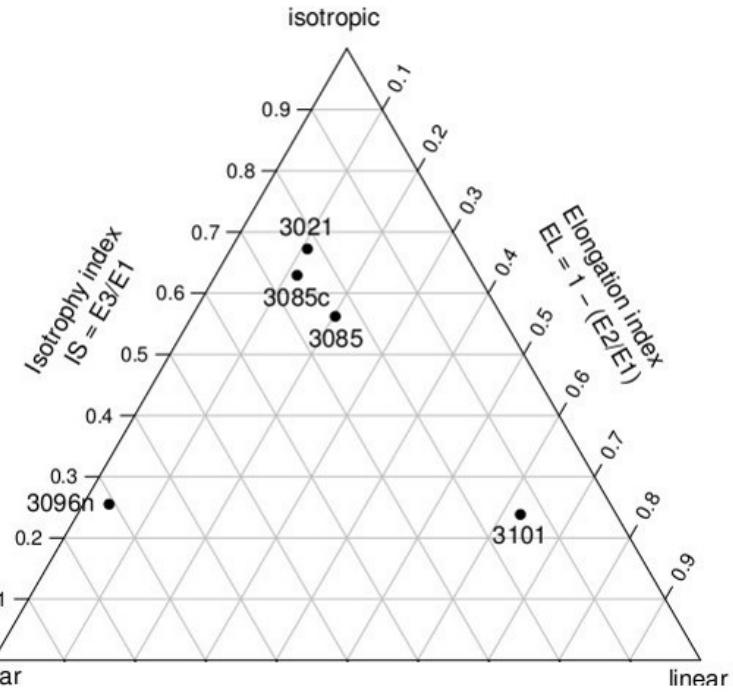
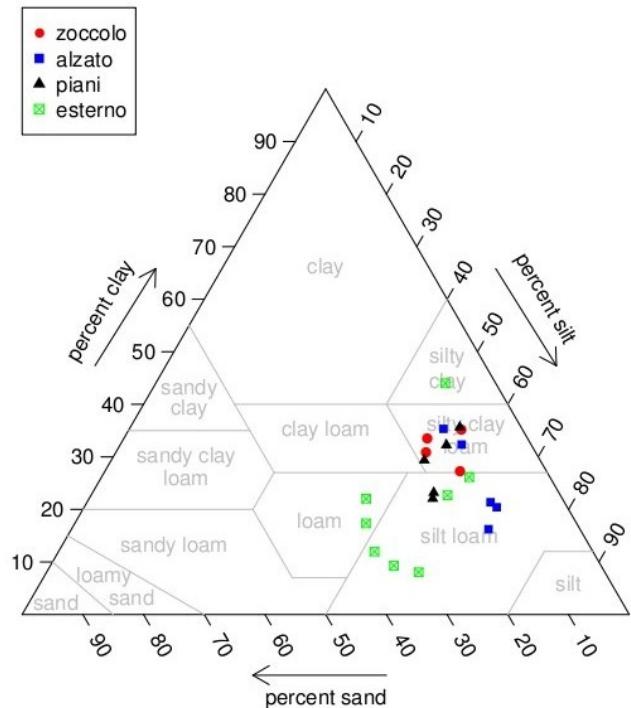
**R Graphics: Device 2 (ACTIVE)**



seriation

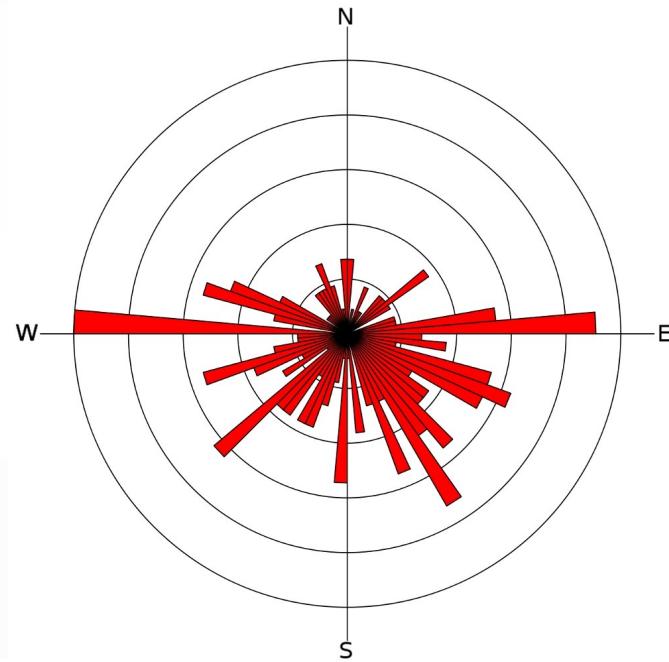


plotrix

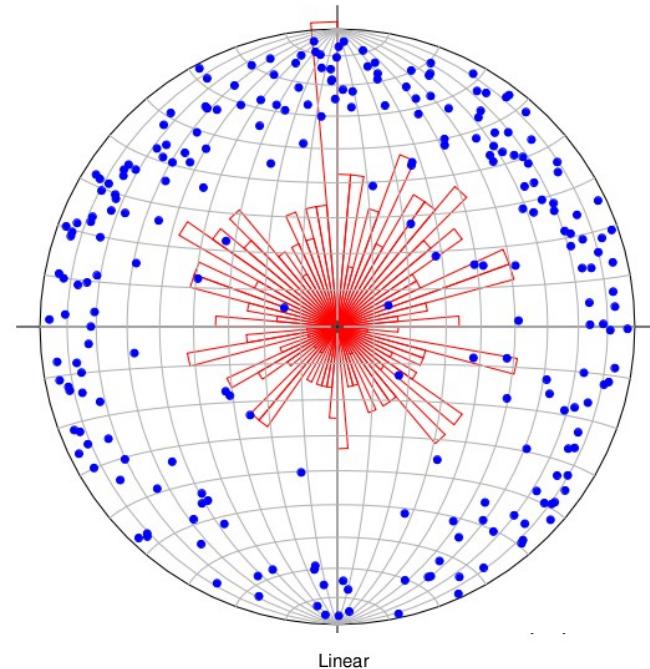




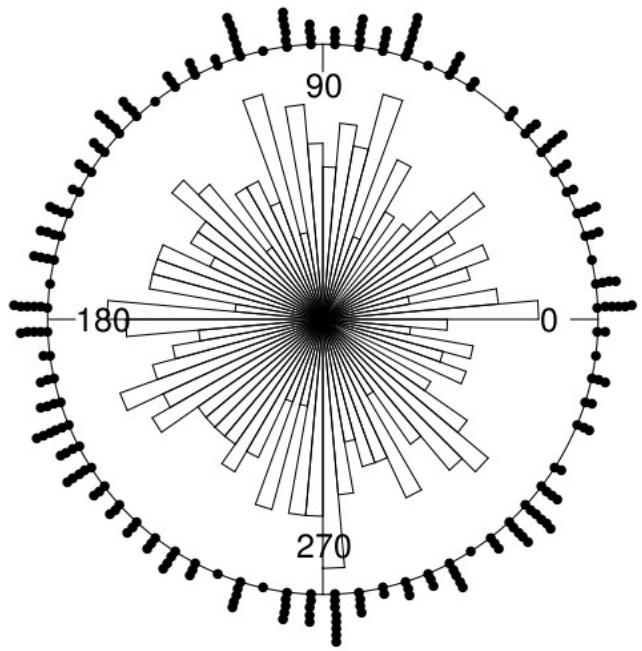
Circle Statistic



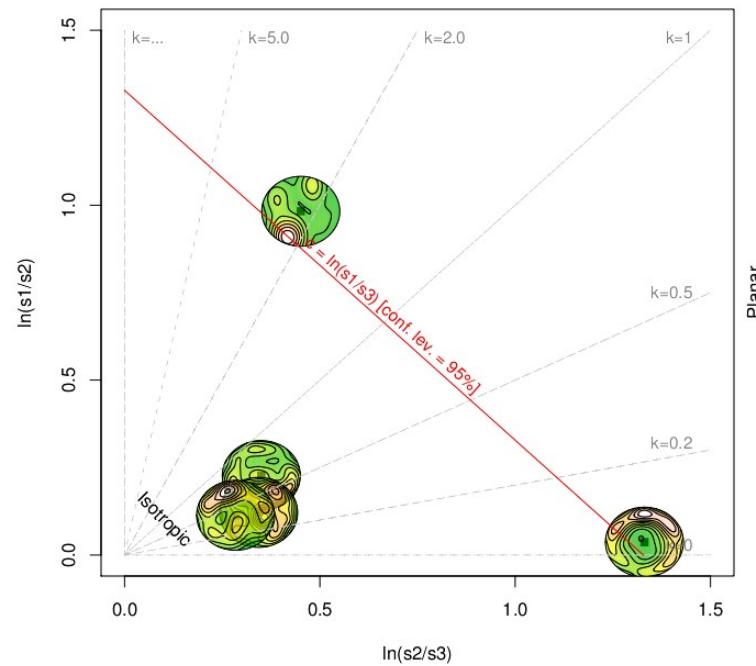
CircStat



her.Misc



RFOC



Planar



# THANKS

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