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WHY PAY PER "VIEW": OPEN SOURCE SOFTWARE AIDS VISUAL DISABILITIES

Summary

- Open-source software
- Accessibility
- Proprietary vs open source software
- Genoa University experience
  - an accessible Linux workstation
  - a Java plugin
- Linux accessibility today
- Two accessible software databases
- Conclusions and future works

Open Source and free software

- Access to the source code
- The freedom to run the program, for any purpose (freedom 0).
- The freedom to study how the program works, and adapt it to your needs (freedom 1).
- The freedom to redistribute copies so you can help your neighbor (freedom 2).
- The freedom to improve the program, and release your improvements to the public, so that the whole community benefits (freedom 3).

Open Source licenses

Open-source software is always released under license.

The **GNU General Public License (GNU GPL** or simply **GPL)** is a widely used free software license, originally written by Richard Stallman for the GNU project.

It is the license used by the Linux kernel.

One popular set of open-source software licenses are those approved by the Open Source Initiative (OSI) based on their Open Source Definition (OSD).

Beyond Software

The same criteria that define an open-source software, also make sense for other kinds of works, such as educational and reference works.

WIKIPEDIA is the best known example.

Any kind of work *can* be free, and the definition of free software has been extended to a definition of free cultural works.

A few dates

- In 1984, it was impossible to use a modern computer without installing a proprietary operating system.

- In 1991, Linus Torvalds developed Linux, the free operating system

- Today, the combination of GNU and Linux is used by millions of people around the world, and its popularity is growing

Accessibilty

Accessibility is a general term used to describe the degree to which a system is usable by as many people as possible. (wikipedia)

Accessibility means to provide the opportunity for people with disabilities to participate in activities such as the use of the web, services, and information.

Proprietary vs open source software

Microsoft was on the right track with Microsoft Active Accessibility, but because the source code to most popular desktop applications which are used in large corporations is not publicly available, they were never made fully accessible. In open source, however, making the necessary modifications to make them accessible is very possible.

Open source software is an ideal way to the needs of disabled users, because accessibility can be fully integrated into the core designs.

Proprietary vs open source software

JAWS (an acronym for *Job Access With Speech*) is a screen reader, a software program for visually impaired users

Genoa University experience

I describe two open source applications which we have experienced as very useful aids for the integration of people suffering from visual impairments, from hypovision to actual blindness.

The first application is based on speech synthesis and has been experienced by disabled university students, enrolled in the Faculty of Sciences.

Speech syntesis
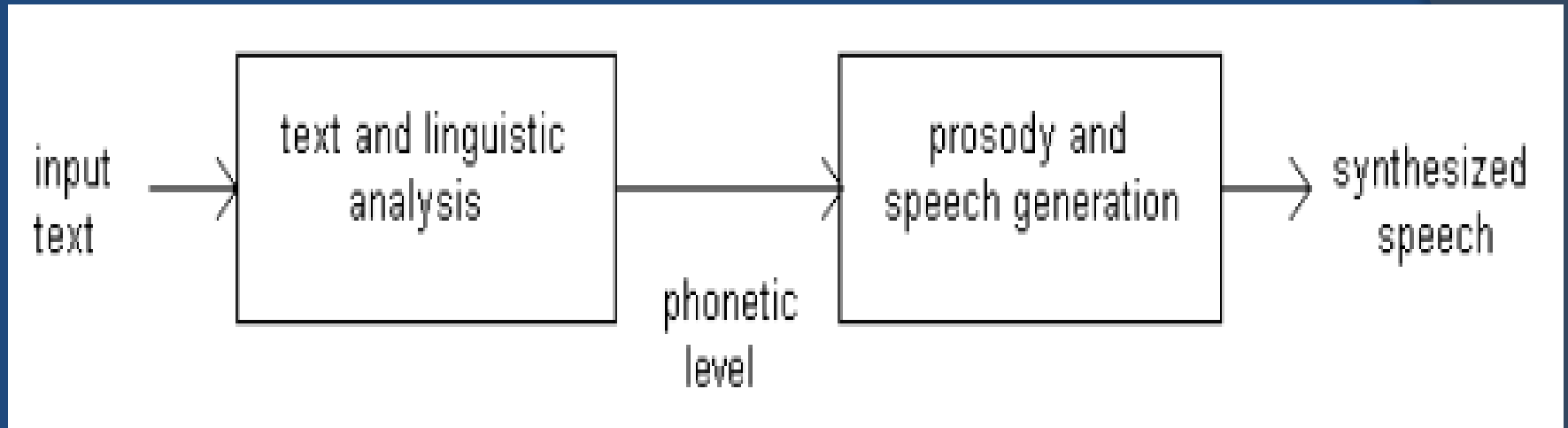
Two-phase process, the second is based on a database of phonemes (language dependent)

An accessible Linux workstation

We used Festival a speech synthesis software with some additional files on Italian phonetics, developed at the Padua Laboratories of the National Research Council.

The result was a lab workstation running open source software, together with software available for free use to non-profit organizations.

The workstation provides speech synthesis in Italian and in English under Linux, with easy keyboard based commands to switch between the two languages.

No Braille device needed to be installed, only earphones.

Festival (in Italiano)

"Il colombre, di Dino Buzzati."

'Quando sarò grande' disse 'voglio andar per mare come te. E comanderò delle navi ancora più belle e grandi della tua'

Genoa university experience

The second experience is oriented to elementary school children with low residual vision, and it is aimed at providing their educators and parents with easy to use tools for image manipulation, especially designed for exploiting residual visual abilities.

Image processing

- ImageJ is an open source image processing tool written in Java
- It implements many features useful for basic image processing

Image processing

ImageJ features may be expanded by plugins.

As result of a thesis work, some students wrote an ImageJ - plugin (IPO-Edges) realizing an automatic image simplification with a user-friendly interface to select a few parameters.

The result can be magnified or Braille printed

IPOEdges DEMO

IPOEdges as servlet web

Another student studied the possibility to convert IPOEdges plugin in a Java servlet.

A visual impaired person can "view" the simplified version of the images contained in all the web pages visited, according the parameters set in his/her profile.

A preliminary version of this servlet was applied to the web page of "Associazione Genitori Ragazzi non Vedenti"

http://www.ageranv.it/

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Qui potrai trovare le __informazioni sull´Associazione__ e, nella sezione Notizie, un aggiornamento sugli __eventi che organizziamo__.

È anche possibile consultare **il nostro catalogo** nel quale potrai trovare CD audio, DVD e libri. **I nostri prodotti possono essere acquistati on line**; per procedere nell'acquisto è necessario registrarsi nell'__area di registrazione__.

E´ disponibile il CD di Natale 2006 realizzato dai nostri ragazzi con la collaborazione del **Maestro Franco Califano**.

E´ inoltre disponibile il calendario 2007 contenente foto in bianco e nero realizzate da Margherita Scelzi con informazioni dei vari mesi scritti anche in braille. E´ possibile richiedere il calendario __cliccando qui__.

CD di Natale 2006: Buoni Konsigli (con la partecipazione del Maestro Franco Califano)

Buoni konsigli
UN PICCOLO DONO INATTESO

RAKELE GHERARDI
NIKOLO' PAGLIETTINI
ERIKA DI MARTINO
ANDREA GUGLIELMELLI
KRISTINA UNALI

Special guest vocal in "Vorrei che fosse Natale"
FRANCO CALIFANO

Internet   100%
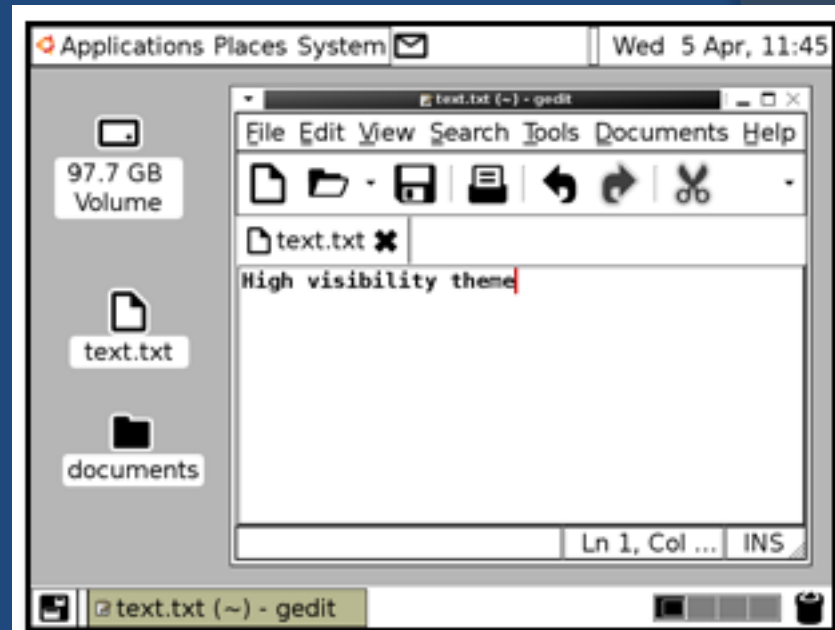
Linux accessibility today

The most common accessibility tools are pre-installed on Ubuntu 6.10, the latest version of the Linux distribution, and are easy to activate.

High Contrast

Ubuntu provides a selection of high contrast themes, complete with custom icons and mouse cursors.

Keyboard modifiers

The Gnome desktop environment supports several options for modifying the behaviour of the mouse and keyboard.

The modifier keys (Shift, Ctrl and Alt) can be made *Sticky* so that when they are pressed once they remain active until the next key is pressed, making it possible to write upper case character or use keyboard shortcuts while only pressing one key at a time.

Other features include *Slow Keys* and *Bounce Keys* which control the reaction rate and repeat rate of keys and *Mouse Keys* which allow the numeric keypad to be used to control the mouse cursor.

On-screen Keyboard

Ubuntu 6.10 includes the on-screen keyboard, a lightweight text-entry application, extensible through macros, scripts and custom layouts.

Also available is *Gnome On-screen Keyboard* (GOK), which in addition to basic text entry, also provides facilities for controlling the entire desktop behaviour through the on-screen keyboard by gathering information about other applications and sending them control signals through the Gnome assistive technology framework *AT-SPI*.

Magnification and Speech synthesis

Orca is a screen reader and magnifier that enables users with limited vision, or no vision, to use the Gnome desktop and associated

applications.

Orca is in OpenSolaris, Ubuntu, Fedora Core, and other LINUX releases. Using various combinations of speech synthesis, braille, and magnification, Orca helps provide access to applications and toolkits that support the AT-SPI (e.g., the GNOME desktop, Firefox and OpenOffice).

Open source software & disabilities

Two example of accessible software repository

Sodilinux by ITD-CNR & AICA

Is a collection of 137 educational software and some standard applications of GNU/LINUX UBUNTU.

Each software is equipped with a description and information on its accessibility.

The database can be browsed by content or by school level

http://sodilinux.itd.cnr.it/

Open Source **A**ssistive **T**ecnology **S**oftware

OATSoft is dedicated to improving Assistive Technology and computer accessibility through the power of Open Source development techniques.
OATSoft makes the best *Open Source Assistive Technology Software (OATS)* easy to find. Users and developers meet at *OATSoft* to create better software.

http://www.oatsoft.org

Conclusions and future works

- Open-source software get often behind with respect to commercial software. However, at present day, this gap has been filled and open-source can be really accessible.

Future works

- A multimedia accessible vocabulary on wikipedia

References

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- http://sodilinux.itd.cnr.it/
- http://www.chiossone.net/
- http://live.gnome.org/Orca