### The monthly GNU Column

# Brave GNU World

I n this monthly column we bring you the news from within the GNU project. In this issue we will look at mapping both on earth and in space along with on-line archiving.

Welcome to another issue of Georg's Brave GNU World. Although earth may be mostly harmless, sometimes it is quite easy to get lost on it. But fortunately there is GpsDrive. **BY GEORG C. F. GREVE**

## GpsDrive

As the name suggests, GpsDrive [1] by Fritz Ganter is a Free Software navigation system under the GNU General Public License, which uses the satellites of the "Global Positioning System" (GPS).

Through a GPS receiver, GpsDrive gets the current position and displays it on an automatically chosen map in a user-selected scaling. Loading the maps can either be done directly off the internet or through a proxy; even from map servers like Expedia or Mapblast.

GpsDrive supports route planning through way points, which can be read from a file or entered dynamically with the mouse. Routes can also be recorded and played back, so it is possible to record ways you have taken and pass them on to friends, which is already being used for bicycle tours, for instance.

To avoid having to stare at the screen all the time, GpsDrive also supports spoken output in English, German and Spanish through the Festival [2] speech synthesis software.



**Figure 1: GPSDrive running on an iPAQ**

Given that development on GpsDrive only began in August 2001, making the project just one year old, the list of features is quite amazing. One of the most unusual ones is clearly the "friendsd" server, which allows friends to share their positions, allowing to display also the positions of the others.

GpsDrive was written in C with the GTK+ toolkit and even though it is already quite stable, it is still under development. Points of interest for future development are a real street navigation and also speech input.

It works with all Garmin GPS receivers which allow for serial output, as well as GPS receivers supporting the NMEA protocol and is usually being used on laptops, where it has been tested under GNU/Linux and FreeBSD.

But of course especially PDAs would be interesting platforms for such applications and owners of the Compaq iPAQ and the Yopy may be happy, because GpsDrive has been used successfully on those. Although GpsDrive has already been localized for 10 languages, especially translation into other languages is an area in which Fritz seeks help to make his project accessible to as many people as possible.

## GNU SpaceChart

GNU SpaceChart [3] by Migual Coca, a relatively new package of the GNU Project, also helps keeping the orientation, although its practical application would be planning of intergalactic by-pass roads. In fact it was the interest in science fiction stories and their "original locations" that made Miguel work on SpaceChart. GNU SpaceChart is a program for star cartography that is not restricted to displaying two-dimensional images of the nightly sky or some constellations, it rather visualizes the position of stars in the sky, as can be seen in the screenshot to the right. The user can look at the sun or another star from a large distance and through tunably filters determine, which kinds of stars are being displayed. To increase the 3-D impression, stars can be connected with lines and rotated.

For Miguel, this is one of the major advantages of SpaceChart compared to other Free Software programs, because they do not give him the same three dimensional feeling.

Programming language used for SpaceChart is C with the GNOME libraries and it is published under the terms of the GNU General Public License. This choice makes it fast, and makes it, for instance, possible to display all stars within 50 light years of the sun and rotate them smoothly in real time.

Other components of GNU SpaceChart are data files created automatically from astronomical catalogs by a Perl script, and documentation, most of which has been contributed by Robert Chassell, who is also the most active beta tester and who (according to Miguel) has a never-ending supply of new ideas for further improvement.

The main audience for this project would be readers and authors of science fiction stories, who would like to have a better idea of how stars are distributed relatively to each other. But he would also like feedback by "real" astronomers to tell him how GNU SpaceChart might become more useful to them. Help is welcome in form of code, testing and documentation, of course.

## GNU EPrints

Christopher Gutteridge of the University of Southampton is working on GNU EPrints [4], a project to create online-archives, with support by Mike Jewell.

Especially in the scientific field, literature research is an incredibly important part of the work and publications are only useful if they can be found. Making this easier is the goal of GNU EPrints, although it can theoretically be deployed in any situation where articles or documents of a research area, project or institution are to be archived.

Professor Stevan Harnad, who is the political force behind GNU EPrints, drew his motivation for the project from the idea to reestablish unencumbered access of science to its results and also to give financially weaker institutes and countries the chance to participate in the scientific exchange.

Despite being Free Software under the GNU General Public License (GPL), GNU EPrints also offers the advantage of being geared towards supporting different languages from the start. Web pages can be provided in different languages and it is also possible to select languages per field. This has already found practical application when some French archives were required to have abstracts in English and French simultaneously. EPrints isn't restricted to European languages, thanks to Unicode, almost anything should be possible.

EPrints was written with an object-oriented approach in Perl, keeping it as understandable as possible, because the design philosophy assumes that it can never be perfect, so it will require changes to adapt it to the local situation. To do this, EPrints employs the concept



**Figure 2: SpaceChart showing constellations**

of "Hooks," which call custom scripts that do useful things.

This makes for a highly customizable system, which sometimes creates the problem of finding the right option or understanding the different functions. In order to help new users on the right way with this, HOWTOs are provided for frequently arising questions and needs.

In real-life practical deployment, the technical side is the minor problem, as far as the experience of the author is concerned. Getting to a solution for archive policy or agreeing on the structure is much more difficult.

There are places, where it took several months and committees to determine the structure of an archive that now contains 20 entries. This once more demonstrates that social problems cannot be solved with technology. In these cases, Christopher Gutteridge uses "carrots and sticks" as the adequate tools.

But once there is agreement on the structure and once users have been educated to provide sufficient amounts of metadata, GNU EPrints can provide an extremely valuable tool.

Since it fulfils the Open Archives Initiative (OAI) [5] standard version 1.1 and 2.0, it is even possible to share archive metadata with other archives, so entries can be searched over multiple online archives simultaneously.

According to Christopher Gutteridge, he doesn't really need help at the moment. The code base seems to be sufficiently stable and thanks to external funding, good documentation is currently under development.

## GCron

GCron [6] will replace the currently used Vixie Cron within the GNU System, because the Vixie Cron has not been maintained since the early nineties and has developed several security problems, which the different GNU/ Linux distros try to address with their own house patches. Thanks to gcron, this will hopefully soon become unnecessary. Even though cron is clearly one of the "classics" of any Unix sys-

tem, some readers may not have heard about it yet – a brief introduction might be useful:

Cron is a program which allows execution for programs i.e. scripts at specific times (week days, times, dates, and so on). This allows automating the periodically necessary tasks, for instance. Cron is being used for system maintenance tasks on almost all installations of Unix-like systems.

Ryan Goldbeck now works on gcron, a security-aware new implementation, which will then be used on all GNU/Linux distributions.

First goal is completing support of the POSIX standard and make the files backwards-compatible to Vixie Cron to allow for a painless migration.

Afterwards GNU/Hurd specific extensions and additions for better information about the executed programs such as the running time or resource usage are planned. It would also be possible to include a better means for controlling system resource usage by the executed programs.

It is not very surprising that gcron is published as Free Software under the GNU General Public License; C is being used as the programming language. Goodbye, and thanks for all the fish!

That's it with the "A Tribute to Douglas Adams" issue, who died too young, little more than a year ago.

And as usual, I'm asking everyone to not be shy in providing ideas, comments, questions, inspiration, opinions and information about interesting projects to the usual address. [7] ∎
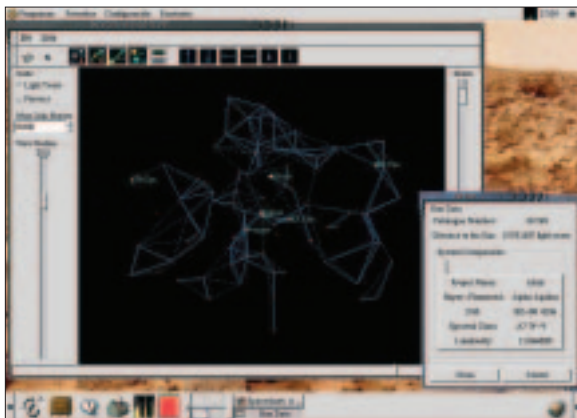
**INFO**

[1] GpsDrive home page *http://gpsdrive. kraftvoll.at*

[2] Festival home page *http://www.cstr.ed. ac.uk/projects/festival/*

[3] GNU SpaceChart home page *http:// www.gnu.org/software/spacechart/*

[4] GNU EPrints home page *http://www. eprints.org/*

[5] Open Archives Initiative (OAI) home page *http://www.openarchives.org*

[6] GCron home page *http://www.gnu.org/ software/gcron/*

[7] Home page of Georg's Brave GNU World *http://www.brave-gnu-world.org* Send ideas, comments and questions to Brave GNU World *column@brave-gnu-world.org*