Workshop on Open Source Computer Algebra

Tuesday 21st - Thursday 23rd of May 2002
Lyon, France

Amphi G3, Bâtiment enseignement [A]
University Claude-Bernard Lyon I, Campus de Gerland
50, avenue Tony-Garnier, Domaine de Gerland, 69366
Lyon Cedex 07

Organizing committee: Daniel Duparc, Bernard Mourrain, Bernard Parisse, Fabrice Rouillier, Marie-Françoise Roy, Nicolas Thiéry, and Paul Zimmermann.

Local organizers: Nicolas Thiéry, Gilles Villard

Contact: nthiery@users.sf.net

Web page: `http://www.lapcs.univ-lyon1.fr/~nthiery/CalculFormelLibre/workshop.html`

This workshop was organized with the support of the GDR Algorithme, Langage et Programmation, of the AS "Calcul Formel", of the Laboratoire de l'Informatique du Parallélisme (ENS-Lyon), of the INRIA, and of the Union des Professeurs de Spéciales.

Here is a preliminary version of the report on this workshop.

1 Scope

The organization of this workshop was initiated after long discussions on the French mailing list calcul-formel-libre@math.cnrs.fr last autumn, where the lack of an open source computer algebra system was deplored. See `http://www.math.cnrs.fr/archives/logiciels-formels/` for the archives, and `http://www.lapcs.univ-lyon1.fr/~nthiery/CalculFormelLibre/` for a tentative summary (in French).

The aim of this workshop is to gather potential users and developers from academy and industry, in order to:

- Take a snapshot of the current situation of free software for computer algebra;
- Specify the needs, for research, teaching, and industry usage as well;
- Study the feasibility of a free system in this domain.

Here, by *free* we mean open source, and more precisely compatible with the GPL (see `http://www.fsf.org/licenses/license-list.html#GPLCompatibleLicenses`); by *system* we mean indifferently a software or a collection of software.

2 Registration

To register to the workshop, please send an e-mail to Helene Zganic (Helene.Zganic@loria.fr), with the following information:

- Name, title:
- Position:
- Address:
- E-mail:
- Tel, fax:
- Expected arrival and departure dates:
- Attendance to the banquet [yes/no]:

If you plan to attend the banquet, please send your registration form before may 10th!

We basically need to know the number of participants in order to organize the coffee breaks, the lunches, and the banquet. There is no registration fee. The banquet will be offered, or proposed at a low price if there are more than 50 participants. The lunches will be taken at the ENS-Lyon. The participants have to take care for themselves for the lodging. You can find some suggestions on `http://www.loria.fr/projets/spaces/cfl.html`.

3 Tentative program

Poster sessions will take place during the whole workshop. If you would like to present a poster about some software, please send us a description before Mai 15th.

Tuesday May 21st, afternoon

Theme: definition of the goals and constraints

14h00-14h50 Opening session

15h-16h Open source software, licenses, and legal issues: Bernard Lang

- Coffee break

16h30-17h10 TeXmacs Joris van der Hoeven

- Software demonstrations:

17h15-17h40 GINAC: Richard B. Kreckel Slides

17h45-18h10 GIAC: Bernard Parisse
Slides

18h15-18h40 Linbox Pascal Giorgi & Gilles Villard

18h45-19h10 TRIP: Jacques Laskar et Mickael Gastineau

19h15-19h40 ACE, mu-EC, and mupad-combinat: Florent Hivert

20h All the participants are welcome to join the organizers for dinner at the nearby Ninkasi restaurant, 267 r Marcel Mérieux 69007 LYON.

Wednesday May 22nd, morning

Theme: Development Tools and Models

9h-9h40 Objective Caml: Pierre Weis

9h45-10h25 SYNAPS: P. Trébuchet

- Coffee break

10h45-10h25 Scilab: Claude Gomez
Slides

11h30-12h25 GAP System development for Computer Algebra: Alexander Hulpke

- Meal at the nearby École Normale Supérieure de Lyon

Wednesday May 22nd, afternoon

Theme: Existing platforms and software

14h-14h40 MuPAD 2.5 - News, Trends and Outlooks: Oliver Kluge

14h45-15h25 The MAGMA Computer Algebra System: Allan Steel, University of Sydney

15h30-16h10 Axiom Tim Daly

- Coffee break

16h45-17h25 Maxima: Annick Valibouze; presented by Marc Giusti

17h30-18h10 Foc: Renaud Rioboo

18h15-18h55 PARI: Karim Belabas
Slides

19h-19h45 Singular: Pfister
Slides

20h30 All the participants are invited for the banquet at the Brasserie Georges, 30, cours de Verdun Perrache, just nearby gare Perrache.

Thursday May 23rd

9h-9h25 g++: Gabriel Dos Reis

This final day will gather the participants who want to get personally involved in a "free computer algebra system" project. Volunteers are warmly welcome! Please note that this does not necessarily require special technical skills, as much of the work will consist in beta-testing and writing documentation. The goal is to write down a synthesis document for this workshop, to define the main lines of the project, and last but not least to find volunteers to contribute!

9h30-10h30 Session 1: Potential users and their needs.

- students, teachers and professors
- researchers (academic)
- engineers (industry)

10h30-11h Coffee break

11h-12h30 Session 2: Technical points.

- specify some precise components and their interfaces, for example: kernel, library, common platform/environment, compiler, documentation, test suite, benchmarks, ...
- for each component: can we restart from existing free software, or push an existing software to become free?
- for each interface: can we reuse an existing (standard or popular) language?
- connection with existing (non necessarily free) systems?

- how to include contributions: referee process by publishing board? Define rules for contributions: benchmarks, bug corrections, ...
- diffusion of the whole distribution: cvs server, ftp, cdrom?
- which language for documentation: pdf?

12h-12h30 (In parallel with session 2): Working groups.

- Interface with numerical libraries (NAG, Octave, Scilab, GnuGSL) [moderator Tim Daly]
- Corba-like communication protocol/server for computer algebra systems [moderator Joris van der Hoeven]

12h30 Meal at the nearby École Normale Supérieure de Lyon

14h-15h Session 3: Project management.

- legal aspects: which law applies (european/US)?
- financial aspects
- manpower, how to find it?
- who decides what: executive committee?
- strategic choices (license, form of collaborative development)
- ensure the diffusion of the system: commercial partners?

15h-15h30 Coffee break

15h30-16h30 Session 4: Workplan.

- list some well-defined tasks and people to achieve them
- create one mailing-list? a web page?
- evaluate the required funding and how/where to find it
- fix deadlines for each technical project?
- constitute an executive committee and a publishing board

16h30 End of the workshop

4 Guidelines for presenting a software

Here are some questions that we would like you to answer about the software you are going to present. Please be helpful: avoid hype, and be as neutral as you can!

- What are the main strengths and weaknesses of the software ?
- What development model is used ?
- What difficulties are encountered ?

- What are the reasons for the success or failure of the software ?
- What's the future of the software ?
- How is the software distributed ?
- What kind of license is used for the software ? Why ?
- Is this an open-source license? If not, would it be possible to switch to an open-source license ?
- Is there an active community of users ?
- Is there an active community of contributers ?
- How are contributions integrated and rewarded ?
- Are there contributions for the core of the system, or only as external modules ?
- What would happen if you stopped the development of the software ?
- Is there documentation (for developers / for users) ? Who writes it ?
- Are there books with tutorials, exercises, and examples ? Are they written by developers of the project or external persons ?
- Where is the software used ? university, industry, high school/university teaching, research, ...
- What is the size of the developer team ?

5 How to come ?

Coming by car: well, just check a map of Lyon; you cannot miss avenue Tony Garnier on it (south of Lyon, on the east side of the Rhône). But prepare for some trouble finding a parking lot.

Coming by plane: there is an international airport in Lyon Satolas, with a bus shuttle that takes you downtown to the railway station "Lyon Part-Dieu" (around 20 euros round trip). Alternatively, there are direct fast trains (TGV, 2 hours for 500 kms) on a very regular basis between the international airport Paris Charles-de-Gaule and Lyon. The price of the train is about 120 euros round trip.

Coming by train: there are two main railway stations in Lyon, many trains going through both of them. We suggest that you use "Lyon Part-Dieu", though "Lyon Perrache" is not much further away from the campus. See `http://voyages.sncf.fr/` for schedules, fares and reservations.

Now, coming from the railway station "Lyon Part-Dieu" to the campus is rather easy. Just beware that *this is not the main campus "La Doua" of the*

university Lyon I. The workshop indeed takes place in new buildings, nearby the École Normale Supérieure de Lyon.

Take the subway, line B, all the way down to "Stade de Gerland" (south of Lyon). At the exit, walk to the west, on avenue Tony Garnier, about 200 meters past the gas station; there are constructions so only the pavement on the right of the avenue is walkable. Cross the street at the light. The building [A] is the 3 stories building with a wood and glass structure that stands in front of you.

You can also check the web site of the Transports Communs de Lyon http://www.tcl.fr/.