



Random Thoughts on Open Source Computer Algebra

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Speaking only for myself



An analogy I've used before

- **I live in a house. It is a little small. It could use a few repairs. Suddenly, someone comes along and gives me... another house!**
 - **My first thought is “Wow! A free house!”**
 - **My second (and third and fourth and...) thought is “What now?”**



Analogy, continued

- **Maxima is my house. There are several other open source CAS's that could be my second house.**
 - **If one was clearly superior I would just move into it.**
 - **In order to move into one system, I have to abandon all the others.**
 - **In the worst case, I still live in a small house, but I have to keep repairing two houses.**
- **Taking advantage of what we have available is not simple.**



Some things that can be done

- **Algorithms can be implemented in such a way that they could easily be translated to other systems.**
 - **Automatic translation tools are the subject of some conversation.**
 - **I do not have much more to say about this strategy.**



Some things that can be done 2

- **We could agree to make our systems talk to each other.**
 - **This is a very hard problem.**
 - **OpenMath is supposed to be a solution.**
 - **I don't know much about it.**
 - **I know of no free implementations.**
 - **I have yet to be convinced.**
 - **Fateman has published some reservations on OpenMath.**
 - **Other solutions could be tried.**



Some things 3

- **None of the open source CAS's have an GUI I find competitive with the big M's. (I am most familiar with Mathematica.)**
 - **We could collaborate on a really good interface to a general CAS.**
 - **At least, we could collaborate on components for CAS GUIs.**

Displayed Equations

- The number one CAS GUI element I would like to have is an equation display widget.
 - Must do line breaking!
 - Hard problem.
 - Should allow selection of subelements.
 - Standards exist for the format
 - MathML
 - Line breaking???
 - TeX
 - Breqn does line breaking
 - Doing line breaking in TeX is very slow.



Plotting tools

- **The second thing I would like to see is a better tool for plotting.**
 - **I would like to use a tool that is general enough to do stand on its own.**
 - **Must generate publication-quality results.**
 - **We could easily beat the commercial CAS tools in this respect.**
 - **Many, many packages exist**
 - **None are quite appropriate, but could be made so with some work.**
 - **I consider 2D and 3D tools to be two separate categories.**