Subject: Inexpensive / free-ware similar to IDL?
Posted by K. S. Balasubramaniam on Tue, 21 Sep 1999 07:00:00 GMT
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I am looking for inexpensive solutions for data analysis, other than IDL, but similar in
capability.

IDL has been a wonderful tool and has enormous strengths, but individuals cannot
afford it. I have used it for over a decade while I worked at govt. sponsored/educational
labs. Its flexibility is addictive. Having moved over to the private sector, and switching
fields, in a different area of data analysis things are different! Many folks have not heard
of IDL, and when informed of its use are able to nod in appreciation but quickly loose interest
because it is way too pricey! and very compareable to the price of some workstations.

I am not sure how many folks out there use ANA http://ana.lmsal.com/ It has the potential for
a robust freeware and needs lots of work. Are there similar freeware packages? I am also
aware of xmgrace, xmgr, etc for less intensive applications. Suggestions appreciated

Subject: Re: Inexpensive / free-ware similar to IDL?
Posted by grunes on Sun, 26 Sep 1999 07:00:00 GMT
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I for one find this very interesting, and
think the post did us all a great service.

Do any of these products have all of the following
characteristics (which IDL and WAVE both have):

(1) Ability to handle arrays of arbitrary dimensionality
(not just 1 or 2 or 3 dimensions), of 1, 2 and 4
byte integers, 4 and 8 byte reals, and 8 and
16 byte complexes (actually, WAVE omits the
16 byte complexes, last I checked).
(2) Ability to read raw bytestream files containing
mixtures of 1,2 and 4 byte integers, 4 and 8 byte
reals, and complex numbers. We all frequently need
to handle other-people's-data-format files.

(3) Ability to reverse byte orders of those data
types, so we can easily interpret data from other
types of machine.
(4) Can produce PROFESSIONAL-LOOKING (e.g. not
GNUPLOT-like) 2D plots, with professional
looking fonts. Can overplot other plots and
isolated points on the same plot frame in other
colors. Should be able to display to screen,
and output to postscript, and output to an image
file would also be nice.
(5) Can display images easily, with user settable
pseudo-color tables. Same comments about display
and output as above.
(6) Can read and write common image formats, like
TIFF and GIF.
(7) Has support for matrix operations (inversion,
solution of equations, eigen-values and eigen
vectors), for the most frequent transcendental
arithmetic operations you find on scientific
calculators.
(8) Allows you to draw buttons (or at least text)
on a graphics screen, and can detect the press
of a mouse button and where it occurred--useful
for setting up one's own GUIs. Another capability
that is nice (but not essential) is the ability
to detect single key presses.

If any of the free packages meet all this, I might
well switch for some purposes, especially if they
run as fast or faster than IDL/PV-WAVE, and run on
multiple platforms.

Subject: Re: Inexpensive / free-ware similar to IDL?
Posted by htonishi on Mon, 27 Sep 1999 07:00:00 GMT
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A few of you may be able to take advantage of RSI's offer
to sell a "home" license to users who have a "work"
license. The price is $500 (pc). I got one and now I get
to work at home as well as the office!?

Subject: Re: Inexpensive / free-ware similar to IDL?
Posted by Chris Schmidt on Mon, 27 Sep 1999 07:00:00 GMT
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> "K. S. Balasubramaniam" wrote:
>> IDL has been a wonderful tool and has enormous strengths, but individuals
>> cannot afford it.

Liam Gumley wrote:

> If you're already familiar with IDL, is the cost of a single-user IDL
> license for Windows more or less than the cost of your salary and
> benefits for however many weeks it takes for you to find, learn, and do
> something productive with a 'free' package?

<climbs onto soapbox>

A part of the price issue that seems to be forgotten is how pricing affects the availability of IDL to students, both graduate and undergraduate. RSI encourages universitiy departments to use IDL by offering discounts for license packages and site licenses. This has happened at both my undergraduate and graduate institutions. In my undergraduate physics program, IDL was indispensible because of the variety of locally written an vendor provided routines. We did things in our homework assignments that we couldn't dream of doing otherwise. We were lucky, however, that there were so few of us, and thus we almost always had access to machines with IDL. However, as dorm PCs (not owned by the university) have become more prevalent and powerful, the option of students having individual copies of IDL has become much more popular. The *idea* is popular, but the price makes it impossible. In the graduate level world, an increasing number of students have their own PCs at home, and again the same problem arises.

Yes, there is a "student version" of IDL. We helped Beta test it at Lawrence University back in 1996 or 1997. Even back then we knew that the array limitations (65,536 bytes of memory/array, not to mention the other limitations) would make it almost difficult or impossible to use the student version for most assignments in even the sophomore level physics courses. We informed RSI of this at the time.

It would be a great convienence to have a full version of IDL available to students (to run on their own machines, not university owned) at reasonable prices (say, sub $300, for example). It is true that in most cases, students who use IDL have access to the full version through a site-license or group of licenses. However, I think it hurts the perception of IDL and also hurts the spread of IDL that there is not a full version that they can afford to run on

their own machines. I know RSI is not a very large company, and I know that they work very hard to put out their products. I am also aware of their concerns that academic pricing could be abused (for example, used in a lab when a site license would be the correct option). I firmly believe, however, that their user-base, and hence revenues, would grow strongly and steadily with increased availability of the full version to students, and as a consequence the prices for the individual, non-academic licence could come down as that larger, young user-base leaves academia for the "real-world" and wishes to continue use of IDL.

<gets off of his well-worn soap-box>

regards,
Chris Schmidt
Research Assistant, CIMSS/SSEC/UW-Madison "Team Ozone"

Subject: Re: Inexpensive / free-ware similar to IDL?
Posted by Chris Schmidt on Tue, 28 Sep 1999 07:00:00 GMT
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htonishi wrote:

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> to sell a "home" license to users who have a "work"
> license. The price is $500 (pc). I got one and now I get
> to work at home as well as the office!?

That will help some people, but it does not address the general problem. $500 is still out of reach of many students at both levels. It sounds like that price is targeted at corporate users.

-Chris

Subject: Re: Inexpensive / free-ware similar to IDL?
Posted by George White on Sat, 02 Oct 1999 07:00:00 GMT
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On 21 Sep 1999, K. S. Balasubramaniam wrote:

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There are lots of open source tools whose functionality overlaps IDL. PerlDL and IBM's DataExplorer are two recent additions to the list. Omegahat is a new and promising project with roots in the statistical community (http://www.omegahat.org). Many open source tools are designed to perform a limited task well and to intact with other "small" tools. To get the capabilities of IDL you would several such tools and a system (e.g. unix) that supports this approach over the single large app model.

As hardware gets cheaper, software costs should increase because the software can be more capable. These days, it is reasonable for software on a typical workstation to cost more than the hardware. Open source software may not have direct costs, but there is still a very real cost associated with each package you install on your system. For most of us, monetary costs are secondary to the losses associated with time spend learning a package that turned out to be ill-suited to the problem or had a show-stopping bug.

In my experience, there is a certain level of reluctance to invest in new software unless the user has strong indications that it will prove useful. Many vendors offer demo versions of their software, but open source software has the advantage that a user can work with it on their own schedule, get updates to fix bugs and incompatibilities, etc. It may impossible to make time to really explore the capablities of a new package during a two-week trial period, but not difficult to spend a few minutes a day over a period of several months getting acquainted with a new package.

Matrix languages overlapping in functionality with IDL are proliferating, and it is not always easy to match project requirements with a suitable language. My current project, for example, involves 2.5 million pixel images with many channels of varying data types (byte, 16-bit ints, and floats). Many channels have missing value codes (some defined in a way that depends on a particular floating point implemention!).

Some of the programs used in this project were designed to use ASCII CSV files. IDL (on SGI irix 6.5 R4000) bogs down with the CSV files and

requires ad-hoc programming to deal with missing value codes, but perhaps the biggest problem is that IDL allocates most of the free memory and appears to do some sort of garbage collection within that arena. Some of the processing takes overnight, but too often I discover next morning that some other process wasn't able to allocate memory and was killed. For my project, handling missing values, support for 16-bit images, and robust memory management are key considerations.

Other large projects will have different requirements.

There are a number of options open to me:

1. seek alternatives to IDL that do "better" in some respects
2. rewrite and restructure parts of the system to better match the capabilities profile of IDL
3. implement critical sections in a compiled language to get better control over time/space tradeoffs and memory usage.

One of the motivations for developing open source software is to get around a limitation of an existing tool. The R stats package (modelled after S-plus) has a very different approach to memory management than S-plus. Octave (modelled after matlab) supports basic unix IPC (popen, waitpid, etc.) that is lacking in matlab.

--
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Bedford Inst. of Oceanography, Nova Scotia, Canada.
