From: Bob Carswell <rfc@ast.cam.ac.uk>
Subject: **Re: Astronomical software articles in MNRAS**
Date: 2010 October 21 06:54:15 GMT+01:00
To: norman@astro.gla.ac.uk
Cc: rfc@ast.cam.ac.uk
Reply-To: Bob Carswell <rfc@ast.cam.ac.uk>
Keywords: m-2010-11-adass, p-astroinformatics

Dear Norman,

I suspect we would not publish any of them as they stand. The sentiment of the editorial board of MNRAS is to publish new scientific results, and descriptions of new software appear only if accompanied by new science derived using it.

Best wishes

Bob Carswell

Monthly Notices of the Royal Astronomical Society

> Dear Colleague,
>
> I write to you in your role as editor of MNRAS
>
> I am one of the organisers of a 'Birds of a Feather' session at the upcoming ADASS conference, covering astronomical data analysis software

<http://adass2010.cfa.harvard.edu/ADASS2010/cgi-bin/TXT/BoF/BoF_GrayNorman_.html

> .
> The session is intended to discuss the way that research in astronomical computing is published, which includes the extent to which the area is covered by existing astronomy journals.
>
> Several astronomy journals describe, in different terms, an in-principle interest in publishing computing-related articles, but it is unclear just what sort of submitted articles would be ruled in-scope or out of scope in practice. This uncertainty is partly because the relevant community has hitherto been happy and able to publish most of its outputs in conference proceedings, rather than refereed journals, so there is little experience of what articles best fit where. This seems likely to change, as the (sub-)discipline changes, and it becomes necessary for the community to change the way it publishes its work.
>
> Could we ask for your assistance in bootstrapping this experience?
>
> I've included below a short selection of titles and abstracts from last year's ADASS conference. Could we ask you as an editor whether these would be a priori in-scope for the relevant area of your journal, in the sense that you would potentially send an accompanying article to a referee, or whether you would promptly rule them out of scope.
>
> The session will take place on 8 November, so if you were able to reply by then it would be warmly appreciated. Many thanks for any advice you can give.
>
> Best wishes,
>
> Norman Gray
> School of Physics and Astronomy, University of Glasgow, UK.
>
> ----
> Article 1 -- software implementation of scientific algorithms
>
> Mixing Bayesian Techniques for Effective Real-time Classification of Astronomical Transients

With the recent advent of time domain astronomy through various surveys several approaches at classification of transients are being tried. Choosing relatively interesting and rarer transients for follow-up is important since following all transients being detected per night is not possible given the limited resources available. In addition, the classification needs to be carried out using minimal number of observations available in order to catch some of the more interesting objects. We present details on two such classification methods: (1) using Bayesian networks with colors and contextual information, and (2) using Gaussian Process Regression and lightcurves. Both can be carried out in real-time and from a very small number of epochs. In order to improve classification i.e. narrow down number of competing classes, it is important to combine as many different classifiers as possible. We show how this can be incorporated in a higher order fusion network and tied with optimal follow-up.

Article 2 -- application progress report

WorldWide Telescope: A system of components enabling institutions to create rich web based data access and visualization tools.

WorldWide Telescope has grown from a standalone visualization platform to a rich set of components that can utilized by portals, data providers or research projects to allow rich data access to both catalog and image data. The WWT Client also provides SAMP enabled interoperability allow a suite of data services across client, web and server.

Article 3 -- pipeline features and recent developments

SIMPLE Imaging and Mosaicking PipeLinE

The SIMPLE Imaging and Mosaicking PipeLinE (SIMPLE) is an IDL based data reduction environment designed for processing optical and near-IR data obtained from wide-field mosaic cameras. It has standard functions for flat fielding, sky subtraction, distortion correction, and photometric and astrometric calibrations. One of the key features of SIMPLE is the ability to correct for image distortion from a set of dithered exposures, without relying on any external information (e.g., distortion function of the optics, or an external astrometric catalog). This is achieved by deriving the first-order derivatives of the distortion function directly out of the dithered images. This greatly help to produce high accuracy on astrometry as well as preserve image sharpness in the mosaicked/stacked image. Despite being designed toward a general reduction environment, the current distribution of SIMPLE has two highly optimized packages, one for the Wide-field InfraRed Camera on the Canada-France-Hawaii Telescope and the other for the Multi-Object InfraRed Camera and Spectrograph on the Subaru Telescope. SIMPLE has produced excellent (photometrically and astrometrically) wide-field images from both cameras. Users and the author of SIMPLE are also developing optimized SIMPLE pipelines for other mosaic cameras such as the Subaru Prime Focus Camera.

Article 4 -- application of general computing technologies to astronomy

Java and High performance computing in Gaia processing.

In recent years Java has matured to a stable easy-to-use language with the flexibility of an interpreter (for reflection etc.) but the performance and type checking of a compiled language. When we started using Java for astronomical applications around 1999 they were the first of their kind in Astronomy. Now a great deal of Astronomy software is written in Java as are many Business applications. We discuss the current environment and trends concerning the language and present an actual example of scientific use of Java for high-performance computing: ESAâ€²s mission Gaia. The Gaia scanning satellite will perform a galactic census of about 1000 million objects in our galaxy. The Gaia community has chosen to write its processing software in Java. We explore the manifold reasons for choosing Java for this large science collaboration including recent sucess using the Amazon Cloud for AGIS.

Article 5 -- development and use of astronomy-specific 'infrastructure'

Another way to explore the sky: HEALPix usage in Aladin full sky mode

The last few years have seen the emergence of a new feature in several astronomical visualization tools : the interactive sky browser supporting immediate panning and zooming. World Wind, Google Sky, World Wide Telescope, Wikisky, Virgo and now Aladin, all these tools have in common a view of the sky based on a hierarchical multi-resolution sky tessellation. The aim is to load and draw the good â€³piecesâ€³ of the sky at the good resolution as fast as possible, according to the current user sky view. The goal is the same but sky indexing solutions differ significantly and do not offer the same capabilities in term of performances, underlying data base complexity, available projections, projection distortion, pixel value access, graphical overlays, etc. Actually, most of the tools offer false-colour skies with a unique simple projection. But this new feature can be used not only for providing a sky background, but also for accessing and analyzing pixel data in the same way that astronomers commonly use FITS images for doing science. In this talk, we will present how Aladin is using an HEALPix sky tessellation for building a powerful sky data base. We will present the arguments in favor of HEALPix, notably: - The intrinsic qualities of HEALPix for implementing fast pixel algorithms such as convolutions, Fourier analysis, wavelet decomposition, nearest neighbor searches, topological analyses... - The hierarchical structure of the sky directly mapped in a simple directory tree, allowing immediate usage for local data; - The projection methods for reducing as much as possible the distortions notably at poles and at the â€³sky bordersâ€³; - The available libraries, and especially the Java package supporting deep sky resolution; - Last but not least, the direct usage for current mission data such as Planck; - etc. We will also discuss about the compatibility/interoperability between all these tools and how we could avoid to duplicate these data bases and implement efficient collaboration. This might open the door to a future VO standard describing this new way to explore the sky.