
Astrophysics Code Sharing?

AAS 221 Splinter Meeting

Wednesday, January 9, 2:00-3:00

Panelists

Peter Teuben, *Astronomy Department, University of Maryland*

Omar Laurino, *Harvard-Smithsonian Center for Astrophysics*

Robert Hanisch, *Space Telescope Science Institute*

Bruce Berriman, *California Institute of Technology*

Alice Allen, *Astrophysics Source Code Library*

ASCL information

- History (V1: 1999; V2: 2010)
 - Meetings
 - ADASS XXI (Paris, Nov 2011)
 - AAS 220 (Anchorage, June 2012)
 - Software Practice, e-Science (Chicago, Oct 2012)
 - ADASS XXII (Urbana-Champaign, Nov 2012)
 - AAS 221 (Long Beach, Jan 2013)
 - Web
 - ascl.net , ascl.net/wp
 - facebook, google+
 - [astrobetter](#) (guest posting)
 - [astrocomputing](#) blog
 - white paper
-

Requirements

(Why should I do that?)

Omar Laurino, SAO

What?! Why?!

Why should code be shared?

1. Reproducibility of Results
2. Software Robustness
3. Software Reusability
4. Transparency

A different question (which I am not addressing) is who should require code to be published: the community? High Impact Factor Journals?

What?! Why?!

Why should code be shared?

1. Reproducibility of Results
2. Software Robustness
3. Software Reusability
4. Transparency

1. only requires black boxes to be published with papers:

- web services
- catalogs

2. and 3. are addressed by open source licences

4. would only require code to be accessible, no matter the license

What?! Why?!

Why should code be shared?

Transparency and openness
trigger positive-sum (win-win) games!

Astrophysics Source Code Library

Alice Allen, ASCL, Editor

Astrophysics Source Code Library

Free on-line registry for source codes of interest to astronomers and astrophysicists

Founded in 1999

Advisory Committee formed in 2011

Active approach to adding codes


Largest resource for codes in existence











Astrophysics Source Code Library

Indexed by ADS ◆ Citable ◆ <http://ascl.net>

The Engineering Deck: Astrophysics Source Code Library

NEWTOPIC* Search this forum Search 321 topics • Page 1 of 4 • 1 2 3 4

ANNOUNCEMENTS	REPLIES	VIEWS	LAST POST
 Welcome & Rules (please read before posting) by RJN » Mon Jan 18, 2010 7:40 pm	0	12543	by RJN ☐ Mon Jan 18, 2010 7:40 pm

TOPICS	REPLIES	VIEWS	LAST POST
 Guide to the Astrophysics Source Code Library Guide includes table of contents by RJN » Sat Jul 24, 2010 8:01 pm			
 Papers of Possible Interest to Astronomical Software Users by owlice » Tue Oct 12, 2010 7:02 am	20	1697	by owlice ☐ Sat Jul 16, 2011 12:32 pm
 The Astrophysics Source Code Library: New codes welcome by RJN » Sat Jul 24, 2010 8:01 pm	14	1290	by owlice ☐ Fri Jun 10, 2011 2:22 pm
 *Web Resources and Tools for Astrophysicists/Astronomers* by owlice » Sat Jul 16, 2011 12:01 pm	10	147	by owlice ☐ Sun Sep 18, 2011 11:31 am
 21cmFAST: Simulation of the High-Redshift 21-cm Signal by owlice » Thu Feb 17, 2011 10:47 pm	0	297	by owlice ☐ Thu Feb 17, 2011 10:47 pm
 A Fast Chi-squared Technique For Period Search of Irregularl by owlice » Thu Oct 21, 2010 8:17 pm	2	412	by Dmpalmer ☐ Sun Feb 20, 2011 4:59 pm
 ADAPTSMOOTH: Adaptive Smoothing of Astronomical Images by owlice » Tue Oct 12, 2010 10:49 pm			by owlice ☐ 10 10:49 pm
 ADIPLS: Aarhus Adiabatic Oscillation Package (ADIPACK) by owlice » Tue Sep 06, 2011 9:46 pm			by owlice ☐ 11 9:46 pm
 AHF: Amiga's Halo Finder by owlice » Fri Feb 04, 2011 12:36 pm	0	262	by owlice ☐ Fri Feb 04, 2011 12:36 pm
 AIPS: Astronomical Image Processing System by owlice » Tue Jul 27, 2010 1:56 pm	0	1253	by owlice ☐ Tue Jul 27, 2010 1:56 pm

Number of topics and pages

Codes are listed in alphabetical order

Changes in the community

Starting to see...

- Coders requesting their code be included
 - Papers citing codes explicitly
 - ASCL entries showing up on CVs, publication lists, and in Google Scholar
 - ASCL listed in code documentation
-

Source Code and Scholarly Publication

Robert Hanisch
Space Telescope Science Institute
Virtual Astronomical Observatory

Goals of scholarly publication

- Disseminate new results
- Expose and describe data upon which conclusions and interpretations are based
- Expose and describe methods by which analysis was conducted
- Create a corpus of community-vetted works that document progress in research

Research results should be transparent, supported by the data and methods, and reproducible

Astronomical research almost totally relies on computation

- Data calibration and analysis
- Custom post-processing
- Modeling and simulation
- Organization and tabulation of results
- Preparation of publications

Pipelines, standard analysis packages, and numerous simulation tools are well-documented and publicly available

Codes should be accessible

Custom processing and modeling codes also need to be accessible in order to meet the goals of scholarly publication

- Some disciplines require code and data sharing as a prerequisite for publication
 - Publications that include data (and/or data links) and source codes are cited at higher rates
 - Please share your codes!
-

Code Repositories In Other Disciplines

Bruce Berriman (IPAC, Caltech)

Neuroimaging Informatics Tools and Resources Clearinghouse

<http://www.nitrc.org/>

- Funded by NIH Blueprint for Neuroscience Research.
- Operational in 2006
 - 520 codes, 517 K visits (235 K unique visitors)
- Download stats per code, ratings, reviews, forum,...

The screenshot displays the NITRC website interface. At the top, there is a navigation bar with links for Home, Tools & Resources, Community, Support, and About NITRC. A search bar is located on the right side. The main content area is divided into several sections:

- Browse tools by domain:** Lists various domains such as CT (21), Clinical Neuroinformatics (12), Domain Independent (30), EEG/MEG/EGG (98), Imaging Genomics (11), MR (99), Optical Imaging (18), and PETSPECT (28).
- Browse tools by functionality:** Lists various functionalities such as Atlas Application (33), Connectivity Analysis (10), Database Application (18), Experimental Control (8), Format Conversion (17), Image Reconstruction (13), Information Theory (2), Modeling (58), Quantification (48), Segmentation (55), Shape Analysis (13), Spatial Transformation (36), Statistical Operations (85), Surface Analysis (17), Temporal Transformation (30), Time Domain Analysis (25), Tractography (32), and Visualization (35).
- Browse other resources:** Lists various resources such as Algorithm or Reusable Library (49), Hardware (28), Information Resource (89), and Platform or Development Environment...
- Find neuroimaging tools here:** A search bar with a search button and a featured tool/resource section.
- Featured tool/resource:** Pipeline system for Octave and Matlab (PSOM). The pipeline system for Octave and Matlab (PSOM) is a lightweight library to manage complex multi-stage data processing. A pipeline is a collection of jobs, i.e. Matlab or Octave codes with a well...
- Latest News:** A list of recent news items, including "aBEAT 1.0 is released", "aBEAT is a 4D Adult Brain Extraction and Analysis Toolbox with graphical user interfaces to consistently analyze 4D adult brain MR images. Single-time-point images can also be analyzed. Main functions of the software include image preprocessing, 4D brain...", "JIST: Java Image Informatics Tools - Dec 16, 2012 - no comments", "JISTms 2012 - Please submit bugs", "We are planning the 4th annual JISTms celebration and bug fixing event. Please submit any lingering annoyances, bugs, and feature requests to the JIST bug portal on NITRC. We'll do our best to address them. Cheers, Bennett", "NITRC will be unavailable due to scheduled maintenance from December 18, 11:00 PM PST (December 19, 0700 GMT); downtime should be under two hours. We apologize for any inconvenience this may cause.", "Pipeline system for Octave and Matlab - Dec 13, 2012 - no comments", "PSOM 1.0 released", "After over a year of test, it is finally time to release PSOM 1.0. This is a stable, production release that includes all of the features planned on the initial roadmap (and a few more).", "Mindboggle-101 manually labeled brain - Dec 6, 2012 - no comments", "151 manually labeled brains now available!", "We are happy to announce the release of the Mindboggle-101 dataset, the largest and most complete set of free, publicly accessible, manually labeled human brain images in the world. <http://mindboggle.informatik.uni-erlangen.de> An article describing the data and labeling...", "NITRC Enhanced Services - Nov 29, 2012 - no comments", "NITRC Announces Computational Environment", "The NITRC team's latest service is NITRC Computational Environment, an on-demand, cloud based computational virtual machine pre-installed with popular NITRC neuroimaging tools. You can upload your data, or data from the NITRC Image Repository (<http://www.nitrc.org/>)...", "NITRC Community - Nov 26, 2012 - no comments", "Videos from NCBC Showcase", "Dear Colleague: As a follow up to the NIH Common Fund National Centers for Biomedical Computing NCBC Showcase (Nov 6-8, 2012), here are links to the NCBC Showcase video Day 1 (<http://videocast.nih.gov/summary.asp?LID=12103>), and Day 2 (<http://videocast.nih.gov/summary.asp?LID=12103>), etc...

At the bottom of the page, there is a footer with links for Feedback, Privacy, Accessibility, Copyright, Glossary, and Site Map. It also mentions "Funded by the NIH" and "Neuroimaging Informatics Tools and Resources Clearinghouse (NITRC) v2.1.10-1".

The Reviews & Ratings section displays the following information:

- Reviews & Ratings**
- User Reviews (38)**
- OVERALL:** 5 stars (all yellow)
- INSTALLATION:** 5 stars (all yellow)
- DOCUMENTATION:** 5 stars (all yellow)

Biostatistics

Established standards for reproducibility of results and for publishing code with the paper.

- Authors submit code, data.
- Dedicated editor evaluates results.
 - Paper tagged as compliant.
- Publishes code and data as supplementary material.

<http://biostatistics.oxfordjournals.org/content/10/3/405.full>



In current issue, Volume 14 Issue 1 January 2013:
11/14 papers post supplementary material

RunMyCode.org

- Web service that supports running codes associated with a scientific publication.
- Create companion site for code; data and code stored on cloud.
- Funded by a number of international agencies (e.g. Sloan Foundation).
- Launched March 2012.
 - Supports R, MATLAB, C++, Fortran, and Rats.
 - 100+ codes from social sciences, economics
 - 8,760 unique visitors (Nov 2012).



The screenshot shows the RunMyCode.org website interface. The top navigation bar includes 'Home', 'First user!', 'Our offering', 'Submit your code', 'Search by themes', 'Advanced search', 'Help/FAQ', 'Our partners', and 'Contact us'. The main content area displays a search result for a code titled "Backtesting Value-at-Risk: A Duration-Based Approach" by Peter F. Christoffersen and Denis Pelletier, published in CEPR (2004). The code is listed as being written by Christophe Harlin (University of Orleans) and Christophe Pérignon (HEC Paris). The code page includes a description of the code, a 'Download' button, and statistics such as 17 Views, Downloads N/A, and Rating N/A. The footer contains copyright information for 2012 RunMyCode - v. 0.02 and links for About, Privacy Policy, Terms of Use, and Contact.

Discussion

Your thoughts...?
