

AXAF USER INTERFACES FOR HETEROGENEOUS ANALYSIS ENVIRONMENTS

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The AXAF Science Center (ASC) will develop software to support all facets of data center activities and user research for the AXAF X-ray Observatory, scheduled for launch in 1999. We would like to provide astronomers with the ability to utilize heterogeneous data analysis packages, that is, to allow astronomers to pick the best packages for doing their scientific analysis. For example, ASC software will be based on IRAF, but we will incorporate non-IRAF programs into the data system where appropriate. Additionally, we will seek to allow AXAF users to mix ASC software with their own local software. The need to support heterogeneous analysis environments is not special to the AXAF project, and therefore finding mechanisms for coordinating heterogeneous programs is an important problem for astronomical software today.

Our approach to solving this problem has been to develop two interfaces that allow the scientific user to run heterogeneous programs together. The first is an IRAF-compatible parameter interface that provides non-IRAF programs with IRAF's parameter handling capabilities. Included in the interface an application programming interface to manipulate parameters from within programs, and also a set of host programs to manipulate parameters at the command line or from within scripts. The parameter interface has been implemented to support parameter storage formats other than IRAF parameter files, allowing one, for example, to access parameters that are stored in data bases.

We have also developed an X Windows graphical user interface called "agcl", layered on top of the IRAF-compatible parameter interface, that provides a standard graphical mechanism for interacting with IRAF and non-IRAF programs. Users can edit parameters and run programs for both non-IRAF programs and IRAF tasks. The agcl interface allows one to communicate with any command line environment in a transparent manner and without any changes to the original environment. For example, we routinely layer the GUI on top of IRAF, ksh, SMongo, and IDL.

The agcl, based on the facilities of a system called Answer Garden, also has sophisticated support for examining documentation and help files, asking questions of experts, and developing a knowledge base of frequently required information. Thus, the GUI becomes a total environment for running programs, accessing information, examining documents, and finding human assistance.

Because the agcl can communicate with any command-line environment, most projects can make use of it easily. We are continually discovering new applications for these interfaces. It is our intention to evolve the GUI and its underlying parameter interface in response to these needs - from users as well as developers - throughout the astronomy community.

This presentation describes the capabilities and technology of the above user interface mechanisms and tools. It also discusses the design philosophies guiding our work, as well as our hopes for the future.