Making FITS available in .NET and its Applications

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FITSLIB, the library

FITSLIB is a library developed for facilitating operations on the FITS files on the Microsoft’s Dot Net Platform.

The library is developed and depends on popular and well-tested CFITSIO package, it provides the object oriented interface to the FITS world.

The Implementation

The implementation focuses on issues such as memory management, invoking the underlying CFITSIO routines, error management, implementing OO data structures and maintaining CFITSIO data structures.

CFitsTable and CFitsImage are the two major implementation classes.
The CFitsTable class implements a major portion of the different interfaces to the Fits Table.

The Design

The essence of the library is the object oriented design completely written in Microsoft’s managed C++ language.

Issues such as memory management, interoperability in the .Net Languages have been the focus of the design.

Provision has been made for developers who would like to have direct access to the underlying data.
The design has been developed in two phases, the interface design and the implementation design.

The Interface

The interface intends to provide an intuitive Document Object Model (DOM) like layout for a FITS file.
The FitFactory provides methods for creation of new interfaces to FITS files. The Fits interface opens FITS files for read or writing operations. There are also specific interfaces for Fits Table and Image units.

The FitHeader interface provides access to header information in every unit.
The Fits Data is the data structure representing a cell of a Table and also the image buffers.

Applications

Thanks to active usage and support from a small number of developers from the initial stage, the tool is already employed successfully in a few applications and WebServices some of which are listed below.

GALEX Summary

The GALEX summary page allows users to browse images in depth and obtain details of individual GALEX objects.
The thumbnail images of objects on the summary page are generated on the fly from the full fits image using C# and FitsLib.

Catalog Archive Server – JOBS

This is a system used to process queries against large astronomical databases. It uses a system of queues and personal databases to accommodate a variety of different queries in a timely and efficient manner.

http://skyservice.pha.jhu.edu/develop/casjobs/

CAS - Service

This is an XML Web Services interface to the SDSS Catalog Archive Server (CAS).
It provides access to catalog data and returns the result in different formats.

http://skyservice.pha.jhu.edu/develop/casservices/casservice.asmx

Summary

FitsLib is a library meant for astronomers and developers working on Microsoft’s .Net Platform. It offers a DOM like layout and the convenience of a .Net language along with the speed of CFITSIO.

The latest documentation, samples, source and binary downloads are available at

http://skyservice.pha.jhu.edu/develop/FitsLib/

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