Extending Iris, the VAO SED Analysis tool

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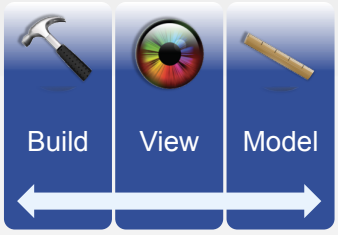
Iris is a tool developed by the Virtual Astronomical Observatory for building and analyzing Spectral Energy Distributions (SEDs). Iris was designed to be extensible, so that new components and models can be developed by third parties and then included at runtime. Iris can be extended in three different ways: new file readers allow users to integrate data in custom formats into Iris SEDs; new models can be fitted to the data, in the form of template libraries for template fitting, data tables and arbitrary python functions. The interoperability-centered design of Iris and the Virtual Observatory standards and protocols can enable new science functionalities involving SED data.

Built-in Capabilities

- Iris provides a fair share of generic capabilities for building, editing, viewing and analyzing SEDs.



SED Builder

- Load SED Segments from File, URL
- Add/Edit/Save/Delete:
  - Photometry Points
  - Photometry Catalogs
  - Entire SEDs, Spectra
- Import non-compliant user files from many different formats
- Integrated client for NED SED service
- SAMP I/O with SED message extension

SED Viewer

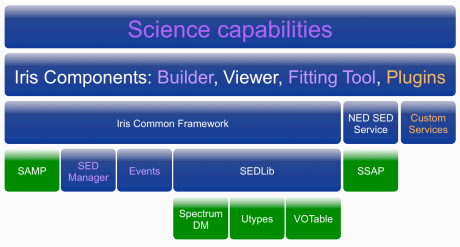
- Metadata Filtering through user defined boolean expressions or interactive selection
- Display single point metadata in tree format
- Interactive Aperture Correction

Fitting Tool

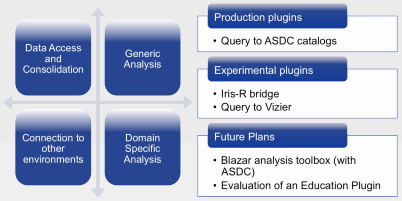
- Arbitrarily combine model components in different spectral ranges
- Compute confidence intervals for best fit parameters
- Template Fitting

Iris components stack

- Builds up a high-cross-section stack of tools, hiding the standards implementation layer from the science layer, in a loosely coupled extensible architecture



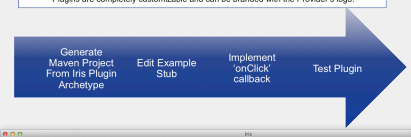
Plugins



Easily implementable
- Example Plugin is 100 lines worth of code.

Smart dependencies
- Dependencies not already included in Iris are automatically packaged with the Plugin.

Branding
- Plugins are completely customizable and can be branded with the Provider's logo.



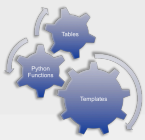
The pictures above show the plugin developed by the Italian Space Agency Science Data Center (ASDC) to allow Iris to query their SED service with a rich Graphical User Interface.

The ASDC Data plugin will be available in the Iris v1.2 distribution, inside the 'contrib' directory.

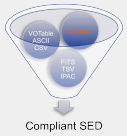
It is already available in the Iris 1.2 beta versions (see below).

Scan the QR code to visit the Iris download page. The features described in this poster are available in the 1.2-beta version.
http://www.usvao.org/science-tools-services/

Extensibility Points



Custom Models
- Sherpa (Iris default fitting engine) allows users to extend the set of existing models by loading:
  - Template Libraries for Template Fitting
  - Custom Python functions
  - Model profiles as custom data tables



Compliant SED

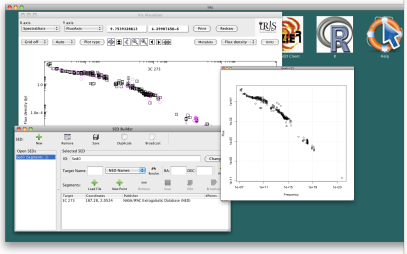
File Filters
- The SED Builder component allows to define new file filters that can be loaded at runtime to import data from non supported file formats, or from particular flavors of supported formats.

SED Manager attachments
- The SED Manager allows plugins to attach arbitrary files to SEDs, so to store additional information.

SAMP Handlers
- Plugins can directly register as SAMP listeners, and they don't have to worry about the SAMP connection/registration details.

Events
- An extensible Events Framework enables a loosely coupled architecture.
- New Events can be easily added to the framework.

The picture below shows a 'proof of concept' R integration plugin. The SED built using Iris is sent to the R workspace where it can be analyzed using R.



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