

Seeing is believing: visualization with IRIS Explorer

IRIS Explorer is a toolkit which allows users to construct data visualization applications by connecting together software building-blocks, or modules. Each module corresponds to a step in a dataflow pipeline – for example, there are modules to read data from files in a variety of formats, to apply filters to the data, to transform it using various visualization techniques, and to render and manipulate geometry. The modules appear on-screen as graphical blocks in IRIS Explorer's visual development interface (see figure below); the application is then built by selecting or replacing modules and making or breaking dataflow connections between them. Once constructed, the application's user interface (i.e. the widgets that control the modules' behaviour) can be interactively edited – with the development interface being hidden, if necessary – before the application is saved.

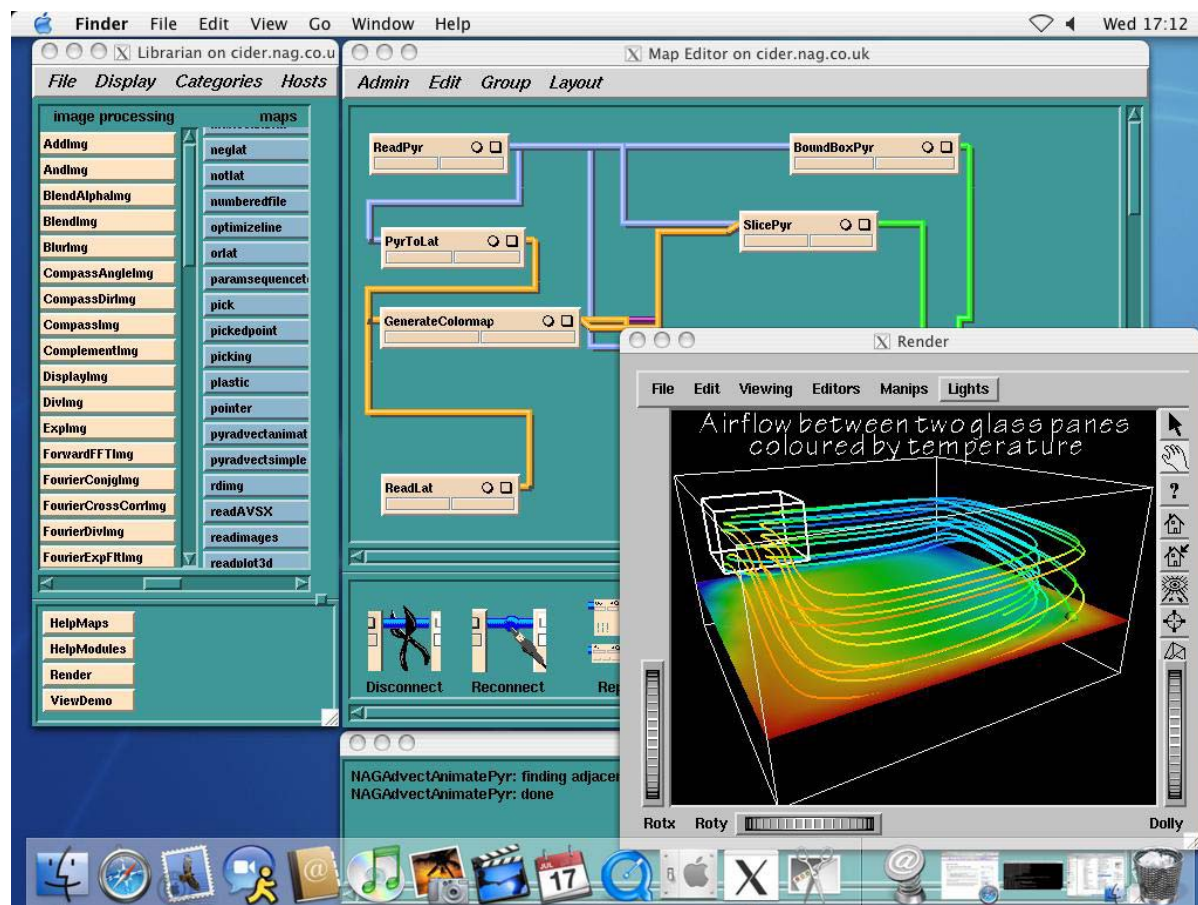


Figure caption:

The visual programming interface in IRIS Explorer. Modules are selected from the Librarian (top left) and dragged to the Map Editor (top middle) where they are connected to create the application. This screenshot comes from IRIS Explorer running under Apple Mac OS X; other ports are available for Windows, Linux and other flavours of Unix.

Because IRIS Explorer is extensible, users can add their own modules to the toolkit, and share them with others. For example, a collection of collaborative modules have been developed that allow visualization applications running at separate locations to communicate by sharing data, modules and connection information. The collaborative extensions to IRIS Explorer have been incorporated into the commercial release of the toolkit, making it one of the first multi-user visualization systems in the world.

More recent work with IRIS Explorer has seen its extension to support "tracking" and "steering". Tracking is the dynamic display of results from a time-dependent simulation, while "steering" allows the user to explore more interesting regions of parameter space by adjusting the simulation's input parameters while it is running. Steering fits well into modern Grid environments where computing tasks are distributed between the desktop and remote servers. Thus, the simulation can be executed remotely while the visualization runs locally, giving the user control over the progress of the calculation from the desktop. Support for tracking and steering will be incorporated into the next commercial release of the package.

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