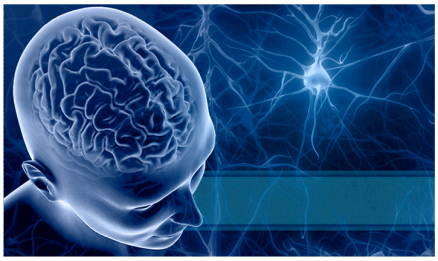
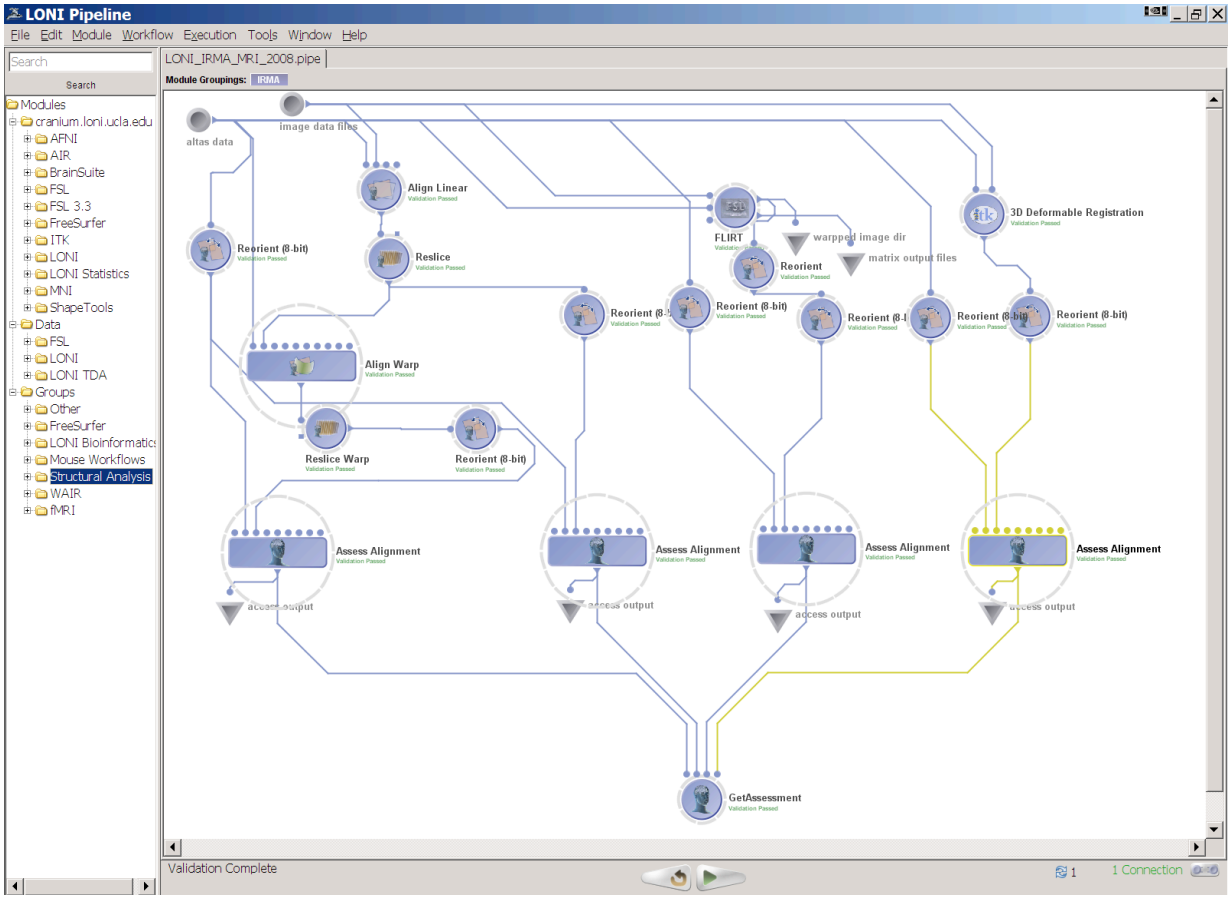


LONI Laboratory of Neuro Imaging

www.loni.ucla.edu

Software Engineering Projects Winter Quarter 2010

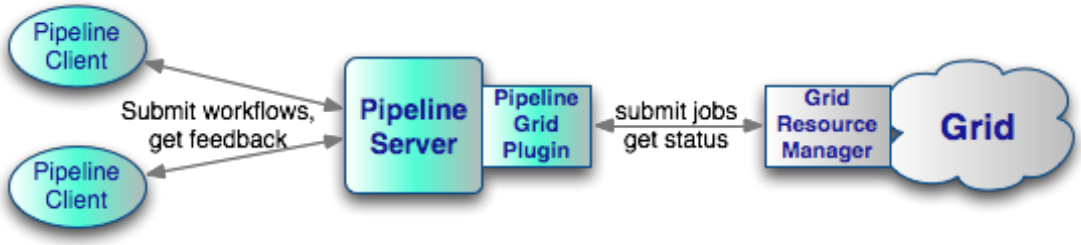
LONI Pipeline



Contact: Pipeline@loni.ucla.edu

Project 1: LONI Pipeline Server Grid Plugin for Globus

The LONI Pipeline lets developers implement custom plugins of their own grid resource managers for the Pipeline server. The Pipeline Grid Plugin is a separate process that communicates with the Pipeline server process and the grid resource manager.



Globus (http://www.globus.org/) is a popular grid software distribution. It is open source and has a Java API.

Your mission: Implement a Pipeline Grid Plugin for Globus and integrate it into the LONI Pipeline. Demonstrate the major features of Pipeline with this Globus Plugin including user authentication, start and stop workflow (job submission and deletion), the status of the workflow (job status), and so on. There is a small Globus system in our lab that can be used for this project.

Pipeline Grid Plugin documentation is available at http://pipeline.loni.ucla.edu/support/server-guide/pipeline-grid-plugin-api-developers-guide/

In addition, demonstrate the operation of the system on a large-scale grid such as the TeraGrid http://www.teragrid.org. We will provide you with a virtual machine with neuroimaging software that can be deployed on third party grids.

Project 2: Python to Java library

We have two Python libraries that provide Intelligence and Scripting capabilities to the Pipeline software. The amount of code is approximately 2,000 lines including comments for the Scripting library and 1,000 lines for the Intelligence library. UCLA students who took the class in 2009 developed a Java version of the Scripting library. This Java library needs to be stabilized, extended and thoroughly tested. The Scripting library translates workflows that are written in the Pipeline XML format and that are executed by the Pipeline server into Unix shell scripts that can be executed at the UNIX command line. Here is the user guide on this feature: http://pipeline.loni.ucla.edu/support/user-guide/advanced-topics/#Exporting%20Pipeline%20Workflow%20to%20Script

An overview of the Pipeline XML format is available at: http://pipeline.loni.ucla.edu/support/xml-overview/

Your mission: Develop a new version of the Java Scripting library and test it with the current Pipeline. In addition to the Pipeline XML schema, we can provide part of the source code of Pipeline, and source code of the Python libraries. This is a shorter project compared to **Project 1**, and is a great exercise in Object Oriented design and development.

Should you need additional challenge, or if there is more than one group that would like to work on this project, you can also translate the Intelligence (Grammar View) library. User guide on this feature: http://pipeline.loni.ucla.edu/support/user-guide/building-a-workflow/#Grammar%20view