

THE DESIGN OF GUI OF DYNAMIC GRID WORKFLOW WEB PORTAL APPLIED TO REMOTE SENSING INFORMATION SERVICE

*Jianwen Ai^{1,2,5}, Yong Xue^{1,3}, Wei Wei^{1,5}, Jianping Guo^{4,5}, Guoping Lei², Shutao Hou²,
Yuqing Li², Fenghai Yang², and Zhihua Wang²*

¹State Key Laboratory of Remote Sensing Sciences, Jointly Sponsored by the Institute of Remote Sensing Applications of Chinese Academy of Sciences and Beijing Normal University, Institute of Remote Sensing Applications, Chinese Academy of Sciences, PO Box 9718, Beijing 100101, China

²College of Resources and Environmental Sciences, Northeast Agricultural University, Harbin, 150030, China

³Department of Computing, London Metropolitan University, 166-220 Holloway Road, London N7 8DB, UK

⁴Chinese Academy of Meteorological Sciences, China Meteorological Administration, Beijing, 100081, China

⁵Graduate University of Chinese Academy of Sciences, Beijing 100049, China

{E-mail: *neau_ajw@hotmail.com* *y.xue@londonmet.ac.uk*}

ABSTRACT

Remote Sensing data processing and analysis are the indispensable part of the Geocomputing, and involves multiple algorithm processes. The high diversity of the algorithms and the high costs of high-performance supercomputers drive us to hunt for an acceptable cost for real-world applications. Fortunately, workflow technologies make it possible. Using workflow technology, we can construct a remote sensing information processing environment to integrate the distributed data and computational resources. Today, Workflow Management Coalition gives many standards for business workflow being used. The workflow executed in distributed Grid infrastructures provides a technology to “glue” distributed data, heterogeneous computing resources, and users from many research institutions together. However, remote sensing data and information are significantly different from those in other disciplines. It has a set of standards specifically for handling data and information. Besides, the business workflow is dominated by control, event, and task-oriented approaches, making them less suitable for the modeling challenges of remote sensing grid workflows. In order to access the distributed and heterogeneous resources and services, designing a workflow portal is necessary, for many users are not only short of the technical expertise to use the existing Grid workflow components, but also have not specific knowledge of the remotely sensed data processing methods. Our remote sensing information

analysis and service Grid node (RSIN) solved the remote cooperation, resource sharing, and management physically distributed. Our ongoing research is to provide the users an intuitive graphical user interface (GUI) to express steps of tasks being processed via Internet, just like the “order form” of tasks. Such a design of workflow is necessity. It not only provides users a new service shared with algorithms and distributed resources by an easy-to-use interfaces, but also gives a paradigm for the geospatial Grid projects being developed.

In this paper, we use a “black-box” to denote the processing steps of remote sensing data file and its algorithms, and to use the “line” to represent the execution order among their sequential or parallel of “black-box”. We represent the design of the dynamic Grid workflow web portal applied to remote sensing information service. Using the Eclipse IDE on Windows-based platforms, we accomplished the development of GUI of dynamic Grid workflow web portal (see Figure 1). By the GUI, the users can modify dynamically the “black-box” and “line” to represent the execution semantic of workflow, accomplishing the utilization of resources and the sharing of the algorithms of remote sensing data processing and analysis. The workflow will be saved and transferred to the remote sensing information service Grid node platform in XML via Internet. According to the semantic, the platform will execute the workflow and response the result to the users.

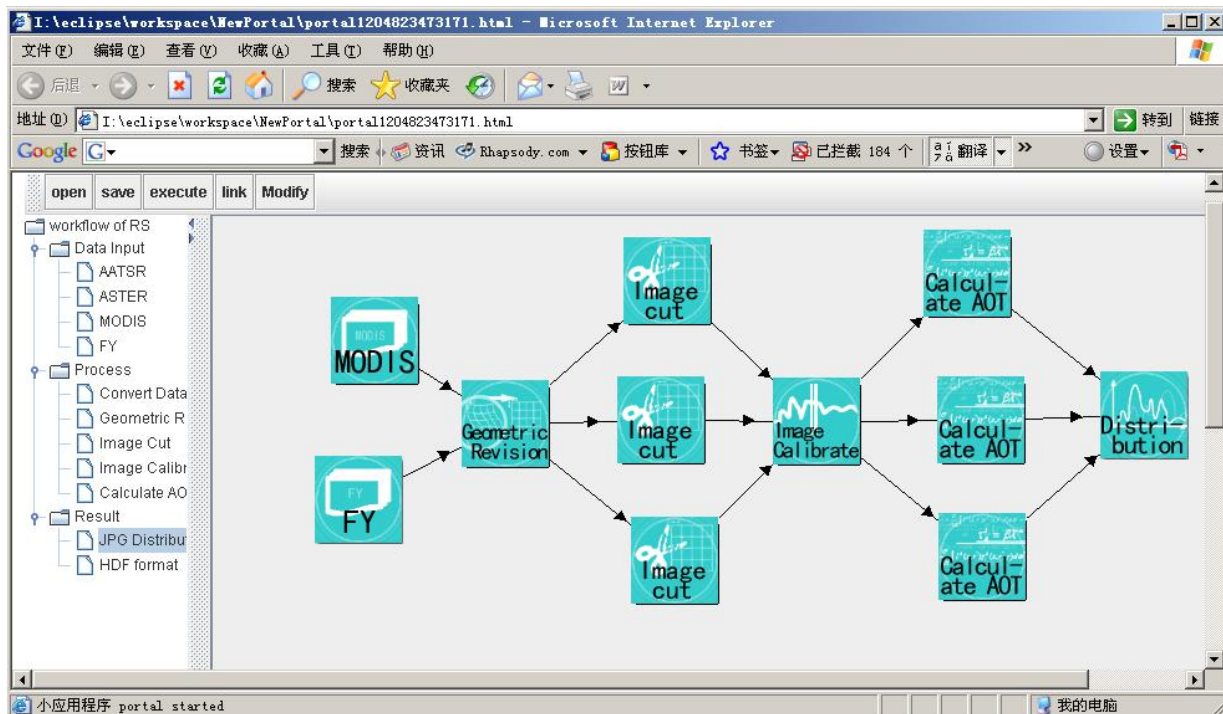


Figure 1. A case of the web portal usage