JIS - THE JOINT INFORMATION SYSTEM

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ABSTRACT

The Joint Information System (JIS) is a fully operable computing tool, which is a combination of a database and interactive web pages, reachable under the web address http://www.solarjis.com. The aim of this tool is to overcome the lack of knowledge amongst the European Solar Physics Community about other institutes, observatories and scientists working in the same field of research by means of a user friendly web interface.

Key words: JIS; OPTICON.

1. INTRODUCTION

The JIS tool is part of the NA\textsuperscript{2} activity of the OPTical Infrared COordination Network for astronomy. OPTICON is a project funded by the European Commission as part of its 6\textsuperscript{th} Framework Programme with the objective to bring together the different scientific groups of Europe with the same interests and scientific aims and combine their human and infrastructural resources.

The participating members of the JIS project are:

- Institut für Geophysik, Astrophysik und Meteorologie (IGAM) Karl-Franzens-Universität Graz, Austria;
- Instituto de Astrofísica de Canarias (IAC), Spain;
- Kiepenheuer-Institut für Sonnenphysik (KIS), Germany.

The objective of the JIS project is to collect all possible data about the institutes and scientists working in the field of solar physics in Europe and to provide all European solar physicists with this information by means of an easy accessible web page which is based on a great variety of query modes to make the search for the user as comfortable as possible.

The security of the system and the protection of the data transmission is the second important point. This was taken into account by restricting the access to sensitive information only to registered members, by running the whole system of pages via https:// and storing the encrypted usernames and passwords in a separate database.

2. LOGISTICS – MYSQL, PHP AND JAVASCRIPT

The whole JIS tool consists of two major parts:

- The system of databases (Figure 1) which are based on MySQL. Only the administrators can actively interact with the databases;
- The JIS website consisting of a huge number of pages written in php and containing JavaScript com-

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\textsuperscript{1}Network Activity 2: Coordination and Integration of European Northern Observatories (ENO) Facilities

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ponents. These pages form the interface between the client and the database.

All databases are based on MySQL which is sufficient for the amount of data the JIS project is dealing with. The system administrator has the choice between the affiliated web interface or the program phpmysqladmin to bring the stored information up to date.

The web pages are programmed in php plus JavaScript components which guarantee the needed interactivity. This makes it imperative that the user activates JavaScript in his browser in order to view the pages without problems. Additionally, cookies must be allowed, since the username and password are stored as cookies on the client’s harddisk.

Some of the components like calendar, news scroller and dropdown menu are complete sets of programs which were adapted to fit to the style of the web page.

3. STRUCTURE OF THE WEB PAGES AND SECURITY

3.1. Page Overview

The JIS tool consists of a system of web pages which can be subdivided into different groups and subgroups.

At a high level, we can say that the JIS interface is separated into two main categories:

- **public pages**
  These can be accessed by anyone interested in solar physics which, however, contain only general information. None of these pages is secured by a password-username combination;

- **restricted pages**
  These can only be reached by registered members through a login interface and also include sensitive information like the email addresses of the scientists. The secured pages can be further divided into two types:

  - **normal pages,**
    where the user deals passively with the data stored in the database. These are, for example, the query pages on which data can be viewed but not changed or added;

  - **administration pages,**
    where the client handles the information actively, i.e. that he can add or alter data in the database via the JIS interface;

![Figure 2. Table to administer the institute data (here: data of IGAM Graz). Only the institute administrator of the IGAM has the right to alter the information. The cells in the third frame are only used in the case of an observatory.](image)

3.2. Security

To guarantee that a misuse of the sensitive data stored in the JIS database is impossible, all sites with information that cannot be found easily in the internet, are secured. These pages can only be accessed after the input of the login data into the login interface on the start page.

The information policy of the JIS project demands that most of the pages – except the scientist query pages and the administration pages – have to be generated in two variants to comply the conditions for the free and the secured pages. It is not only the calling of the page check.php which validates the username-password combination that makes the difference between these two types but also the specification of which data in the different tables of the solar physics database is limited to the secured area and therefore cannot be shown on the equivalent page in the public area.
The secured area itself contains pages which are limited to certain groups of members, which means they are even more restrictive. Therefore each scientist will be assigned a "level" denoting the degree of access on the pages.

A special type of restricted pages are the "administration pages", which can only be accessed by people with at least a level 2 clearance. On these pages one person per institute has the right to modify and add information by the facility to the database. A second keyword (the "team" membership) guarantees that the institute administrator has only access to the data of the one facility he works for (see Figure 2).

4. THE QUERY PAGES

The aim of the system is to provide the user with as much information as possible about the institutes, groups and scientists in a way such that data can be accessed as fast as possible. Furthermore, the interface between the user and the database should be easy to use, especially with regard to the queries.

To cover all conceivable wishes of the clients, the JIS tool does not use a normal search machine like "Google", but consists of various web pages which enclose single search criteria.

On some of the pages a simple click on a link is sufficient to reach the result (e.g. "University-query" page). On other pages the user is granted the greatest possible interactivity and almost all parameters can be chosen freely (e.g. "Detailed Institutes query" page).

The whole database can be searched by means of the following query modes, which can be reached through the search parameter table in the left column of the JIS pages:

- "Map of Europe"
  Leads to the start page of the country query mode and subsequently to the info pages;

- "Universities"
  Opens a page with a table including all universities holding a solar physics facility;

- "Institutes"
  Matching the needs of the user. There exist two versions:
  - A "simple form" which simply consists of a table containing all solar physics facilities;
  - An "advanced form" leading to a more developed query mode with the possibility to select different parameters;

- "Scientists"
  This mode only exists in the secured area and here we also have two types:
  - "Letter pages" containing a table with all scientists whose surname starts with the chosen letter;
  - An "advanced query" which is comparable to the case of the institutes query. The last step of the query delivers a table comparable to Figure 3.

- "Area of Research"
  leads to an introduction page holding a table with all available keywords. Each of these keywords directs the user to a new page where either all scientists – this option is only available in the secured area – or all institutes working in this field of science are summarized;

- "International Projects"
  opens a page with a list of all projects. Clicking on the nearby folder symbol reveals the popup-menu with all International Projects. Each project name is a link giving the user access to the corresponding info query page.

In nearly all cases the text in the different cells of the resulting tables also works as a link to an affiliated info page. Thus, for example, the names in the first cell of Figure 3 opens the 'Scientist info' page, the second cell the 'Institute info' page and the third the 'Country info' page. In the fourth cell each of the keywords leads to one of the previously discussed 'Area of Research' query pages. The one or two symbols in the last cell provide the opportunity to contact the listed scientist via email or to reach the scientist's homepage.
5. THE INFO PAGES

The JIS system contains info pages about the universities, institutes, groups, and scientists connected to solar physics in Europe. On these pages all relevant information like contact addresses, area of research, longitude, latitude, height, and infrastructure in the case of observatories, link to the list of publications in the case of scientists and much more can be found.

The info pages could be counted as a part of the query pages, since they can only be reached through them. But while the query-pages just contain quantitative information about the institutes, scientists, etc. that match the chosen settings the info pages show all data about a special institute, person or country in detail.

5.1. The 'Country Info' Page

As an example for the info pages the 'Country info' page for Spain is shown in Figure 4. The info section is divided into to parts, the map frame and the info frame. In the upper frame a map of the chosen country is shown. All locations with solar physics facilities are underlined red and the area around a certain name works as a so called hot spot. Clicking on this area opens the connected web page in a new window.

The lower frame contains the complete list of Spanish solar physics facilities and, additionally, given the institute is not independent, the name of the affiliated university. The name of the university and the 'External link' button below opens a new page containing either the university or the institute web page. Both are external links, whereas the name of the solar physics facility leads to the 'Institute info' page belonging to the JIS system.

6. IMPLEMENTATION

The future steps for the implementation to the JIS system are:

- Nomination of the responsible administrators by the institutes;
- Beta test of the tool by a small group of scientists;
- Opening of a basic version to the community;
- Improvement of the system due to feedback of the participating institutes;
- Release of the final version of the JIS tool.

Figure 4. The 'Country info' page. Here the basic information about the institutes in Spain is shown. In the map all locations with solar physics facilities are underlined red. The table below contains the full list of text-links to the facilities.