

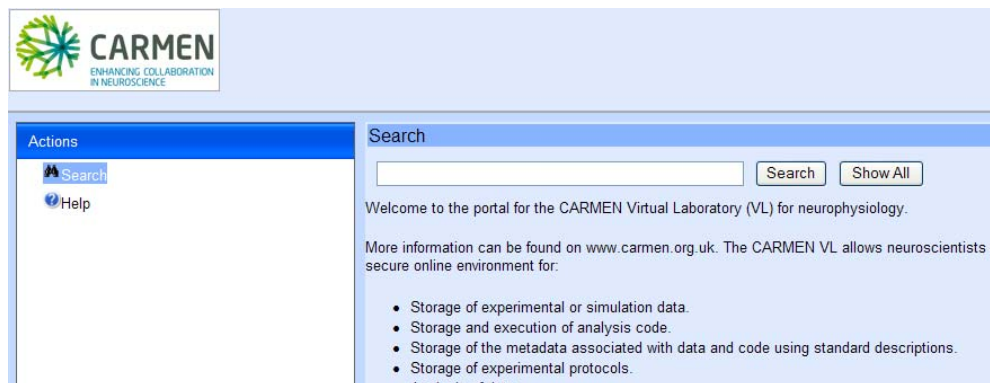
Introduction to the CARMEN system

Welcome to the CARMEN portal. The CARMEN system has been designed to allow neuroscientists to share data and programs (services) from neurophysiological experiments. The 'Portal' is a web interface onto the CARMEN system, and provides end-users with access to the computer and data storage resources which are at the core of the system.

The portal provides functionality to meet the following objectives:

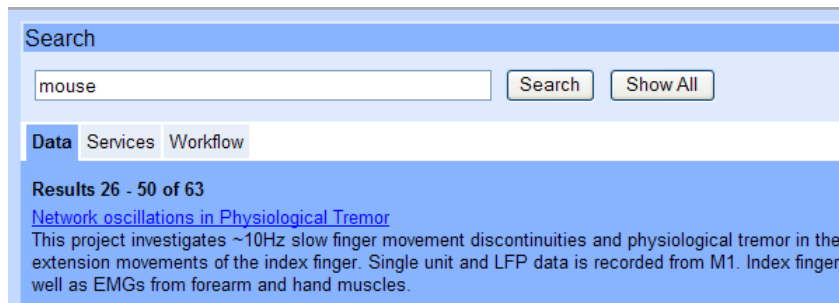
- 1) To search across archived data sets
- 2) To upload, annotate and store experimental data
- 3) To run processes and routines on the stored data on the CARMEN computers.

1. Search: The search facility is available to anybody opening the portal within a standard web browser. It provides a search box for text entry terms to search against the stored meta-data attached to the processes and data. Only data that has been stored and archived as 'public' is available to non-registered users. The search facility is accessed on the left hand menu column, by clicking on '**Actions**' menu tab, as shown below (note that this is also the default 'home' page for non-registered users).



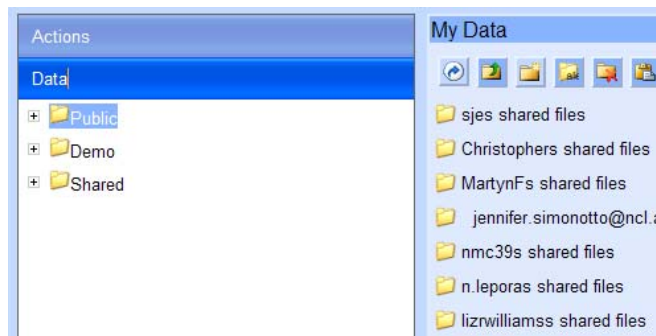
Search is activated by typing search terms (English text) into the search box and clicking the '**search**' button to the right of the text field. Any matched results are shown in the window area below the search text box. The system provides the ability to *view the metadata* associated with any archived data (i.e. the experimental environment and context) and to *download the data* for local processing.

Note that the search process is carried out across all of the archived items in the CARMEN system, which includes experimental data, analysis services and workflows. The search results for each type are shown under the tabbed views on the search results window, as shown below:



The 'Show All' button provides an immediate way to list all archived data, services and workflow within the system, irrespective of a text search term. For non-registered users this will only list the publically visible items.

Access to data is also available interactively via the '**Data**' menu tab in the Portal window (this is initially at the bottom left of the menu screen). This provides an interactive folder display of all of the available data (as defined by the security policy). This is shown in the example below:



By clicking on the folders and the [+] symbols end-users can navigate around the data.

2. Data Upload: The Portal provides the means to upload experimental data to the CARMEN system. Currently this facility is only available to *registered users* of the system (see later).

For registered users, access to the Data Upload functions are found in the '**Actions**' menu tab in the left hand window, as shown below:

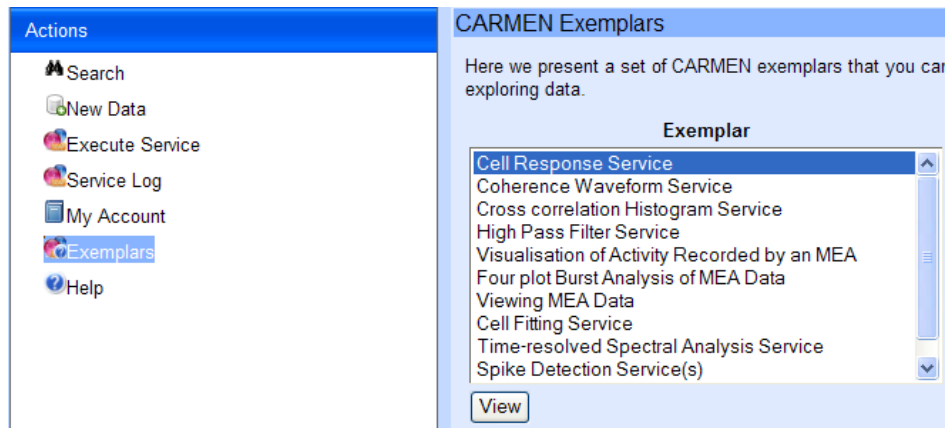


The CARMEN system has been designed to allow end-users to share data amongst collaborators, in a secure and formally annotated manner. The data upload process guides users through a series of forms for describing the data (metadata annotation forms), so that the scientific context of the experiment can be captured. This is essential for the long-term archiving ambitions of the CARMEN project. Users who upload data regularly can use templates to automatically populate sections of the annotation forms. The Portal's upload facility provides a simple and secure mechanism to upload data from a user's local machine onto the CARMEN data repositories.

In addition to the detailed annotation of uploaded data, the Portal also enforces a security policy on archived data. Through a simple user interface the end-user can specify who has access to the stored data (and metadata) that they have uploaded. Data and metadata can be made 'public', which is accessible to anybody opening the Portal, private, which is accessible only to the user, or protected via Access Control Lists, such that only predefined registered users have visibility and access to the data.

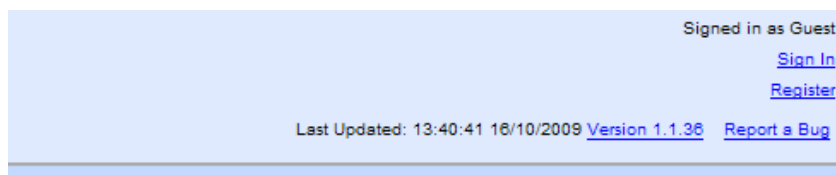
3. Analysis Services: In addition to storing data from experimental procedures, the CARMEN system also allows registered users to store and archive the analysis routines that were used to process the data. This allows collaborators to share tools, methods and algorithms, and provides the means to run the analysis on the CARMEN computer resources. The analysis services are implemented as 'web-services' on the CARMEN system, and there is a simple CARMEN process available which can convert code from the lab environment (written in languages such as Matlab, R, Python, JAVA) into services that are available to other users. As with the data and metadata upload, there is a security and Access Control List policy attached to the archived services which provides control over who can see or run the services. Services and algorithms cannot be downloaded, and they remain under the control of the original author. Currently, services cannot be directly uploaded by end-users. This is achieved through contact with the CARMEN system support staff.

There are number of public services on the Portal, which provide access to common neurophysiological processing functions such as data filters, neural spike detection and spike sorting. Some of these services have been used to create tutorial exemplars of how to use the services, for new or non-registered users. These exemplars walk through the steps needed to run a service using data archived on the system. The exemplars are available within the '**Actions**' menu tab in the left hand window of the Portal, as shown below:



The **'view'** button launches a separate pop-out window with step-by-step instructions on how to work through the chosen data processing task on a stored analysis service. Use of these is a good way to get started with the system.

Registration: To gain full access to the CARMEN functionality it is necessary to register. This is achieved through a link in the upper right hand window, as shown below:



The system requires the following information from users in order to register:

Account Registration

This is where you register for an account on the CARMEN system. Please fill in the form below. When you are happy press "Register". Once your request has been received you will click the link or copy and paste it into your web browser. This will confirm your identity and allow you to logon to the CARMEN portal.

Please complete all the mandatory fields marked with an *.

*Salutation

*First Name

*Family Name

*User Name (No Spaces)

*Password

*Password

*Email

*Organisation

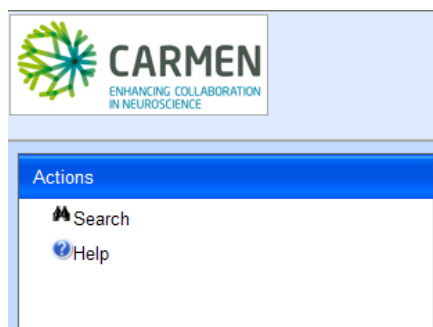
*Phone

How would you like to be known? (default/advised: First name Family name [e-mail])

Display Name:

Once the form has been completed, registration is achieved via an approval process by the CARMEN system administrators, which results in an email confirmation and authorisation to access the system.

Further information about the use of the Portal is available via the **'Help'** menu item in the **'Actions'** menu, as shown below:



Further Information

For further information about the CARMEN project and its long term objectives, please refer to the CARMEN website, www.carmen.org.uk. Contact details of the lead investigators are available via the website, which may be used for any follow-up questions in regard to use of the system or in regard to collaborating with the CARMEN project team.