OPEGRA Platform

Tutorial for Algorithms Developers

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1. Download and run the User Interface

You can download the installer from the ChAirGest website (https://project.eia-fr.ch/chairgest/Pages/Opegra/Download.aspx).

1) Run the installer and install OPEGRA
   a. **You can discard the error occurring during the installation**: "Error 1904. Module KinectAudio10.dll failed to register". This error does not impact the installation of the platform.
2) Start the platform using the shortcut created on your desktop.

2. Sign up to create your account

You need an account to use the OPEGRA platform. You can create one using the interface. Once your account created, you need to wait the validation of the account by the administrator of the platform. You will be notified by e-mail as soon as the validation occurs.

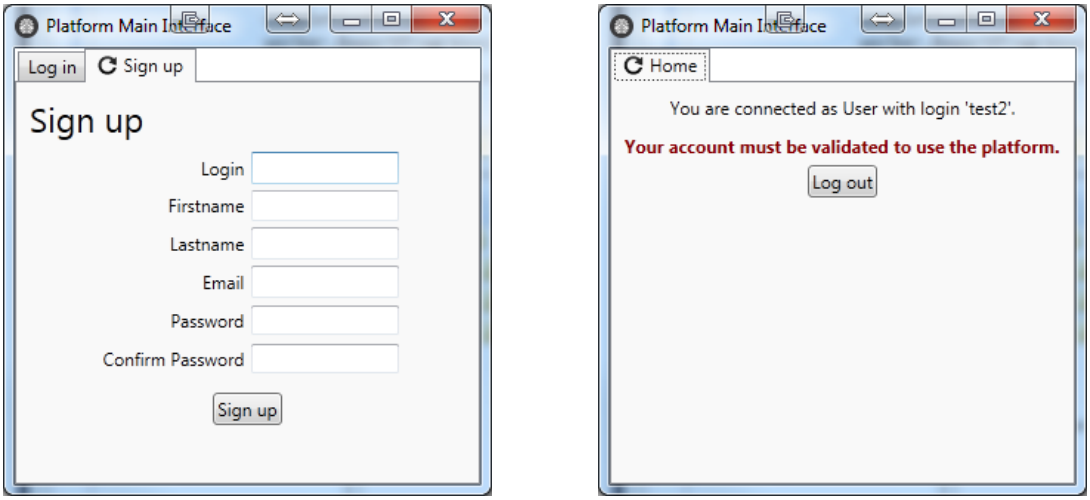


Figure 1: Left: the sign up window. Right: Once you signed up your account must be validated before using the platform.

3. First Login and overview of the interface

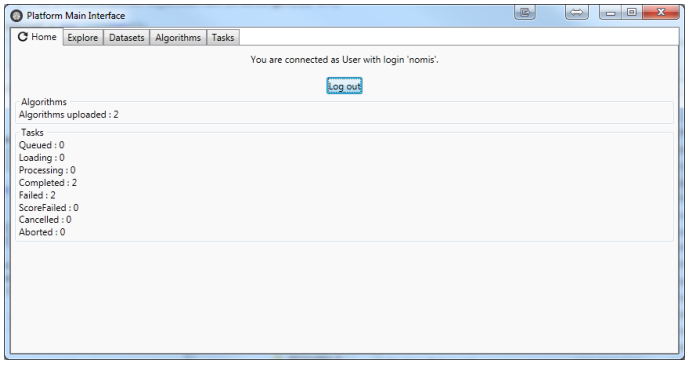
Once the validation received, you can log in and start using the platform. Note that currently, the data displayed on the user interface is updated only when a tab is (re)loaded or when the small refresh button located on the selected tab is pressed; the icon is circled in red in Figure 2.

Figure 2: An overview of the tabs of the user interface. The icon to refresh the data is circled in red.

The user interface contains 5 different tabs; each tab is dedicated to a specific purpose. Each of these tabs are described below.

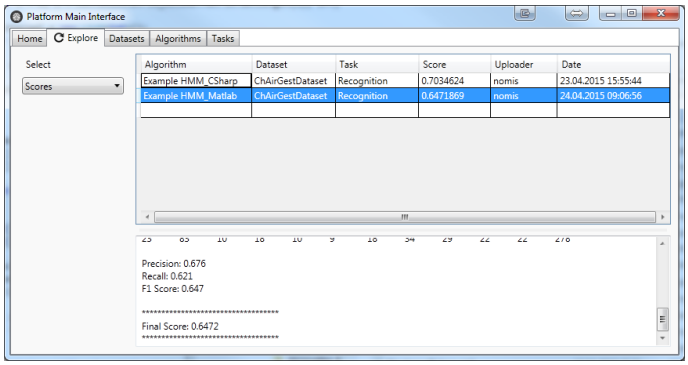
Home tab

This tab displays a quick summary of the statistics of the logged user. It shows the number of algorithms that the user has uploaded and a summary of his evaluation tasks. More information should be added in the future.



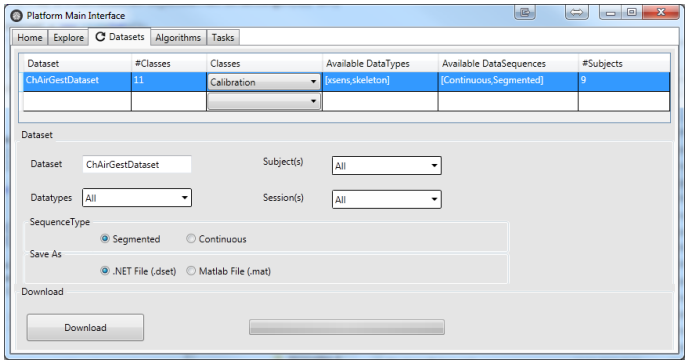
Explore tab

This tab allows the user to explore and visualize the data available on the platform: datasets, algorithms and scores. It provides additional information compared to the specific datasets and algorithms tabs.



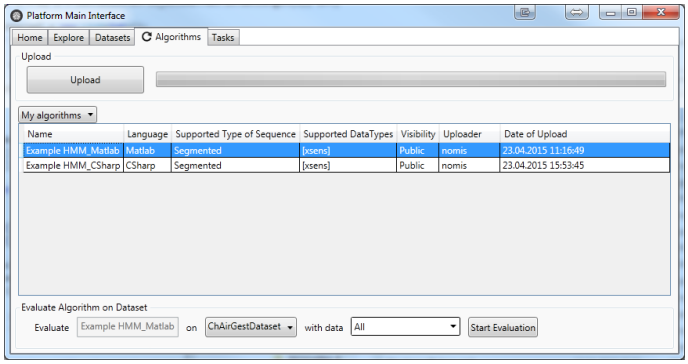
Datasets tab

This tab allows the user to visualize the datasets available on the platform and download the desired Training Set for a dataset. More details about this tab are described in Step 4.



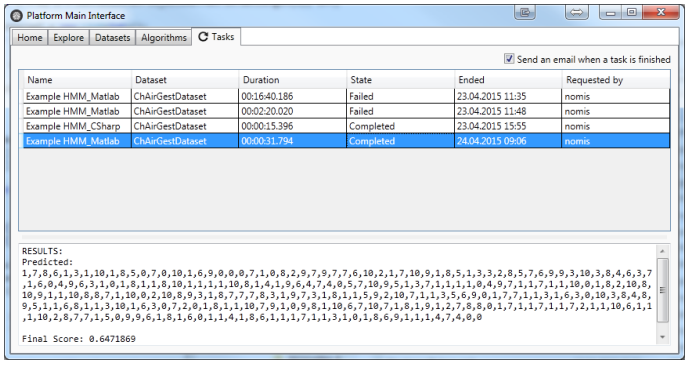
Algorithms tab

This tab allows the user to visualize the algorithms that he uploaded and the public and open-source ones. It also allows the user to upload new algorithms. The user can also request evaluations from this tab. By right-clicking on an algorithm, the user can download the sources of 'open-source' algorithms.



Tasks tab

This tab allows the user to visualize his evaluation tasks and their status. A running task might be cancelled by right-clicking it and selecting "Cancel" from the sub-menu. Once completed, a summary of the results of the selected evaluation task is displayed on the bottom textbox.



4. Download a dataset

The first thing you need to do to start working with the platform is to select and download your first dataset in order to start developing and optimizing your algorithms.

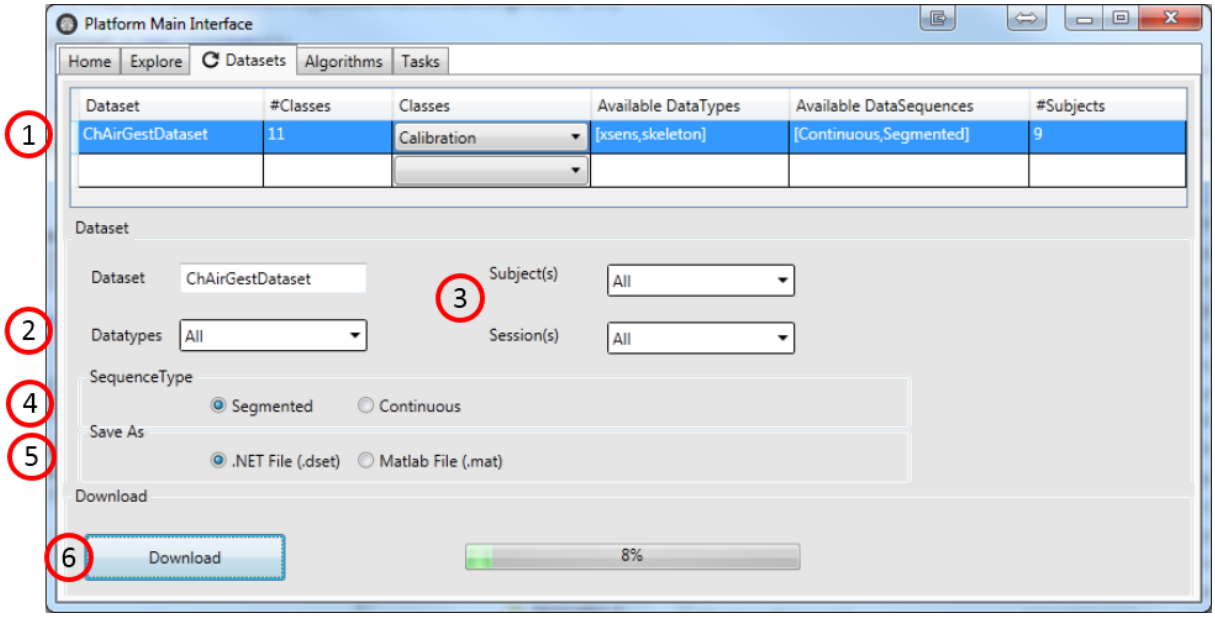


Figure 3: Select the dataset to download and customize the types of data and its format.

In order to download a Training Set on your computer, you must perform the following actions:

1) Select a dataset
2) Select the types of data you want to download (all or only specific ones)
3) Potentially select which subjects and session(s) you want to download
    a. All are selected by default
4) Select which type of sequence you want to download
    a. Segmented sequences correspond to pre-segmented occurrences of gesture. The ground truth contains the label for each occurrence. This data is used to train algorithm on the recognition task.
    b. Continuous sequences corresponds to un-segmented data. The ground truth contains start and stop time for the nucleus of each occurrence of gesture as well as the label. This data is used to train algorithm on the spotting & recognition task. This data is considerably larger (in memory size).

5) Select the type of format to download the dataset.
    a. '.dset' if you develop in C#. Note you must use the provided C# DataTypes_Lib.dll library to work with this data. (the library is available with the dummy C# algorithm, see next section)
    b. '.mat' if you develop in Matlab. This file can be directly opened in Matlab.
6) Finally download your Training Set by pressing the 'Download' button.
    a. Note that this might take some time as the data is converted on the fly.

The dataset is now saved on your hard-drive and you can start using it for your development.

5. Develop & optimize your algorithm

Now that you have the Training set on your computer, you can start developing and optimizing your algorithm. The platform currently support two types of languages: C# and Matlab. The platform provides skeleton of algorithms to ease the development.

- If you develop in C#, you can download the Dummy C# algorithm which contains sources and executable. Once downloaded, you can open the project source with Visual Studio and start working on your Algorithm.
- If you develop in Matlab, you can download the Dummy Matlab algorithm which contains the sources for the algorithm.

Those "Dummy algorithms" also provide a Readme.pdf file which shortly describe their structure in order to help you start developing.

In order to download these algorithms, you must perform the following actions

1) Select the "Algorithms tab"
2) Select to display all algorithms
3) Right-click on the desired algorithm
4) Select "Download"

Note that you can download the algorithms marked as "Open-Source" and the ones that you uploaded.

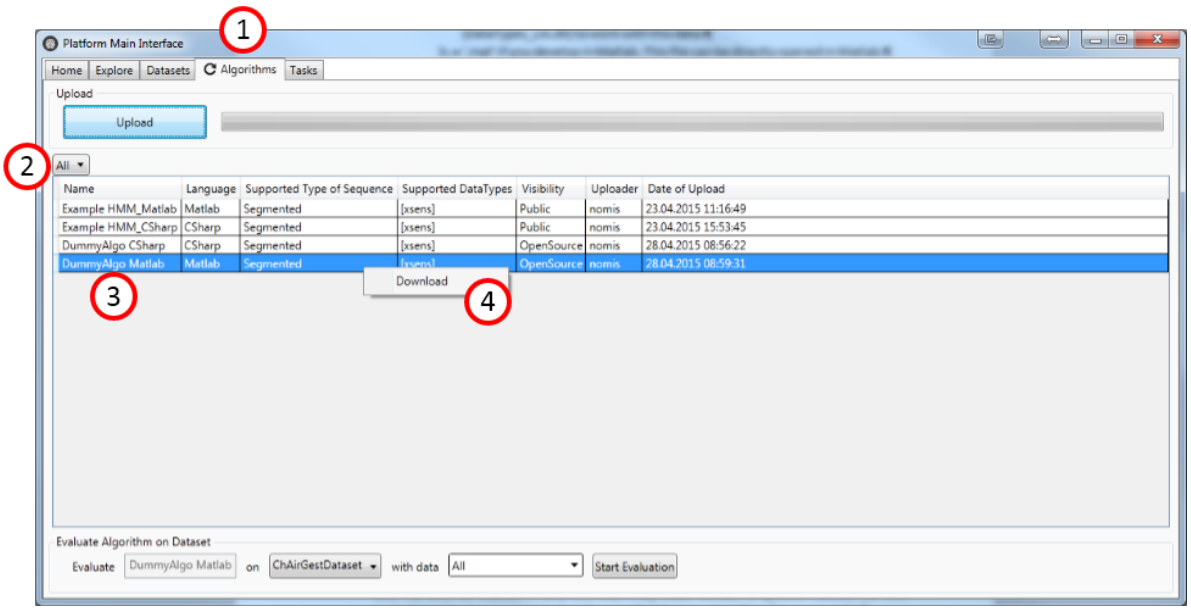


Figure 4: Download a sample algorithm

6. Upload an algorithm

Once you developed, trained and optimized your algorithm using the downloaded Training Set, you can upload your algorithm to obtain an official evaluation from the platform. To do so, you must upload your algorithm as a '.zip' file and this zip file must contain two files at its root:

- The 'algorithm.info' file: this file contains the description of the algorithm and its specifications. These will be used by the platform when performing the evaluation.
- The executable file: this file correspond to the entry point for your algorithm. In C# it is the .exe file and for Matlab it is a .m. file. They must contain a specific method for the evaluation. You may want to look at the provided dummy algorithms for an example.
- Ensure your executable file is correctly specified in the algorithm.info (TAG: RunFile). See red square in Figure 5.

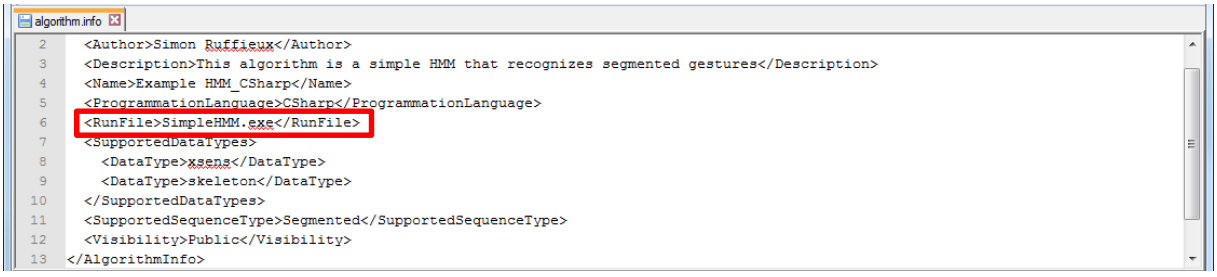


Figure 5: An example of 'algorithm.info' file for a C-Sharp algorithm using Xsens and Skeleton data and performing the recognition task (segmented sequences).

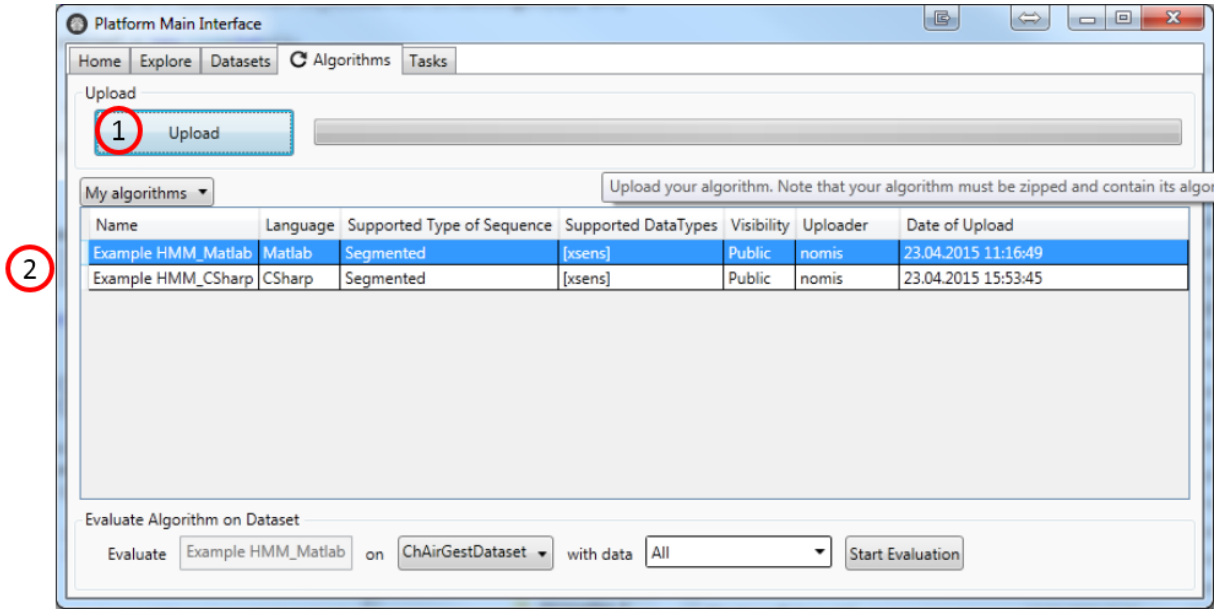


Figure 6: Upload your algorithm.

Once the zip file of your algorithm is ready, you can upload it to the platform by pressing the upload button (Figure 6: 1). The uploaded algorithm should then be visible on the list of algorithms (Figure 6: 2).

7. Request an evaluation

Once your algorithm has been correctly uploaded and is visible on the algorithm list, you start its evaluation. You need to

1) Select your algorithm on the list
2) Select a compatible dataset
    a. You should use the dataset you trained your data on
3) Select the data you want to use
    a. You should use the data you used during training (By default: 'all')
4) Press the button 'Start Evaluation'

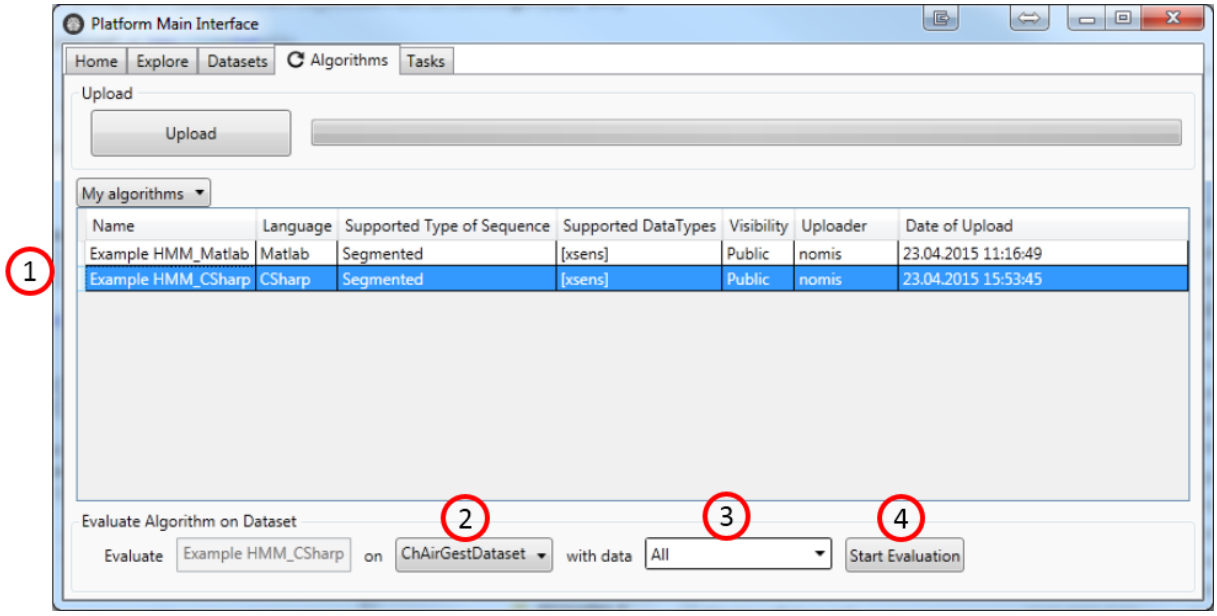


Figure 7: Request an evaluation for your algorithm.

5) You will automatically be redirected to the 'Tasks' tab.
6) Wait until the evaluation is complete
    a. Note that this might take a while depending on the number of tasks before yours.
    b. Remember that the window does not refresh automatically but you can use the refresh icon (next to 5 in Figure 9).
    c. You will received a mail upon completion if the option is ticked (7). An example of mail is shown in Figure 9.

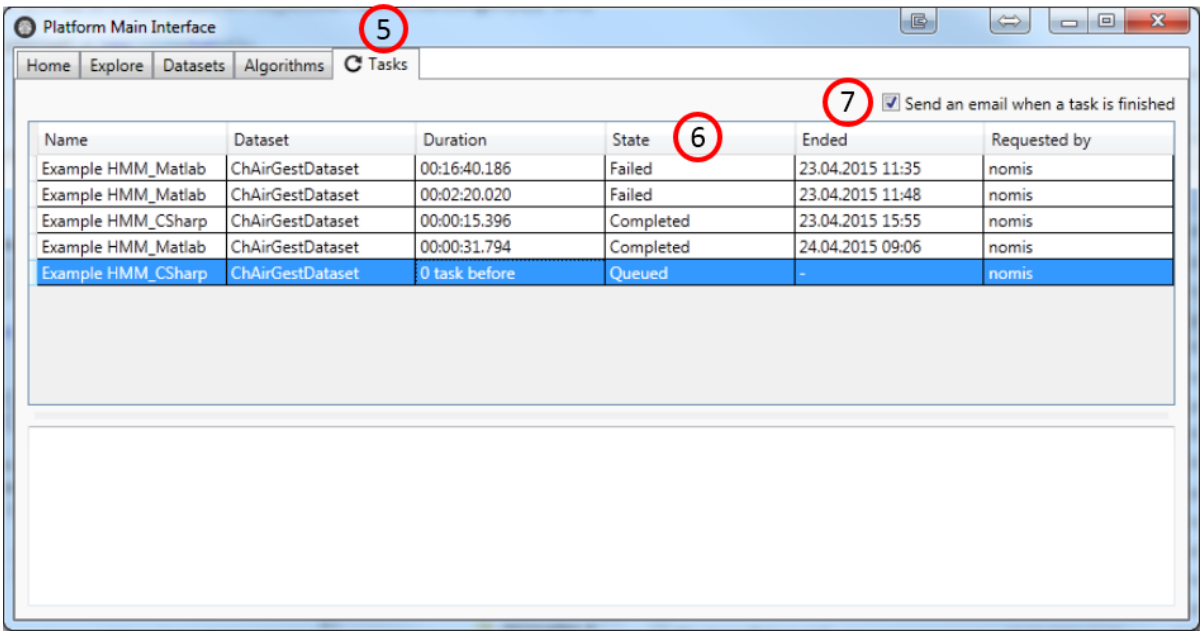


Figure 8: Monitor the status of your evaluation.

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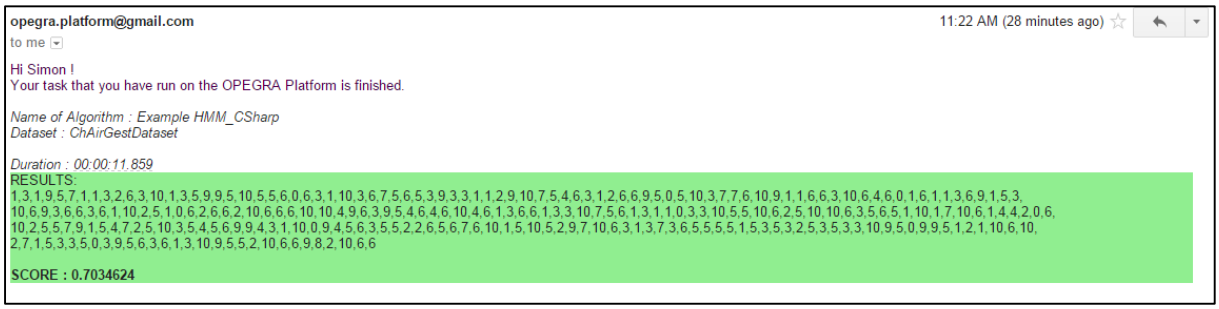

Figure 9 : An example of received mail once a task is completed.

8. Visualize the scores

Once an Evaluation Task has been successfully completed, its results are visible in the Explore tab, section "Scores". To visualize them, perform the following actions

1) Go to the Explore tab
2) Select Scores from the drop-down list
3) Select your score from the list
    a. The last ones are shown at the bottom
4) Visualize the results of the evaluation in the textbox.
    a. The duration
    b. The Confusion Matrix
    c. The recall score
    d. The precision score
    e. The F1-Score

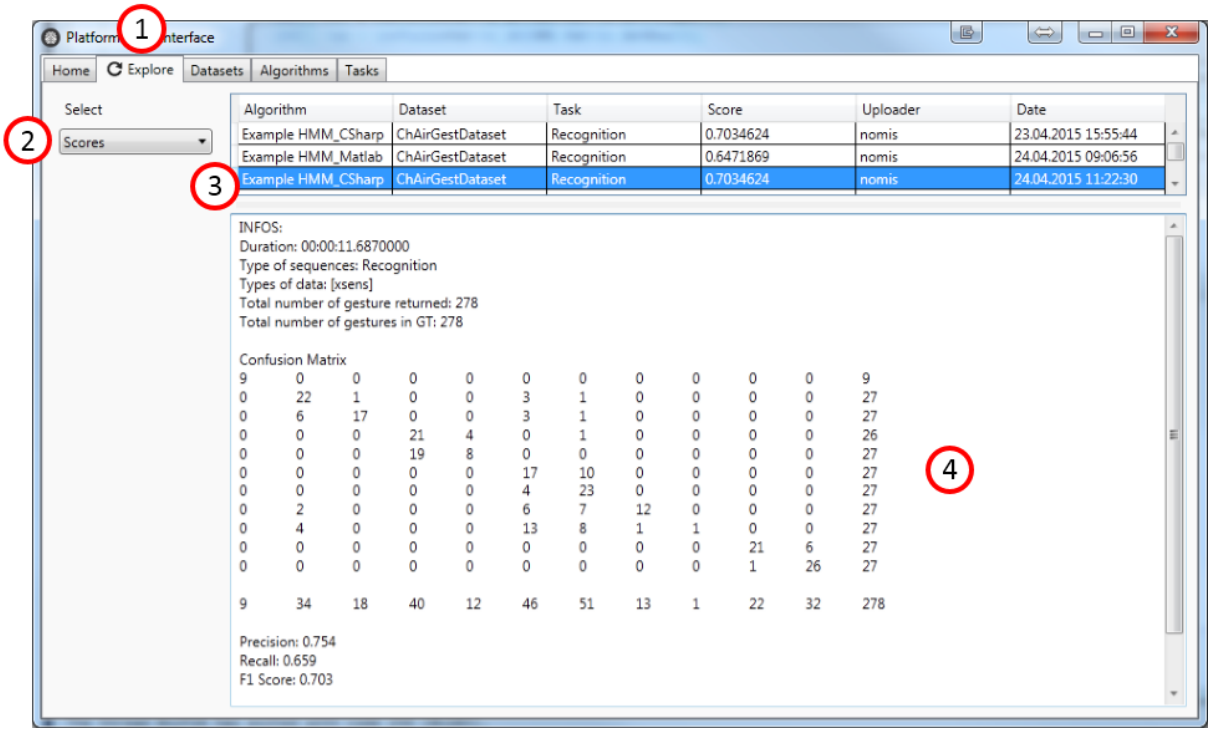

Figure 10: Visualize the results of your evaluation.