PH^2 Browser

Tutorial

ADDI Project

Automated Computer-Based Diagnosis System for Dermoscopy Images

July, 2013

Índice

Introduction

PH^2 is a database of 100 dermoscopic images acquired at *Unidade Local de Saúde de Matosinho - Pedro Hispano Hospital* (ULSM-HPH) under supervision of *Dr. Jorge Rozeira*, Director of the Dermatology Service. This database includes medical annotation of all the images namely medical segmentation of the lesion, clinical diagnosis and dermoscopic criteria (asymmetry, colors and the presence of typical and atypical differential structures). The database will be freely available through internet to all researchers after 35th International Conference of the IEEE Engineering in Medicine and Biology Society, July 3-7, Osaka International Convention Center, Osaka, Japan (EMBC 2013).

PH^2 *Browser* is a software developed in *Matlab* and available as a x86 and a x64 *Matlab* executable. PH^2 *Browser* is a software that enables the search and selection of the PH^2 database, with the issue of allowing the exportation of the interest images of the PH^2 database. This exportation could be made not only to a *Matlab* file but also to an *Excel* and *Notepad* file. The PH^2 database and PH^2 *Browser* are only available for research and educational purposes.

For more information please visit the Web page of ADDI project: http://www2.fc.up.pt/addi/ph2%20database.html
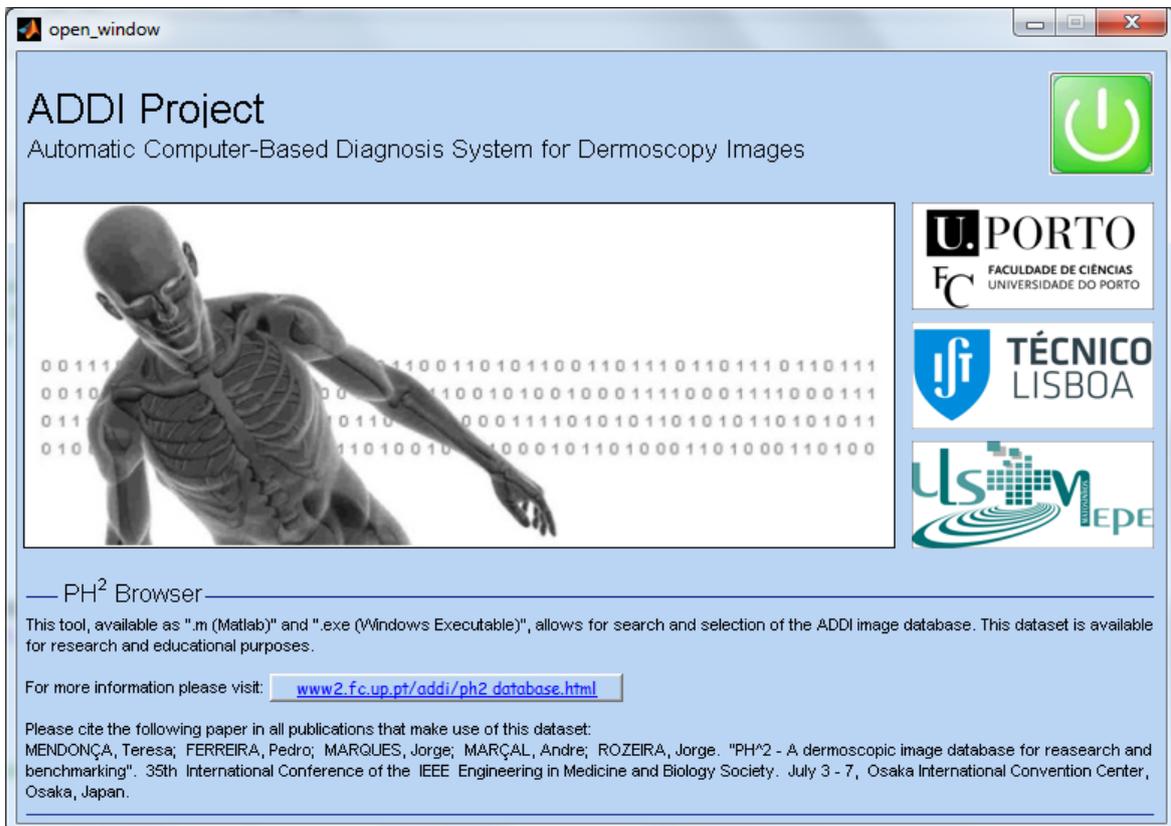
PH² Browser Windows

Opening Window

Figure 1 - Opening Window

The opening window is the first window of the *PH² Browser* and contains the logo of the *ADDI project* as well as the logos of the *ADDI* partners involved in this software. Through this window the user can open the Web page of the *ADDI project* or continue to the main window of this software.

Opening Window Buttons

When the user presses this button the web page of the *ADDI Project* will open with the *Matlab* Browser.

Start Button. This button allows to start the main window of the *PH² Browser*. During this action it will occur the load of the *PH²* database, and this action could take some seconds. During this time a message box will appear to warn of the time consumption (Fig. 2).
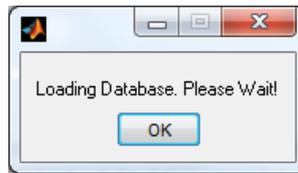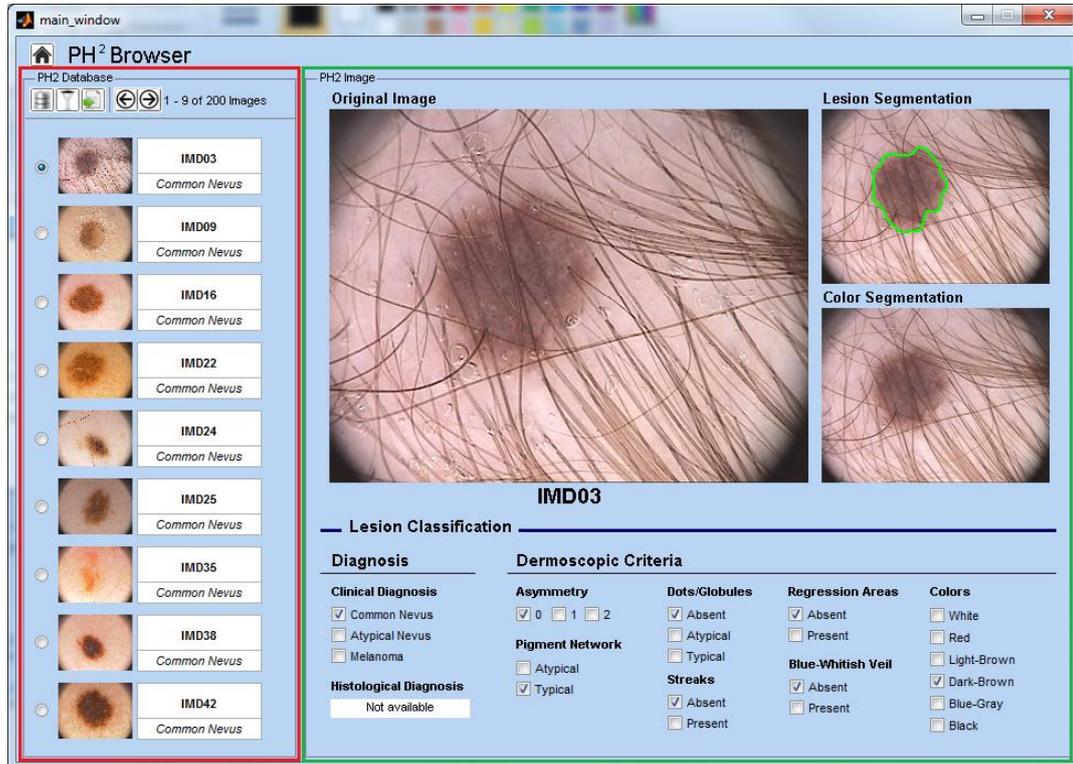
Figure 2 - Message Box

Main Window

Figure 3 - Main window

The main window page is the core of the PH² Browser software. It will be here where the user will see the loaded ADDI images, and the different characteristics of each dermoscopic case.

On the left side of the Fig. 3 in a red rectangle (PH2 Dataset) it can be seen where the database images are loaded.

On the right side in a green rectangle (PH2 Image) it is shown the information about each individual image of the dataset where the information available for each case is:

- RGB image (Original Image);
- Lesion segmentation image (Lesion Segmentation);
- Color segmentation image (Color Segmentation) (if available);
- Case name (in this case IMD03);
- Diagnosis:
    - Clinical Diagnosis;
    - Histological Diagnosis (if available);
- Dermoscopic criteria:
    - Asymmetry;
    - Pigment Network;

     o   Dots/Globules;
     o   Streaks;
     o   Regression Areas;
     o   Blue-Whitish Veil;
     o   Colors.

Main Window Buttons

Home button. This button when pressed loads the opening window (Fig.1)

Load All button. This button loads the entire ADDI images database. Is useful when the user wants to see the entire database after doing a filter action.

Filter button. This button when pressed opens the filter window (Fig. 4). It allows the user to load only the ADDI images of interest.

Export to button. This button allows the user to export the images loaded on the left side of the main window.
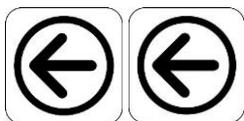
Navigation buttons. These buttons allow the user to navigate between the different pages on the left side of the main window (PH2 Dataset). Each page presents 9 ADDI images. If the amount of images is greater than 9 those images are distributed between different pages.
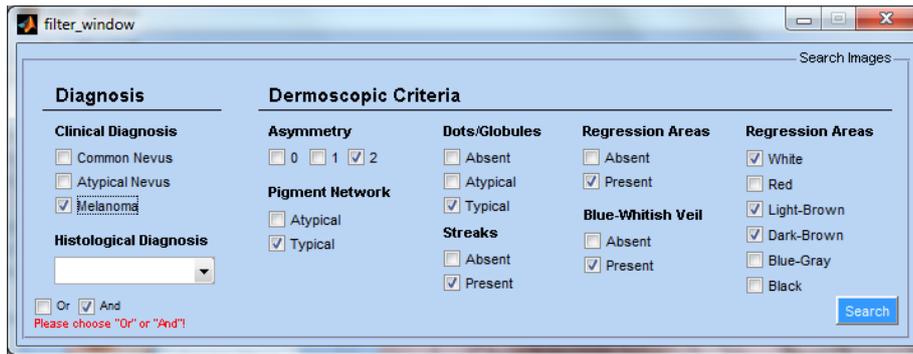
<u>*Filter Window*</u>

Figure 4 - Filter window

The filter window allows the user to make a specific search inside the *PH² database*. The filter windows enables a *or/and* search. For example, the user wants to load only the cases presenting *Atypical Nevus*, or the cases with *Asymmetry* 0, and for that the option "*and*" must be selected. On the other side, if the user wants to filter not only the *Atypical Nevus* but also the *Melanomas* it must be used the option "or".
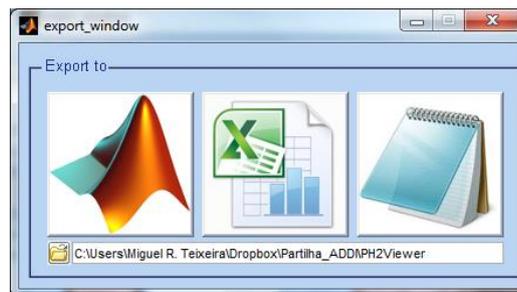
<u>*Export Window*</u>

Figure 5 - Export to window

The export to window permit the user to export the information of the ADDI images loaded on the left side of the main window. The export could be made to a ".mat" file (Matlab), ".xls" file (Excel), or ".txt" file (Notepad). Before choosing the format file the user must define the directory where the file will be save by pressing the folder button, or can leave the default directory.

PH^2 Image Information

Original Image

Contains the original RGB image of the skin lesion.

Lesion Segmentation

Contains the manual segmentation of the lesion.

Color Segmentation

Contains the segmentation of the colors of the lesion.

Diagnosis
- Clinical Diagnosis:
    - Typical Nevus;
    - Atypical Nevus;
    - Melanoma.
- Histological Diagnosis (so far):
    - Dysplastic Nevus;
    - Intradermal Nevus;
    - Blue Nevus;
    - Melanoma;
    - Lentigo Maligna;
    - Nodular Melanoma.

Dermoscopic Criteria
- Asymmetry:
    - 0 - Fully symmetric;
    - 1 - Simmetric in one axes;
    - 2 - Fully Asymmetric.
- Pigment Network:
    - Atypical;
    - Typical.
- Dots/Globules:
    - Absent;
    - Atypical;
    - Typical.
- Streaks:
    - Absent;
    - Present.
- Regression Areas:
    - Absent;
    - Present.
- Blue-Whitish Veil:
    - Absent;
    - Present.
- Colors:
    - White;
    - Red;
    - Light-Brown;
    - Dark-Brown;
    - Blue-Gray;
    - Black.