Superimpose maps tool

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Brief description of how to use the tool to superimpose maps to a reference image.

1. Using the tool

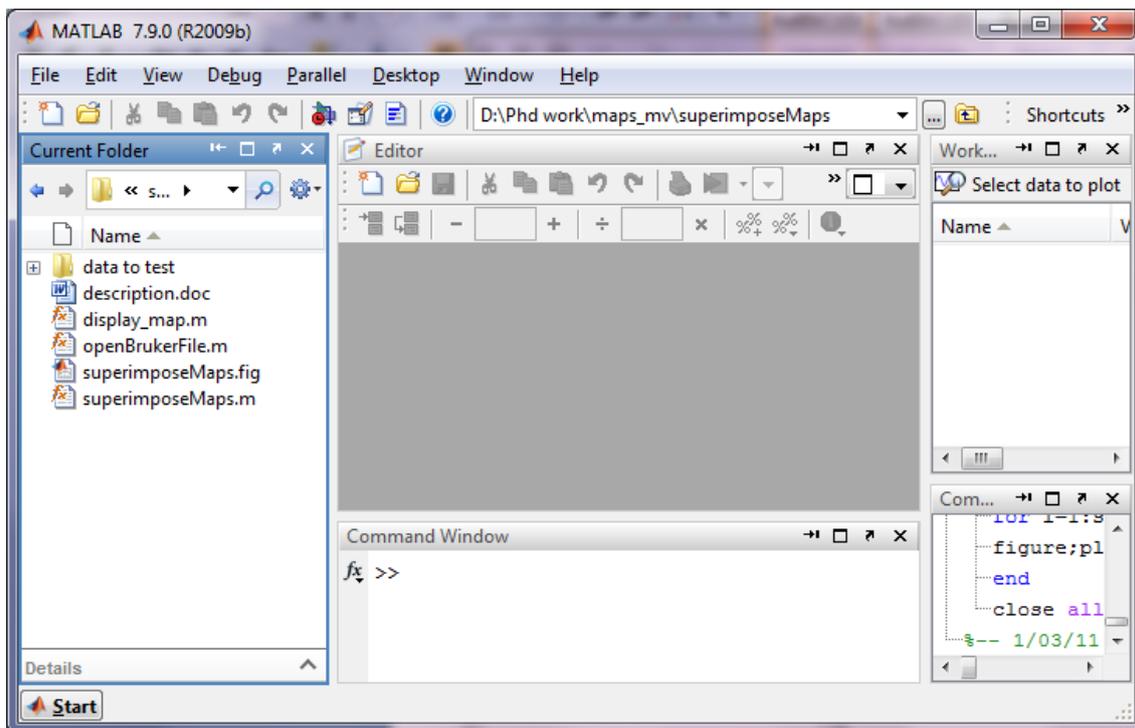1.1 Open the folder in MATLAB where the tool is saved (similar to Fig. 1).

Fig. 1. Folder of the tool opened in Matlab

1.2 Right click over 'superimposeMaps.m' and then select 'Run file' option in the menu displayed. The main screen will be opened (Fig. 2). This main screen will allow users to enter the parametes and data needed for creating the maps. It is divided in three main sections:

- Parameters from the method file:
  'PVM_Fov' and 'CSIRecoMatrix' values can be read in the method file.
- Reference image:
  At the moment, the tool is capable of reading Bruker images. The reference image (i.e. T2-weighted image) has to be in 2dseq format. 'Data type', 'MRSI resolution', 'Image width', 'Image height', 'Number of images', 'X(VOI)' and 'Y(VOI)' are parameters of the MRI reference, and 'Image to display' can be used to decide which of the images (from the 'Number of images' parameter) to import. After setting this parameters, click the 'Import image' button to select the 2dseq file. The path and name of the opened image file will be displayed above the 'Import image' button. Make sure, after changing any parameter you require, of importing again the 2dseq file in the new condition.
- Heights map:
  This section is to display peak height maps (see section *2. Heights maps* in this document for details).
- Classification map:

This section can be used to display classification maps (see section *3. Classification maps* in this document for details).
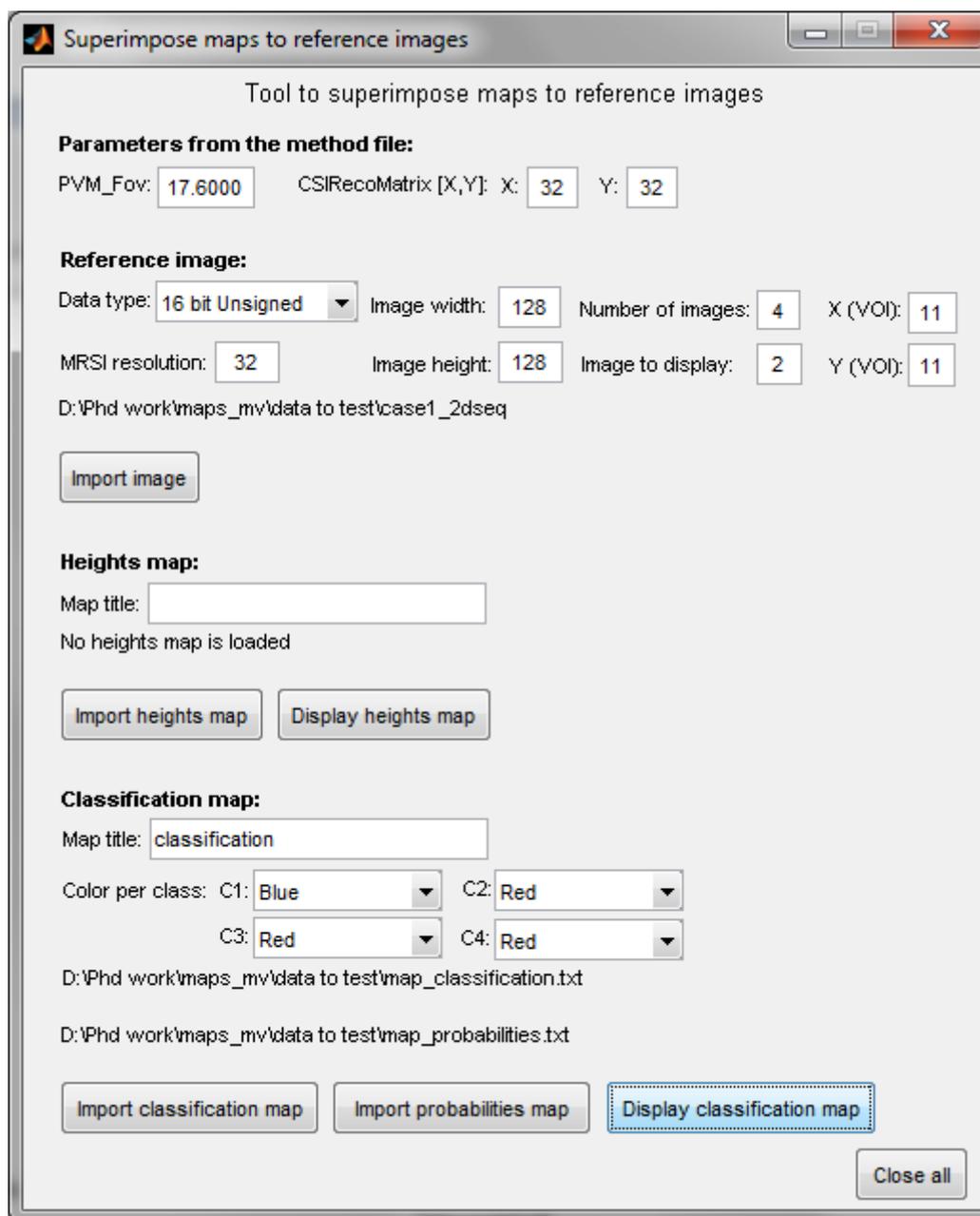

Fig. 2. Main screen of the tool, showing the parameters to be entered.

2. Displaying height maps

2.1) This section is to import the file containing the values of the heights map to be displayed. The map title parameter is not mandatory. It is only used to insert a title into the figures displayed with the maps. The 'Import heights map' button can be used to import the map file. The path and name of the opened map file will be displayed above the 'Import heights map' button.

For more details in the format of the heights maps, please see section *4. Important notes*.

2.2) Click on 'Display heights map' button to display the map loaded. The map will be shown in three different ways:

- Interpolated over the reference image (Fig. 3)
- Not interpolated, over the reference image (Fig. 4)
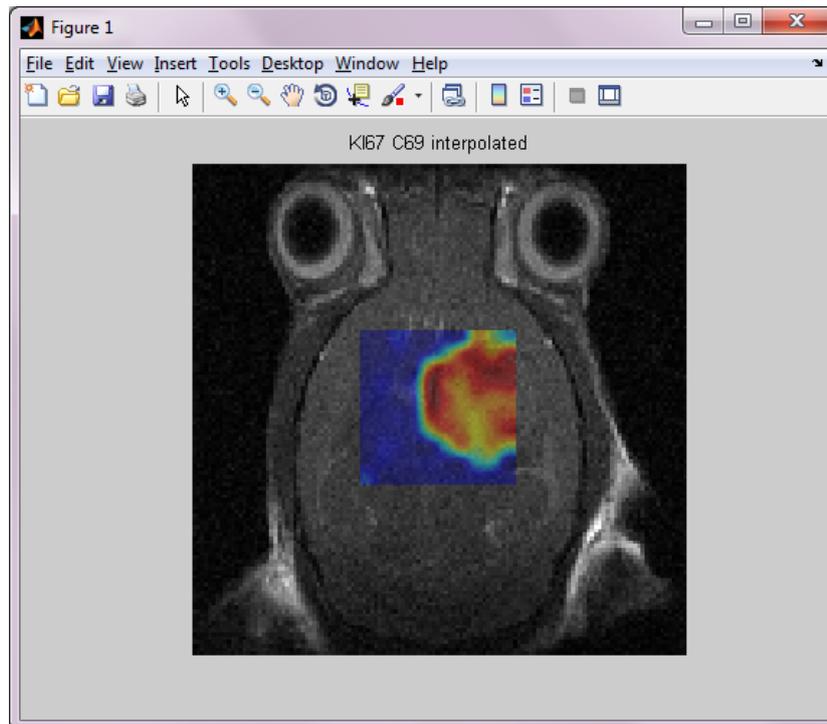- Not interpolated, without the reference image (Fig. 5)

Fig. 3 Screen of Figure 1 of the tool, showing the heights map interpolated superimposed to the reference image.
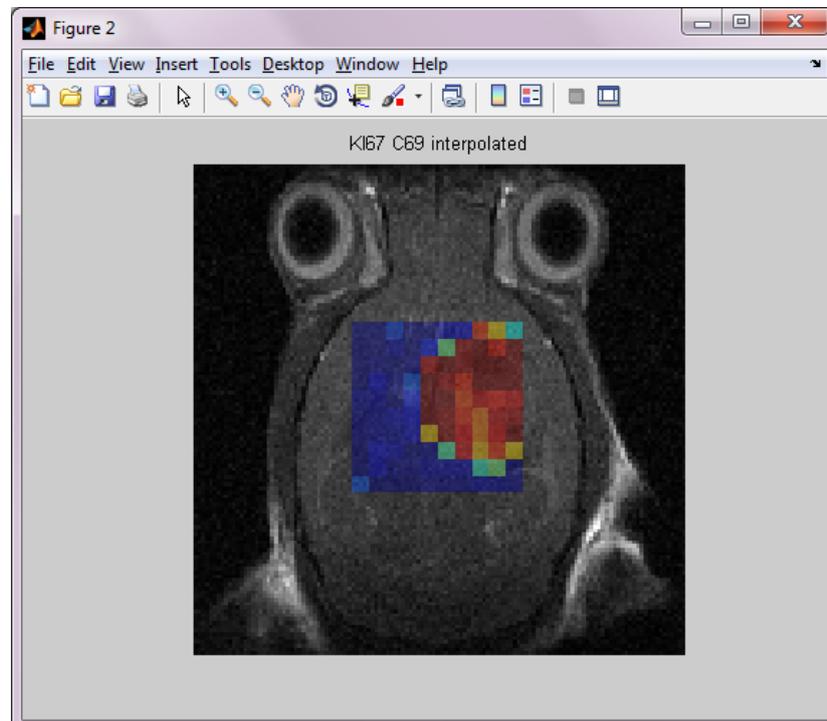

Fig. 4 Screen of Figure 2 of the tool, showing the heights map (not interpolated) superimposed to the reference image.
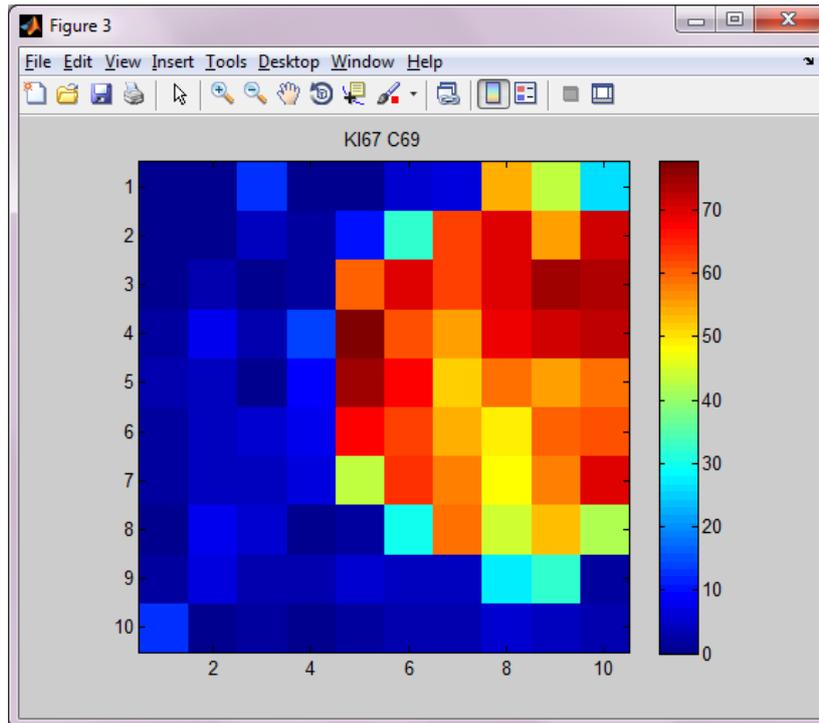
Fig. 5 Screen of Figure 3 of the tool, showing only the heights map (not interpolated), and without the reference image.

3. Classification maps

3.1) This section is to import the file containing the values of the classification map to be displayed. Again, the map title parameter is not mandatory. It is only used to insert a title to the figures displayed with the maps. The input parameters 'Color per class: C1, C2, C3 and C4' allow the user to select a color for each class. The available colors are: red, green, blue and black. 'Import classification map' button can be used to import the map file. The path and name of the opened map file will be displayed above the 'Import classification map' button.

Another way of displaying the classification maps is taking the probabilities of the classification. The higher the probability of being represented by a class, the brighter is the color of the corresponding class. The 'Import probabilities map' button can be used to import the map with the probability values. This parameter (the probabilities map) is not mandatory. When no probabilities maps is imported, the probability value assumed is 1, and the color of the corresponding class will be the brightest. It is however, mandatory to import a map with the predicted classes. After importing a probabilities map, the path and name of the opened file will be displayed above the 'Import classification map' button, and below the path and name of the classification map imported.

For more details in the format of the classification and probabilities maps, please see section *4. Important notes*.

3.2) Click on 'Display classification map' button to display the classification map. The map will be shown in two different ways:
- Classification map over the reference image (Fig. 6)

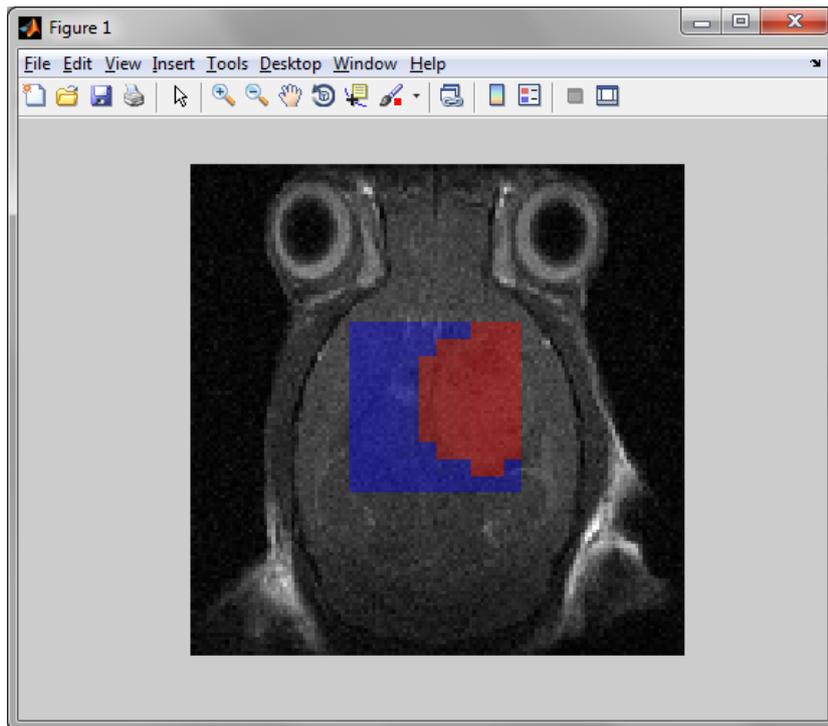- Classification map, without the reference image (Fig. 7)

Fig. 6 Screen of Figure 1, showing the classification map over the reference image.
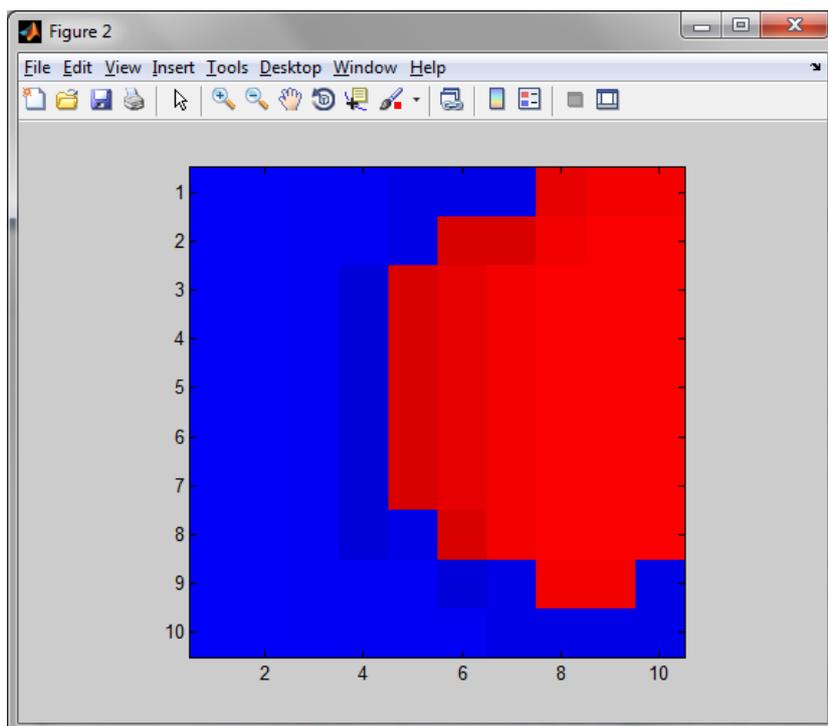

Fig. 7 Screen of Figure 2, showing the classification map without the reference image.

4. Important notes

- Format of the maps:
  The file containing the values of the map to be superimposed should be a text file (with extension .txt). The decimals must be expressed using points, not commas. The maps can be developed using any tool (even hand-made), provided they meet the

requirements mentioned above. There is also no restriction for the maps to be squared; matrices with different numbers of rows and columns are accepted.

Fig. 8 shows an example of a 10x10 heights map (see section *2. Display heights maps*).

Fig. 9 shows an example of a 10x10 classification map, and Fig. 10 shows an example of a 10x10 probabilities map. (See section *3. Classification maps*). Note that the values of the classification map are digits between 0 and 4 (representing 4 classes, and zero for undefined elements). All zero values will be painted black, and the rest of values (1, 2, 3 and 4) with the selected color, i.e. C1, C2, C3 and C4, respectively. The same color can be used in more than one class.

- Saving figures:

  The save tool in each figure window can be used to save the whole image into one of the Matlab supported formats, such as: .fig, .bmp, .eps, .jpg, .pdf, .png, .tif, among others.

Fig. 8 Example of a heights map file.
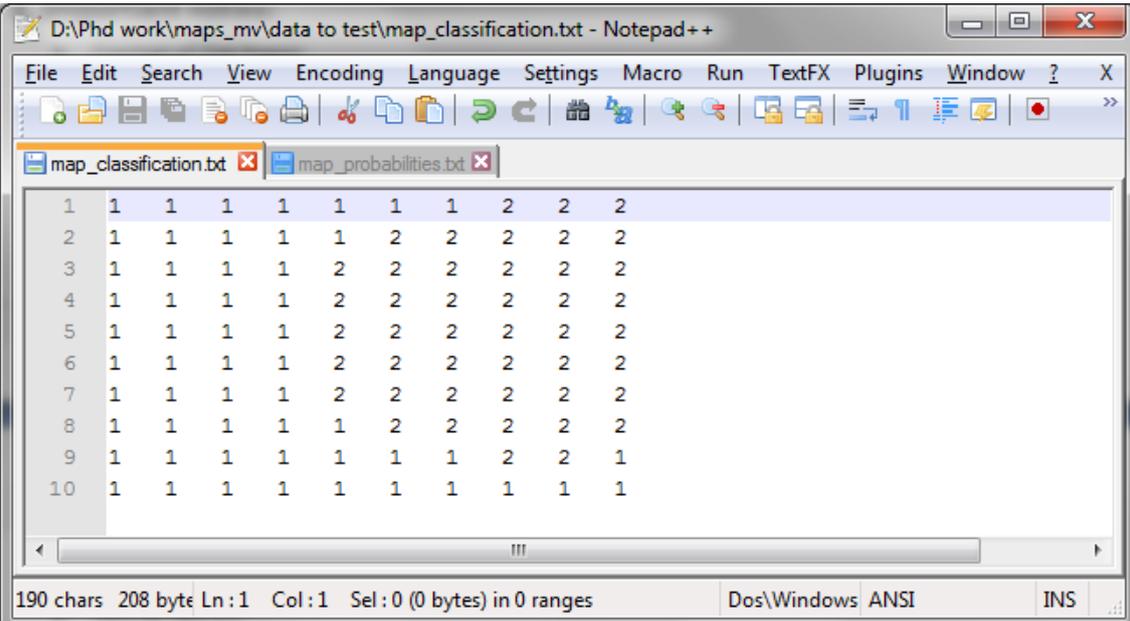
Fig. 9. Example of a classification map file.

Fig. 10. Example of a probabilities map file.