

APOLLO

Apollo is the new efficient solution for your archive of vintage photographs. It permits to automatically restore most of the defects which can affect an old photographic print, and even fractured glass plates. Its user-friendly interface ensures a simple restoration process. The common defects which Apollo can detect and treat are: semi-transparent blotches, cracks, creases and foxing.

The Apollo code has been developed in a C++ environment. In order to allow the code portability (also for further client-server applications) Apollo has been divided in two executables: the interface and the processing kernel. Its final version will operate on Windows, MacIntosh, and Linux platforms. The demo version offered in this package has a GUI that runs only under the Windows operating system.

To use the Apollo program, please, copy all the files here enclosed to a local directory on your hard disk and then double click on *ApolloInterface.exe*.

For the Apollo Demo version it is possible to utilize only images in the JPEG format.

Using the up and down arrows it is possible to zoom the image. The present zooming factor is visible in the title bar of the image.

1 Blotch

Semi-transparent blotches are originated by water or humidity (in Italian they are also called "gore d'acqua"). They superimpose a dark, noisy disturbance to the original information of the pixel. For this reason Apollo preserves the available information: it does not replace the damaged area with a simple color but it enhances the latent details.

The restoration process starts when "blotch" is selected in the "processing" menu (Fig. 1). Apollo needs to know where the damaged area is. For this demo version Apollo searches for a mask, where all the points in the blotch are painted in black. We suggest to use a software like Photoshop to create the mask image. Fig. 2 shows an example of mask for the semi-transparent blotch in Fig. 1.

The window with the blotch parameters (Fig. 3) permits to choose the file containing the mask and the name of the output. The *distance from*

the border and the *width of the flawless region* are two parameters of the restoration. Default values are suggested by the program.

2 Crack

It is the procedure to restore fractured glass plates. The restoration process starts when "crack" is selected in the "processing" menu (Fig. 5). The window with the crack parameters (Fig. 6) permits to choose the file name of the output. The *white threshold* and the *degree start/stop* are parameters of the restoration. Default values are suggested by the program.

Apollo asks the user to click one point in one fragment and one in the other fragment (Figs. 7 and 8).

3 Foxing

It is the procedure to restore foxing stains in photographic prints. The restoration process starts when "foxing" is selected in the "processing" menu (Fig. 10). The window with the foxing parameters (Fig. 11) permits to choose the file name of the output. The *foxing detection amplitude*, the *distance from the border*, and the *width of the flawless region* are parameters of the restoration. Default values are suggested by the program.

The detection and restoration process is completely automatic.

4 Crease

It is the procedure to restore creases in photographic prints. The restoration process starts when "crease" is selected in the "processing" menu (Fig. 13). The window with the crease parameters (Fig. 14) permits to choose the file name of the output. The *threshold for mean and variance*, the *filter dimension*, and the *moving average dimension* are parameters of the restoration. Default values are suggested by the program.

Apollo asks the user to crop the region to restore using the manual click and drag selection (Fig. 15).

5 Contact

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 semi-transparent blotches, cracks, creases and foxing.



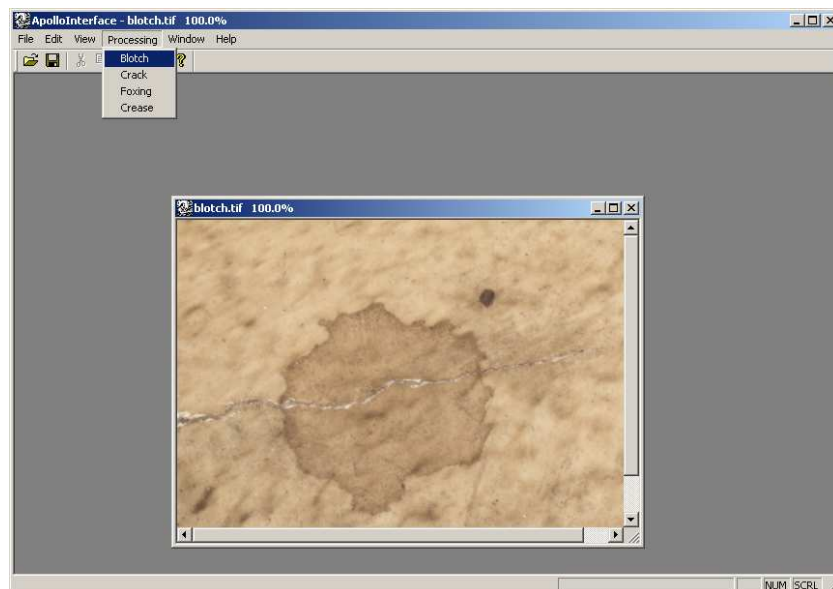
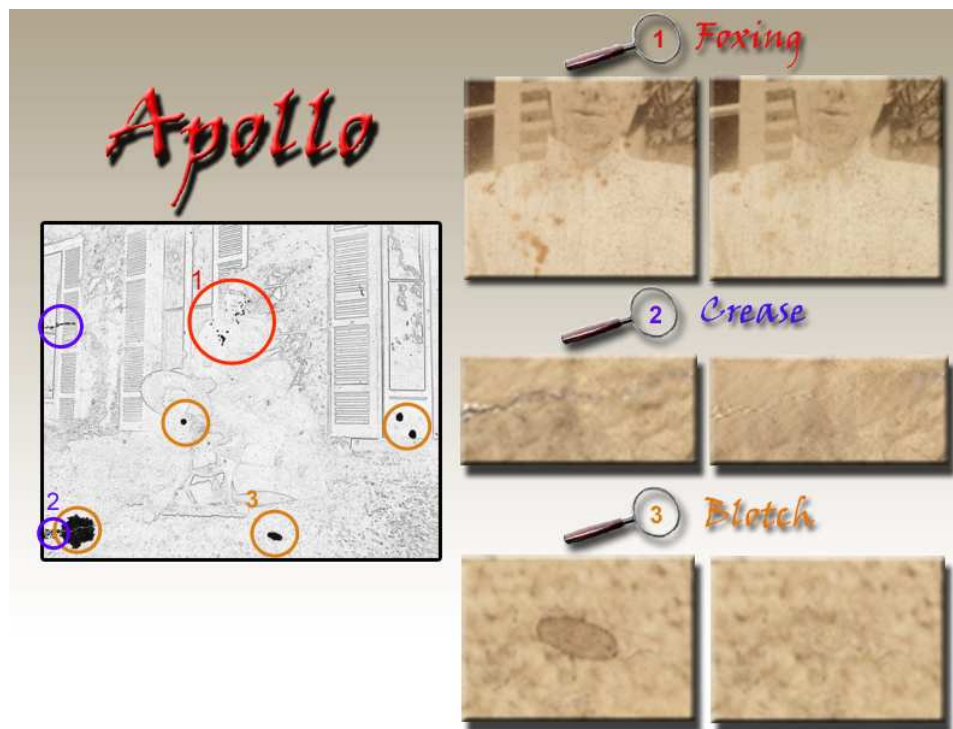


Figure 1: How to start the restoration of semi-transparent blotch.

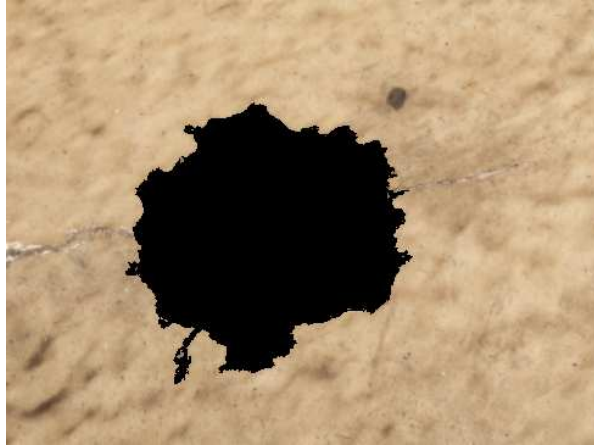


Figure 2: An example of mask for a semi-transparent blotch.

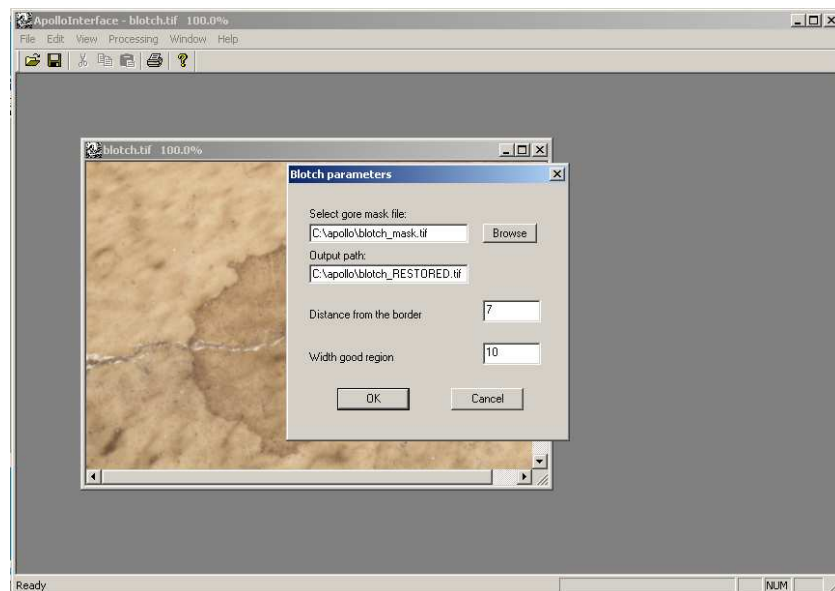


Figure 3: Parameters dialogue window.

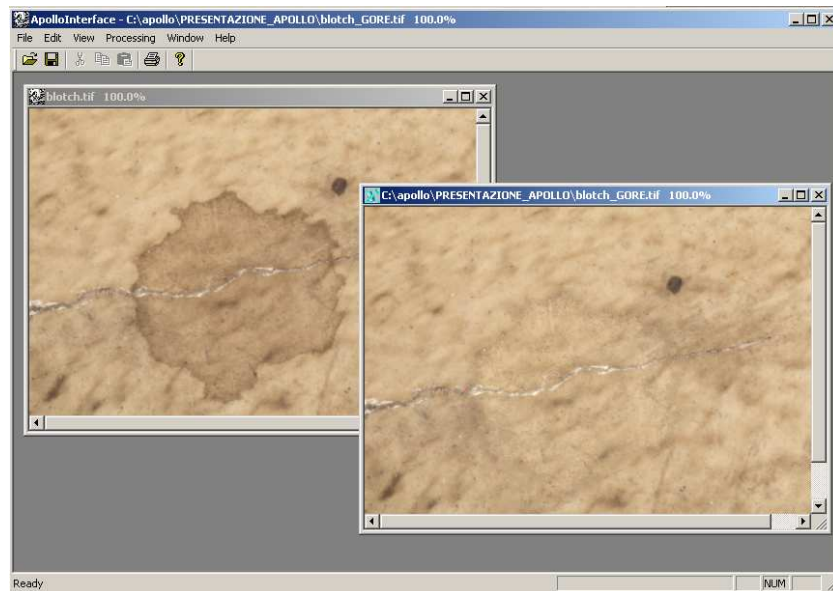


Figure 4: Final result

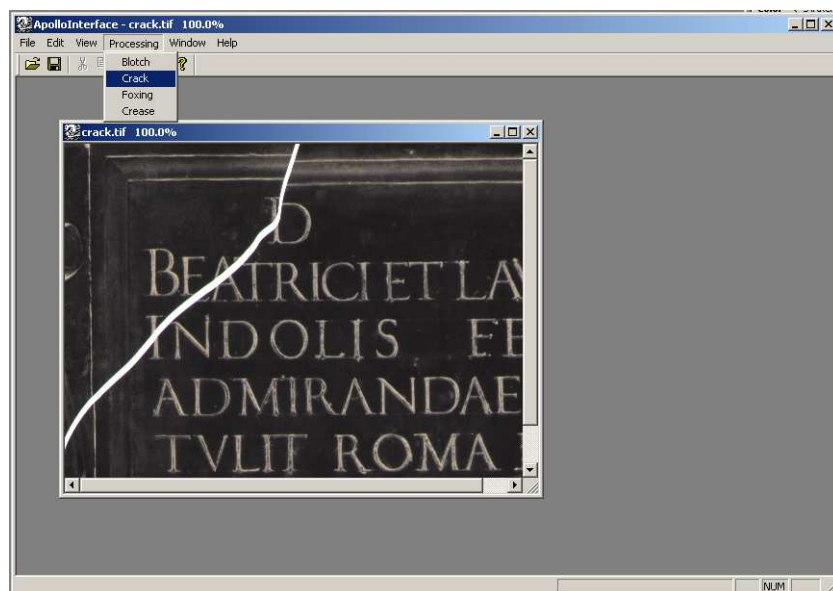


Figure 5: How to start the restoration of a crack.

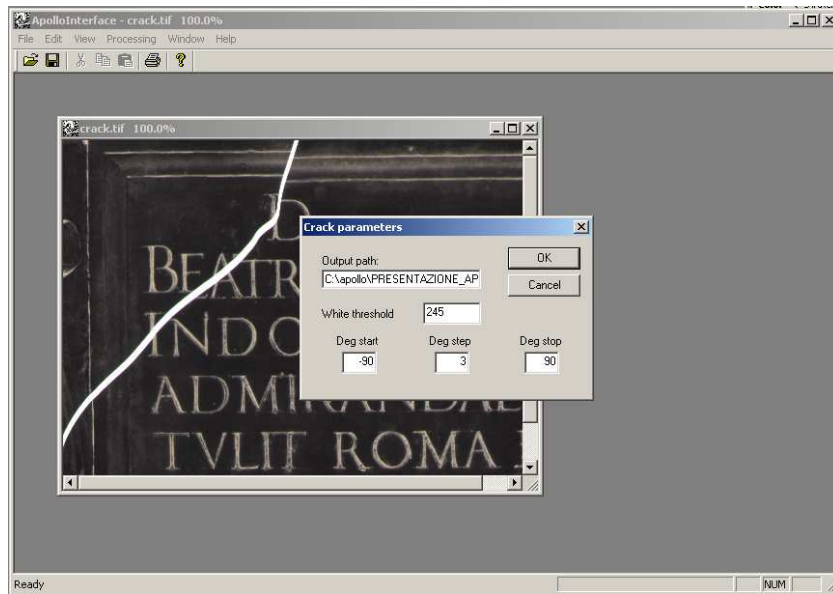


Figure 6: Parameters dialogue window.

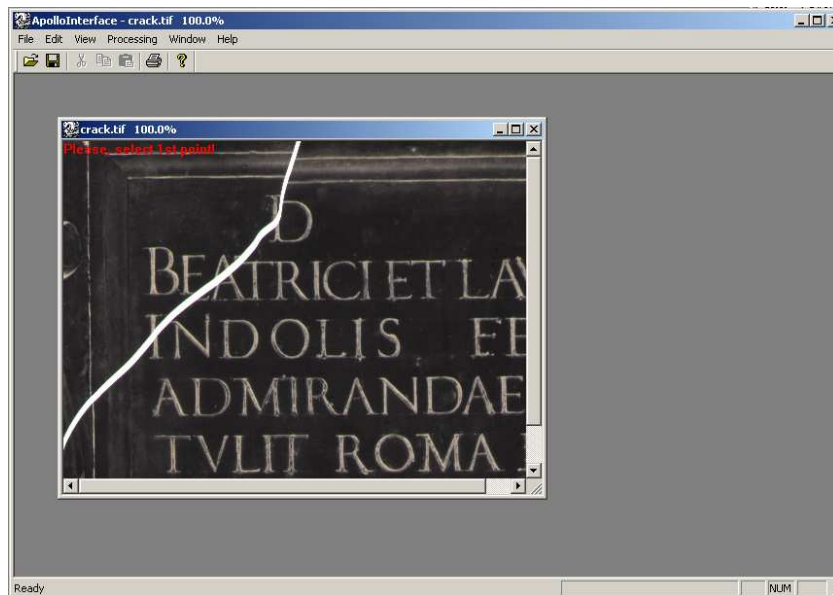


Figure 7: Selection of the first fragment.

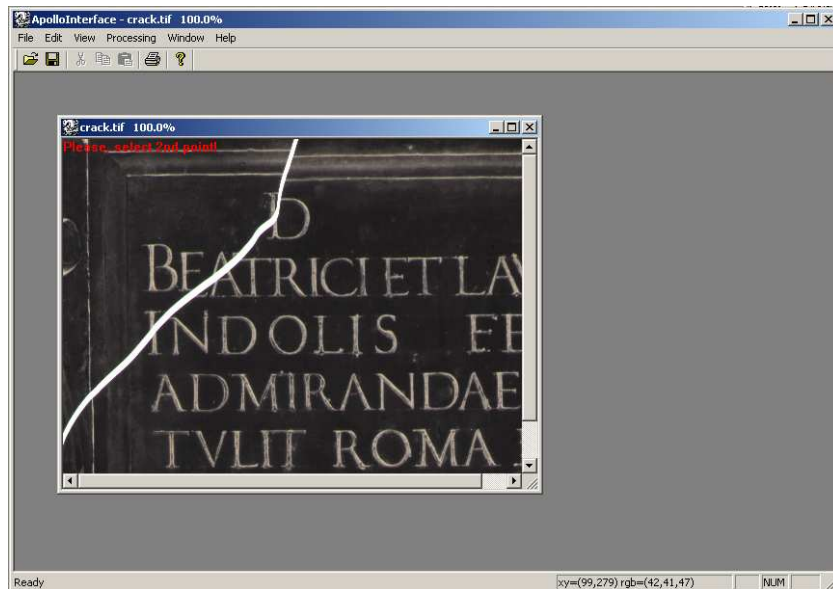


Figure 8: Selection of the second fragment.

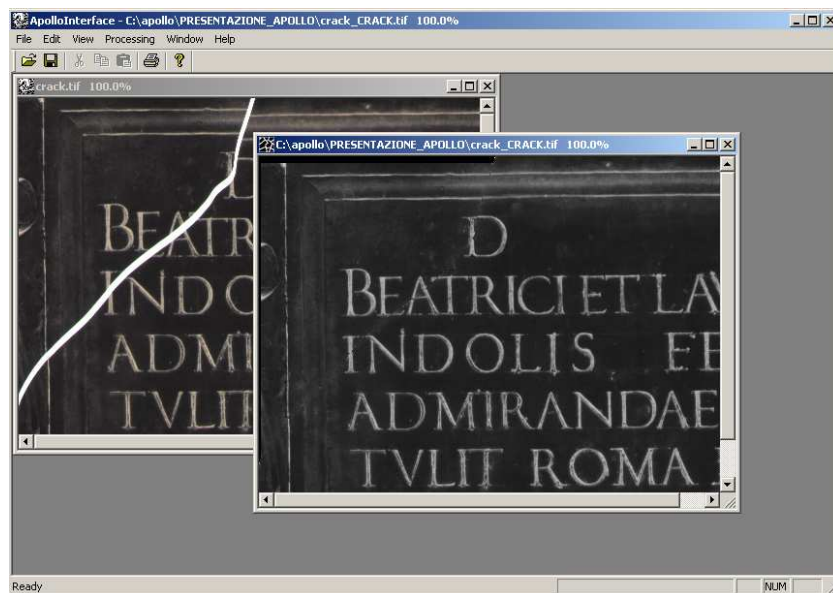


Figure 9: Final result.

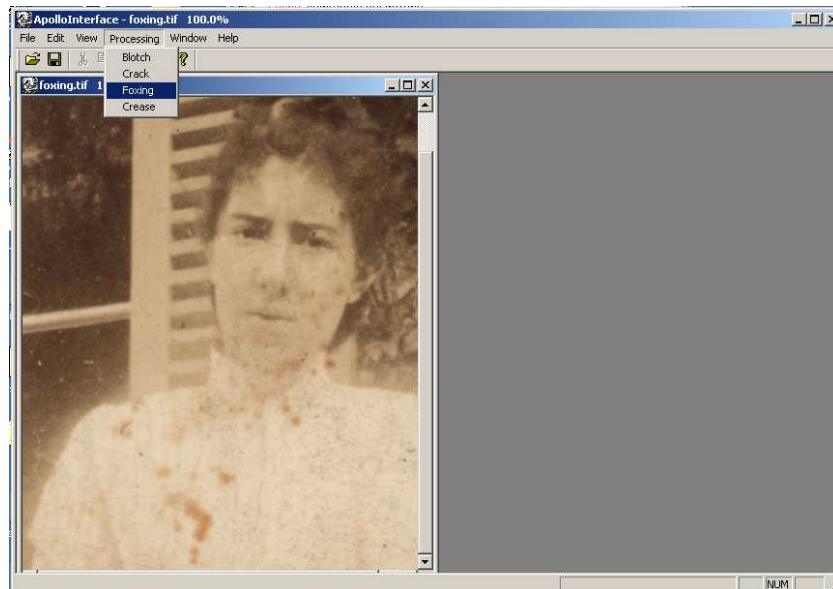


Figure 10: How to start the restoration of foxing.

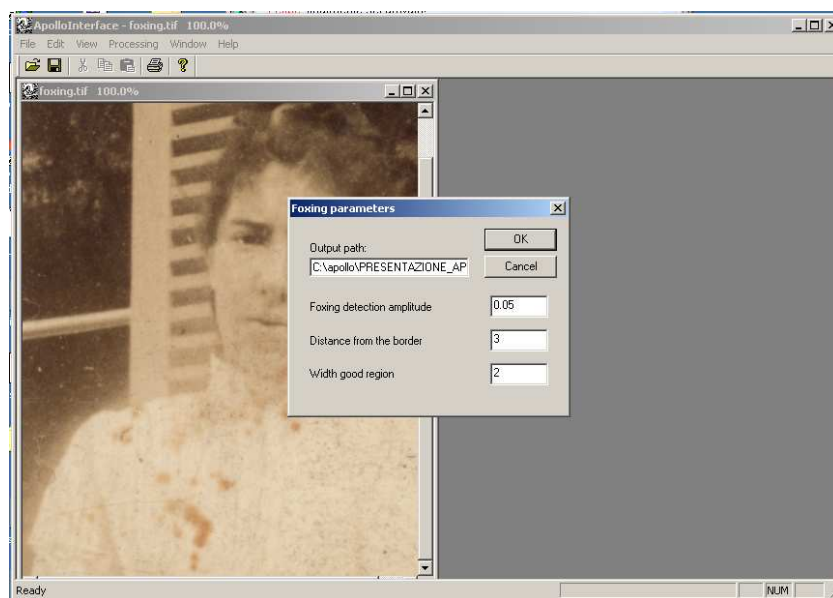


Figure 11: Parameters dialogue window.

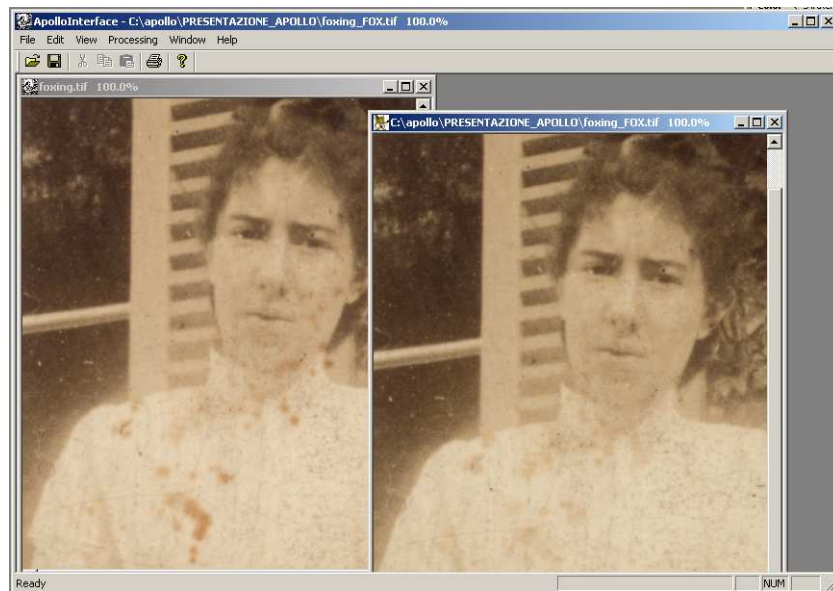


Figure 12: Final result.

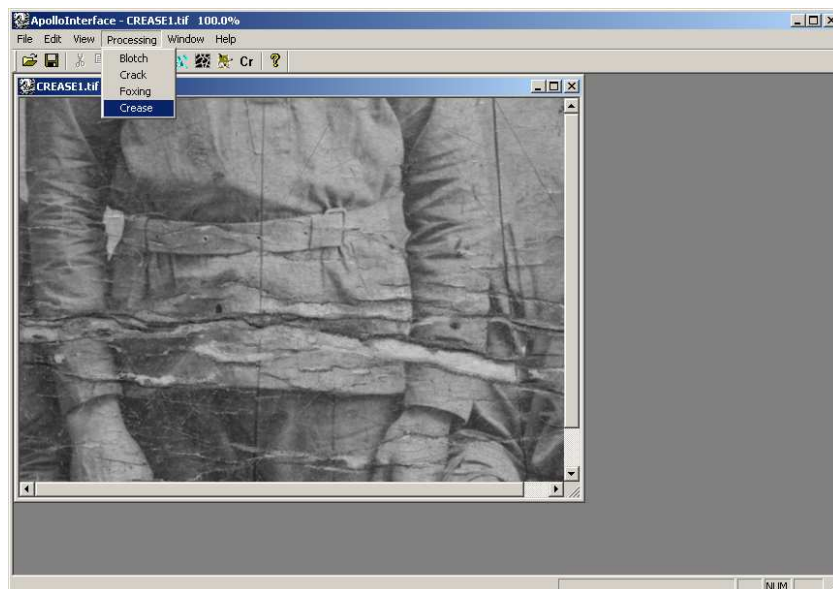


Figure 13: How to start the restoration of crease.

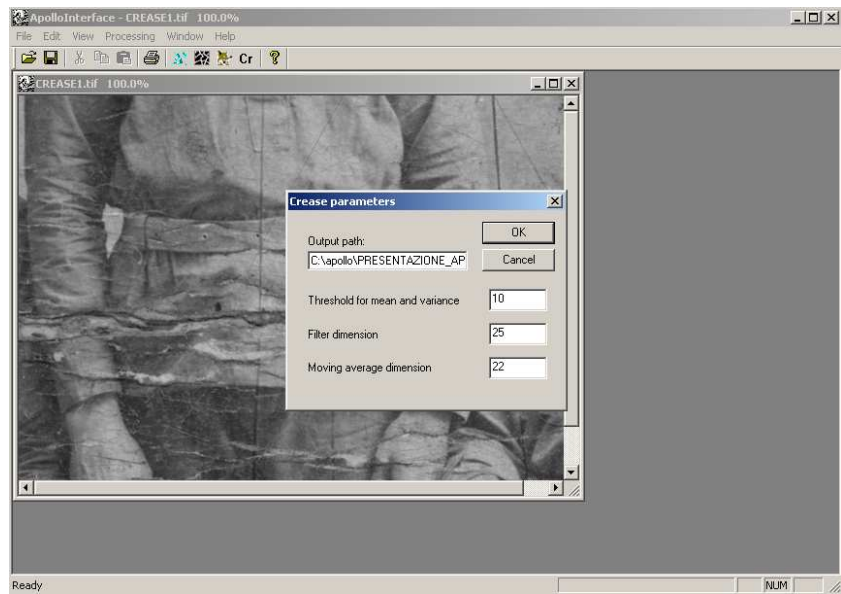


Figure 14: Parameters dialogue window.

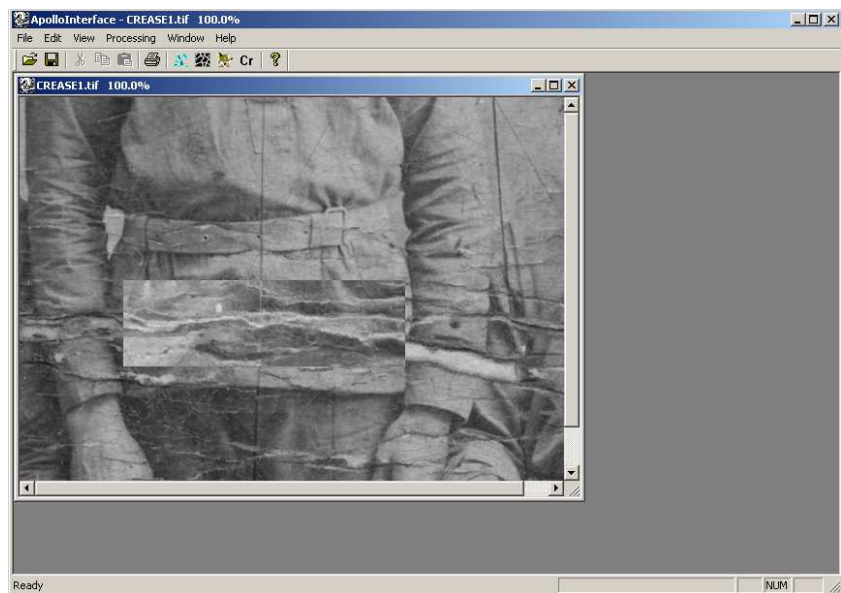


Figure 15: Selection area.

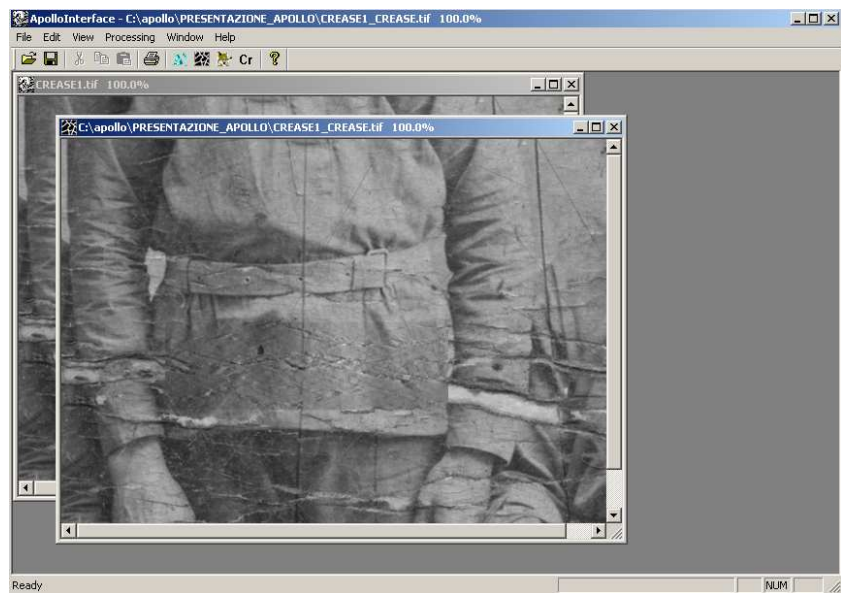


Figure 16: Final result.