

Bounded biharmonic blending of Möbius transformations for flexible omnidirectional image rectification - Supplementary Material

1 Interface Description

In this supplementary material we describe the interface we have developed using Matlab/GUI. A demonstration of the use of this interface can be found in the accompanying video. It is composed of two windows and we describe each of them below.

1.1 First Window

This window is responsible for defining the handles that will be used to modify the image. Figure 1 shows a screenshot of this window.

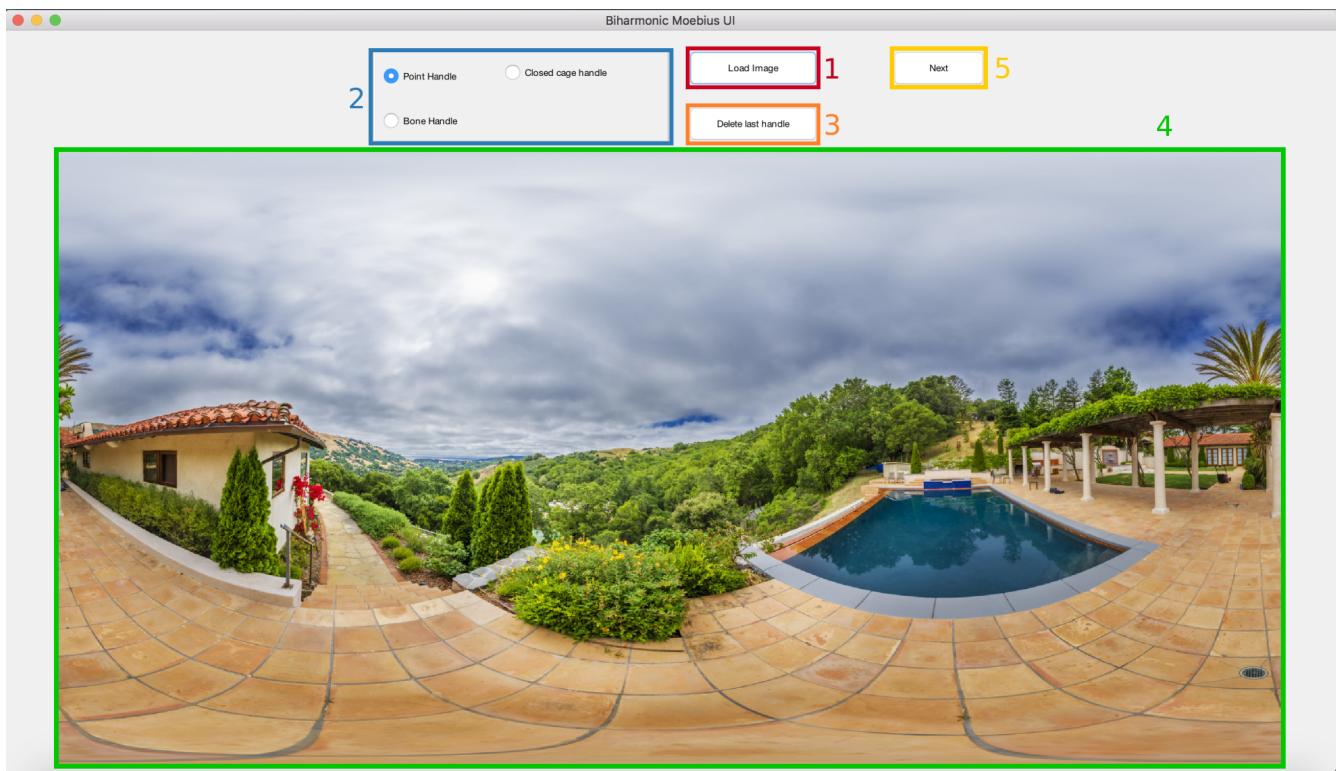


Figure 1: Screenshot of the first window of the user interface.

1.1.1 “Load Image” button (1)

When this button is clicked a pop-up window appears, allowing the user to search for a JPEG image that will be modified using the technique described in the paper.

1.1.2 Type of handle selection region (2)

In this region, the user is able to select the desired type of handle: point, curved bone or closed cage handle. If a user changes from closed cage handle to any of the two other options during an unfinished cage, the algorithm closes the cage automatically by connecting the first and last vertices of the cage.

1.1.3 “Delete last handle” button (3)

This button enables the user to delete the last handle that was added to the image.

1.1.4 Handle addition region (4)

In this region of the interface the user can add the selected handle by clicking on the image. For a point handle a single left click is required, while two clicks are required for a curved bone handle to define the endpoints of the bone. For a closed cage handle, the user can left click until the desired number of vertices is achieved, and close the current cage by right clicking with the mouse. The interface then will connect the first and last handles with a segment. Please notice that our algorithm obeys the spherical topology. Therefore bone and cage segments can pass through left and right borders to the other side to connect points.

1.1.5 “Next” button (5)

By clicking on this button the user finishes working on handle addition and the interface proceeds to the next window. At this moment the algorithm automatically divides intersecting bones and create joints if needed. After clicking this button, the first window will be closed and the next window will automatically appear.

1.2 Second Window

This window allows the input image to be transformed according to the specified handles. Figure 2 shows a screenshot of this window.

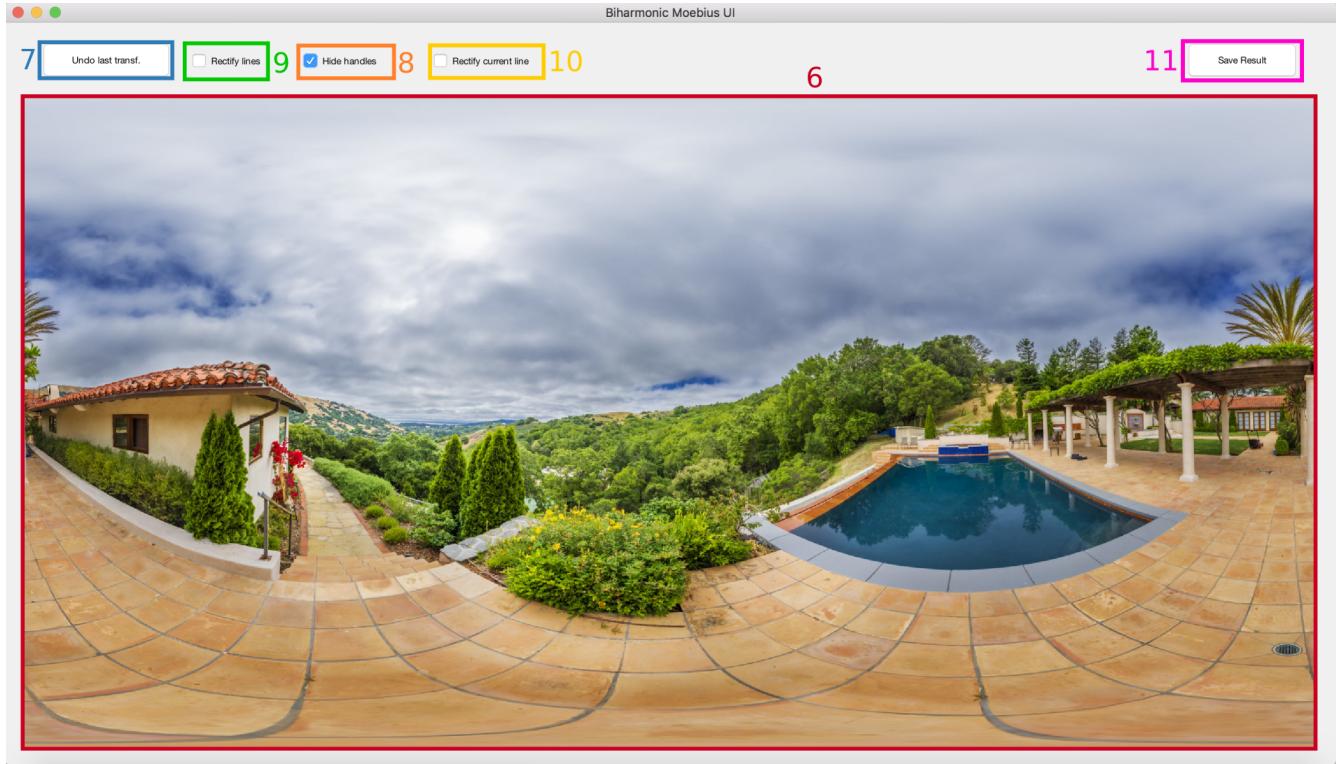


Figure 2: Screenshot of the second window of the user interface.

1.2.1 Image modification region (6)

This is the interactive region where the user can modify the position of the handles. First the user needs to left click on a control handle. The handle will then change color to yellow, and the user can left click in the image to change the position of the current control handle. The algorithm will then perform the image modification as described in paper. For point handles, the secondary control points will be shown as arrows that can be clicked and modified as well, resulting in rotation and scaling around the main control point.

1.2.2 “Undo last transf.” button (7)

This button enables the user to undo the position modification of the current control point, returning to the initial state.

1.2.3 “Hide handles” selection box (8)

This selection box enables the user to hide/show all the handles in the image for visualization purposes. The user will not be able to change the current control point if this option is selected.

1.2.4 “Rectify lines” selection box (9)

This selection box enables the user to rectify automatically every curved bone in the image using the optimization described in the paper. When this option is active, the middle control point is hidden from the user and the endpoints (as well as joints) are available for editing. If a bone endpoint is modified, the middle point will obey the positioning described in Eq.(4) of the paper, disregarding relative position preservation between handles. If this option off, middle points can be moved as well.

1.2.5 “Rectify current line” selection box (10)

This selection box enables the user to rectify a selected line. If the selected control point is a joint between multiple bones, every bone connected to this joint will be rectified as well. The middle point is hidden/shown if this selection box is marked/unmarked.

1.2.6 “Save result” button (11)

If the user clicks this button a pop-up window appears, enabling the user to save the current state of the image in JPEG format.