

GIMP's Liquid Rescale Plug-In

Documentation

Interaction Design for the Real World

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introduction

Liquid Rescale Plug-In allows to change the proportions of the images and also to remove objects without distortion of the important parts.

The existing interaction design reflects GIMP's commitment to create effective and powerful image resizing tool. The information contained in this document represents the areas of the Plug-In that can be improved in order to encourage its wider use and make the user interaction better.

functionality

- the changes are made and saved in different layers.
- the areas to protect or discard can be specified by the use of masks.
- the target size of resizing can be set by horizontal and vertical, while increasing the width, it decreases the height.
- the buttons next to the width and height fields allow resetting the values to the original ones or to the last used values, and also to activate the interactive mode.
- the results can be customized by the output and advanced options, which allow controlling the layers, the canvas, the seams, the rigidity and the gradient functions.
- by adjusting of rigidity it is possible to control the inclination of the seams setting them to be more or less straight.

user scenarios

There are four use scenarios possible:

scenario 1 (simple resizing)

the users can change the width and height, the width and height values (pixels, percent, millimeters etc.), reset the size parameters to the original size or set them to the last used values, use the interactive mode and change the output options.

scenario 2 (masks and precision)

the users take control over the tool by making selection to protect and discard the areas of the image using masks, rescale the image (change the width and height), change the output options.

scenario 3 (removing)

it is possible to remove an element from an image by using discard features mask, to define the strength of the mask, optionally to choose the scaling direction

scenario 4 (creative use)

the users use the full range of features mentioned in scenarios 1-3, choosing the options they want to work with, they have freedom to resize not just the image canvas but also the auxiliary layers. They you are able to control the different settings of the seams (like rigidity) and other operation of control (like the rescale order), compare the results of applying different features in order to express their creative potential.

expert evaluation

After going through these four user scenarios we performed the expert evaluation of the tool.

Good features:

- +the dialog offers good overall overview of all the functions.
- +there is an option for the users to undo any activity at any time. This allows the users to recover from errors.
- +displaying explanatory text to each option and giving the user guidance.

We also identified some problem areas.

1. separate windows, window overlapping

That fact that the original image is not in the same window as the scaling options makes the rescaling process slower. The large window with all the options and parameters takes a lot of screen space. It constantly gets in the users' way and doesn't allow concentrating on the result of changes. The focus should belong to the image the user is working on, and not to the dialog itself. It is not comfortable when the dialog is displayed in place of the image. Only working with dual monitors can eliminate this problem so far.

2. confusing icons

three buttons to the right side of the Width and Height fields. The appearance of icons needs to be understandable because the users are not supposed to spend their time trying to figure out how to go back to the original size of the image.

3. interactive mode

although the interactive mode makes the dialog window smaller and allows to see the entire image, its icons of the buttons are not clear enough. There is no apply-button in the dialog.

4. using feature masks

- if the users want to select the field "preserve features" they click into it and find that its inactive, it is not understandable that they have to create a new layer first. This is likely to confuse the users, because it doesn't match their expectations.
- when the new layer is selected, the main dialog remains in the foreground, and has to be dragged to the side, which makes marking process slower.
- undo liquid rescale - the layer with the preservation mask remains in the layer list.

5. layer structure

once the mask is created, the users should not forget to switch back to the main layer before they run the plugin, or it won't work properly.

6. the structure of the Liquid Rescale dialog

is not really optimized for the frequency of the users tasks. For example, while going through scenario 1 in the main tab we see the options for the masks, although we don't need it. Also the output options are not always required. The users get too much information even if they don't need it. Also the parameters structure is not the adequate because in some cases they don't belong to the option they have to (they are not related to each other) and they are also not in a priority order.

7. unexpected actions

if the settings in the output or advanced tab were changed, the natural way to confirm the changes is to click the ok-button. But if we do so, the whole plug-in dialog closes and we have to call it again. We have the feeling that we have no control over the dialog window. The same happens with the cancel button in these tabs.

Generally, the current solution offers a good overview of all possibilities/parameters while making overview and control over the changes on the image itself less easily available.

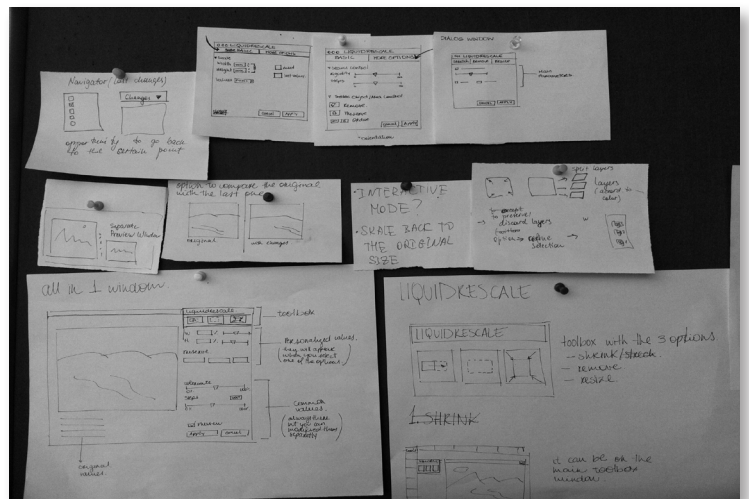
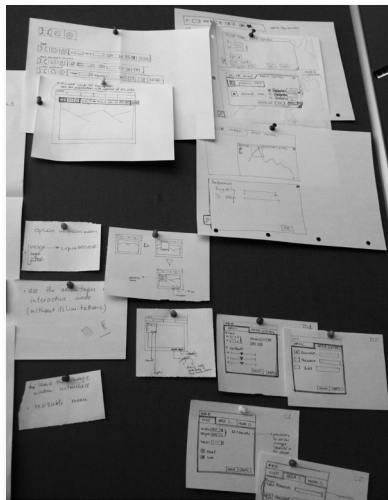
brainstorming

Having determined the features within an interface that can be improved, our team started to find the ways to speed up the user interaction of the plug-in and to increase the user control over the tool.

According to that our immediate results were:

- A new layer should be created automatically when a change is made.
- The tabs in the dialog window should be named and represent what they allow the user to do.
- Have a preview of the image in real time in the canvas or in a small separate window.
- Have a toolbox with representative icons of 3 options (rescale, area control, more options), this way the user could identify better the tools and also have a better view of the canvas.
- To avoid opening the settings in another window.
- Each option has its own features allowing the user to have control of the changes.

There are some pictures below which we took during our brainstorming process.



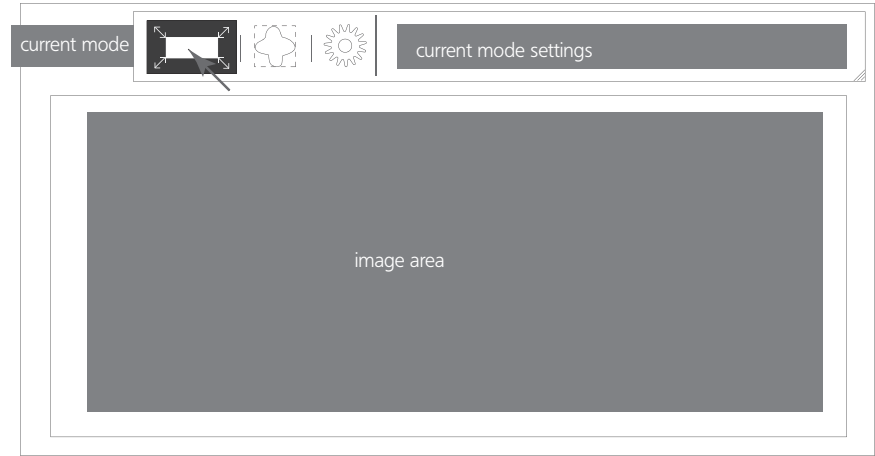
our solution

The result of expert evaluation is a redesign solution that corrects confusing elements of the current user interface and highlights it's strengths.

For the most successful implementation we have decided to focus on such features as:
-single window mode and
-real time preview.

single window

The solution includes using only one dialog for the image and all the options. The tool bar is on the top of the original image window and has by default horizontal orientation, while the picture takes the rest of the place in the window. Once the change is made, the image gets updated. So, we use the advantages of the interactive mode by keeping the image area untouched. Moreover, we reduce the information, which is rarely needed.



real time preview

Rescaling happens in real time. It offers a degree of control to ensure that the recent changes are adequate and to be aware that the results are satisfactory without having to go through an extended dialogue. On the other hand, the full range of available options always stays in the field of view.

icons

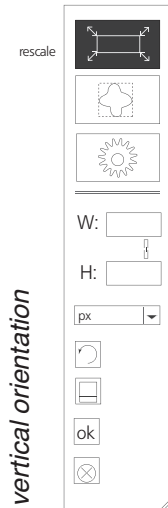
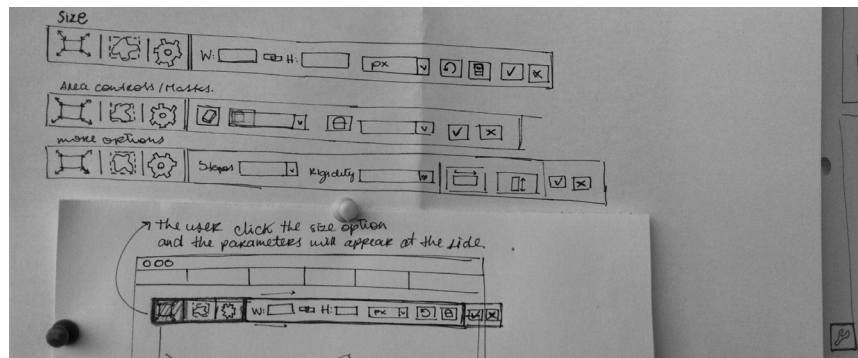
We used large icons in order to provide better overview and developed new symbols for each option to make it faster to identify and to navigate the options.

- | | |
|--|---------------------------|
| | rescale |
| | area control |
| | more options |
| | info |
| | back to the original size |
| | cancel |
| | horizontal rescale first |
| | vertical rescale first |
| | create a new layer |

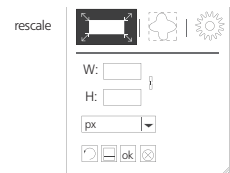
resizable toolbox

GIMP has customizable interface, and we paid attention to the opportunity to adjust the toolbox appearance according to the users' taste. This makes working with the plug-in more comfortable.

first sketch



horizontal orientation



classic orientation

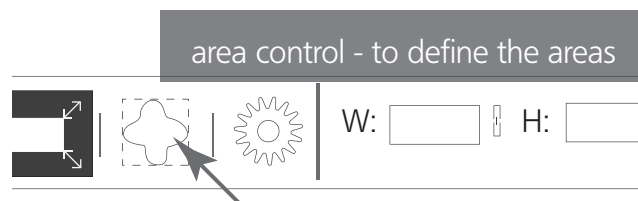
The Toolbox is resizable, three diagonal lines on the lower-right corner of a tool bar indicate that there are other variations of the orientation available.

Moreover, it can be moved anywhere on the screen by clicking and dragging it by its top bar. This increases the freedom of positioning the tool bar according to the image.

Three main buttons indicating which mode is currently used, should be the most quickly accessed targets in the window, so they are placed in the top/left corner because of their pinning action.

information fields

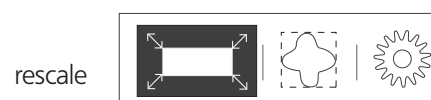
To keep the users informed about what is going on, we maintained such useful feature of the existing solution as giving support information and applied it to every option available. There are info-tools that give an immediate feedback. The info-tools are displayed when the users roll over the tool button with the mouse pointer.



tabs

We decided to divide the functions into 3 categories: „rescale“, „area control“ and „more options“ to make information appear in a logical order.

Activating one of the modes is made by selecting a tool by clicking on its button. In the example shown here, the rescale mode is currently selected so that's why it's highlighted in dark grey (contrast color - catches attention). On the left side the users also see the name of the current mode.



Modifying the structure of the tabs that way has several advantages:

1. **clarity and improved overview** - keeps the presentation of the options compact, but still clear and readable,
2. **reducing the information** - helps to avoid displaying irrelevant information (for example, while going on scenario 1)
3. helps the users **differentiate tasks better**,
4. **minimizes the time** needed to scan objects on the screen.

All that points help to increase the speed of performance.

layer structure



Each tab contains „OK“ and „cancel“ buttons. It relates only to the changes of the settings that are made in this tab, and has no influence on the closing of the entire plug-in window.

Special case („area control“ and „more options“ tabs): Once the button „OK“ or „cancel“ is clicked, the users come back to the tab „rescale“ (the plug-in is still open) and can perform image manipulation with the new settings. So, nothing unexpected happens and the users have a feeling of complete control over the tool.

We eliminated the Output tab of the dialog, because in our solution the plug-in performs Output on a New Layer automatically. This has two advantages:

- keeping the original, unscaled version of the image,
- the users don't have to use undo option to come back to the original.

When the change of the size is made and confirmed, a new layer is created and appears immediately in the layer window. The name of the layer reflects the character of the change including the value, for example House height 120%.

This offers an opportunity to experiment, to compare the results of changes and to choose the suitable rescaling proportions. Especially since there is no option to group the layers, this system keeps the users informed and free to decide what layer should be deleted and what matches the expectations and should be kept.

Resizing image canvas is also performed automatically, if the rescaled image is larger than the canvas size.

rescale mode

Each mode has a set of properties or options that can be modified. These properties are displayed in the tool options bar.

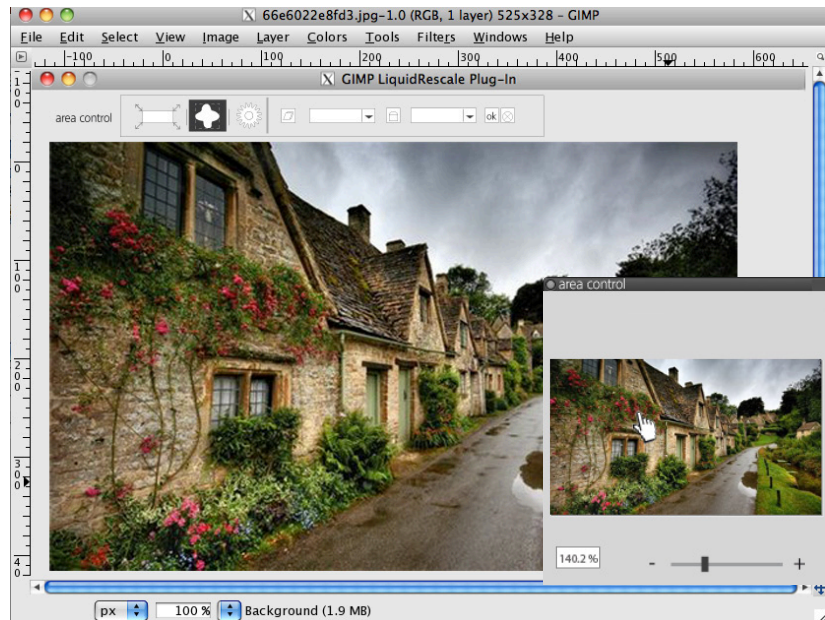


When the „rescale“ mode is selected, the Tool Options will change to display all the settings available for the rescaling. An example of the implementation of the tool options bar for the rescale mode is shown above.

If simple rescaling required (*scenario 1*), there are all the relevant parameters on the right side of the tab. These are width, height, input field for the value (pixel, percent etc). The users can upload the image in Liquid Rescale, enter desired width and height, apply and cancel the changes.

Undo and redo buttons can be called from the Edit menu, as in the existing solution of the plug-in. It's very convenient in that case, that the irrelevant area control settings are not visible. So, they don't distract the users from concentrating on the image.

area control mode



The second tab „area control“ allows to define the areas of the image that should be protected or discarded during the rescaling process. We decided to keep this option separately, because our aim was the clear separation of 2 tasks: changing the size and selecting certain features of the picture. This tab is the main section that is used on scenario 2 (using masks, precision).

fast navigation

We implemented a ‘fast navigation’ system in the window, in order to offer the opportunity to choose the areas of the picture more quickly. The users can click with the mouse pointer on the certain part of the small window „area control“ and zoom it up to 1000%. This allows to mark the objects precisely. The navigation in the fast navigation window is easy and is done with the mouse (hand symbol). This small window can be closed when needed. This feature is useful when going on scenario 4 (creative use).

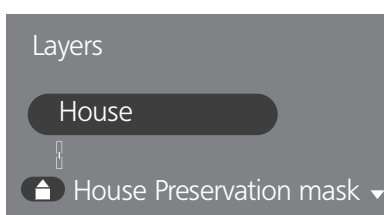
a) selecting the area to be preserved or discarded

There are feature preservation and discard masks. The users create a new layer mask and get recommendation to choose one of the selection tools in the toolbar. This support information appears as a pop-up window on the top of the window on the right side. It means that the users doesn't have to roll over the information icon as in the existing solution and can't miss the instruction. Once the area is marked, with one click on the OK button the selection is confirmed.

When the area is defined, it is logical way for the users to come back to the „rescale“ tab and perform the changes on the size of image, because these two options are visibly separated. So the plug-in supports the users in the tasks they wish to undertake.

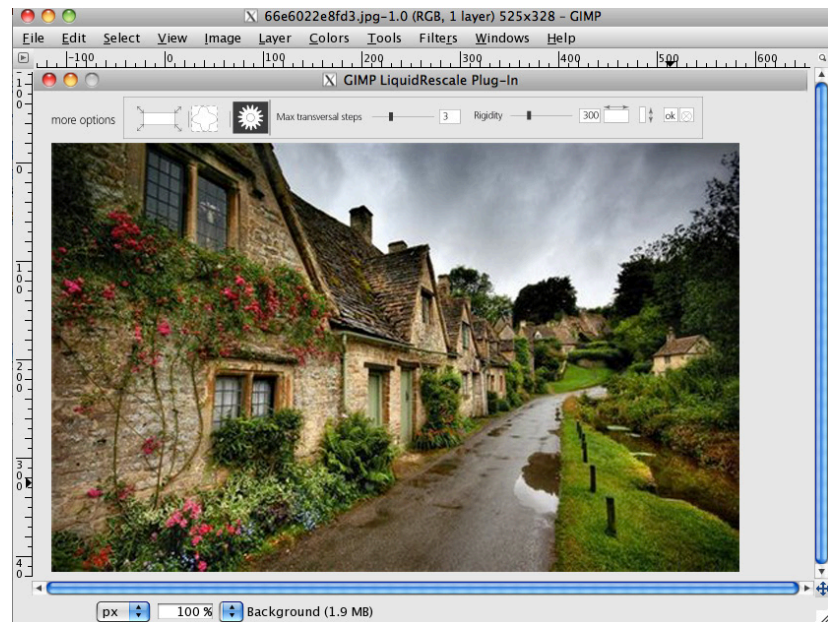
b) working with the masks

the mask can be created by clicking on its symbol. Once the mask is created, the users come back to the main (working) layer automatically. By default the mask is bound with the working layer and is placed under it in the layer window. But there is an opportunity to set it free, duplicate, move and assign it to another layer. These options are available by clicking on the triangle near the name of the mask. These options are useful when we perform scenario 4 for example to create artistic collage.



more options mode (settings)

In this tab can be specified important but infrequent features, which are related to the technical aspects of scaling.



As the picture shows, the tab „more options“ has three parameters the users can control: max. transversal step, rigidity and orientation of the seam map (horizontal and vertical). Default values normally provides adequate results, but the opportunity to set it depending on the image offer an increased degree of control and freedom.

conclusion

It was quite a challenge for us to modify such a powerful tool. Our solution offers a simple and fast way to use the Liquid Rescale Plug-in and interact with all it's features. It provides sense of control und increased speed of interaction.

We integrated the options and put them in a logical order. Improved overview and customizable elements give the users freedom and satisfaction with the results.

The toolbox offers a better way to work in the canvas and the icons allow to identify the different options very quickly. Each option contains its own specific values, so the user doesn't have to search in different tabs the values that are not there.

We hope that this solution contributes to the wider use of GIMP.