



Implement IWarp into the Toolbox

Focus

Based on the product vision, the main goal was to implement IWarp's functions into Gimp's main toolbar and improve its Deforming modes. In addition to apply a pressure function for tablets allowing the user to have more freedom and design possibilities. Also add a Smooth and an Undo function.

Functionality

Move	move pixel parts
Swirl CCW	turn pixel parts in clock-wise
Swirl CW	turn pixel in counter-clockwise
Shrink	contract pixel parts
Remove	remove changes
Grow	blow up pixel parts
Smooth	blurry pixel parts
Pressure	use sensor pressure amount when working with a pen/tablet
Undo	can undo every single step

User scenarios with current IWarp

First scenario:

Manipulate a person with the goal to look real and not manipulated.

Second scenario:

Create an unreal looking image of a person like a fabulous creature.

Third scenario:

Manipulate the pixels in kind of art working, combine and play with the functions.

The IWarp opens a new window that contains the Deform modes: Move, Remove, Grow, Shrink, Swirl CW and Swirl CCW, Deform Radius of each function, Deform Amount of each function and Bilinear.

Compare Photoshop's Liquify vs GIMP's IWarp.

Zoom and visibility of the radius:

IWarp has a lack of zoom and radius visibility which makes the image more difficult to deform as you can't directly see what's being affected.

Undo:

There is only a Reset button, you depend entirely on the Remove function to rub out your last mistakes in IWarp because of the Reset button, it is troublesome to use the Remove button to fix an image because you can accidentally remove the function from a certain area you actually didn't want to change.

Pixels on the edges:

When modifying an image, the deform functions can't alter the pixels on the edges of the image in IWarp. The mask tool in Liquify gives the user more control while altering images without affecting selected areas.

Bilinear:

The Bilinear checkmark box is unnecessary because it is an old function that is used to smooth the pixels in each function. Nowadays, nobody would work without this function; it should be implemented.

Hot keys:

It is faster to work with hot keys which should be added to the functions on IWarp.

Masking:

In the window of IWarp you could not select a part of pixels to choose the part of affecting.

A good point of GIMP is that it has a clearer visualization; they keep their toolbars simple and easy to understand.

	Liquify	IWarp
radius visibility	✓	✗
zoom button	✓	✗
mask tools	✓	✗
undo buttons	✓	✗
faster (less funct.)	✗	✓
grabs edges	✓	✗
clear visualization	✗	✓
remove function	✓	✓



Brainstorming

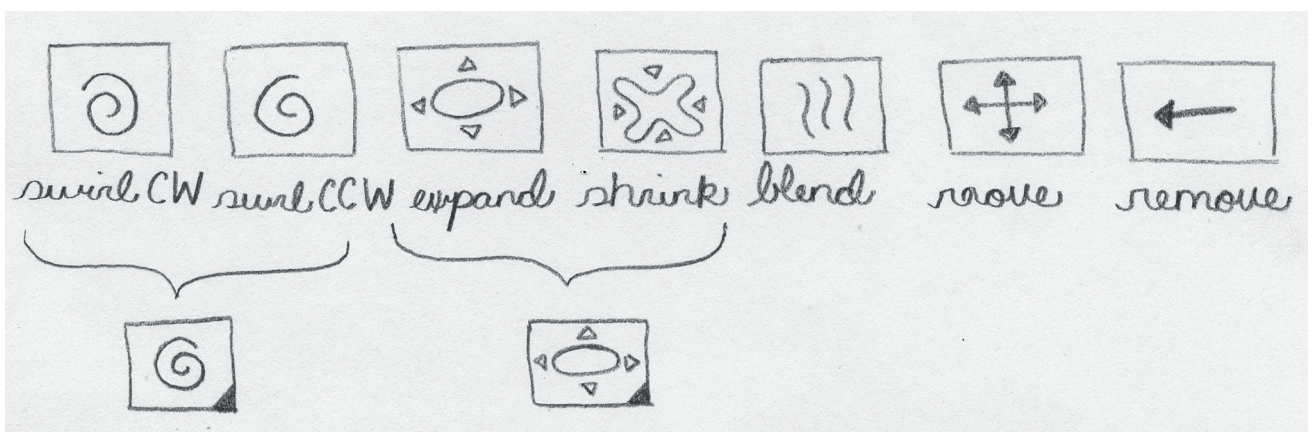
We thought of all the problems and have solved them. Implement all of the useful and valued functions based on the product vision of GIMP. Also try out to work with the pen on the tablet.

Design

Implement IWarp into the Toolbar

To not disturb the usual behaviour we choose the place of the tool options below the toolbar. Also we obtain the GIMP style of the tool options for the same reason.

To get a clearer design we have reduced the functions by putting similar functions together: swirl CCW and swirl CW, grow and shrink;



Radius Visibility

The selected radius amount has to be visible because it gives the users more feeling of control. The user is able to know which areas will be affected while deforming the image. In fact, due to the canvas the visualisation of the selected radius is visible and additionally a little ikon in the right edge is seen to know which tool is selected.

Undo

The undo function to step backwards and remove the deforming is still working in the Canvas as a hot key and is also visible in the History window.

Zoom

Yes, also the zoom function works in the Canvas as the user is used to it.

Masking

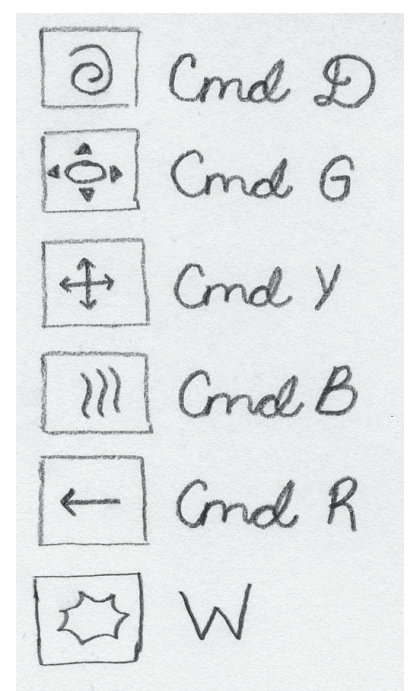
In the Canvas there are also more possibilities to combine different functions. Just as the selection tool to choose a limited part of pixels to manipulate.

Bilinear

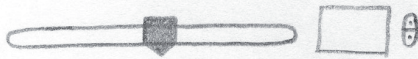
This option of the tool of the IWarp is still to be deleted, that must always be switched on.

Hot keys

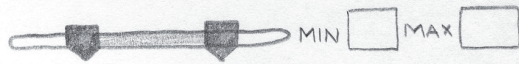
Adding shortcuts has been essential for professional users. Users would be able to work faster and save up valuable time. With adding the button cmd to a letter button we found our hot keys for the five functions. We have assigned also the w letter button to select the IWarp function. The letter buttons are always used as a small letter.



Mouse View



Tablet View



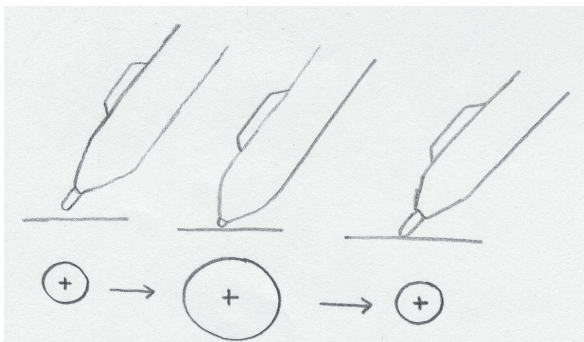
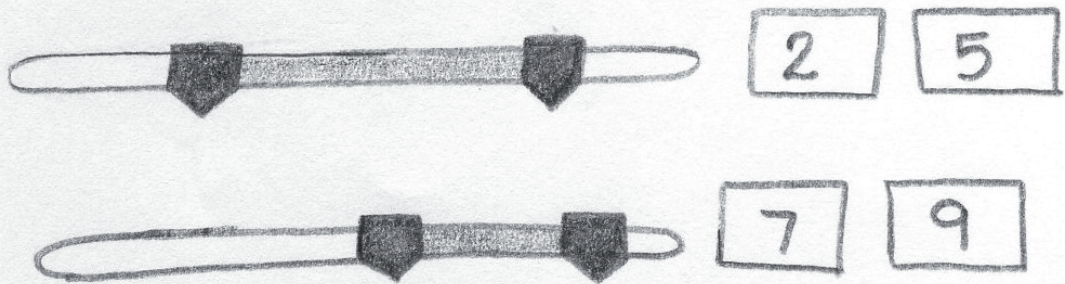
Pressure Pen

With the tablet we have tested how sensitive the pen is to the pressure it was applied. The Deform amount would be affected directly by the pressure of the pen. There would be a predetermined limit as to how much the Deform amount could go up. For example when full pressure has been added to the pen the maximum deform radius would always be $+0.20$ of the amount you selected.

In summary:

The conclusion is to give the user the opportunity to control his Deform radius the user would have more freedom to design. The minimum and maximum Deform radius and Amount are manually controlled by scroll buttons found on the slider. This new slider gives more control to the user and allows more possibilities. The color between the scroll buttons helps visualizing the possible range.

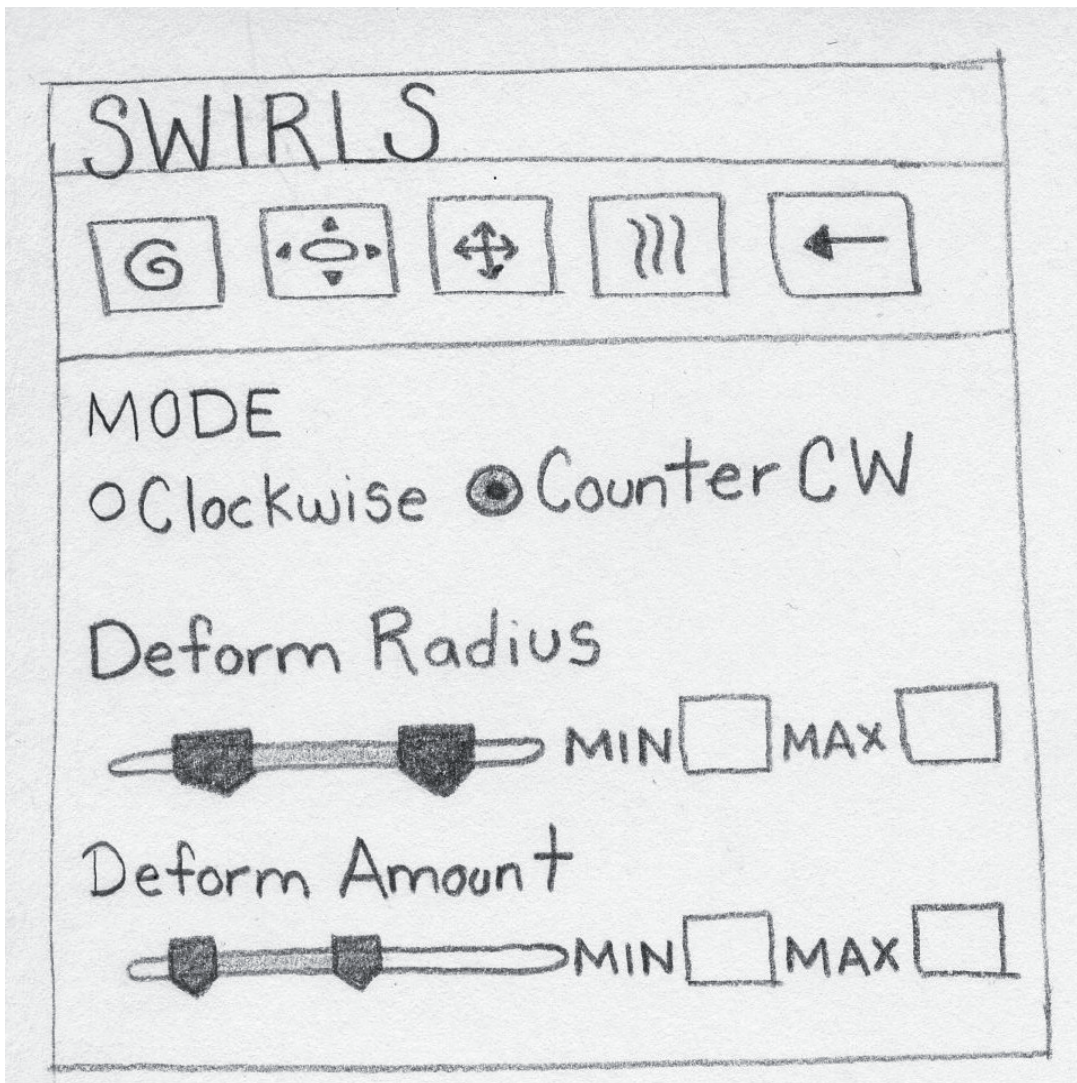
Solution



Whether the radius size increases or decreases depends on the pressure that has been applied on the pen sensor, which makes it especially visible for the user.

Final Toolbar

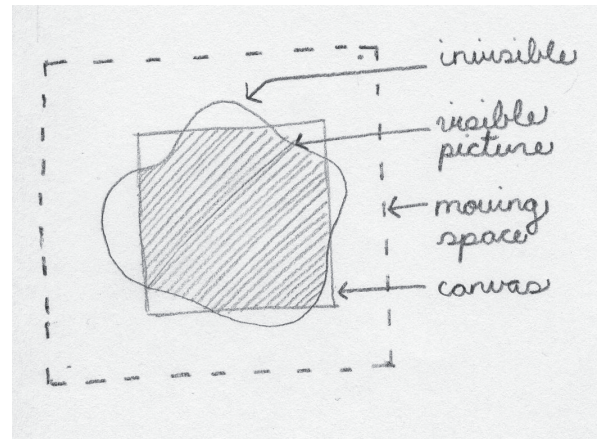
Our toolbar combines certain functions of IWarp with the final tool options containing the elements that work best. It contains the icons for the five different functions. There is also the written selected function to make it more united and easier to understand. We have also used a Radio button because it gets faster to select and read. The final solutions for the pressure pen have also been implemented on this design.



Extra Function

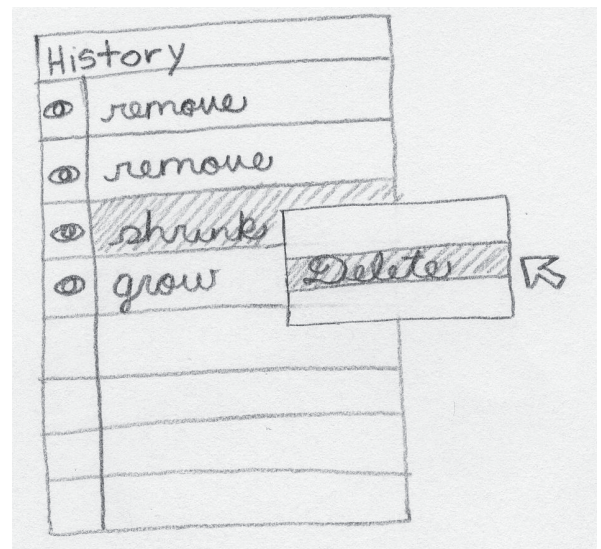
Pixels in the edges

The main problem with the pixel selection in IWarp is that whenever you try to select the pixels on the edges they don't move because they are fixed. The tool is not able to calculate more pixels from the outside of the picture because there isn't any pixel. So the pixel in the edge is only able to increase and therefore the image is not as distorted as the user would have thought. The solution is to make an invisible marging space around the image outside of the Canvas. The pixels which are moved outside of the Canvas do not disappear but are only moved out to the invisible marging space. Otherwise, if the pixels from the edges are moved into the picture the IWarp function calculates white pixels into the image and manipulated the pixels of the image like the user wants.



Undo Function

As an additional extra function to the History window we have created an added value. There it is impossible to remove not only each single step in the sequence they are created. In addition, the user is able to blank out the steps in the desired sequence using the eye check box, and also to delete them. The users obtain more freedom to work because they can remove each single step which is created. After having creating for example 10 steps, you do not have to delete all these steps in order to remove the first one.



Conclusions

The final IWarp obtain five functions which are now in the part beneath the toolbar. All the problems which are displayed in the user scenarios have been solved. All the five functions we have in the IWarp work with the same slider options, the Deform amount and the Deform radius. The Icons and the menus fit perfectly into GIMP's simple and easy to read style. Our design of the new IWarp reaches the ultimate goal of working fast and creative.