Sfumato Stitch
Exercise 4 – Levoca Design

This booklet is compilation of an on-line exercise posted to Sfumato Stitch group (http://groups.yahoo.com/group/sfumatostitch). The Levoca photo used in this exercise is available for download in Files section at http://groups.yahoo.com/group/sfumatostitch/files

Lesson 1
Adjustment of Image and Choice of Colors

Levoca 1a

Open Levoca image in Painter. I have already resized it to about 4.72" (12 cm) width. If you want to have it in other size, resample it. Hit Preview button to see grayscale (no colors selected yet) preview. The brightness and contrast of previewed design are quite good, but I would like to add more black. Let's try if we can achieve it by equalisation of image.
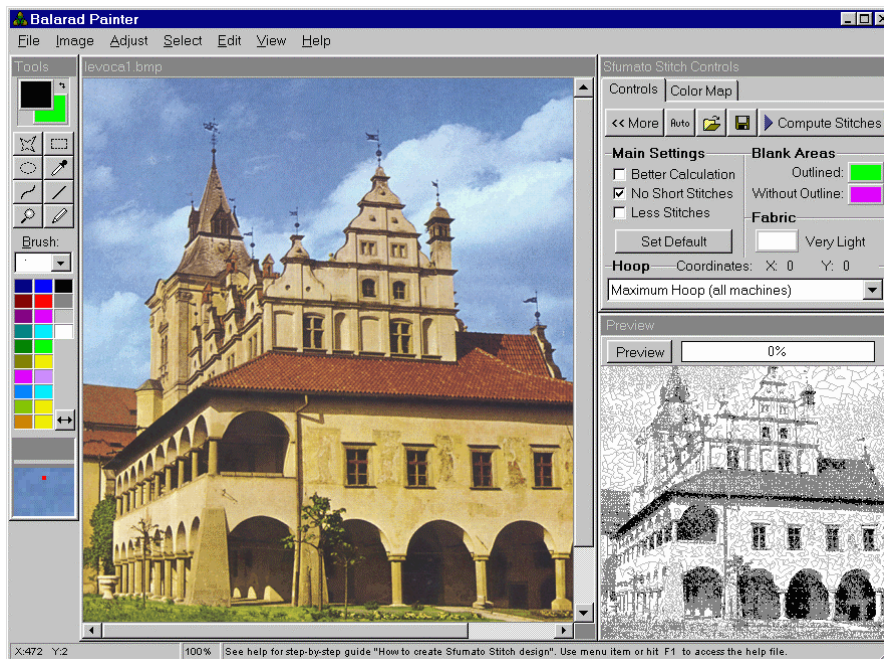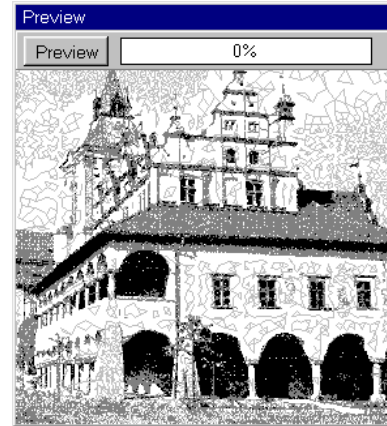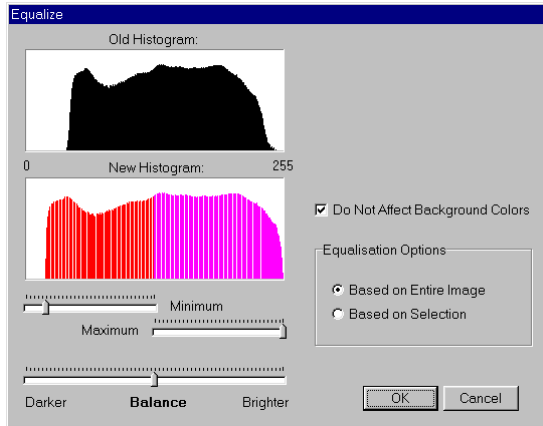

Levoca 1b

Click on ADJUST / EQUALIZE in Painter menu. The OLD HISTOGRAM in Equalisation window indicates that brightness of image does not cover whole range from black to white (from 0 to 255). Equalisation will widen the range of image brightness. However, I do not want to extend the left part as far as black. I have tried it and image looked too dark. Therefore, I have placed the thumb of MINIMUM control to value somewhat larger than 0 (zero). Hit Ok.
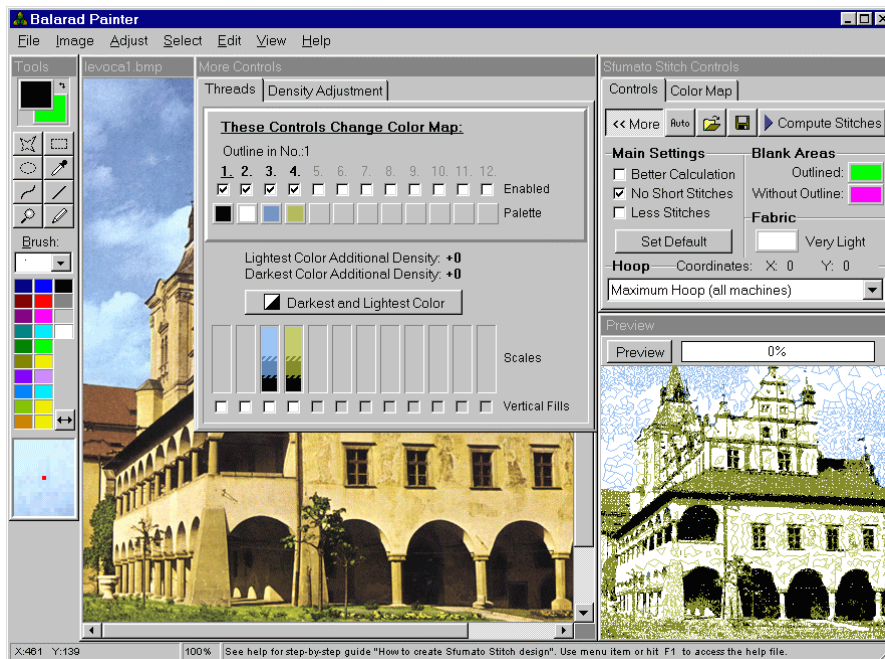
Levoca 1c
Hit Preview button. I would say that windows on the building are more visible now. I am satisfied with grayscale preview now and we can proceed to colors. Let's see what will Automatics do with colors choice. Hit the AUTO button and wait a minute until colors and preview are calculated.

Levoca 1d
Program decided to use two color scales (blue and green). However, I would like to add yellow and red scale.

Levoca 1e
Enable two new scales (no. 5 and 6) by checking the boxes below scale numbers. Then click on any enabled Palette color to open Histogram window for editing of Palette colors.
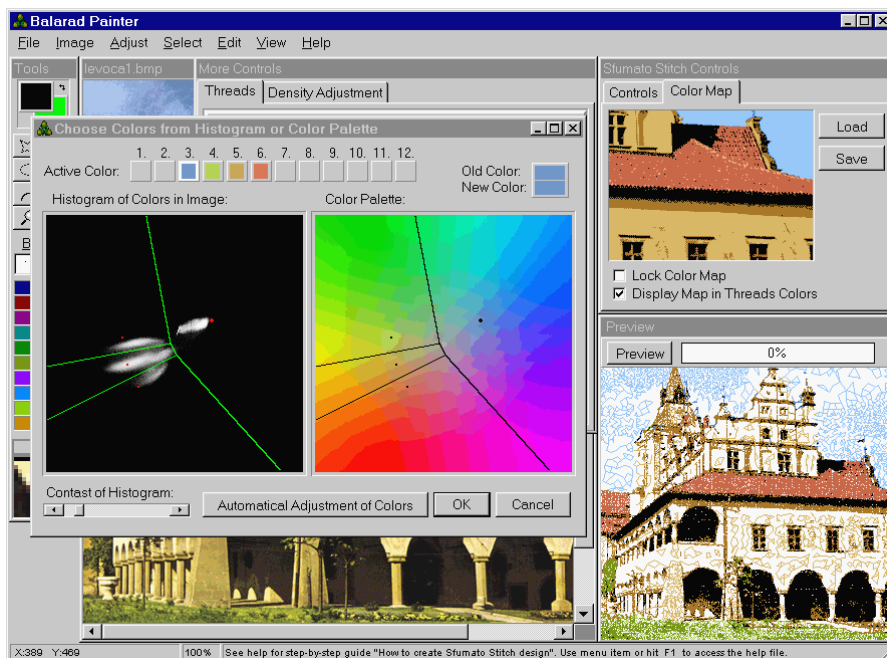
Levoca 1f
The white clouds on black square is histogram of Levoca image that shows which colors are used and which are not. There are four well circumscribed (bounded) clouds, which means

that colors in image can be separated into four ranges that to not intermigle one with other very much. This simplifies our work very much, because it is quite easy to select several colors for design. May be we will even not need to edit the Color Map. Let's place our four Palette colors and see.
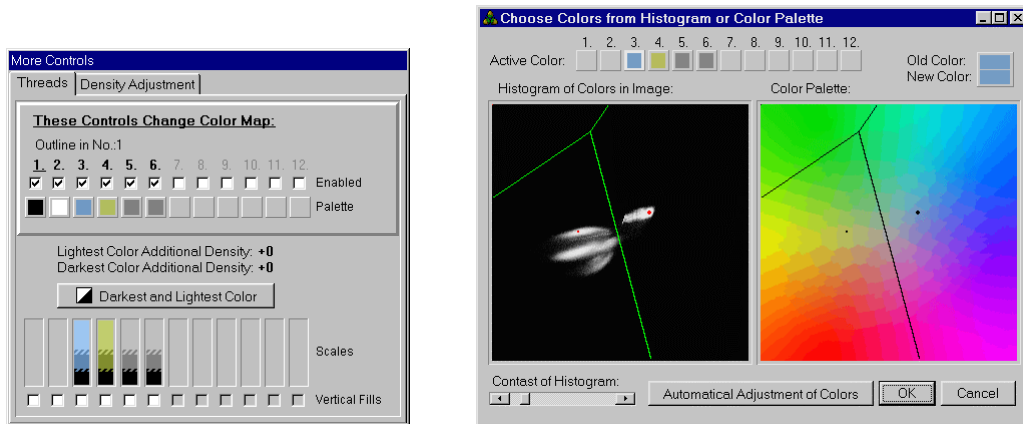
Levoca 1g

I have placed four Palette color (red dots) so that green lines that separate color areas run between the clouds. Doing this, I have achieved that whole cloud belonging to bluish colors fits into one area, cloud of reddish colors fits into other area and so on. This means, that all bluish colors from image will be represented with single blue scale (red dot). The same principle applies for all clouds. You can click on Color Map label in Controls window to see Map (colors layout) and see how it changes while moving red dots in Histogram. Also, you can hit Preview button occasionally and see preview of design in actual colors. The colors in Preview looks good to me now.


Levoca 1h

Here are the Palette colors that I have selected. Sfumato generated the light and dark Thread Shades from chosen colors automatically (see Scales bars).

Levoca 1i

Click on floppy disc icon in Controls window to save our Project file. This file contains all settings (including colors) and link to image. It means that in next lesson you need to open just the Project file and it will launch the image automatically.
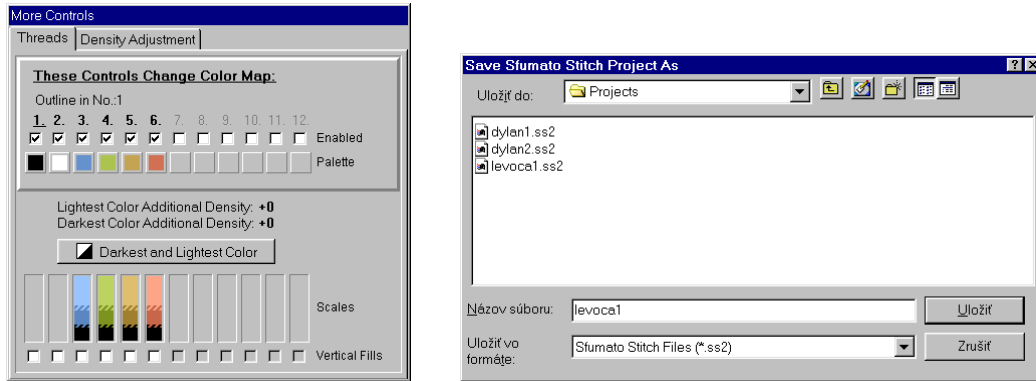
Discussion to Lesson 1

Question: Could you give us a more detailed explanation of Histogram and its meaning?

Answer: Colors can be represented by two components: 1.brightness, 2.hue. Sfumato produces brightness partly with stitch density and partly with thread shades within the scales. Once the hue is chosen, program can compute threads shades and stitch density to represent the brightness component of color.

The problem is in chosing the right hue from palette, because the lower is the number of used colors, the harder is their choice if you want your design really look like original image. Usually, automatics cannot chose small number of colors to your satisfaction.

Now we come to Histogram. To allow you to chose hue components of colors, I have programmed the Histogram window. There is a palette of hues on the right side of window and you can pick required hues from it. The palette is deprived of brightness component, because we are interested only in hue now. To give you an idea which hues are really used in image, there is a Histogram that shows how many times the particular hue from palette is used in image. Each pixel in palette represents one hue and corresponding pixel in Histogram shows how often this hue appears in image. The lighter is the pixel in Histogram, the more often is the hue used in image. Pixel in Histogram is "counter" of use of corresponding hue from palette in image.

Usually, image contains several ranges of similar colors like yellowish, reddish ... etc. Similar colors have similar hues. Similar hues lay one near to other in palette, therefore their "counters" in Histogram (bright pixels) form a "cloud". If yellowish colors in image gradate continuously into reddish colors, they would not form distinctive clouds in histogram, but the two clouds would intermingle one into other, forming one larger cloud. Also, there may be no clouds at all. If you use some image with reduced number of colors (16, for example), there will be only solitary and hardly visible dots in histogram and no clouds.

You should choose several hues that make your design represent the image as closely as possible. However, this is not enough. Usually, whatever is your choice of colors, when you hit Preview button you will find that face color run into shirt (or similar thing) and it cannot be avoided, because the chosen colors are similar one to other and program cannot distinguish where is the margin of shirt and face. You will need to edit the Color Map to adjust colors layout anyway. Therefore, it is no good to play with Histogram too much. It should help you to decide what number of colors is needed and place them roughly. Then edit the Color Map to adjust fine details.

Lesson 2
Adjustment of Thresholds and Blend Ranges

Levoca 2a

This is the preview of design as we have left it in first lesson. The colors layout is quite good, but I think that design can be enhanced by adjustment of shades thresholds and blend ranges. Also, I would increase density of light yellow shade. Please note that blue colors is not only on the sky but also on the building. May be we will be able to eliminate it (replace with black) with proper setting of threshold.
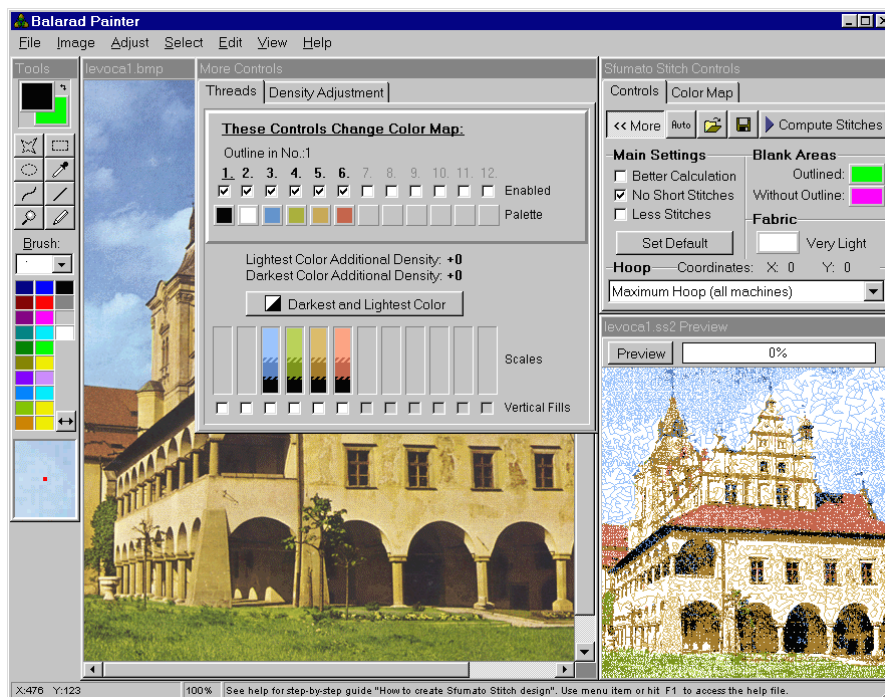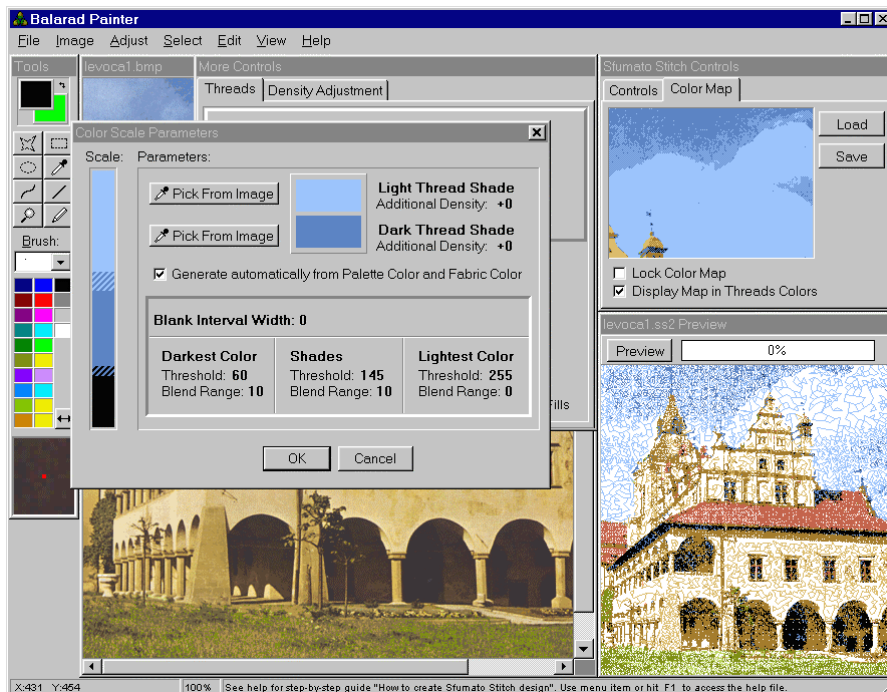

Levoca 2b

First of all, let us add some darker blue into sky. There is already some dark blue, but it is not much visible in the preview. Click on blue scale bar to open window for editing of thresholds and additional densities.
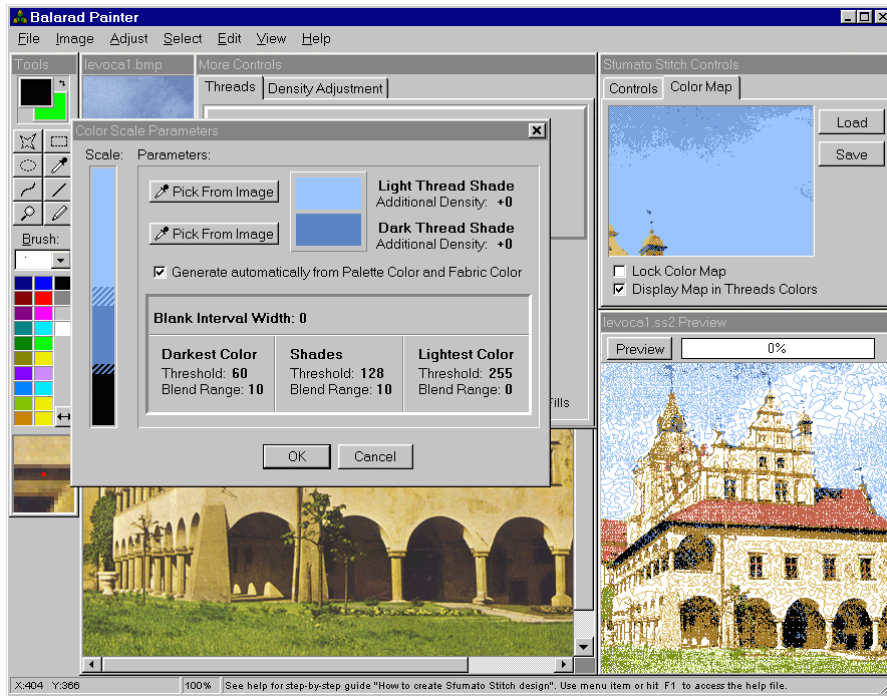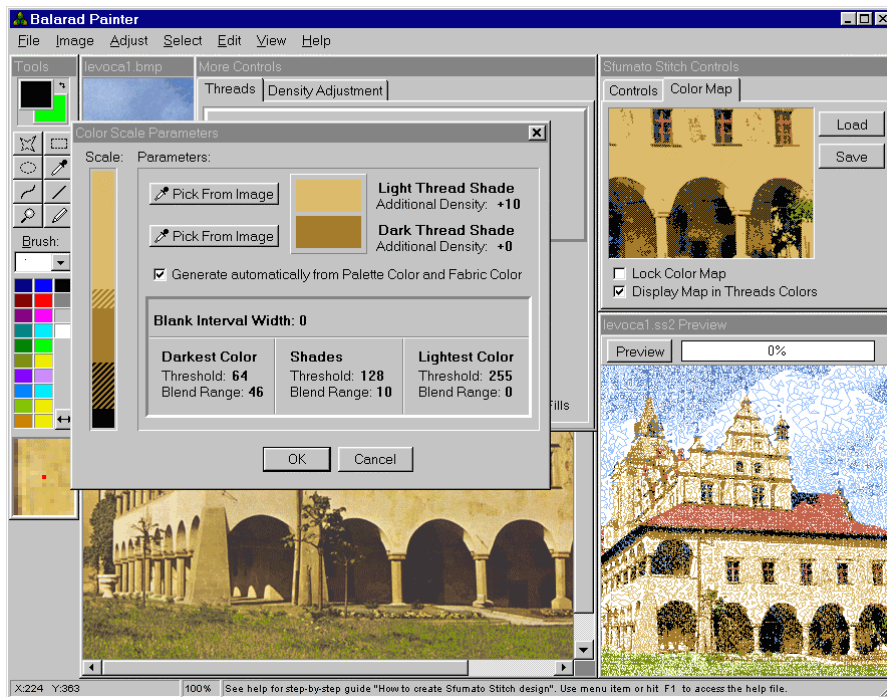
Levoca 2c

Click on blue scale in More Controls window to open Scale Parameters window. Change Shades Threshold from 128 to 145. See how Color Map in top right corner of the screen reflects the change of threshold. Then hit Preview button to see effect of change on design.
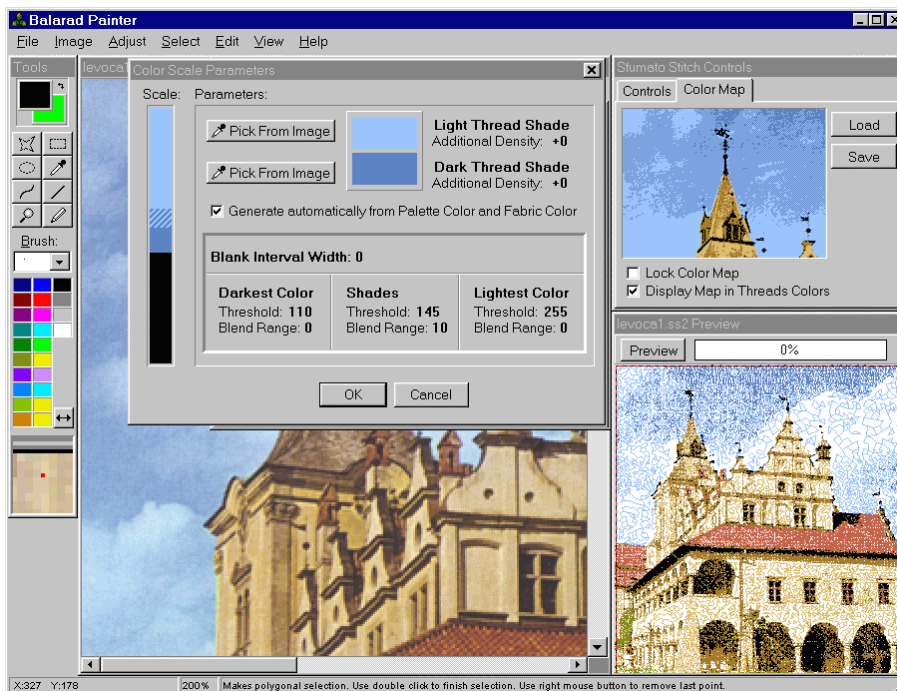

Levoca 2d

Now let's adjust the yellow scale. I have increased additional density of light yellow. Hit Preview to see effect on design. Also, I have adjusted Darkest Color (black) threshold and blend range to achieve more continuous shading between the pylons (pillars). I have increased

threshold of black color to get more black and then I have increased its blend range to soften gradation from dark yellow to black. Hit Preview.
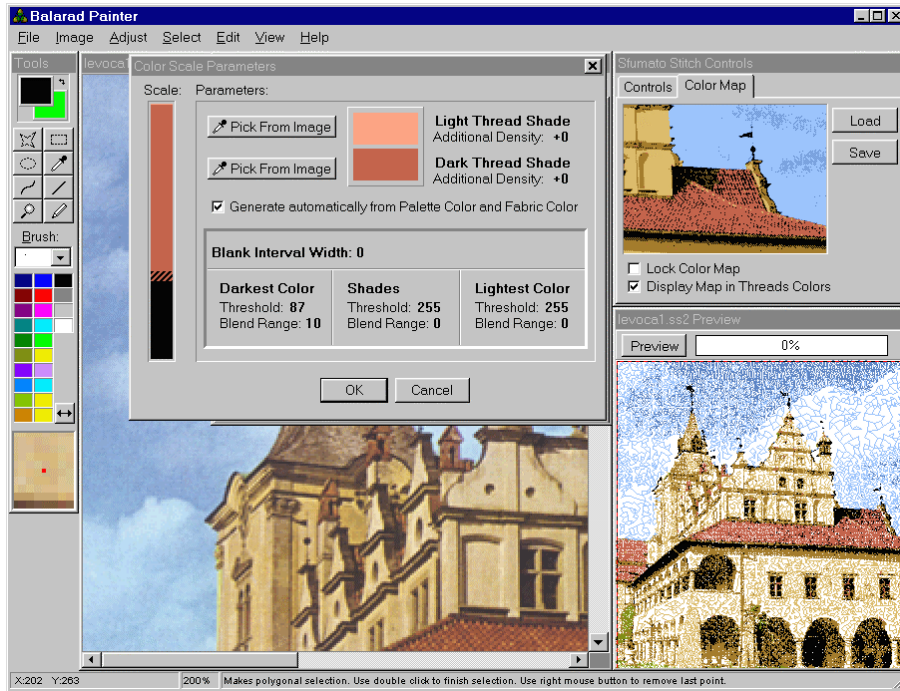

Levoca 2e

I have returned to blue scale and tried to eliminate blue from building. I have moved that part of Color Map that shows top of tower and sky to visible part of its window . Then I have increased black (Darkest Color) threshold until the top of tower and flag became black and the sky still remained blue. I have decreased black blend range to 0, because I didn't want the black intermingle with blue.

Levoca 2f

Now the red scale. I think that one red shade is sufficient for this design. Therefore, I have increased the Shades threshold to 255 to get rid of light red. I had to decrease the shades blend range to zero to eliminate last areas of light red. Then I have decided to put more black on the red roof to emphasize its structure. Therefore, I have increased the black threshold.
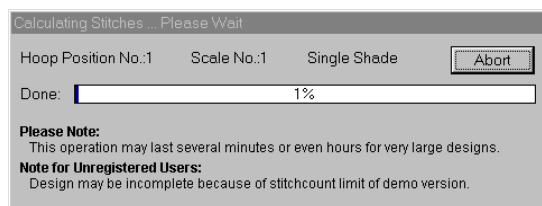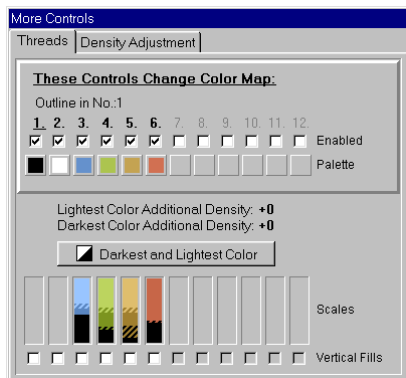

Levoca 2g

The color bars in More Controls window visualize the thresholds and blend ranges values.
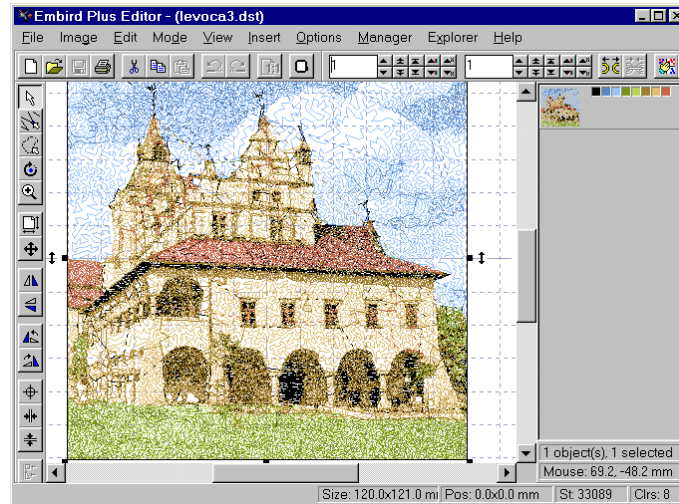
Levoca 2h

I would say that design looks quite good now. Although we did not edit the Color Map, the colors layout seems to be all right. Of course, there may be misplaced small dots of colors that do not affect the look of design very much. However, thay may increase the number of floating stitches (jumps) a lot. Anyway, let's try to compute design and see. Hit the Compute Stitches button.
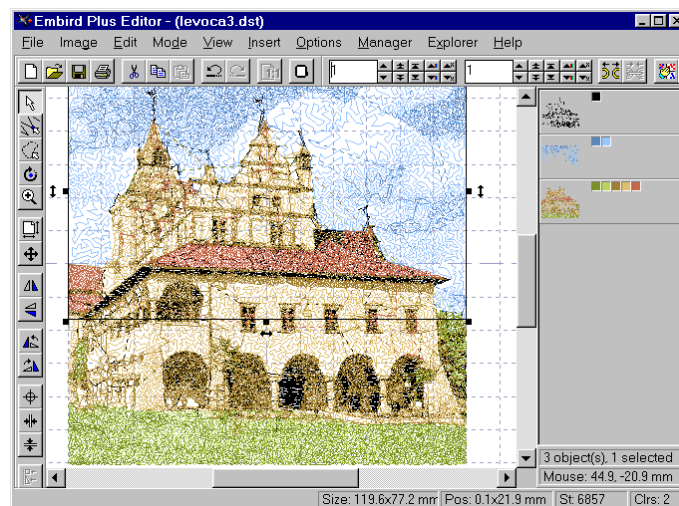
Levoca 2i

When calculation is finished, Sfumato will ask you whether to put design into Embird Editor or not. Click OK. Here is design in Embird Editor. I have already seen it in 3D preview mode, therefore I do already know that blue shades should be sewn before black to make flags and poles on towers more visible. Also, the dark yellow should be sewn before black to make the arcs look better. Let's change the order of colors.
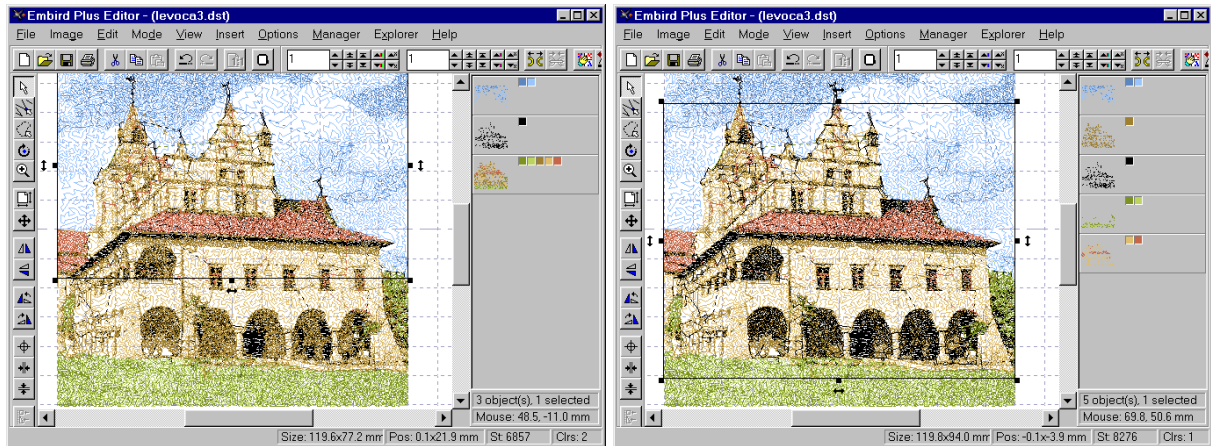

Levoca 2j

Separate the black color and the two blue shades in the object inspector window on the right side of screen. Click the right button on small color box to open pop-up menu for separation of colors.

Levoca 2k

Drag and drop the blue parts (the icon in the right window) on black parts and change their order.

Levoca 2l

Separate the dark yellow color and put it before black.

Levoca 2m

Save design in desired format and close Editor window. Design should appear in Manager 3D preview. I would say that it looks good. I have examined it more closely and there is a lot of jumps (about 100). I think that we could reduce their number significantly by editing of Color Map.
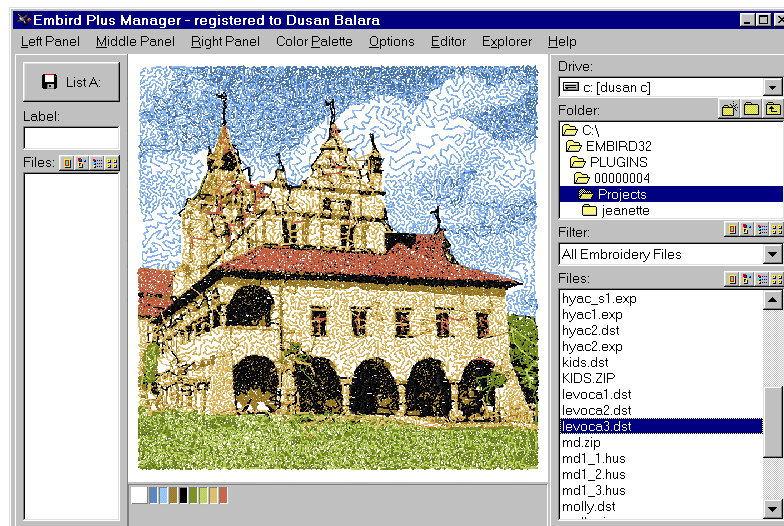
Discussion to Lesson 2

Question: Should I save the project file (ss2) BEFORE I hit the Compute Stitches button ?
Also, the project file (ss2) contains only " addresses " of the files images, or also modifications made to images?

Answer: yes, you should save the project file before you hit the Compute Stitches button. Project file (*.ss2) does not contain modifications of images. Project file contains only links to image and color map and settings like fabric color, thread shades, thresholds, blend ranges, density adjustment curve etc. Modifications made to images are held only in computer memory as UNDO steps. If you do not save image (or color map) after editing, all modifications will be lost.

Lesson 3
Color Map Editing

Levoca 3a

I have finished entire design in previous lesson, but I think that there are too many jump stitches. The original layout of colors was quite good, therefore I have omitted editing of Color Map. I think that we should clean the Color Map and delete tiny spots of colors that result in too much trimming. Open the Levoca project and save Color Map from Controls window. Open the Map in Painter. You can see small yellow and brown dots in windows and on the building.

Levoca 3b

Enlarged detail of Color Map shows misplaced color dots.
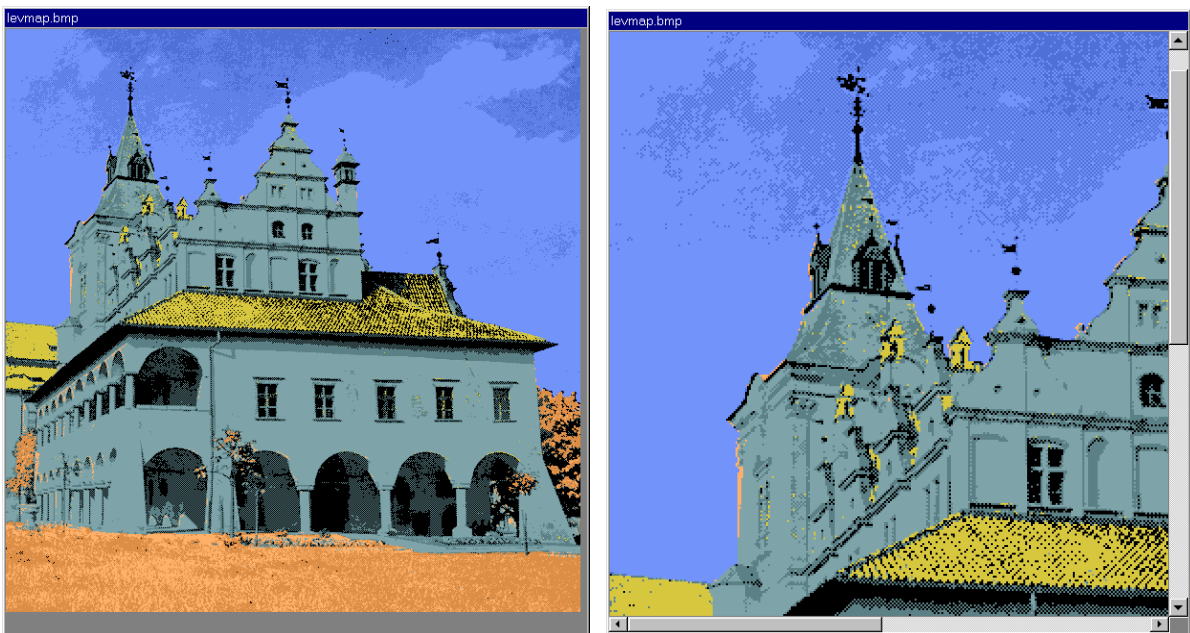
Levoca 3c

Clean the Color Map using the Replace Colors function (CTRL+R). Color areas are more compact now and there should be less trimming in design. Your edited Map should be similar to this picture. Save edited Map using the File/Save command from Painter menu.

Levoca 3d

Open Levoca image in Painter and load edited Map into Sfumato Stitch Controls window. Hit Preview. The diference between previous and new design in Preview window is hardly noticable, but design will be cleaner. Save project file to store the link to edited Color Map with other parameters. Click Compute Stitches button. When calculation is finished, click OK to put design into Embird Editor.
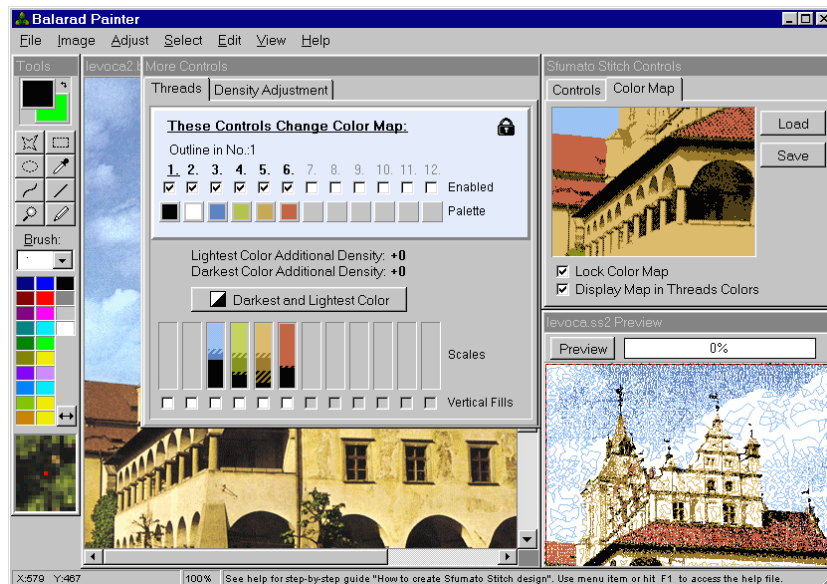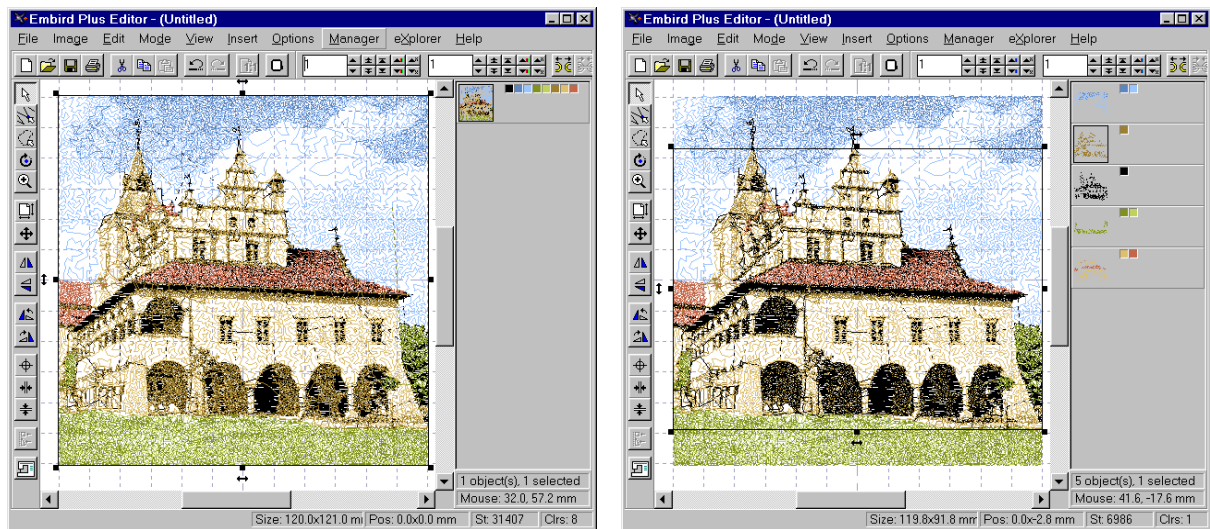

Levoca 3e

Here is new design. Let's change order of colors as we did in previous version.

Levoca 3f

Click right button on black color and separate it. Do the same with brown color. Then rearange the colors order by dragging and droping icons in object inspector window at the

right side of screen. The sky should sew first as it is in the background. The brown color looks better if sewn before black (in this particular design). Then save design in desired format and close the Editor window.

Levoca 3g

Design will appear in Manager window. I think that we could consider it for finished now.
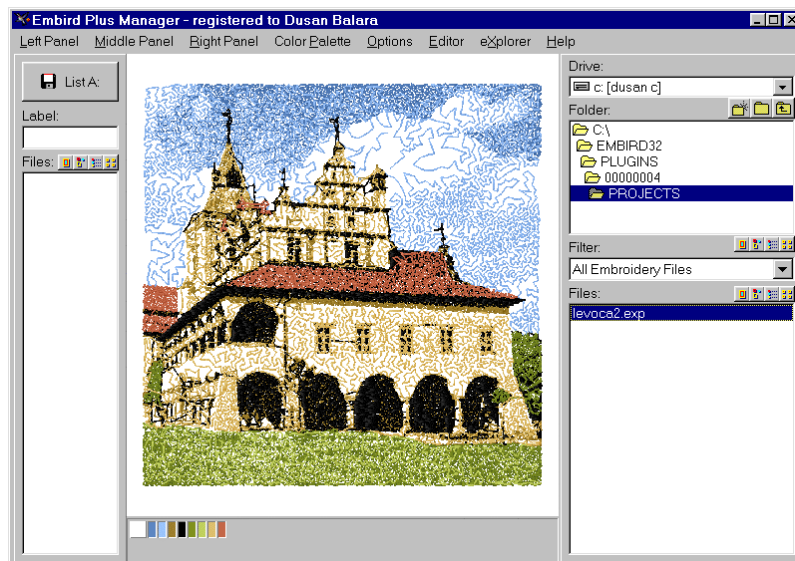
Discussion to Lesson 3

Question: I would like to know when the boxes " vertical fills " under the color scales are used .

Answer: on places where stitches would be very dense, Sfumato uses fill stitches instead of meandring small stitches. Fill stitches can be either horizontal or vertical. Default direction is horizontal. Usually, it doesn't matter very much in Sfumato designs what direction of fill stitches is used. However, you may want to use vertical direction on eyebrows, mouth or other vertical objects to achieve crisper edges. Or you may want to use different directions on different colors just to make their texture looking different.