

Dynamic brush.

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The set of graphic tools of most graphic editors contains a brush tool. The brush is applied to drawing of lines and filling image areas. Typically a brush is the raster image, which is painting at moving of the mouse. The user chooses type of a brush from the limited preliminary given set of brushes and can set or change some their parameters.

In this article I offer other approach to development of this tool. Realization of lines with the help of a brush is carried out in two stages. On the first stage the trajectory is set. At the second stage brush images painting is carried out. Depending on length and a configuration of a trajectory the amount and coordinates of the points being the center of painting images are determined. As a brush it can be used not only the raster image but also the vector image. Depending on what type the image is used we shall use terms a raster brush and a vector brush.

At movement of a brush on a trajectory the vector brush can change their parameters. These parameters are the sizes of a brush, its proportions, angle of turn concerning the center and angles of turn concerning axes X and Y. It allows receiving some graphic effects, in particular, 3D effect.

Such approach is used in the program "Images Generator". The general schema of brush using is identical to a raster and vector brush. The user needs to create brush before realization of a line. For this purpose the user set settings and presses the button "Make a brush". Thus the brush is created and kept in memory. After the brush is created, the user determines a trajectory of movement of a brush. For determination of a trajectory the following methods are used:

- The trajectory can be set with the help of the mouse in modes "Freehand", "Line", "Bezier".
- The trajectory can be set with the help of shape templates. In the program there is many of the built - in shape templates. Combining them, the unlimited amount of shape templates can be created. The sizes, proportions and angles of turn of shape templates are changeable.
- The trajectory can be set by determination of border of the one-coherent one-color area or the one-coherent area with relatives among themselves colors.
- The trajectory can be set by determination of border between the one-coherent area and a background.
- There is a many of the built - in graphic curves that can be used for determination of a trajectory.

After the trajectory is determined, the user presses button " Go ". Thus realization of a line is carried out.

There are distinctions in use of a raster and vector brush.

Raster brush:

The raster brush is created from already existing opened image. For this purpose the part of this image is selected with the help of the same tools, which are used to the trajectory determination. The sizes of a brush are determined by descriptive rectangle of the selected area of the image. The shape of a brush is determined by the choice of transparent color. By default the shape of a brush coincides with the shape of selection. On Figure 1 the image created with the help of a raster brush is shown.



Figure 1: Image created by moving raster brush on trajectory

Vector brush.

The vector brush is sequences of graphic operations for drawing of lines. In graphic editors usually drawing of lines is carried out by one color with using such tool, as a pencil. The program “ Images Generator ” let you to carry out lines in two stages similarly to drawing lines with the help of a brush. On the first stage the trajectory is determined, and on the second stage the line is carried out. Drawing of a line is carried with using of several colors allocated in the certain sequence. The sequence of colors is determined with the help of the color panel. There is a plenty of the built - in templates of color sequences, and there are also a tools for their editing. It allows generating any color sequence for short time. The amount of colors can be chosen equal to amount of points of a line of which the brush consists.

The vector brush is kept in memory as a sequence of coordinates of points. These points consistently connect among themselves by line segments. For each point values of color and width are kept too.

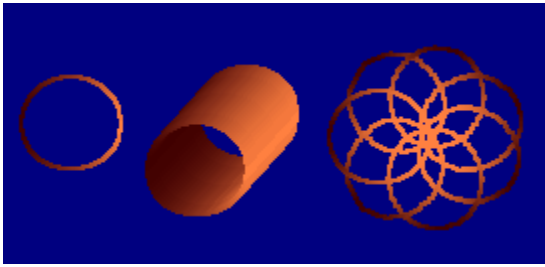


Figure 2: Vector brush and images created by moving brush on trajectories

On Figure 2 the example of the line having the shape of an ellipse is shown. This line can be used as a vector brush. In the same figure examples of creation of images with the help of this brush are shown. Trajectories for creation of images in these examples are line segment and a circle. The sizes of a brush in these examples remained constant. The angle of turn around of the brush center at movement of a brush on a circle changes from zero up to 360 degrees.

At movement of a brush on a trajectory the brush can change the sizes and proportions. In the program the scale coefficients, determining a degree of changing of the sizes on axes X and Y, are used. For each point of a trajectory coordinates X and Y of brushes concerning its center are determined by multiplication of initial coordinates on the corresponded scale coefficients in this point. Scale coefficients can change on the linear law or on more complex functional laws. The built - in functions are used for determination of scale coefficients in points of a trajectory. Functions of change of scale coefficients are displayed graphically by two diagrams, corresponds to axes X and Y. On diagrams horizontal axis corresponds to a trajectory, and vertical axis corresponds to value of scale coefficient. The user manually can change functional dependences in an interactive mode with the help of elements of adjustments. Examples of using of the having elliptic shape brush are shown on Figure 3. In these examples various trajectories and various functions of change of scale coefficients are used.

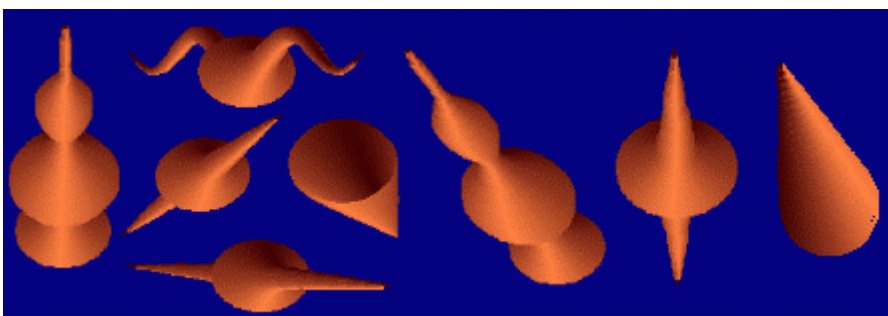


Figure 3: Images created by moving vector brush and using variable scale coefficient

The brush can consist of several lines. Example of using brush, consisting of two lines, is shown on Figure 4. The trajectory also can consist of several lines. Example of using trajectory, consisting of concentric circles, is shown on Figure 5.

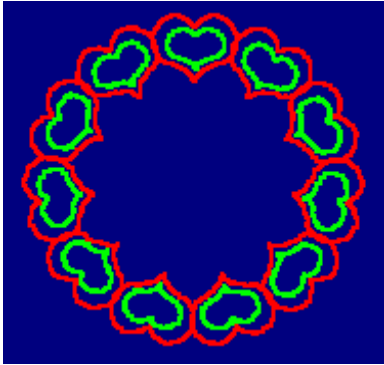


Figure 4: Using vector brush consisting from two lines

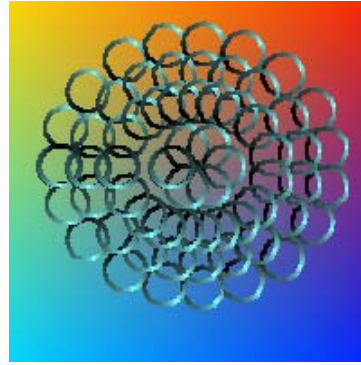


Figure 5: Using trajectory consisting from concentric circles

The image shown on a Figure 6 is created as follows. The trajectory is created in a mode “freehand” with the help of the mouse. At movement on a trajectory the brush changed the sizes and angle of turn concerning axis X.

In the program “Images Generator” the mode at which coordinates of all points of a trajectory are identical is stipulated. If the angles of turn of a brush around of its central point are different the image similar to image shown on Figure 7 is created. As a brush for creation of this image the multicolor line segment is used.

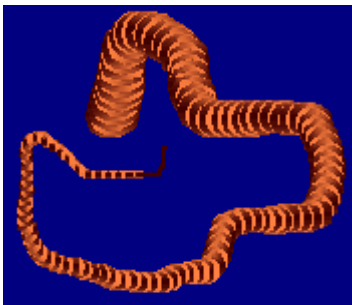


Figure 6: Image created by using variable scale coefficients and rotation of brush around axes

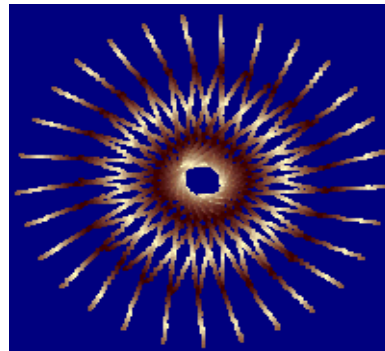


Figure 7: Image created by rotation of brush around center

As a brush the curve or a broken line can be used. Segments of a broken line can be carried out by different colors. In figure 8 the example of a having the shape of octagon brush and image, created by these brush is given.

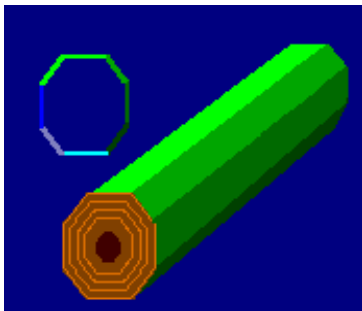


Figure 8: Octagon brush and image created by using octagon brush.

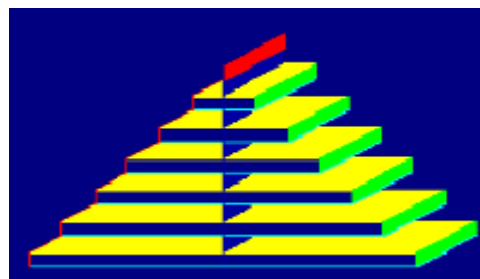


Figure 9: Image created by using vector and raster brush

Each type of a brush a vector type or raster type has own advantages. A raster brush provides higher speed. The vector brush provides more ample opportunities. Simultaneous using of both types of brush is most effectively. With the help of a vector brush you can to create image, which can be used as raster brush. Example of using such technique is shown on Figure 9. The rectangle is used as a vector brush. With its help the pyramid of the rectangles having identical height is created. The given pyramid is used as a raster brush.

Web info:

program “Images Generator” site <http://www.imagesgenerator.com> ,

program “Images Generator” loading <http://www.imagesgenerator.com/ImagesGeneratorSetup.exe>

Abstract:

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