



# **Sketchify Tutorial**

## **Graphics and Animation in Sketchify**

[sketchify.sf.net](http://sketchify.sf.net)

Željko Obrenović

[z.obrenovic@tue.nl](mailto:z.obrenovic@tue.nl)



# Graphics and Animation in Sketchify

- Creating Images
  - Background Image
  - Images in Regions
- Graphical Transformations
  - Region Transformations
  - Sketch Transformations
- Animation
  - Flip Book Animation
  - Build-In Properties Animation
- Free-Hand Gesture Support
  - Defining Trajectory and Timers through Gesture



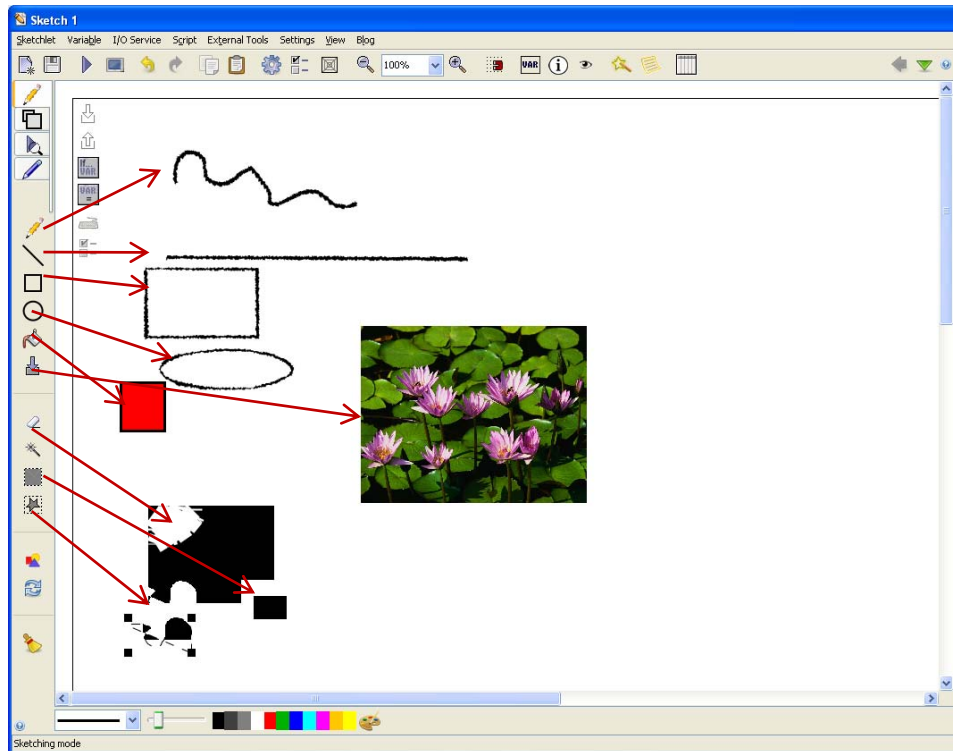
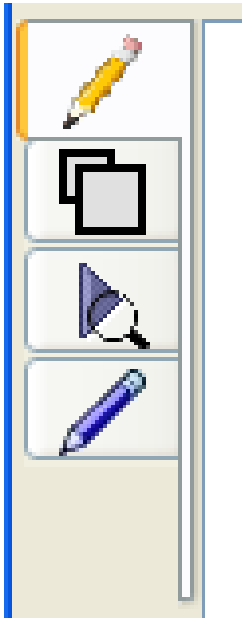
# Graphics and Animation in Sketchify

- **Creating Images**
  - Background Image
  - Images in Active Regions
- Graphical Transformations
  - Region Transformations
  - Sketch Transformations
- Animation
  - Flip Book Animation
  - Build-In Properties Animation
- Free-Hand Gesture Support
  - Defining Trajectory and Timers through Gesture



# Creating Background Image

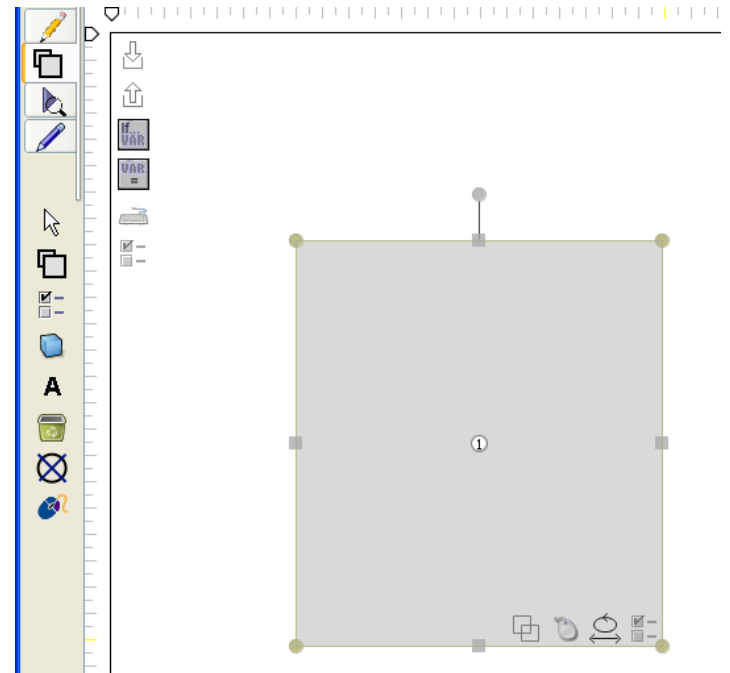
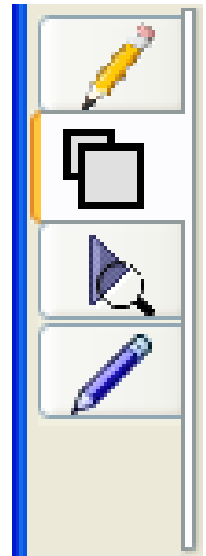
- In the drawing mode, you draw on the background bitmap image of the sketchlet. You can use simple standard options to create simple images, import a file from the file, or open it in the external editor for more complex processing.





# Active Regions

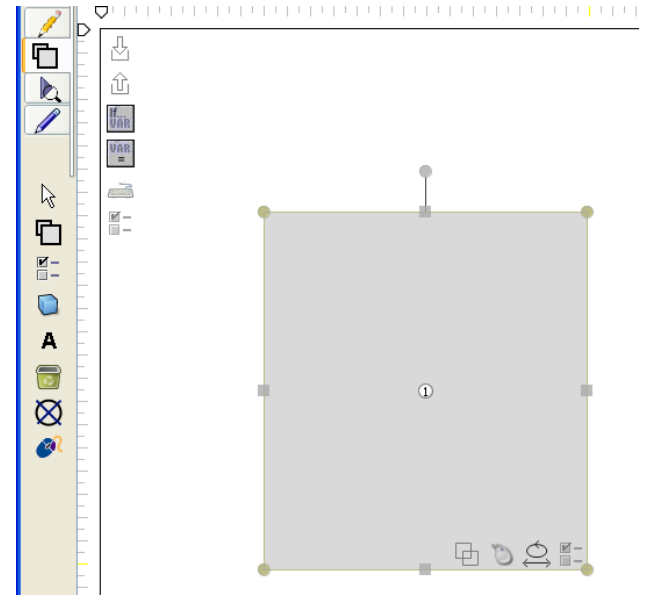
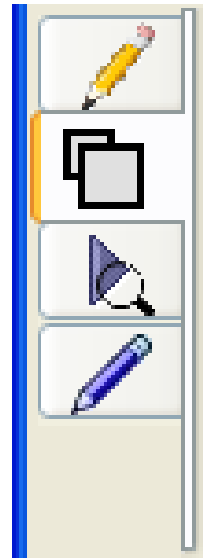
- An *active region* is a rectangular region in the sketch that can display drawings and text, but can also capture user events and that can be graphically transformed (translated and rotated).
- An active region may also embed one or more other sketches (with other active regions).

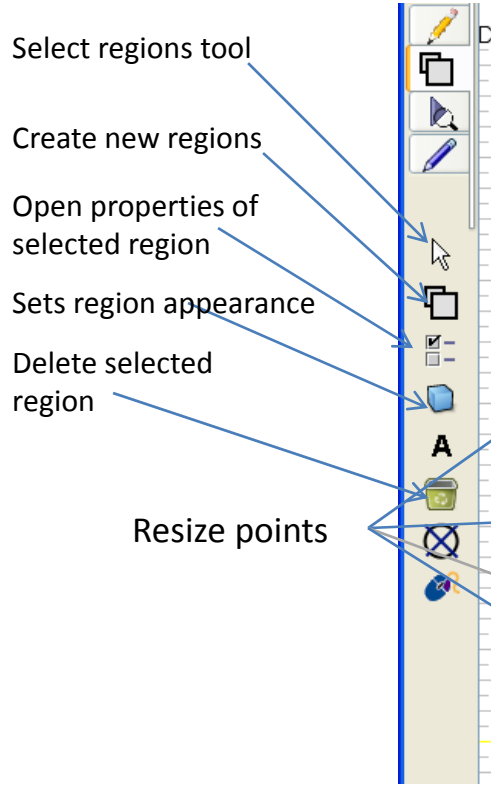




# Active Regions

- Active regions allow to easily creating a multitude of interactive effects within sketches. They can, for example, detect mouse events, such as mouse clicks or mouse movement, or overlap of the regions.
- We can directly, or through variables, control most properties of an active region,
  - geometrical properties, transparency, the path to the image file that is associated with it, textual label...





Select regions tool

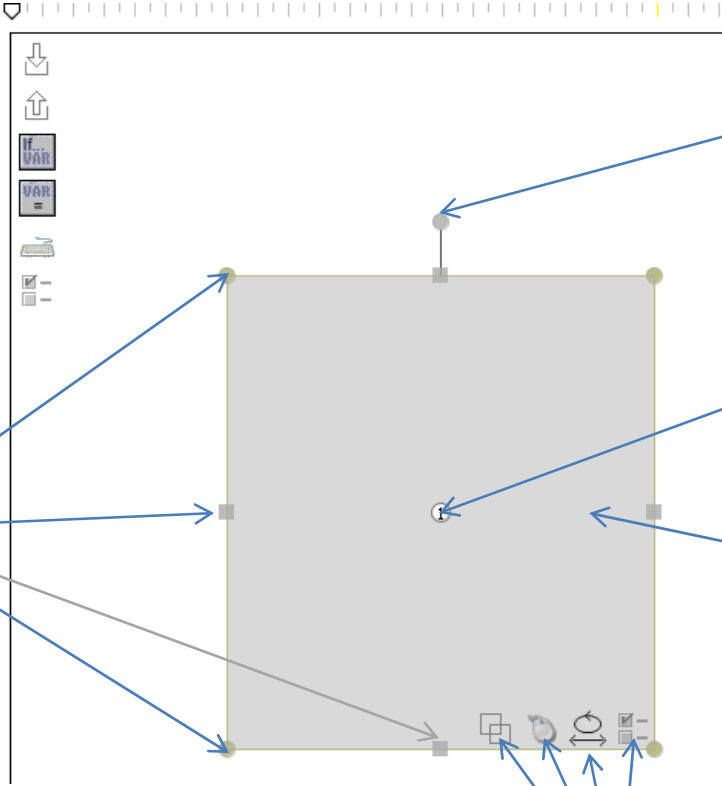
Create new regions

Open properties of selected region

Sets region appearance

Delete selected region

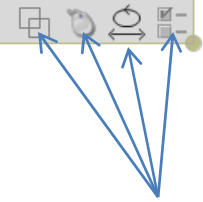
Resize points



Rotation point  
(you can also rotate the region by dragging it with the right mouse button)

Center of rotation  
(you can change it by pressing CTRL on the keyboard, and than dragging it with the left mouse button)

An active region





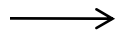
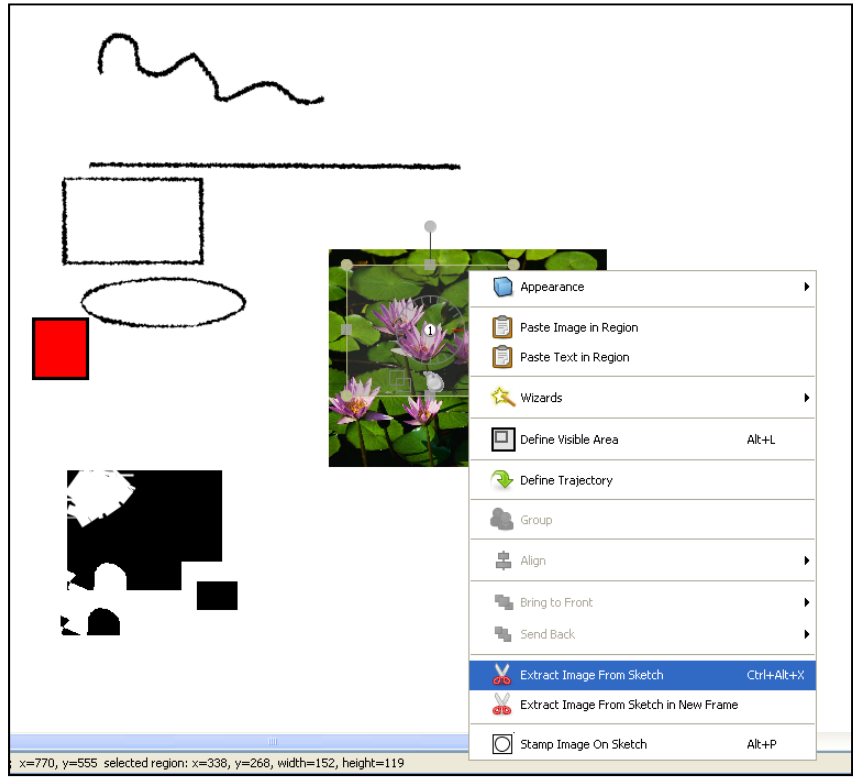
# Images in Active Regions

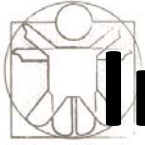
- Extracting from the background image
- Drawing
- From URL
- Screen Capture
- Text
- Shape
- HTML
- SVG



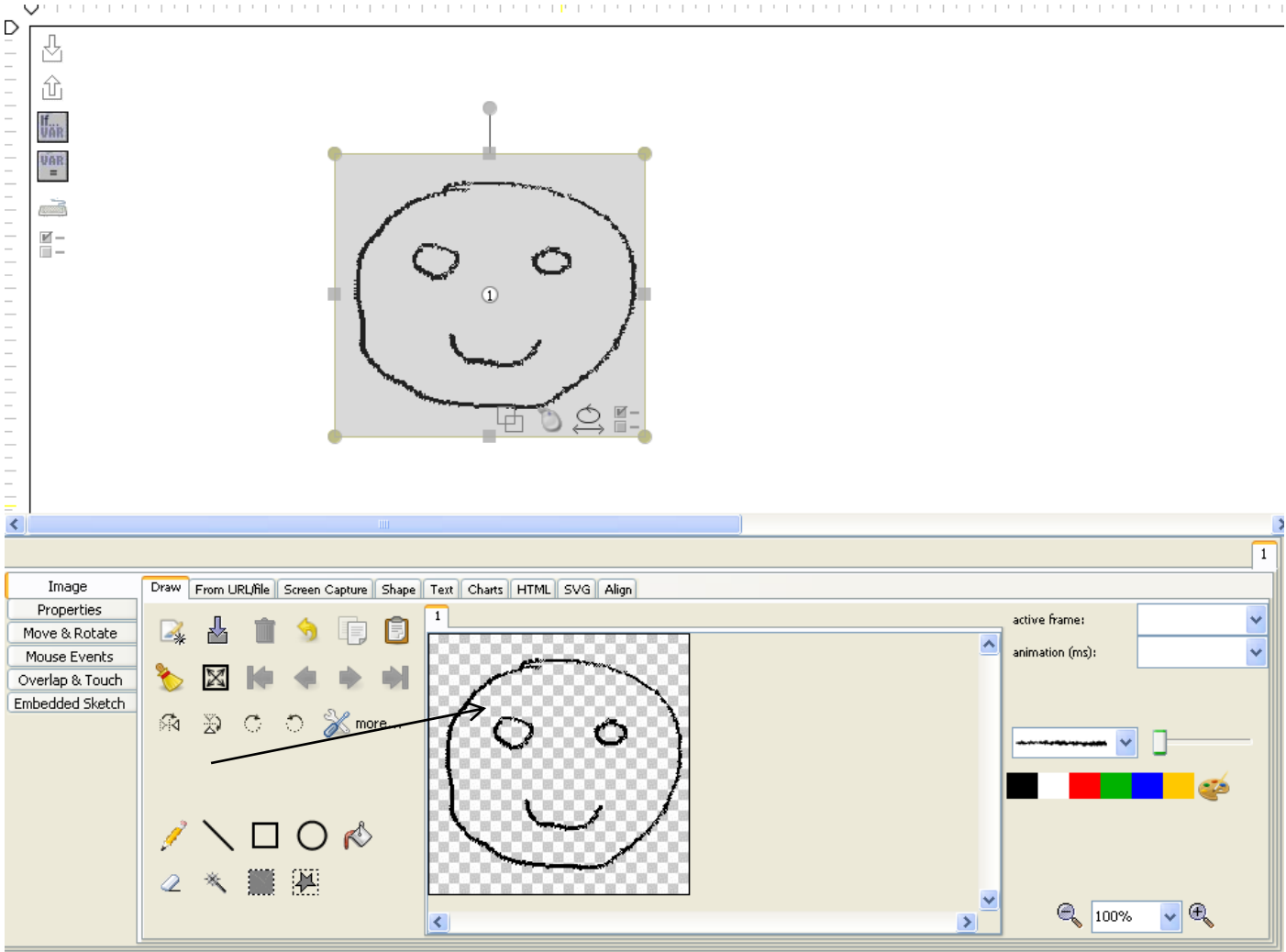


# Image in Active Region: Extracting image from the background sketch





# Image in Active Region: Drawing in Simple Image Editor





# Image in Active Region: From URL

The screenshot shows a software interface for adding an image. The main canvas displays a Vitruvian Man logo with a bounding box and a small '1' in the center. A toolbar on the left contains icons for download, upload, and other functions. The bottom panel has a tabbed interface with the following tabs: Image, From URL/file, Screen Capture, Shape, Text, Charts, HTML, SVG, and Align. The 'From URL/file' tab is selected, and the 'URL/path:' field contains the text 'www.vip.id.tue.nl/sketchify/images/logo\_small.png'. A blue arrow points from the text 'URL of the image' to the URL field.

URL of the image



# Image in Active Region: Screen Capture

The image displays two windows side-by-side. On the left is the Sketch 4 application, and on the right is the Mozilla Firefox browser window.

The Firefox window shows the Google homepage at <http://www.google.com/>. A blue rectangular box highlights the search area, including the Google logo, the search input field, and the "Google Search" and "I'm Feeling Lucky" buttons. Below the search area, there is a link for "Magnitude 8.8 earthquake in Chile - Help and learn more" and a footer with "©2010 - Privacy".

The Sketch 4 window shows a tilted version of the captured search area. The "Image" panel is open, and the "Screen Capture" tab is selected. The "Capture Part of the Screen" checkbox is checked, and the "Define capturing area" button is visible. The following values are shown in the panel:

- X (left): 1068
- Y (top): 270
- Width: 489
- Height: 224

At the bottom of the Sketch 4 window, the text reads: "Active regions mode: x=738, y=363 selected region: x=119, y=88, width=483, height=247".



# Image in Active Region: Text

The screenshot displays a software interface for editing text. At the top, a grey rectangular text box contains the letters 'ABCDEF' in a decorative, black, serif font. The text box has a thin border and several small square handles at its corners and midpoints for resizing. To the left of the text box is a vertical ruler with tick marks. Below the text box is a toolbar with icons for copy, paste, undo, redo, and a list icon. Below the main workspace is a properties panel with a tabbed interface. The 'Text' tab is active, showing a font dropdown menu with 'Harrington' selected. Below the font list, there is a 'Text file' input field and a '...' button. At the bottom of the panel, there are checkboxes for 'Trim' and 'Wrap text', followed by input fields for 'characters per line' and 'Show at most' lines.

Font: Harrington

ABCDEF

Text file: [input field] ...

Trim  Wrap text [input field] characters per line Show at most [input field] lines



# Image in Active Region: Shape

The screenshot displays a software interface with a central shape menu and a canvas on the right. The menu lists various shapes: None, Rectangle, Oval (highlighted), Rounded Rectangle, Triangle, Triangle, Line, Line, Horizontal Line, and Vertical Line. Below the menu, the 'Oval' option is selected, and its properties are shown: Line style (dashed 1), Line thickness (25), Line Color (yellow), and Fill Color (green). On the right, a canvas shows a green oval with a yellow dashed border, centered within a gray square frame. The interface includes a toolbar on the left and a bottom panel with 'Image', 'Draw', and 'Align' tabs.



# Image in Active Region: HTML

The screenshot shows a web editor interface. At the top, a preview window displays a gray rectangular area containing the text "My First Heading" in a large, bold, serif font, followed by "My first paragraph." in a smaller, regular serif font. The text is centered. A small circle with the number "1" is positioned below the paragraph. The preview area has several control handles: a vertical line with a circle at the top center, a square at the top center, and squares at the corners and midpoints of the sides. A toolbar with icons for copy, undo, redo, and zoom is located at the bottom right of the preview area. Below the preview is a code editor window. The code editor has a tab labeled "HTML" and a toolbar with icons for drawing, copy, paste, undo, redo, zoom, and other editing functions. The code editor contains the following HTML code:

```
1 <h1>My First Heading</h1>  
2 <p>My first paragraph.</p>
```



# Image in Active Region: SVG

The screenshot shows a software interface for editing an image. On the left is a vertical toolbar with icons for zooming, erasing, and other tools. The main canvas displays a gray square with a red rounded rectangle inside it. A small circle with the number '1' is positioned below the red rectangle. At the bottom of the canvas are icons for copy, paste, and other editing functions. Below the canvas is a menu bar with options: Image, Properties, Move & Rotate, Mouse Events, Overlap & Touch, and Embedded Sketch. The 'Image' menu is open, showing sub-menus: Draw, From URL/file, Screen Capture, Shape, Text, Charts, HTML, SVG, and Align. The 'SVG' sub-menu is active, displaying a code editor with the following XML code:

```
1 <?xml version="1.0" standalone="no"?>
2 <!DOCTYPE svg PUBLIC "-//W3C//DTD SVG 1.1//EN"
3 "http://www.w3.org/Graphics/SVG/1.1/DTD/svg11.dtd">
4
5 <svg width="100%" height="100%" version="1.1"
6 xmlns="http://www.w3.org/2000/svg">
7
8 <rect x="20" y="20" rx="20" ry="20" width="250" height="100"
9 style="fill:red;stroke:black;stroke-width:5;opacity:0.5"/>
10
11 </svg>
12
```





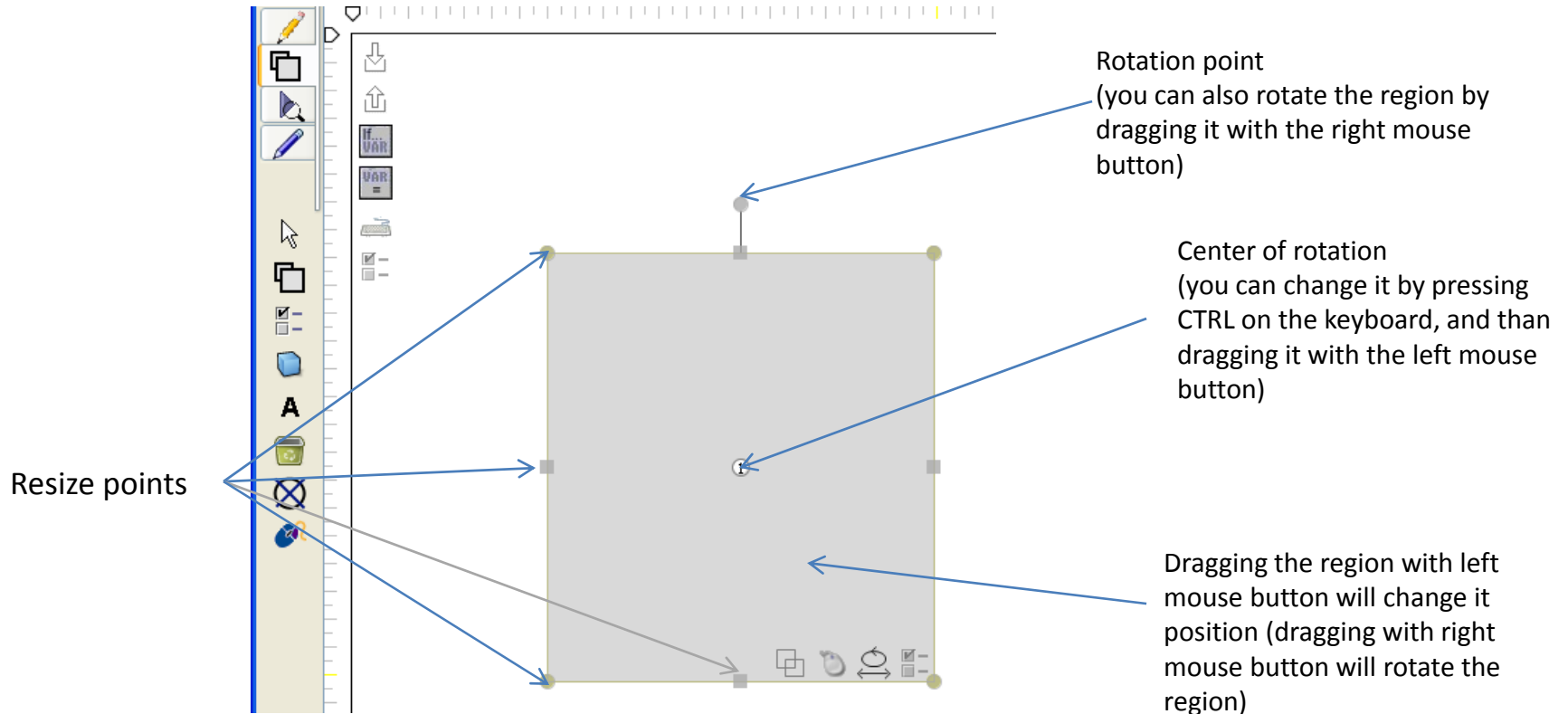
# Graphics and Animation in Sketchify

- Creating Images
  - Background Image
  - Images in Regions
- **Graphical Transformations**
  - **Region Transformations**
  - **Sketch Transformations**
- Animation
  - Flip Book Animation
  - Build-In Properties Animation
- Free-Hand Gesture Support
  - Defining Trajectory and Timers through Gesture



# Transforming Regions by Mouse

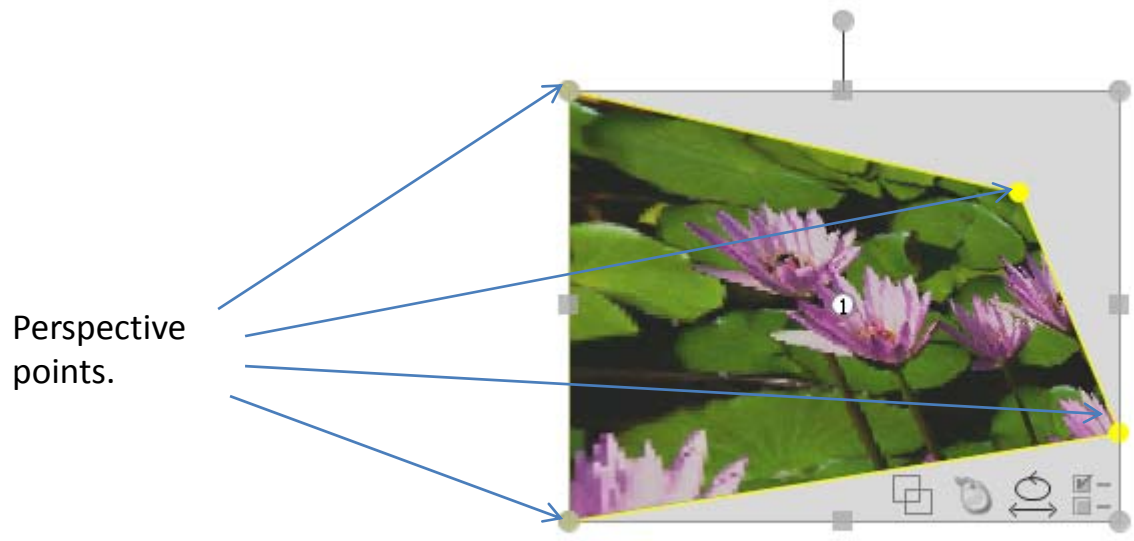
- Change position, size, and orientation





# Transforming Regions by Mouse

- If you try to resize the active region with the CTRL key pressed on the keyboard, you can set the perspective points of the region:





# Shortcuts for Some Properties: Right Mouse Click on the Region

The screenshot shows a right-click context menu for a green circular region in a software application. The menu is organized into two columns. The left column contains options such as 'Appearance', 'Paste Image in Region', 'Paste Text in Region', 'Wizards', 'Define Visible Area' (with shortcut Alt+L), 'Define Trajectory', 'Group', 'Align', 'Bring to Front', 'Send Back', 'Extract Image From Sketch' (with shortcut Ctrl+Alt+X), 'Extract Image From Sketch in New Frame', and 'Stamp Image On Sketch' (with shortcut Alt+P). The right column contains options like 'Shape', 'Fill Color', 'Line Color', 'Text Color', 'Transparency', 'Line Weight', 'Line Style', 'Pen Thickness', 'Horizontal 3D Rotation', 'Vertical 3D Rotation', 'Speed', 'Rotation Speed', 'Alignment', 'Automatic Perspective', and 'Perspective Depth'. The 'Fill Color' option is currently selected, and a color palette is displayed to its right, showing various color swatches including white, black, red, blue, green, yellow, gray, dark\_gray, orange, cyan, pink, and a 'more colors' option.



# More Region Transformations

<b>Position</b>	
position x	horizontal position (left, 0 to 1000)
position y	vertical position (top, 0 to 1000)
relative x	relative horizontal position (0.0 to 1.0)
relative y	vertical position (0.0 to 1.0)
trajectory position	0.0 to 1.0
<b>Size</b>	
width	region width
height	region height
<b>Orientation</b>	
rotation	angle
<b>Transparency</b>	
transparency	0.0 to 1.0
<b>Visible area</b>	
visible area x	
visible area y	
visible area width	
visible area height	
<b>Motion</b>	
speed	pixels per second
direction	angle
<b>Pen</b>	
pen thickness	0, 1, 2...

<b>Advanced / Coordinates</b>	
x1	
y1	
x2	
y2	
<b>Advanced / Sheer</b>	
shear x	0.0 to 1.0
shear y	0.0 to 1.0
<b>Advanced / 3D</b>	
horizontal 3d rotation	0 to 360
vertical 3d rotation	0 to 360
<b>Advanced / Perspective</b>	
perspective x1	0 to 1, x top left corner
perspective y1	0 to 1, y top left corner
perspective x2	0 to 1, x top right corner
perspective y2	0 to 1, y top right corner
perspective x3	0 to 1, x bottom right corner
perspective y3	0 to 1, y bottom right corner
perspective x4	0 to 1, x bottom left corner
perspective y4	0 to 1, y bottom left corner
automatic perspective	left, right, top, bottom, parallel
perspective depth	relative perceptive depth 0.0 to 1.0



- **Expressions in properties**

- Literals

- 90

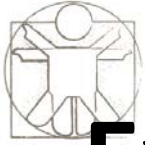
- Formulas

- =variable
- =a + (b-c) / 50

- String templates

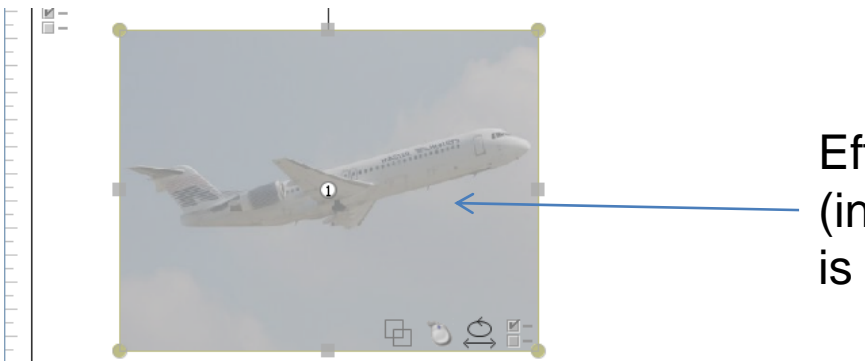
- You said <%=text%>

- Values may be given directly, for example "**120**" or indirectly through variables. For example, the expression "**=a**", means that the value will be taken from the variable "a".
- More on variables comes later in separate tutorial...



# Exploring Effects of Transformations

- You can also explore the effects of transformations in the properties tab using a simple slider interface



Effect of changing property  
(in this example changing transparency)  
is immediately visible in the sketch.

Property	Value	Description
<b>Position</b>		
position x		horizontal position (left, 0 ...
position y		vertical position (top, 0 to ...
relative x		relative horizontal position ...
relative y		vertical position (0.0 to 1.0)
trajectory position		0.0 to 1.0
<b>Size</b>		
width		region width
height		region height
<b>Orientation</b>		
rotation		angle
<b>Transparency</b>	<b>0.5</b>	<b>0.0 to 1.0</b>
transparency	0.5	0.0 to 1.0

Maximal value for the property

Current value for the property.  
You can change it by moving the slider

Minimal value for the property

Selected property (in this case transparency)



# Region Transformations:

## Position, Size Orientation

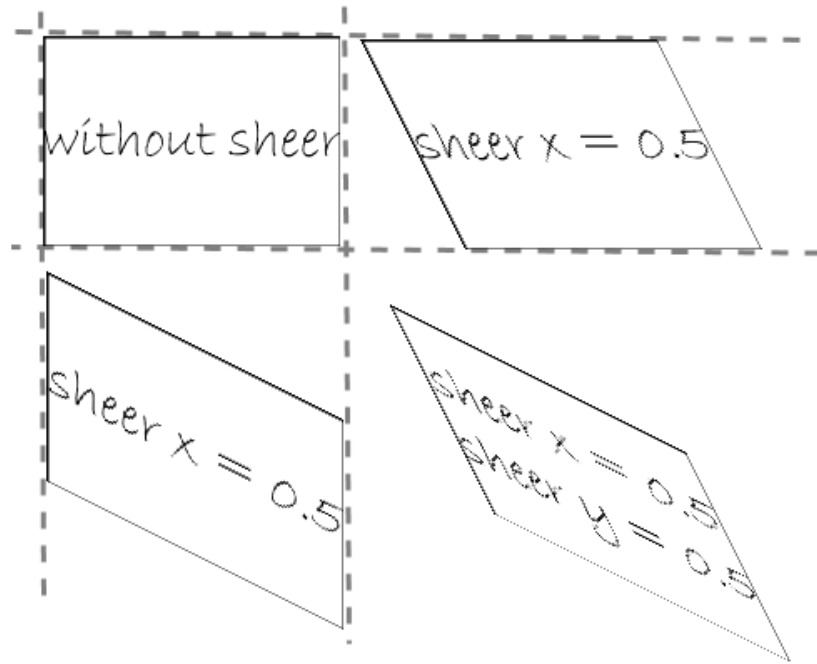
- **position x** - horizontal position, in pixels, from 0 to image width
- **position y** - vertical position, in pixels, from 0 to image width
- **relative x** - relative horizontal position from 0.0 to 1.0. For example, 0.5 means that the region will be positioned in the middle of its interaction space (also depends on motion limits).
- **relative y** - relative vertical position from 0.0 to 1.0
- **trajectory position** - if the trajectory is defined, you can define the relative position of the region on the trajectory from 0.0 to 1.0 (to define a trajectory, go to main window, right-click on the active region and select "Start Defining Trajectory...")
- **width** - region width
- **height** - region height
- **rotation** - the region orientation, from 0 to 360. May also have the value "random", which means that the region will randomly rotate when its position is animated (it is used only in the combination with "speed" parameter)





# Region Transformations: Shear

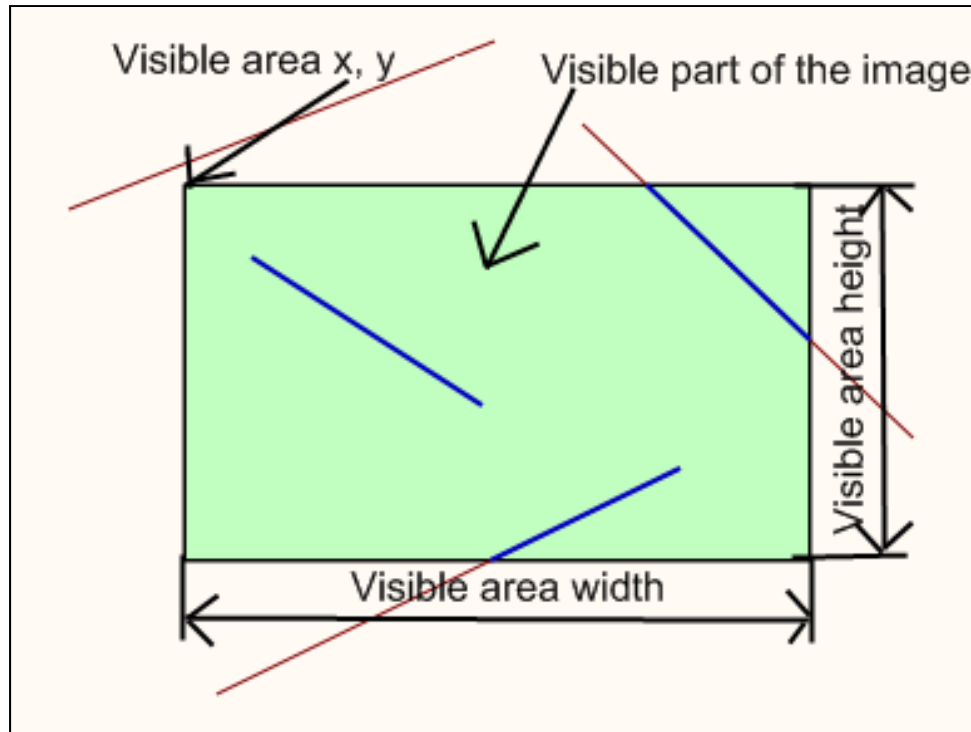
- **shear x** - horizontal shear transformations (for details see <http://mathworld.wolfram.com/Shear.html>)
- **shear y** - vertical shear transformations (for details see <http://mathworld.wolfram.com/Shear.html>)





# Region Transformations: Visible Area

- **visible area x** - horizontal position of the visible area of the
- **visible area y** - vertical position of the visible area of the
- **visible area width** - width of the visible area of the image
- **visible area height** - height of the visible area of the image





# Region Transformations: Transparency

- **transparency** - from 0.0 to 1.0 (for details see <http://en.wikipedia.org/wiki/Transparent>)

Transparency 0.1

Transparency 0.3

Transparency 0.5

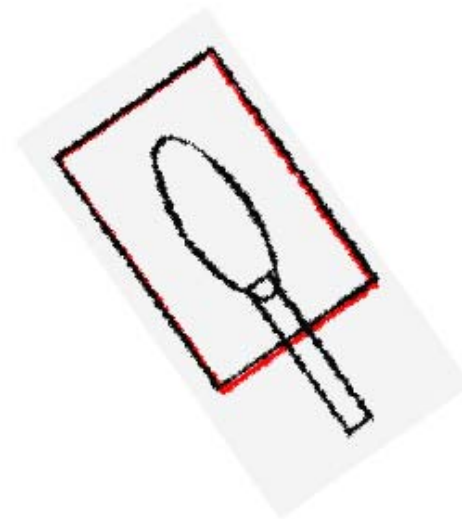
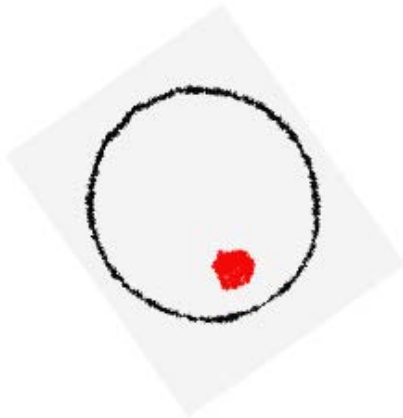
Transparency 0.8

Transparency 1.0



# Region Transformations: **Motion**

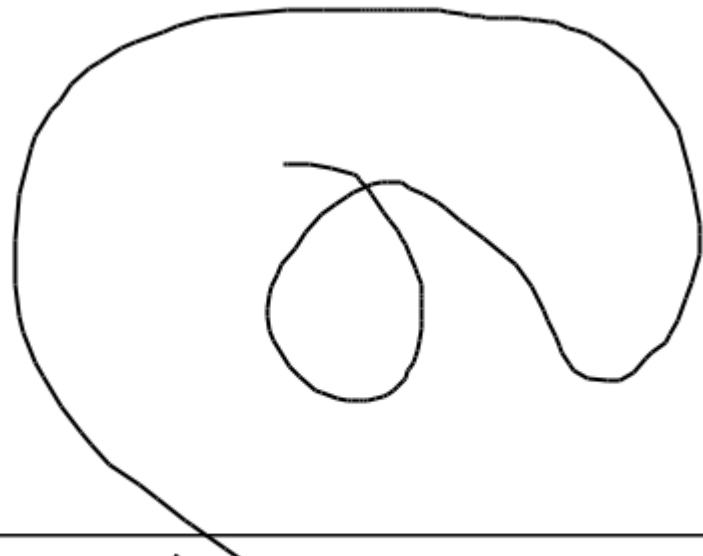
- **speed** - in pixels per second, in the playback mode, the region will move in the direction of current
- **direction** - direction of the motion (used in combination with "speed"). Can also have the value "random". If it is not defined, that "rotation" parameter is used to define the direction of the movement.





# Region Transformations: **Pen**

- **pen thickness** - if region is moved around, it can leave the trace, and here you can define the thickness of the pen

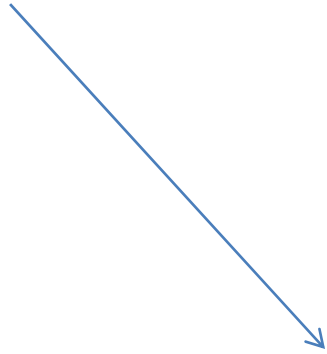


Pen thickness = 2



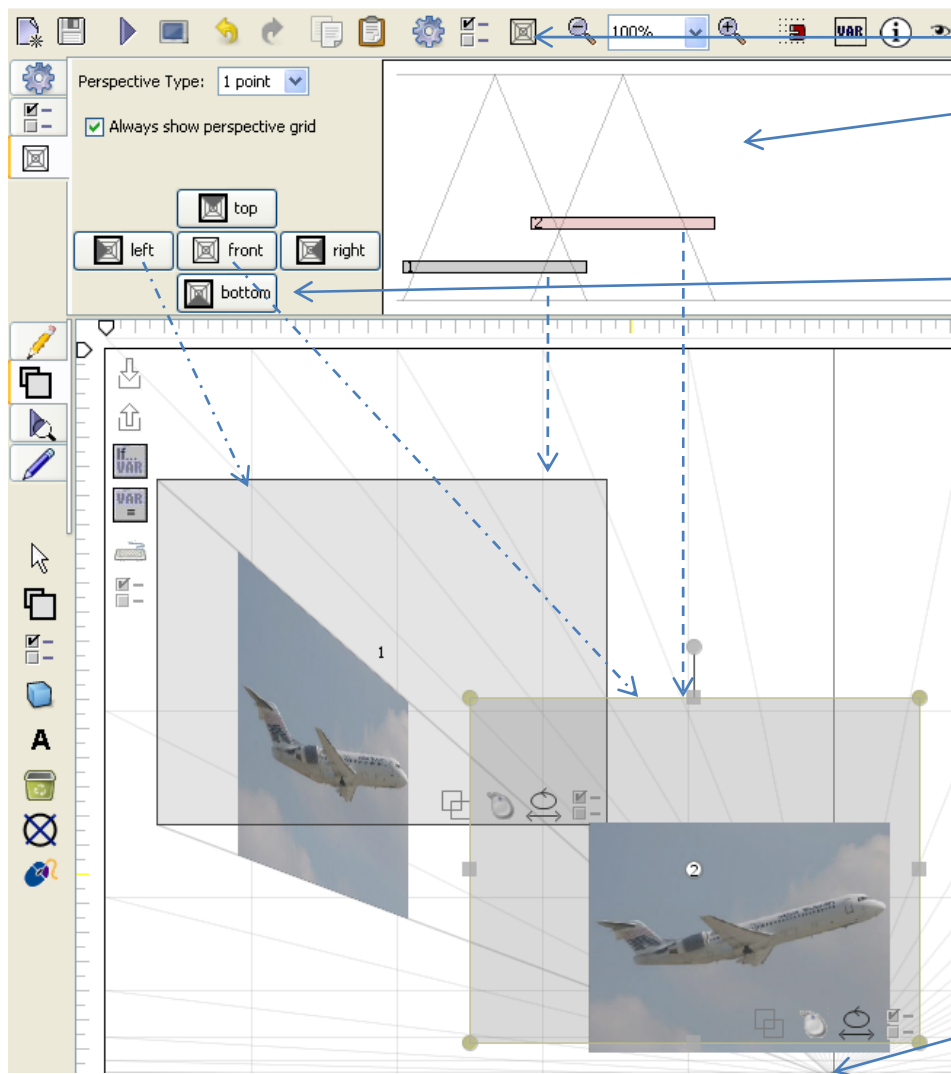
# Region Transformations: 3D Pen

- horizontal 3D rotation
- vertical 3D rotation





# Region Transformations: Perspective Depth



Toolbar icon for opening the perspective tab

Changing the perceptual depth of regions

Changing the side on which the image will be shown in the perspective

Perspective point. You can drag it and change.



# Sketch Properties/ Transformations

Set Properties | Animate Properties | Map to Numeric Variables

Property	Value	Description
<b>Color</b>		
background color		red, blue, green, gray, yellow....
transparency		0.0 .. 1.0
<b>Zoom</b>		
		<b>1.0 means 100%</b>
zoom		1.0 means 100%
zoom center x		default is 0
zoom center y		default is 0
<b>Offset</b>		
background offset x		
background offset y		
regions offset x		
regions offset y		
<b>Perspective</b>		
perspective type		1 point or two point
perspective y		horizon
perspective x1		point 1 on the horizon
perspective x2		point 2 on the horizon

Explore

Clear





# Graphics and Animation in Sketchify

- Creating Images
  - Background Image
  - Images in Regions
- Graphical Transformations
  - Region Transformations
  - Sketch Transformations
- **Animation**
  - **Flip Book Animation in Active Regions**
  - **Build-In Properties Animation**
- Free-Hand Gesture Support
  - Defining Trajectory and Timers through Gesture



# Simple Animation

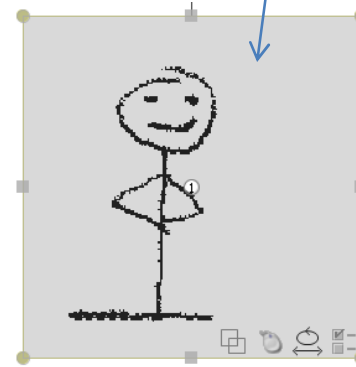
- **Flip Book Animation in Active Regions**
  - Analogous to traditional flipbook animation
  - Creating multiple frames with different images, and changing the image periodically
- **Build-In Properties Animation**
  - You can animate any property of the active region or sketch
- Animation start automatically when you open a sketch in preview or playback mode



# Flip Book Animation in Active Regions

- You can create more than one image in an active region
- You can then specify which of them will be shown or define animation by defining pause between them

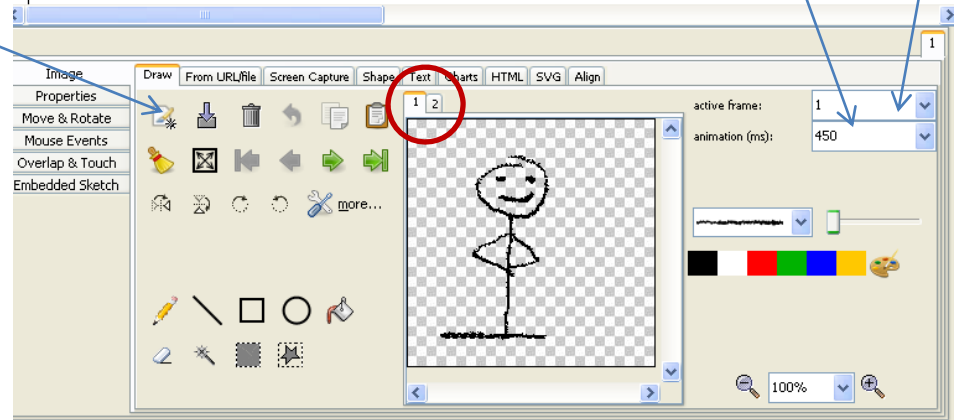
Active frame is shown in the sketch



Define animation by setting pause between frames

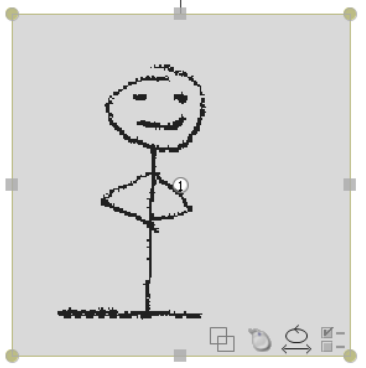
Active frame

Create a new frame within the region

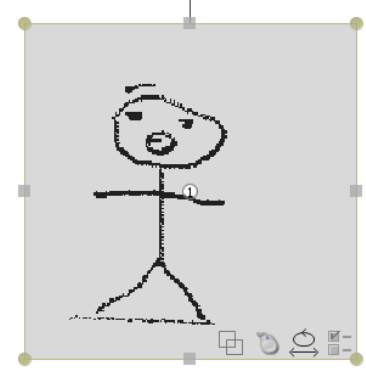




Frame 1



Frame 2



Software interface showing two panels for Frame 1 and Frame 2.

**Frame 1 Panel:**

- Image: Stick figure with a smile.
- Properties: active frame: 1, animation (ms): 450.
- Tools: Draw, From URL/file, Screen Capture, Shape, Text, Charts, HTML, SVG, Align.
- Buttons: Move & Rotate, Mouse Events, Overlap & Touch, Embedded Sketch.
- Color palette and zoom (100%) are visible.

**Frame 2 Panel:**

- Image: Stick figure with a different expression.
- Properties: active frame: 2, animation (ms): 450.
- Tools: Draw, From URL/file, Screen Capture, Shape, Text, Charts, HTML, SVG, Align.
- Buttons: Move & Rotate, Mouse Events, Overlap & Touch, Embedded Sketch.
- Color palette and zoom (100%) are visible.



# Build-In Properties Animation

- You can animate any property of the active region or sketch, by defining
  - **Type of Animation**
    - Loop Once, Loop Forever
    - Pulse Once, Pulse Forever
  - **Start Value**
  - **End Value**
  - **Cycle Duration** (in seconds)



# Build-In Properties Animation

In this example, four properties are animated simultaneously:  
position x, width, height, and transparency

Use current value as start value for animation

Explore the effects of the properties value with slider

Use current value as end value for animation

Animate Properties Tab

Dimension	Animation Type	Start Value	End Value	Cycle Duration	Curve
<b>Position</b>					
position x	Loop Forever	50	500	1.0	
position y					
relative x					
relative y					
trajectory position					
<b>Size</b>					
width	Puls Forever	50	100	1.0	
height	Puls Forever	50	100	1.0	
<b>Orientation</b>					
rotation					
<b>Transparency</b>					
transparency	Puls Forever	0.0	1.0	1.0	
<b>Visible area</b>					
visible.area.x					



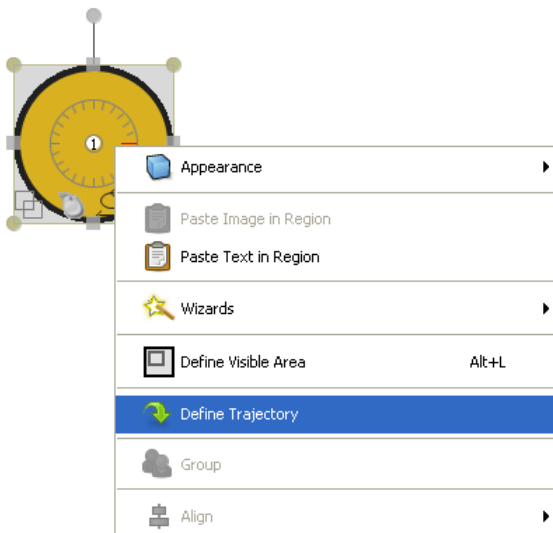
# Graphics and Animation in Sketchify

- Creating Images
  - Background Image
  - Images in Regions
- Graphical Transformations
  - Region Transformations
  - Sketch Transformations
- Animation
  - Flip Book Animation
  - Build-In Properties Animation
- **Free-Hand Gesture Support**
  - **Defining Trajectory and Timers through Gesture**



# Freehand Gesture Support

- You can also limit a motion of the region to a freehand sketched trajectory
  - Right-click on the active region and select “Define Trajectory”

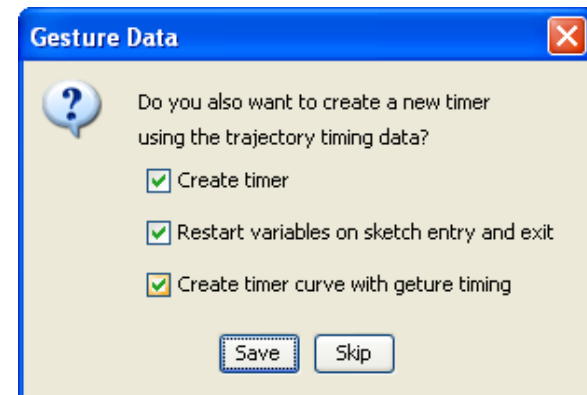






# Saving Gesture Data

- In addition to creating trajectory, you can also use gesture timing to create a timer and timer curve
- This means that timer can repeat your gesture with the same timing as you
- More on timers and timer curves in a separate tutorial...





# Graphics and Animation in Sketchify

- Creating Images
  - Background Image
  - Images in Regions
- Graphical Transformations
  - Region Transformations
  - Sketch Transformations
- Animation
  - Flip Book Animation
  - Build-In Properties Animation
- Free-Hand Gesture Support
  - Defining Trajectory and Timers through Gesture