Sketchify Tutorial
Properties and Variables

sketchify.sf.net

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Properties and Variables

- Properties of active regions and sketches can be given directly, or indirectly through variables
  - Directly specify the value
    - 90
  - Indirectly specify the value through variables
    - Using formulas

      =variable

      =a + (b-c) / 50
    - Using string templates

      You said <%=text%>

Why Variables?

- Benefits of indirect specification
  - One variable can control several properties
  - Through variables, objects in sketches can communicate with each other and with external services (such as Wii, text-to-speech service)

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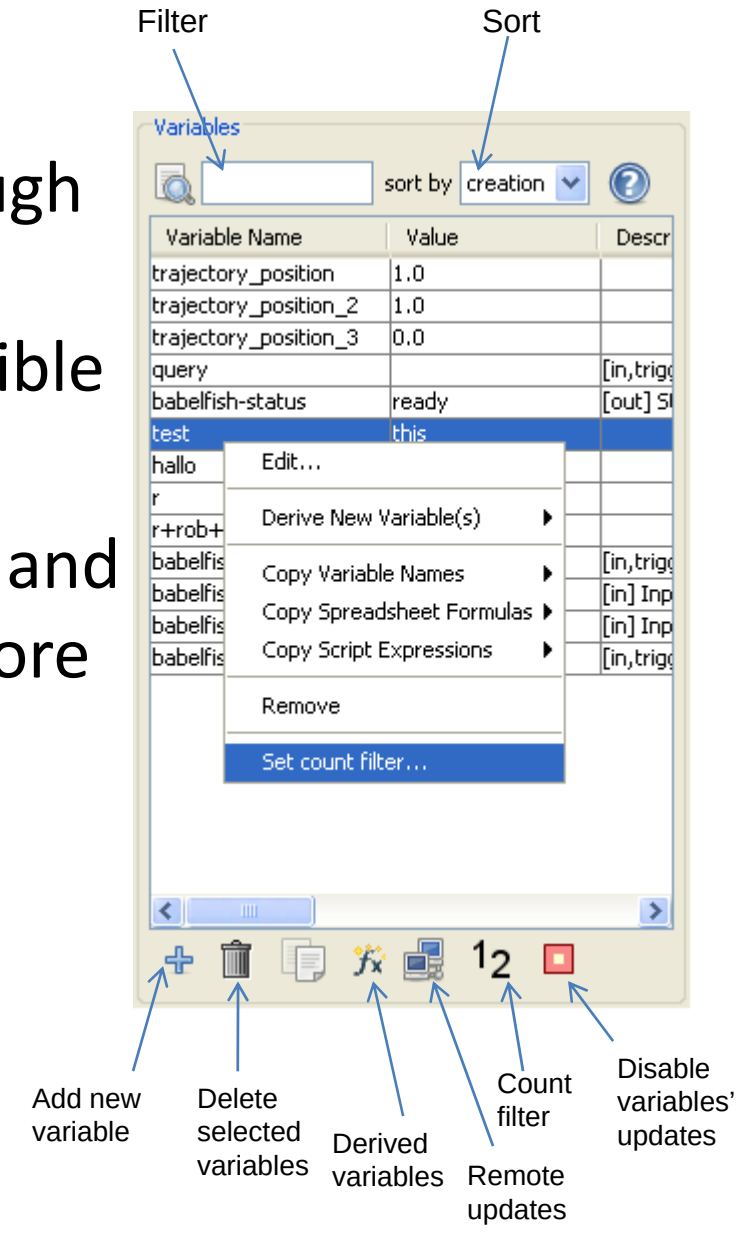
Interface for Working with Variables

- Variables can be accessed through a spreadsheet-like interface, making all data immediately visible and manipulatable.
- A designer can directly observe and update variables; useful to explore and play with the functionality.

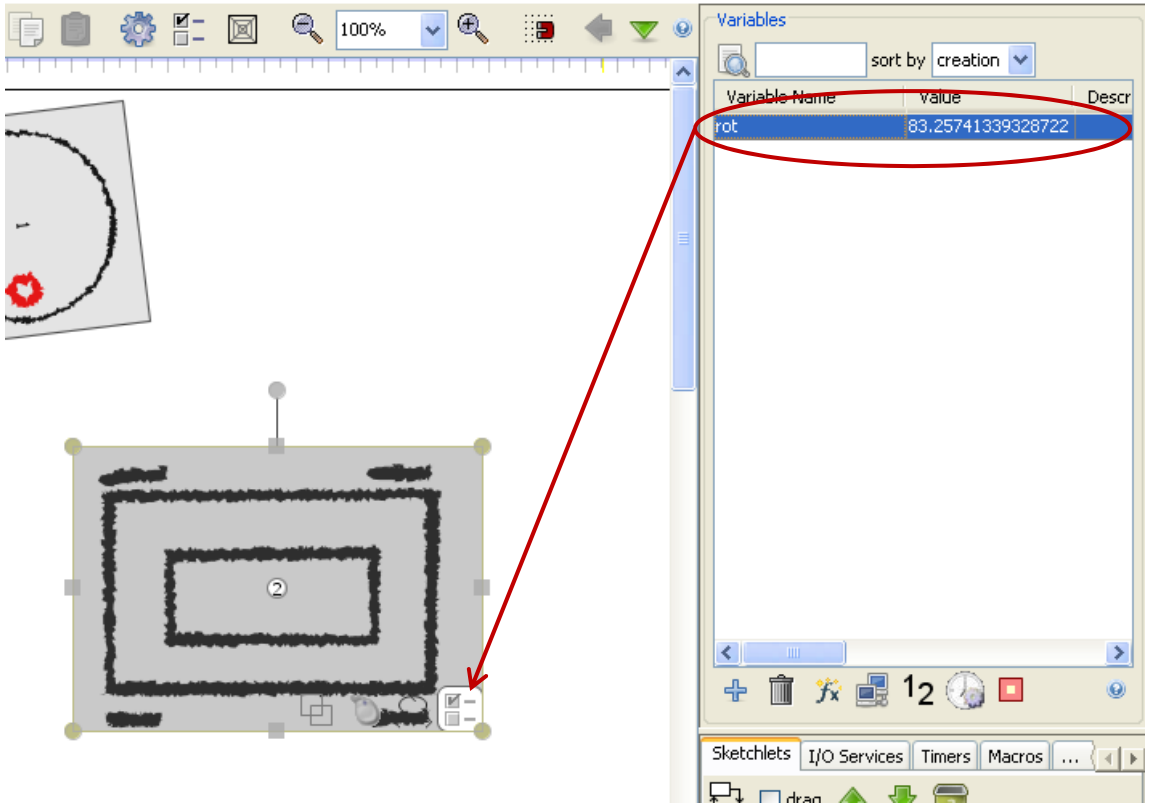


Connecting Variables and Properties

- Drag-and-Drop
  - You can drag a variable and drop it on the region or sketch to set its properties
- Specifying property value in region setting
  - With expressions and formulas
  - With string templates

Drag-and-Drop Connection between Variables and Properties

- You can drag-and-drop the variable on the region properties icon, and select property



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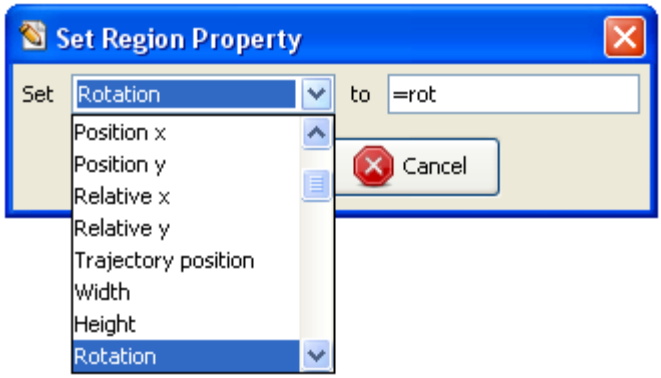
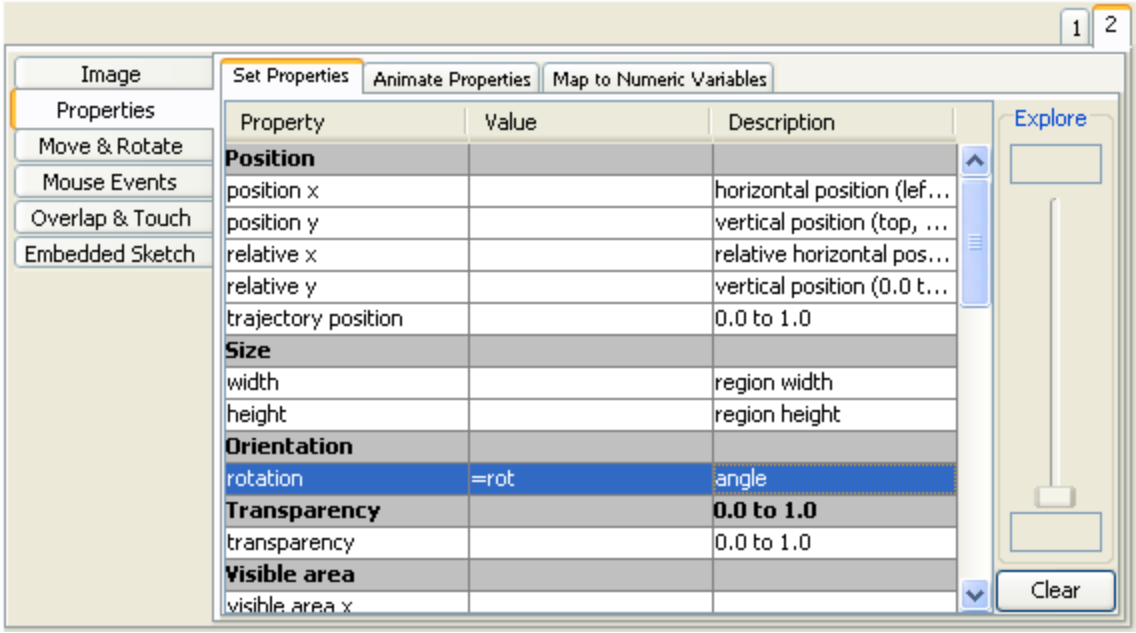


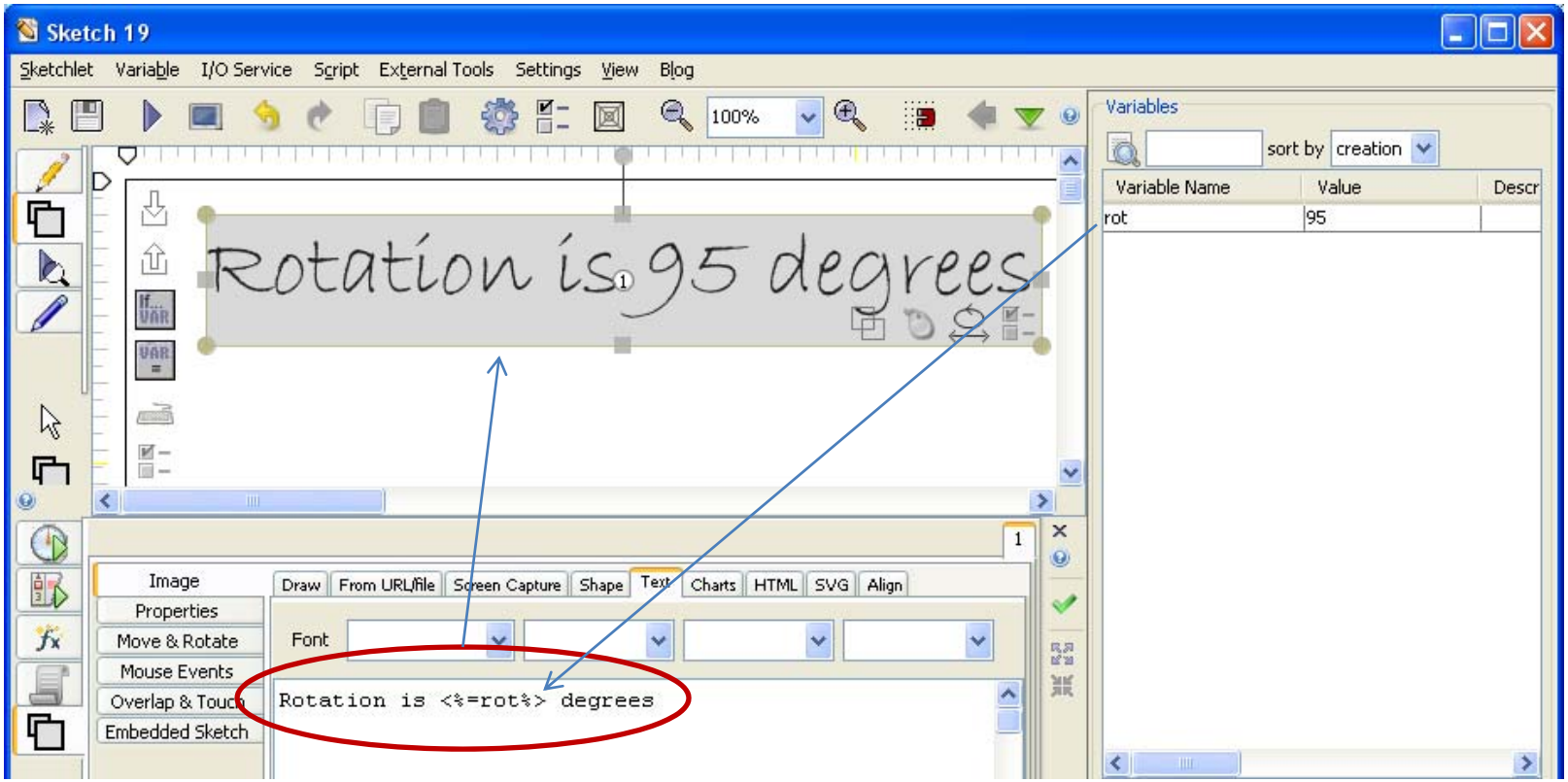
Specifying in the Properties Tab

- You can also specify properties by going to the properties tab of the region
- Instead of giving the value directly, you can use the expression “=variable”
- This means that value will be taken from the variable



Variables and Templates

- Templates are simple way to define a text with some part of it will be replaced with the variable value: “Rotation is <%=rot%> degrees”



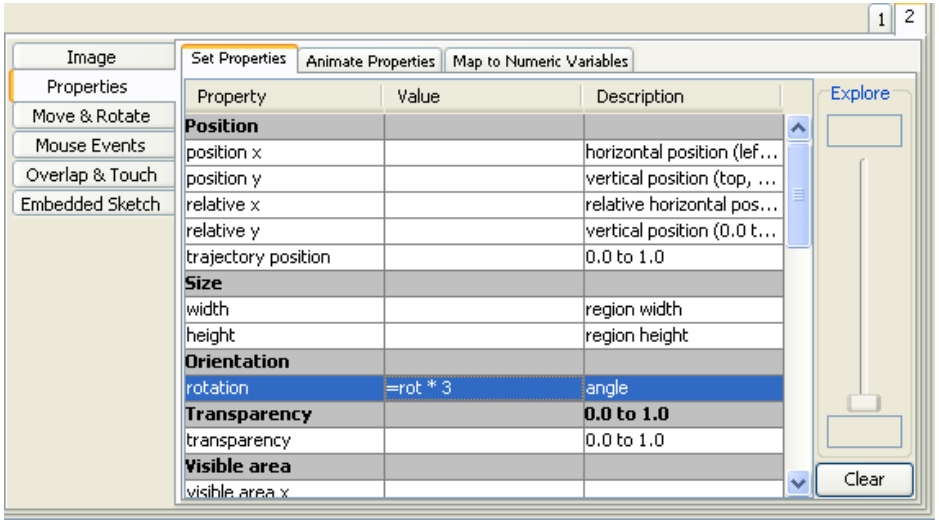
Variables and Formulas

- You can also use more complex formulas to derive values using diverse operators and function
- Examples

  =sqrt(a^2 + b^2)

  =rot * 3

  =100 + 50 * sin(rot)



- Expression with formulas have to start with “=“
- **NOTE**: If the variable name contains operator, such as "-", you have to put the name within apostrophes, for example "**'movement-intensity' / 2**".

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Formulas

- All common arithmetic operators are supported. Boolean operators are also fully supported.
- You can also derive the value conditionally using the **if** command.
  - For example, the formula "**if(a > -0.1 && a < 0.1, b, 1.0)**" will return the value of variable **b** if the variable **a** is within **-0.1** and **0.1**, or **1.0** otherwise. Boolean expressions are evaluated to be either 1 or 0 (true or false respectively).

Operators

Power	^
Boolean Not	!
Unary Plus, Unary Minus	+x, -x
Modulus	%
Division	/
Multiplication	*
Addition, Subtraction	+, -
Less or Equal, More or Equal	=, >=
Less Than, Greater Than	, >
Not Equal, Equal	!=, ==
Boolean And	&&
Boolean Or	||

Functions

Sine	sin(x)
Cosine	cos(x)
Tangent	tan(x)
Arc Sine	asin(x)
Arc Cosine	acos(x)
Arc Tangent	atan(x)
Arc Tangent (with 2 parameters)	atan2(y, x)
Hyperbolic Sine	sinh(x)
Hyperbolic Cosine	cosh(x)
Hyperbolic Tangent	tanh(x)
Inverse Hyperbolic Sine	asinh(x)
Inverse Hyperbolic Cosine	acosh(x)
Inverse Hyperbolic Tangent	atanh(x)
Natural Logarithm	ln(x)
Logarithm base 10	log(x)
Exponential (e^x)	exp(x)
Absolute Value / Magnitude	abs(x)
Random number (between 0 and 1)	rand()
Modulus	mod(x,y) = x % y
Square Root	sqrt(x)
Min	mix(x,y)
Max	max(x,y)
Sum	sum(x,y,z)
If	if(cond,trueval,falseval)
Str (number to string)	str(x)
Binomial coefficients	binom(n,i)