

Elasticurve Instruction Manuel / FAQ

Hello and welcome to the Elasticurve instruction manual. Here, I will discuss the functionality offered by the Elasticurve application, as well as answer some frequently asked questions.

Overview:

Elasticurves are an attempt to utilize input stroke dynamics information as a means to infer precision. This is inspired by the idea that, typically, one can associate slow movement with precise activity, whereas fast movement is generally associated with imprecise activity. Elasticurves use this information to create curves which match the stroke input very exactly at slowly drawn sections, while approximating heavily at quickly drawn ones.

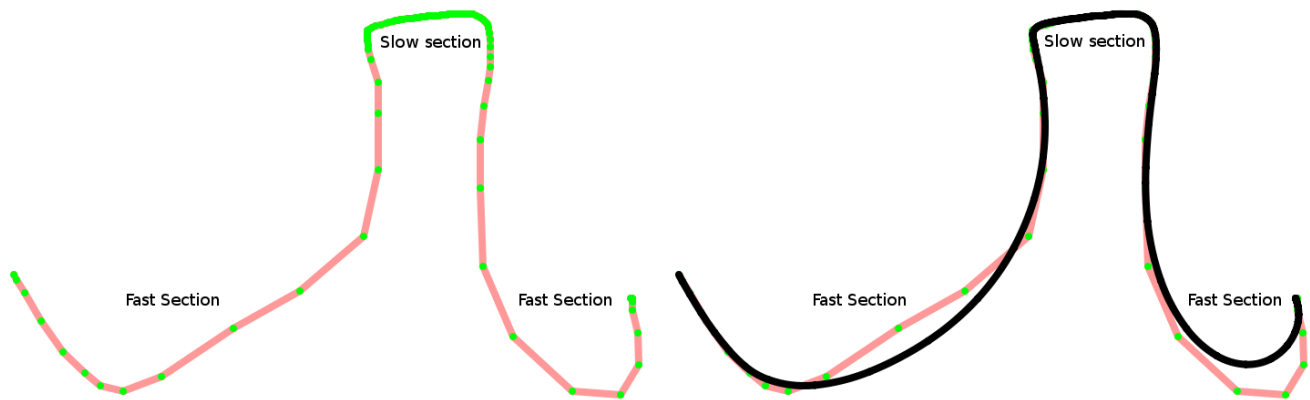


Figure 1: On the left, an input stroke is drawn with varying dynamics. Note how it possesses both slow and fast sections. On the right, the generated elasticurve.

Controls:

Responsiveness Slider:

Responsiveness [0-1]:



The responsiveness slider controls the responsiveness used in the drawn curves. Responsiveness is an indication of how strongly the elasticcurve should track your input stroke. Lower values are to indicate the strong variation from your input is permissible, and vice versa for higher values. Note that the responsiveness value affects quickly drawn sections of the input much more than slowly drawn ones, as regardless of responsiveness, the slowly drawn sections will largely remain intact.

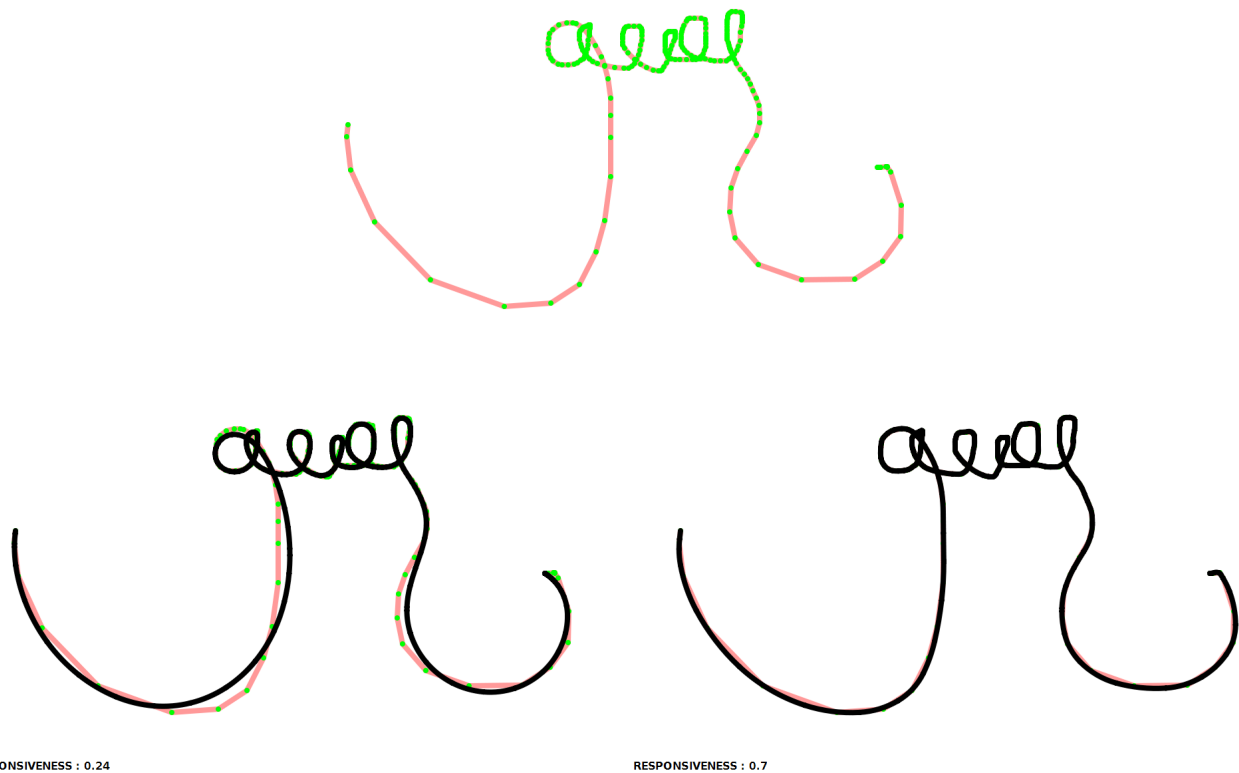
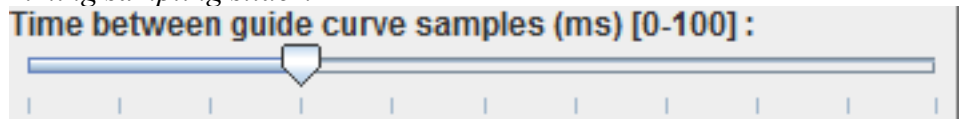


Figure 2: An input stroke (top), and the elasticcurves generated at different responsiveness values. Bottom left: Responsiveness of 0.24. Bottom Right : Responsiveness of 0.7

Timing sampling slider:



When processing your input, elasticurves will reparameterize your stroke such the distance is an indication of speed. It does this by making each point on the curve a fixed time interval apart. For example, suppose the interval is 30 ms (as shown above), then when you are drawing a curve, every 30 ms, if your cursor has moved, a point will be added. The size of the interval used is controlled by this slider.

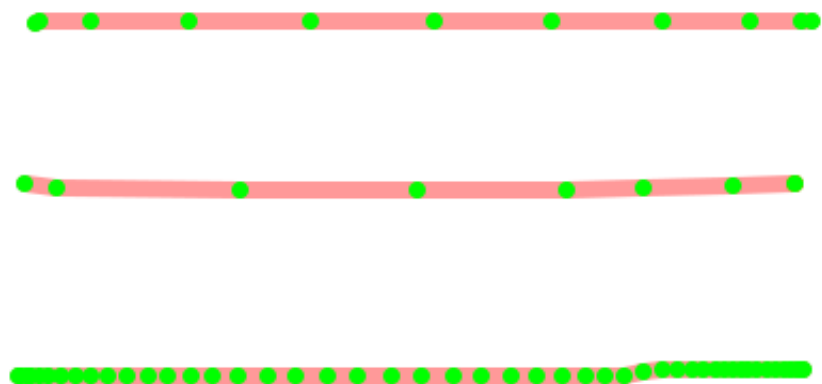
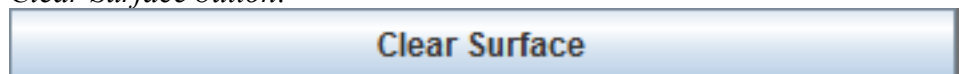


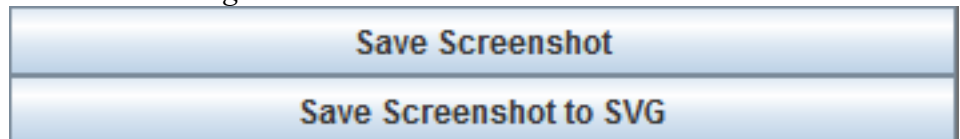
Figure 3: Input strokes drawn at constant speed sampled based on different timing intervals. Top: 30 ms. Middle: 50 ms. Bottom 0 ms.

Clear Surface button:



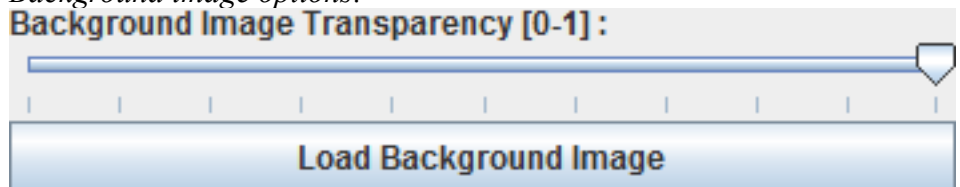
The clear surface button will clear the drawing area of ALL generated curves. Note that you can delete individual curves by right-clicking on one of their points.

Screenshot saving buttons:



These buttons allow you to save a screenshot of the current canvas in either a PNG or SVG format. When a screenshot is made, the saved image will appear in the location where the Elasticurve application was run with a random number as the title (Eg. 1300981987433.svg).

Background image options:



If desired, a background image can be loaded into the drawing area using the "Load Background Image" button. PNG, GIF and JPG formats are supported. Further the opacity of this background image can be modified with the "Background Image Transparency" slider.

Saving/Loading functionality:

Save Canvas
Load Canvas
Save Curves In Maya Format
Load Maya Curves

The elasticuve application allows you to save your work as a .elasti file using the the “Save Canvas” button. Similarly, the “Load Canvas” button will load .elasti files into the drawing area. Maya ascii files (.ma) of curves can be used in a similar manner using the “Save Curves in Maya format” and “Load Maya curves” buttons.

Navigation Buttons:

Zoom In	Move Up	Zoom Out
Move Left	Move Down	Move Right

The navigation buttons will allow the camera to move in different directions and to zoom in and out of the drawing area.

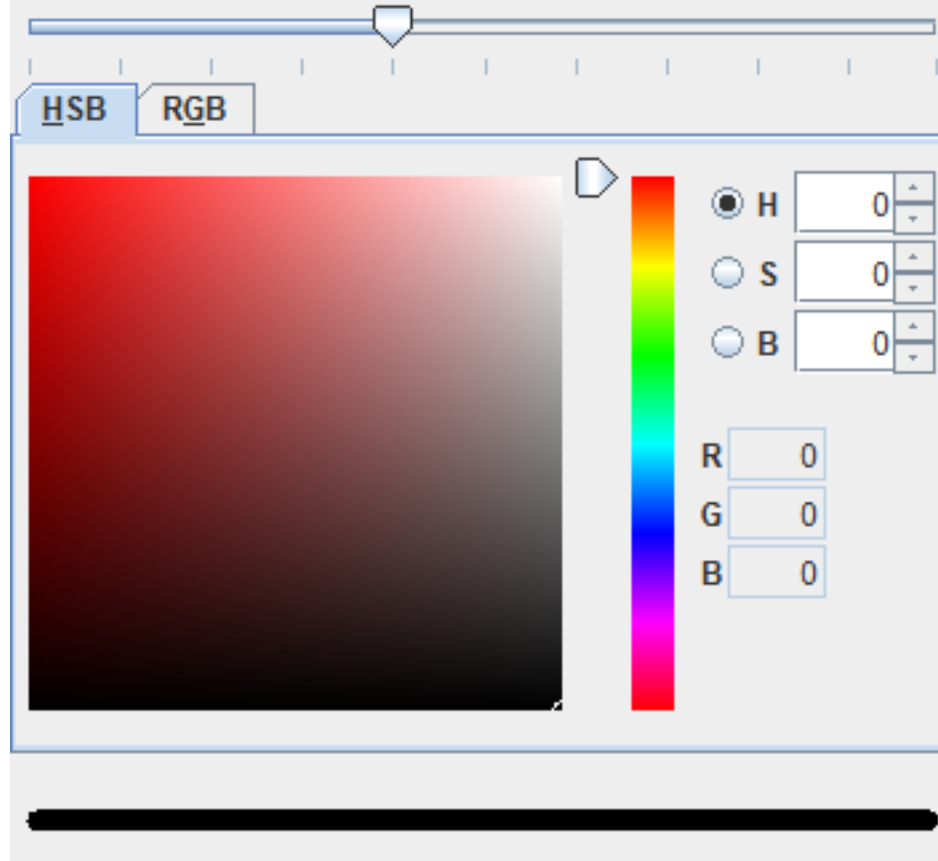
Display Options:

<input type="checkbox"/> Draw Guide Lines ?
<input checked="" type="checkbox"/> Draw Resulting Lines ?
<input type="checkbox"/> Draw Guide Points ?
<input type="checkbox"/> Draw Resulting Points ?
<input checked="" type="checkbox"/> Draw Background Image ?

The display options allow for different aspects of the elasticuves to be shown or hidden. The “Draw Guide Lines” check box indicates whether or not the input strokes should be shown, and the “Draw Guide Points” check box indicates if their points should be shown. Similarly, The “Draw Resulting Lines” check box indicates whether or not the generated elasticurves should be shown, and the “Draw Resulting Points” check box indicates if their points should be shown. Finally, the “Draw Background Image” check box indicates, if a background image is loaded, whether or not it should be drawn.

Esthetic Controls:

Stroke Thickness :



Esthetic properties of the elasticurves, such as thickness and color, can be modified here. A preview of the stroke's appearance is also provided.

Curve Type drop down menu:

Curve Type :
CIRCLE

The type of elasticcurve to be generated can be selected here. Linear elasticcurves are best for drawing lines, while Circle elasticcurves favor circular and curved strokes. Quadric elasticcurves are much like linear elasticcurves, though they have better results with segments with slight curvature. The reasoning as to why each type is better for certain kinds of strokes is because of the manner in which each type is constructed (see figure below).

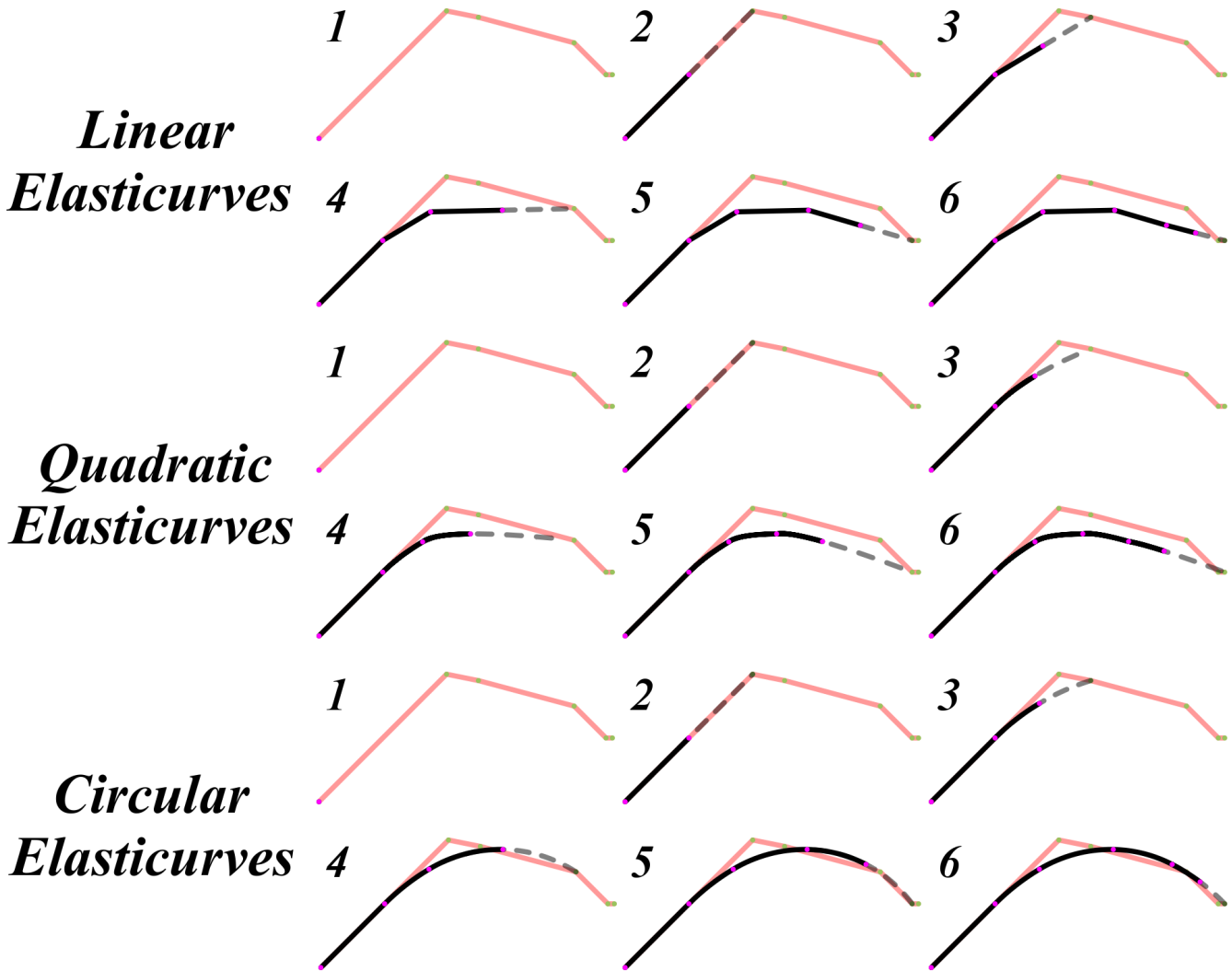


Figure 4: The construction of different elasticcurves. Each time a new input point is specified, a connector (dotted line) is built between the last generated point of the elasticcurve and the input point. A fraction of this connector (this fraction being the responsiveness) is then appended to the elasticcurve and this process iterates until each input point is processed.

Pause time slider:

Additional Time for Pause to be detected (ms) [0-1000]:

A consequence of the manner in which elasticcurves are built is that the generated elasticcurve will never come to join the cursor position without an explicit trigger (see figure 4). The trigger we use is a detection of pause in the sketching motion. If, when drawing, your cursor remains at the same position for the time specified by this slider, the elasticcurve will then rapidly join up to the cursor's position.

Update time slider:



The update time slider indicates the amount of time that must elapse before a new generated elasticurve point is added. While this does not have any effect on the actual generation of the elasticurve, it can provide better visualization, as it allows for the elasticurve built from one of your drawn strokes to be built in slow motion.

Frequently Asked Questions:

If I have a cool creation that I wish to share with you, what is the best way to do so ?

The best way to show us one of your creations is to send us the .elasti (see *Saving/Loading functionality*) file once your sketch is finished. You can send it to me at ythiel@dgp.toronto.edu.

I've been noticing lag between my cursor and the generated stroke. Is this normal ?

Yes. Introducing lag is what allows us to build up the elasticurve using the input stroke's dynamics. If you wish the generated stroke to catch up to the cursor at any point, simply pause your movement (see *Pause time slider*).

Sometimes my elasticurves change slightly after I'm finished drawing them. What's happening ?

Very little post-processing is done to the elasticurve after it is generated. The only thing that can happen is if your curve ends in a nearby area of its starting point, the system will make it such that the end point is equal to the start point, and will further make it such that the resulting elasticurve will have either tangent continuity at that point, or be properly perpendicular (depending on which one makes sense). This, combined with low responsiveness, makes it simple to draw perfect circles and shapes even with a mouse.

I want to draw stroke X, what elasticurve type should I use ?

There is no perfect guideline other than the hints mentioned in the *Curve Type drop down menu* section. A good default is to use Circle Elasticurves. In my experience, those are the ones which handle the most cases adequately.

How do I erase specific elasticurves ?

See the *Clear Surface button* section.

I have a background image I would like to trace over, is that acceptable ?

Of course ! While original sketches are preferred, not everyone is good at visualizing how things should be drawn. If you feel you need a background image to start off with, no problem. If you send us that creation, however, please mention that you did so and also send us the background image you used.

I am having trouble drawing small elasticurves, or very fine detail. How can I remedy this ?

Indeed, as is the case with most neatening techniques, drawing something small and detailed is troublesome. The nature of stroke neatening is we are ultimately filtering down your curve, and so in general the input stroke needs to be “bigger” than the generated one. If you wish to do small, detailed strokes, the best idea is to zoom in to the desired location (see *Navigation buttons*) and then draw it.

I have a question not answered here, how can I reach you ?

Further questions can be directed at me at ythiel@dgp.toronto.edu.