Re: Joining two striagt lines with a smooth curve

Source: http://sci.tech−archive.net/Archive/sci.math/2004−08/3971.html

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Date: 08/21/04

Date: Sat, 21 Aug 2004 17:30:49 GMT

On Sat, 21 Aug 2004 12:26:43 +0000 (UTC), mathma18@hotmail.com
("G.L.Narasimham") wrote:

>On 20 Aug 2004, Richard Owlett wrote:
*>>y1 = a1*x + b1*
*>>y2 = a2*x + b2*
>>ycurve = f(a1,a2,b1,b2)
>>Question 1.
>>The simplest case would be joining the two line segments with a
>>tangent circular arc. I can do this with compass and straight edge. >Is there an analytical expression for a family of such arcs.
>>This would have characteristic that first derivative of the curve
>>would match the first derivative (slope) of the joined segment.
>
>Just like the geometric construction, you need to also determine offset d, radius of tangent circular arc. Write y1,y2 into forms p=x cos(al)+y sin(al), replace p with p−d to solve for the center of arc, when ycurve = f(a1,a2,b1,b2,d)
>
>>Question 2.
>>Are there analytical expressions for curves whose K higher order
>>derivatives would be 0 at the point of tangency?
>
>For higher order contact ,both curves should have a matching minimum order derivative, which is possible if straight lines y1,y2 are replaced by higher order curves, say other circles or parabolas.

For real world applications like railroads, you want to match the
second derivative so as not to have discontinuous jumps in
acceleration and corresponding forces such as you would normally get
with second degree curves. Look up the subject of "transfer curves".

−−Lynn