Subject: Image comparison and tricky shortest vector problem
Posted by matt_westmore on Fri, 18 Jun 2004 13:40:56 GMT
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Hi group,
I'd really appreciate some help with the following problem.

Essentially I have two images I want to compare. My comparison criteria is based on the difference in intensity values and also on the differnece in distance between two points that have similar intensity values.

For each pixel in the first image I need to find the (inter-pixel) point in the seccond image that minimises the length of the following vector.

G = (x2-x0)i + (y2-y0)j + (d2-d0)k

where x0,y0,d0 is the x,y and intensity of the PIXEL in the first image
where x2,y2,d2 is the x,y and intensity of the POINT in the seccond image

It's not a straight forward min() problem becasue the minimum condition could (and normally is) met between pixels in the second image; i.e. effectively I need to interpolate.

I'd be greatful for any advice.

Cheers
Matt

Some Background(For those in the know)
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I'm comparing radiotherpy dose distributions and so I've implemented the Gamma index. This is effectivly the length of a vector that joins two pixels in two dose distributions. Gamma is of the form (dx,dy,ddose); i.e. consists of the diference in distance between the two points and the difference in dose. The task is to search a secondary dose distribution to find the minimum value of gamma fro each pixel in the primary dose distribution.

The problem is that my implementation is approximate and very very slow as I interpolate the secondary dataset to a fine scale and filter for the minimum gamma. This done for each point in th first image with a for loop.