
Subject: Re: Convolution with non-constant Kernel?

Posted by [MC](#) on Fri, 12 Nov 2010 02:05:36 GMT

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On Nov 12, 1:56 pm, SonicKenking <ywa...@gmail.com> wrote:

> Hi, I wonder if there is an easy way to perform convolution on an
> array with non-constant kernel.
>
> The IDL built-in CONVOL function requires the kernel to be a fixed
> array, e.g.
> [-1,2,-1]. I want to have a dynamic kernel that changes based on the
> position of the array. Something like
>
> array = [8,6,7,9,1,3,4,5], kernel=[sin(index_i-1), 2, sin(index_i+1)]
>
> Is there any other built-in IDL function that can do this or is there
> someone who has already coded this up? If the answer is no, I'll go
> ahead and code my own program. Just checking it here beforehand to
> avoid re-inventing wheels.
>

Just a thought, if the kernel is smoothly varying I think you could remap (warp) your data, convolve and then unwarp the data so that you could use a constant kernel?

Another idea, could you could use the linearity of convolution to form it from the sum of convolutions with a series of suitable basis functions which are added with weights into the final convolution? These weights would scale the amplitudes of components that are spatially invariant.

Hope these ideas can help, but for some problems these 'tricks' may not work.

Cheers Mark
