Subject: Re: Automatic Brain Detection from MRI scans
Posted by Ivan Zimine on Sat, 08 Jul 2000 07:00:00 GMT
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anne martel wrote:
>
> There is a lot of literature on how to segment brains in MRI scans
> ranging from fairly simple techniques which could easily be written in
> idl to very complex methods that would take months of work to implement.
> The best method to use will depend on the type of MRI scan you are
> working on and how accurate you want the segmentation to be. For large 3d
> volumes with > 50 slices then a method to set upper and lower threshold
> levels combined with 3d morphology operators to break the connections
> between the brain and the surrounding structures is the simplest
> approach.
> For scans with just a few slices a manual approach which allows
> thresholds to be set interactively and also allows the user to restrict
> the region from growing out into unwanted regions would work.
>
> This bit of code works for a single 128x128 T1 weighted slice (summed
> image)- values of r and thresh have been optimised for our images and can
> be adjusted. We use it to segment the brain from single slice dynamic
> sequences.
>
> mask = bytarr(s[1],s[2])
> r=7
> disc = SHIFT(DIST(2*r+1), r, r) LE r
> thresh=0.25*max(summed_image)
> mask=summed_image gt thresh
> mask=morph_open(mask,disc)
> ; now fill holes
> roi = search2d(mask,0,0,0,0) ;fill holes
> mask(*)=1
> mask(roi)=0
>
> Anne Martel,
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>
> Michael Cugley wrote:
>
>> I've just been given an assignment involving MRI scans of the brain;
>> one of the "wish list" features is being able to automatically detect
>> the brain within each scan. Failing that, some way of making the
>> process easier, such as a single click on "brain", and the program
>> then selecting the rest of the "brain" from there (similar to "magic
>> wand" selection tools in paint programs).

>>
>> Has anyone any experience in this area? References to look up? I'd
>> rather not have to re-invent the wheel on this one...
>>
>> --
>> Michael Cugley (mjcugley@medphys.dundee.ac.uk)

also regs=label_region(mask) & histogram(regs) can help to get rid of
non-brain structures
and roberts function to get the contour of the cortex.

--
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