Subject: IDLffDicom and multiple items
Posted by justspam03 on Thu, 10 Jun 2004 12:45:41 GMT
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Hi all,

I have a problem with Dicom files containing more than one 'item'. In my special case, the dicom file contains 3 items, all of which contain an instance number (tag 0020x,0013x which is of multiplicity 1), but only the second item contains all the patient, examination and image data I'm interested in.

When accessing this tag via IDLffDicom's getvalue method, IDL returns a 3-element array - one element for each 'item', but only the second element contains a meaningful instance number.

Unluckily, I cannot rely on the fact, that it will always be the second.

Now for my question:
Is there any way in IDL to find out about the 'item' hierarchy which allows me to link, say, the image data to a certain item and thus derive the index to use for the instance tag?

Thanks
Oliver

Subject: Re: IDLffDicom and multiple items
Posted by muswick on Mon, 14 Jun 2004 20:50:12 GMT
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Dear Oliver,

What you are observing is a situation where the same tag exists multiple times within one DICOM file. According to the DICOM standard, tags may appear only once, and in ascending order, except when sequences are present (VR type SQ). Sequences are allowed to reuse the tags but with the same restrictions (only once and in ascending order). For example, when a thumbnail or icon image is stored in a dicom file, you will have two sets of "rows", "columns", "pixel data" etc.

The tag (0020,0013) used to be called "image number" in older revisions. It is somewhat a meaningless number. Each manufacturer

can decide on how to use this number. It is just a number that identifies the image in relation to other images in series or acquisition. It can be in numerical order starting at one for each series or it can continue counting up for every image of the patient.

However, back to the problem at hand, what to do when you have indentical tags in the same dicom file. Keep in mind that each additional tag that has the same group/element numbers, and will be within a new sequence. IDLffDICOM provides a method for tracking the hirearchy of sequences (yes, sequences can contain sequences.) The GetChildren and GetParent methods are used to identify which sequence hirearchy the tag belongs to.

Thus, in the case of an icon image that is imbedded in a dicom file, the GetReference method for (0028,0010) "rows" will return an array of two reference numbers, one for the primary image and the other for the icon image. Using the GetParent method for each of these reference numbers, it will return either -1 (no parent sequence) or a reference number of the "icon image" sequence (0088,0200). In the case the icon sequence, the "row", "column", and "pixel data" references will all have the same parent.

I bring up the point of the icon image sequence because they are used frequently with CT and CR images. When you encounter a dicom file with an icon image embedded, IDL will return value arrays for "rows", "columns" and "pixel data" as follows:

```
rows = dicomobj->GetValue('0028'x,'0010'x,/NO_COPY)
HELP,rows
ROWS            INT       = Array[2]
PRINT,rows
512, 64
columns = dicomobj->GetValue('0028'x,'0011'x,/NO_COPY)
HELP,columns
COLUMNS         INT       = Array[2]
PRINT,columns
512, 64
image = dicomobj->GetValue('7fe0'x,'0010'x,/NO_COPY)
HELP, image
IMAGE           POINTER   = Array[2]
HELP,*image[0]
<PtrHeapVar116> INT       = Array[64, 64]
HELP,*image[1]
<PtrHeapVar143> INT       = Array[512, 512]
```

The problem is that the first elements of the "row" and "column" arrays represent the size of the primary image, ie 512xs512, which is the second image array pointer. The second elements of "row" and

"column" arrays are those of the icon image, ie 64x64 which is the
first pixel array encountered.

The reason this happens goes back to the primary rule of ascending
order of all tags. The tag (0088,0200) "icon image" comes after "row"
(0028,0010) and "column" (0028,0011) tags. The tags that follow after
(0088,0200) will be "row" (0028,0010), "column" (0028,0011) and
"pixel data" (7fe0,0010) of the icon image. After the end of the
"icon image" sequence, another "pixel data" (7fe0,0010) will indicate
the primary image data.

In your case, you might have two sequences that have "instance number"
contained in them. Knowing the definition of the parent tag, ie
sequence, with tell you which one you are dealing with. In your case,
I will bet that the one you want, will always have a GetParent value
of -1.

I hope this helps.

Gary Muswick

justspam03@yahoo.de (Oliver Thilmann) wrote in message
news:<c992bd37.0406100445.739f082a@posting.google.com>...
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> Thanks

> Oliver

Subject: Re: IDLffDicom and multiple items
Posted by justspam03 on Wed, 16 Jun 2004 09:36:05 GMT
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Hello Gary,

thank you so much for your extensive answer!

> I hope this helps.

It sure does.

Best regards
Oliver