DCMTK - Feature #279

VOI-Fensterung

2008-07-16 00:00 - Jörg Riesmeier

Status:	New	**Start date:**	
Priority:	Normal	**Due date:**	
Assignee:		**% Done:**	0%
Category:		**Estimated time:**	0:00 hour
Target version:			
Module:	dcmimgle	**Compiler:**	
Operating System:			

Description

Mail von ME vom 2008-04-02
Bei IHE gibt es als Teil des Mammographie-Integrationsprofils eine relativ detaillierte Liste von Anforderungen in Bezug auf die Fensterung. Neben der Unterstützung der "VOI LUT Function" (Sigmoid) wird dabei insbesondere auch gefordert, dass ein Viewer Bilder mit VOI LUT "nachfenstern" können muss - die Veränderung von Window Center/Width wirkt dabei als Skalierung der LUT.
Es wird auch (knapp) erläutert, wie das funktioniert.
Das wäre doch etwas, was wir in DCMTK (dcmimage) auch gerne hätten, oder...?

> We have tried to explain this in the IHE Radiology Technical Framework Volume 2, when we were adding in the Mammo profile.
>
> Specifically:
>
> "4.16.4.2.2.1 Display of Digital X-Ray, Mammo and Intra-Oral Images
>
> For the “For Presentation” variant of the Digital X-Ray Image, the Digital Mammography Image, and the Digital Intra-oral X-Ray Image, the Image Display or Imaging Document Consumer actor shall have both the capability to apply all the transformations specified by the VOI LUT Sequence (0028,3010) and the capability to apply all the transformations specified by the Window Width (0028,1051)/Window Center (0028,1050)/VOI LUT Function (0028,1056) attributes in the DX Image Module as selected by the user from the choices available (e.g., guided by Window Center/Width Explanation (0028,1055) or LUT Explanation(0028,3003).
>
> If VOI LUT Function (0028,1056) is absent, then Window Width (0028,1051)/Window Center (0028,1050) shall be assumed to be the parameters of a linear window operation. VOI LUT Function (0028,1056) values of “SIGMOID” and “LINEAR” shall be supported.
>
> The Image Display or Imaging Document Consumer shall support the application of LUT Data (0028,3006) in items of the VOI LUT Sequence (0028,3010) regardless of the Value Representation (i.e., the DICOM standard allows either OW or US Value Representation).
>
> The Image Display or Imaging Document Consumer actor must also support pixel rendering according to the Grayscale Standard Display Function (GSDF) defined in DICOM 2007 PS 3.14, because the output values of these images are always P-Values.
>
> If the DICOM image is referenced by other DICOM composite objects, such as Grayscale Softcopy Presentation States, it is optional for the Image Display or Imaging Document Consumer to actually retrieve and display/apply these objects."
>
> and

"4.16.4.2.2.1.1.4 Image Contrast Adjustment

As described in 4.16.4.2.2.1 Display of Digital X-Ray, Mammography and Intra-Oral Images, the Image Display shall provide the user with the ability to select amongst the available window and VOI LUT choices available in the image object.

Subsequent to the initial application of the chosen contrast transformation, the Image Display actor shall allow the user to adjust the contrast without reverting to a purely linear transformation:

- If the chosen contrast transformation is a lookup table, then the Image Display shall allow the input value of the lookup table to be stretched and translated so as to give the affect of adjusting contrast and brightness whilst applying the same general shape as the curve encoded in the lookup table. To provide feedback to the user, the “window width” can be reported as the adjusted range of input values to the LUT, and the “window center” can be reported as the center value of that range.

- If the chosen contrast transformation is a sigmoid shaped VOI LUT Function parameterized by the window center and width, then the Image Display shall allow the window center and width values to be adjusted and a sigmoid function reapplied.

If a Pixel Padding Value (0028,0120) only is present in the image then image contrast manipulations shall be not be applied to those pixels with the value specified in Pixel Padding Value (0028,0120).

If both Pixel Padding Value (0028,0120) and Pixel Padding Range Limit (0028,0121) are present in the image then image contrast manipulations shall not be applied to those pixels with values in the range between the values of Pixel Padding Value (0028,0120) and Pixel Padding Range Limit (0028,0121), inclusive."