Usage of Presentation State (PR) Objects for Ultrasound 3D images

Ramanjini Dasari
Philips Healthcare
Sr. Technical Specialist
Bangalore, India

Co-Authors: Rupam Sarkar
Software Architect
Bangalore, India
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Agenda

- DICOM Presentation State
- Relationship to Image
- 3D Presentation State Object
- Examples
- Conclusions
DICOM Presentation State

- An independent DICOM Information Object Definition (IOD)
- Contains no pixel data
- Lightweight object
- Saves visual display specification
- Multiple presentation states
- Manually adjusting visual display settings
A set of standard DICOM attributes

- (0008,1115) ReferencedSeriesSequence
- (0008,1140) ReferencedImageSequence
- (0008,1150) ReferencedSOPClassUID
- (0008,1155) ReferencedSOPInstanceUID
Relationship to Image (Contd..)

Diagram:

- **Study**
  - **ThreedPR Series**: 1:0-1
  - **Image Series**: 1::1
  - **SR Series**: 1:0-1

- **Threed Presentation State**: 0..*

- **Image**: 0..*

- **SR Document**: 0..*
Need to transfer studies with 3D images
Implemented DICOM 3D Presentation State object creation
Render the 3D volume same as before capture
Store\Retrieve to\from a PACS system
Use of private tags
3D Presentation State object stores the information given below:

- Volume orientation and rotation matrices
- Zoom factor, Gray map, Chroma map (colorization)
- Echo and color vision setting, smoothing, gain
- Brightness, Compression (dynamic range)
- Rotation style (absolute or relative)
- Volume look direction (Top, bottom, left, right, front and back)
- Color baseline, Volume crop info
Original image with default Presentation State object
Same image with different orientation
Same image with different rotation info
Same image with different colorization
Same image with change in Zoom factor
Conclusions

- An independent DICOM IOD
- Helps to display/view DICOM images with different visual display specifications
  - 3D image volumes in different orientations and rotations
- Multiple presentation states
- Store/Retrieve to/from a PACS system
- DICOM Working Group - Defining an N dimensional Presentation State object
  - Enhances interoperability
References

http://dicom.nema.org/
Author Contacts

- Ramanjini.Dasari@philips.com
- Rupam.Sarkar@philips.com

Thank you for your attention!