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| 1 |  | Run the run\_ACR\_test.m script |
| 2 |  | Choose “Test Demo” if you want to perform on the demo images. Choose “My Own Site” if you want to do QA on your site’s image.  The zip file also comes with QA image acquired at HMRI’s Siemens 3T Prisma scanner. You can use this image to try the “My Own Site” button.  The geometric distortion on S1 should fail in this image, because the air bubble.  The zip file also comes with QA image acquired at the Hunter Radiology, Glendale. Scanner is a Toshiba Vantage Titan 1.5T. You can also try this image.  The geometric distortion measured diagonally on S5 should fail, because the existence of bright segments at the image lateral side. I don’t know the cause of those segment yet. Please contact me if you know the answer.    Both images have the field strength DICOM tag, so user doesn’t need to choose field strength when doing PIU test (please see point 13). |
| 3 |  | If you chose “My Own Site”, you will need to select the directories of localizer, T1 and T2 images one by one.  Please note that you need to double click the folder and get into the folder before clicking “OK” or “Select Folder”.  Please note that ACR recommended T2 image was dual echo with 22 images in total. You don’t need to delete the first 11 images, the program can detect the right images to use by itself. |
| 4 |  | User’s visual contrast on that particular monitor. The number is in %.  If you know the value, then click "Yes" and then enter the value in the popup window. If not, click "No" and proceed to next step. |
| 5 |  | To test the contrast sensitivity, find the pixel pair with lowest contrast that you can identify both horizontal and vertical dots.  Put the cursor on the lower left dark pixel. The contrast (in %) is given at the bottom left corner (indicated by the red circle). |
| 6 |  | Enter the contrast value shown in previous window. |
| 7 |  | Automatic HCSR (high contrast spatial resolution) test is available.  It is based on the best contrast value you entered in the previous step. |
| 8 |  | If selected “Manual”, then change the intensity level and windows to perform HCSR as instructed in the ACR manual.  You need to be able to identify 4 points at anyone of the given rows in the upper left corner point matrix and 4 points at anyone of the given columns in the lower right corner. You can use the histogram tool to adjust the window and level to help identification. |
| 9 |  | Enter the HCSR results, if selected “Manual”.  Left= 1.1  Middle= 1.0 or 1  Right= 0.9 |
| 10 |  | Automatic PIU (percentage intensity uniformity) test is available.  If you chose "Automatic", then ignore the next 2 steps. |
| 11 |  | If selected “Manual”, then choose the ROI area first |
| 12 |  | Follow the prompt window, select “Yes” until dark spot is observed. A window will pops up, user can use a cross curser to click at any place to generate a 1cm2 ROI around that place. Later do the same to the bright spot. |
| 13 |  | If the image does not have the field strength DICOM tag, user need to select the field strength manually. Otherwise, it can be done automatically |
| 14 |  | Following the PIU and ghosting test, the low contrast object detectability test images will be shown. For each sequence, there are 4 such images.  When you do the LCOD test, change the image intensity level and window and observe how many high intensity spokes with the same size you can see. You have to be able to see all three spokes with the same size to say you can detect spokes of that size. |
| 15 |  | Close the image window and this window pops up. Enter the number of spokes (1-10) you can see on that image.  Click “OK” and the next image will be shown. |
| **After T1 image QA, T2 image QA will take place, so follow the same procedure** | | |
| 16 |  | Once T2 QA has been done, this window pops up. Name the Excel file name (you don’t have to include the extension like .xlsx). |
| 17 |  | The path of the saved Excel file and log file is shown in cmd window |
| 18 |  | Log.txt is a log file contains the test results and test time. It is suitable for a quick review of the test result after the test. |
| 19 |  | Excel report is a summary of the test results. For long term performance summary, user can copy/paste each test results (row) to a summary Excel file. |