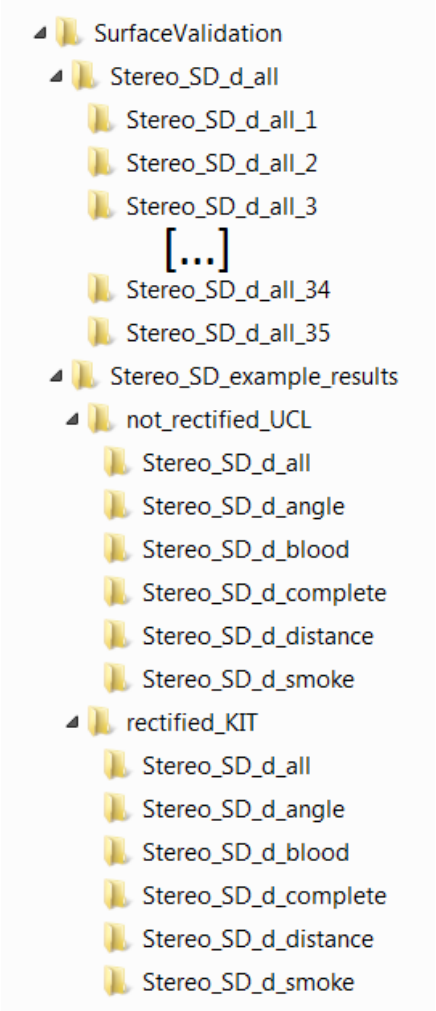
Crash Course: Use the Validation Tool to Reproduce Results from the Paper

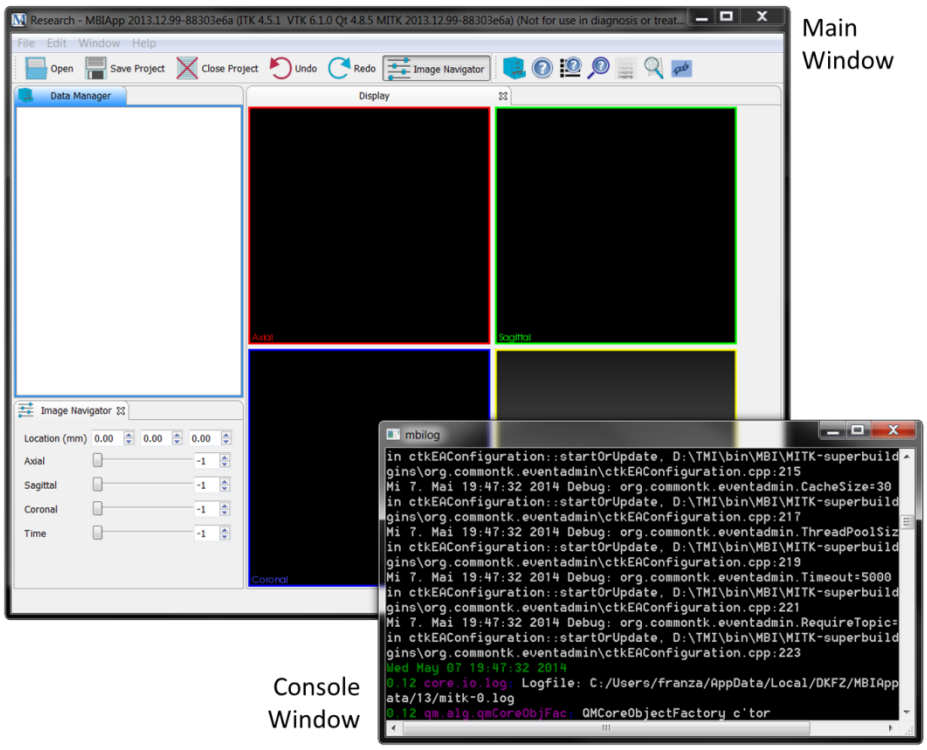
Step 1: Installation

- Download the validation tool installer, a data set and the example reconstructions zip file (Stereo_SD_example_results.zip). As data set we take “D-All” (Stereo_SD_d_all.zip) in this crash course, so we can reproduce the results from Figure 9 of the paper.
- Install the validation tool.
- Extract both zip archives (Stereo_SD_example_results.zip and Stereo_SD_d_all.zip) to a folder of your choice. Best create a new folder, e.g., “C:/temp/SurfaceValidation”. Your folder should now look like this:



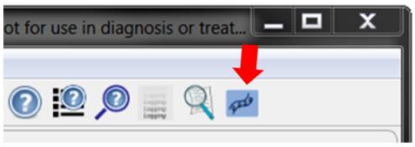
→ Then start the validation tool

You should see an application looking like the screenshot on the top of the next page. The application includes the main window containing the user interface as well as a console window which shows output messages.

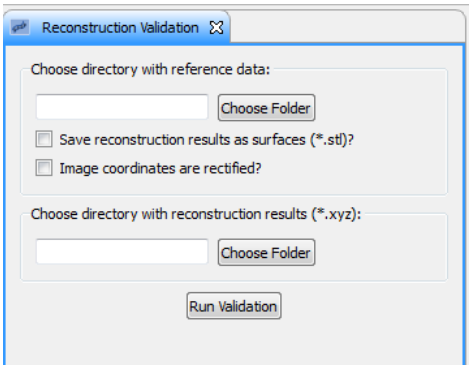


Step 2: Initialize the Validation Tool

- Activate the “Reconstruction Validation” plugin by clicking the icon in the upper main window.



- First click “Choose Folder” for the folder containing the reference data sets and browse to directory of the D-All data set, e.g. “C:\temp\SurfaceValidation\Stereo_SD_d_all”
- Then activate the checkbox “Image coordinates are rectified”, because we will validate rectified data in this case.
- Last, click “Choose Folder” for the folder containing the reconstruction results and browse to the subdirectory “rectified_KIT\Stereo_SD_d_all” of the example rectifications. E.g., “C:\temp\SurfaceValidation\Stereo_SD_example_results\rectified_KIT\Stereo_SD_d_all”. Make sure, that the validation criterion (all, angle, blood, etc.) of reference and reconstruction data is the same (in this example all).

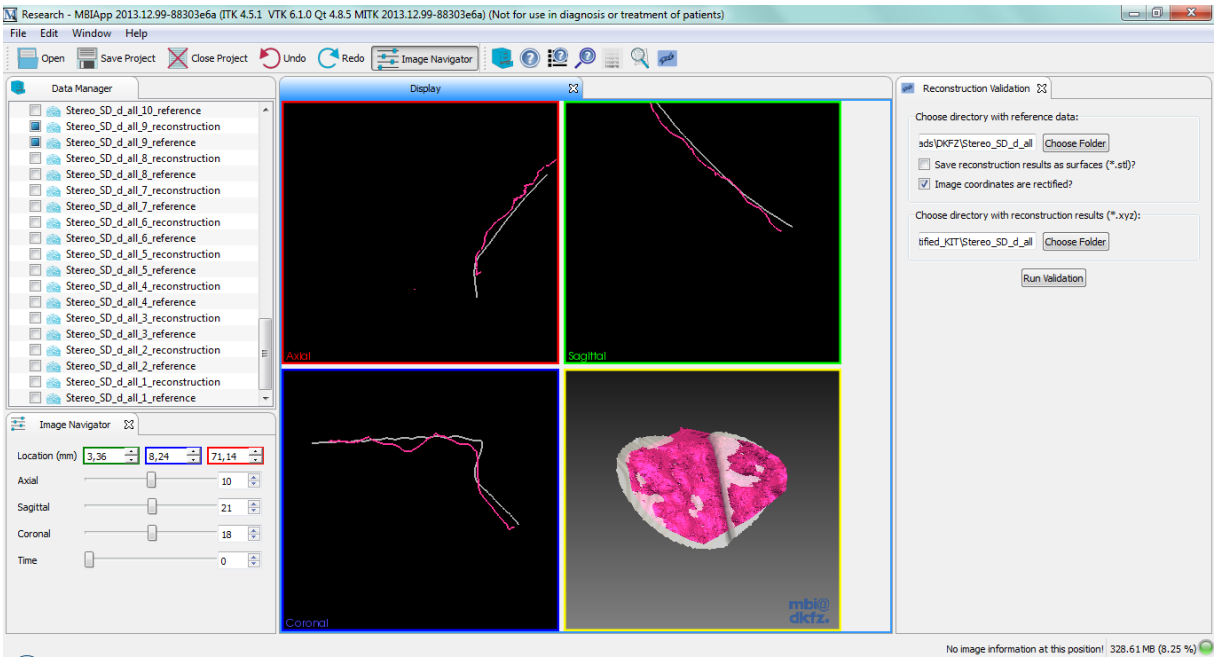


Step 3: Run the validation

- Click “Run Validation” and wait until the progress bar and the hourglass mouse pointer disappear.

Step 4: Have a look on your results in the main window

When the validation is finished, you can see all reconstruction results together with the reference data in the data manager plugin as shown in the screenshot on the left side. Click on these results to make them visible in the main window as shown below.

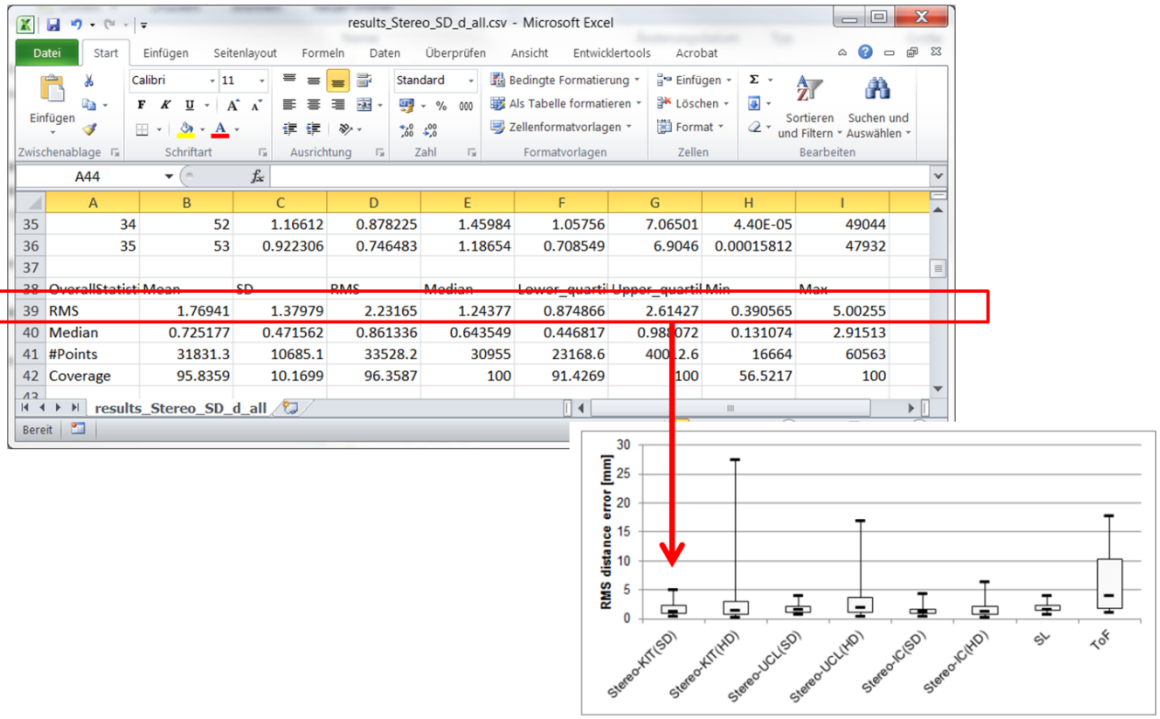


Step 5: Compare the results to the paper

The validation tool is also generating statistics over all validated data sets. These statistics can be found in the reference folder in a csv file.

E.g.: “D:\temp\SurfaceValidation\Stereo_SD_d_all\results_Stereo_SD_d_all.csv”

You can open this csv file and compare the results to Figure 9 of the paper.



	A	B	C	D	E	F	G	H	I
35	34	52	1.16612	0.878225	1.45984	1.05756	7.06501	4.40E-05	49044
36	35	53	0.922306	0.746483	1.18654	0.708549	6.9046	0.00015812	47932
37									
38	OverallStatist	Mean	SD	RMS	Median	Lower_quartil	Upper_quartil	Min	Max
39	RMS	1.76941	1.37979	2.23165	1.24377	0.874866	2.61427	0.390565	5.00255
40	Median	0.725177	0.471562	0.861336	0.643549	0.446817	0.98[illegible]072	0.131074	2.91513
41	#Points	31831.3	10685.1	33528.2	30955	23168.6	400[illegible]2.6	16664	60563
42	Coverage	95.8359	10.1699	96.3587	100	91.4269	[illegible]100	56.5217	100

Fig. 9. Box plot (median, first and third quartiles, minimum and maximum) of the root-mean squared (RMS) surface reconstruction error according to sec. III-H, determined for all shapes without blood and smoke ($n = 35$) for all reconstruction techniques investigated in this study (cf. sec. II).