

Online Resource 1

Optimization of the AutoRef pre- and post-processing settings on the validation set

We optimized the following pre- and post-processing parameters on the validation set: type of scaling, number of the detector training stages, radius of the morphological opening structure, number of the evaluated slices, low (muscle) and high (fat) percentiles used to calculate the reference intensity values and focus regions (inferior-superior slices and posterior-anterior rows) for fat and muscle. The table below lists the effect on the median histogram intersection (HI) when changing one parameter at the time, while keeping the other parameters set at the **bold** values. The **bold** set of parameters was considered our optimal set as no further improvements of more than 1% could be achieved by additional tuning of the parameters (i.e. Change in HI median < 1% for all parameter values).

Settings	HI median	Change in HI median (%)	Selected as an optimal
<i>Scaling</i>			
99th Percentile	0.76997959	0	X
Median	0.77183996	0.241613039	
Max	0.76662009	-0.436310938	
None	0.75950878	-1.359881374	
<i>Number of detector Stages</i>			
1	0.77192269	0.252357431	
2	0.76997959	0	X
3	0.76997959	0	
4	0.76997959	0	
5	0.76997959	0	
<i>Morphological opening structure radius</i>			
1	0.76997959	0	X
2	0.77002793	0.006277583	
3	0.7677967	-0.283500407	
4	0.76807893	-0.246846188	
5	0.7675968	-0.309461357	
<i>Number of evaluated Slices</i>			
1	0.76806568	-0.248566275	
2	0.77272643	0.356741256	
3	0.76997959	0	X
4	0.76859372	-0.179988324	
5	0.77103737	0.137376853	

<i>Low percentile (Muscle)</i>			
25	0.7736801	0.48059794	
20	0.77221788	0.290693982	
15	0.77017365	0.025203469	
10	0.76997959	0	X
5	0.76839093	-0.206325746	
<i>High percentile (Fat)</i>			
75	0.76036739	-1.044199148	
80	0.76423774	-0.540504432	
85	0.76676418	-0.211708731	
90	0.76839093	0	X
95	0.76178638	-0.859529925	
<i>Focus Region Slices (Fat)</i>			
All [0-100%]	0.76997959	0	
Lower Half [0-50%]	0.76997959	0	
lower 75% [0-75%]	0.76997959	0	X
Middle [25%-75%]	0.76964891	-0.042946643	
Upper Half [50%-100%]	0.74567085	-3.157063397	
Upper 75% [25%-100%]	0.76964891	-0.042946643	
<i>Focus Region Rows (Fat)</i>			
All [0-100%]	0.76968231	-0.03860894	
Lower Half [0-50%]	0.76997959	0	X
lower 75% [0-75%]	0.76968231	-0.03860894	
Middle [25%-75%]	0.75187963	-2.3507062	
Upper 75% [25%-100%]	0.75562408	-1.864402074	
<i>Focus Region Slices (Muscle)</i>			
All [0-100%]	0.77053318	0.071896978	
Lower Half [0-50%]	0.7737537	0.490156996	
lower 75% [0-75%]	0.76997959	0	
Middle [25%-75%]	0.76997959	0	X
Upper Half [50%-100%]	0.7679594	-0.262369737	
Upper 75% [25%-100%]	0.77053318	0.071896978	
<i>Focus Region Rows (Muscle)</i>			
All [0-100%]	0.76913026	-0.110305212	
Lower Half [0-50%]	0.76709563	-0.374550451	
lower 75% [0-75%]	0.76913026	-0.110305212	
Middle [25%-75%]	0.76997959	0	X
Upper 75% [25%-100%]	0.76912854	-0.110528935	