

Image Optimization

Accurate tracking of bones is sensitive to the X-ray and [digitally reconstructed radiograph](#) (DRR) image processing parameters. In some cases it can take a significant amount of trial and error to determine the parameter values that enable the image matching algorithm to “lock in” on the correct bone pose. That is, the parameter values that cause the global minimum of the image fitness function to be at the correct bone pose. There are 15 different parameters, and sometimes changes of 1 or 2% in one of them can change the “optimal” bone pose by a few degrees or millimeters.

Image Optimization Widget

The *Image Optimization* widget is a tool for automatically finding optimal values of the parameters.

Image Optimization

Max Iterations:

200

Xray Merge (%):

50

500

Xray Min Edge (%):

0

30

Xray Max Edge (%):

20

100

Xray Threshold Min (%):

0

50

Xray Threshold Max (%):

50

100

Xray Scale:

200

300

DRR Merge (%):

5

200

DRR Min Edge (%):

0

20

DRR Max Edge (%):

20

100

DRR Threshold Min (%):

0

30

DRR Threshold Max (%):

50

100

DRR Scale:

200

300

Bright Factor:

0

10

Bright Threshold:

200

300

Diff Threshold:

1

100

Optimize

Stop

The sliders allow you to specify ranges for each of the 15 parameters in the [X-Ray and DRR Settings widget](#). The *Max Iterations* slider at the top is for specifying how many tracking optimizations to perform with randomly chosen parameter values within the specified ranges.

Each tracking optimization proceeds as if you had selected *Solve Current Frame* in the *Object Tracking* widget. It optimizes the selected bones, starting at their current poses, and compares the final poses to the initial ones. The smaller this difference, the better the result.

Tutorial

See [How To: Optimize X-Ray/DRR Settings](#) for a step-by-step guide on using this widget.

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