

aiAveraging

Sub-Tomogram Averaging estimates the rotation and shift of each sub-tomogram relative to reference.

aiAveraging needs a configuration file provided by the **-u** argument. Some options can be overwritten using command line arguments.

Options are:

CudaDeviceIDs

The deviceIDs of the GPUs to use.

Argument for command line: **-d** or **--CudaDeviceIDs**

Type: **List<int>**, a list of integer values

Option is mandatory: **true**

LP

Low pass filter value.

Argument for command line: **-lp** or **--LP**

Type: **float**

Option is mandatory: **true**

LPS

Low pass filter sigma value.

Argument for command line: **-lps** or **--LPS**

Type: **float**

Option is mandatory: **true**

HP

High pass filter value.

Argument for command line: **-hp** or **--HP**

Type: **float**

Option is mandatory: **false**

Default value if not set: **0**

HPS

High pass filter sigma value.

Argument for command line: **-hps** or **--HPS**

Type: **float**

Option is mandatory: **false**

Default value if not set: **0**

MotiveList

The list of particles to average. Naming convention: filename_IterationNr.motl.

Type: **string**

Option is mandatory: **true**

Particles

Particle filename. Two naming conventions are possible: filename_PartNr.em/mrc or filename_TomoNr_PartInTomoNr.em/mrc

Type: **string**

Option is mandatory: **true**

References

Reference filename. Naming convention: filename__RefNr__IterationNr.em/mrc.

Type: **string**

Option is mandatory: **true**

Wedges

Wedge filename. Naming convention: filename__WedgeNr.em/mrc.

Type: **string**

Option is mandatory: **true**

Mask

Mask filename. Naming convention: filename__MaskNr.em/mrc.

Type: **string**

Option is mandatory: **true**

RotateMask

Indicates if the reference mask has to be rotated with the particle orientation.

Type: **bool**

Option is mandatory: **true**

MaxShift

Maximum allowed shift (or set MaskCC filename)

Type: **int**

Option is mandatory: **false**

Default value if not set: **0**

MaskCC

MaskCC filename. Naming convention: filename.em/mrc.

Type: **string**

Option is mandatory: **true**

Only applicable if **MaxShift** = -1.

RotateMaskCC

Indicates if the CC-Mask has to be rotated with the particle orientation.

Type: **bool**

Option is mandatory: **true**

Only applicable if **MaxShift** = -1.

StartIteration

The iteration to start with this run of averaging.

Type: **int**

Option is mandatory: **true**

IterationCount

The number of iterations to perform starting at 'StartIteration'.

Type: **int**

Option is mandatory: **true**

AngIter

Number of angular search increments.

Type: **int**

Option is mandatory: **true**

AngIncr

Angular search increment.

Type: **float**

Option is mandatory: **true**

PhiAngIter

Number of angular search increments for phi angle.

Type: **int**

Option is mandatory: **true**

PhiAngIncr

Angular search increment for phi angle.

Type: **float**

Option is mandatory: **true**

BestParticleRatio

Only sum up the best 'BestParticleRatio' particles for each reference.

Type: **float**

Option is mandatory: **false**

Default value if not set: **1**

CouplePhiToPsi

Indicates if the phi angle is coupled to psi (can be necessary for restricted search ranges).

Type: **bool**

Option is mandatory: **true**

Method

Defines the averaging method: 'Standard' for averaging on a single reference per class, 'Gold-Standard' for two independent references per class, 'Multi-Reference' for classification.

Type: one of [**GOLDSTANDARD**, **MULTIREFERENCE**, **STANDARD**]

Option is mandatory: **true**

Possible notations:

- **GOLDSTANDARD**: GOLDSTANDARD, GOLD-STANDARD, Gold-Standard, gold-standard, Gold-Standard, goldstandard
- **MULTIREFERENCE**: MULTIREFERENCE, MULTI-REFERENCE, Multi-Reference, multi-reference, MultiReference, multireference
- **STANDARD**: STANDARD, Standard, standard

CorrelationMethod

Defines the correlation method to use: 'Cross-Correlation' or 'Phase-Correlation'.

Type: one of [**CROSSCORRELATION**, **PHASECORRELATION**]

Option is mandatory: **true**

Possible notations:

- **CROSSCORRELATION**: CROSSCORRELATION, CROSS-CORRELATION, CROSS_CORRELATION, CrossCorrelation, Cross-Correlation, Cross_Correlation, crosscorrelation, cross-correlation, cross_correlation
- **PHASECORRELATION**: PHASECORRELATION, PHASE-CORRELATION, PHASE_CORRELATION, PhaseCorrelation, Phase-Correlation, Phase_Correlation, phasecorrelation, phase-correlation, phase_correlation

CompensateNoWBPWeighting

When particles are reconstructed without WBP weighting and when using cross-correlation, the amplified amplitudes due to reconstruction are corrected before cross-correlation, if set to 'true'.

Type: **bool**

Option is mandatory: **true**

Only applicable if **CorrelationMethod** = CROSSCORRELATION.

SubPixelRatio

For values > 1, the shift is determined with sub-pixel precision. 2=0.5 pixel shift, 4=0.25 pixel shift, etc.

Type: **int**

Option is mandatory: **false**

Default value if not set: **1**

PhaseRandomizationLimit

When assessing resolution, an additional FSC is performed with randomized phases for frequencies above the limit. This allows to quantify the influence of the mask on the FSC.

Type: **int**

Option is mandatory: **true**

AddParticles

If set, the particles are only summed up to create a new reference for the first given iteration.

Argument for command line: **-add** or **--AddParticles**

Type: **bool**

Option is mandatory: **false**

Default value if not set: **false**

DoseWeighting

Enabled by default, if set to false, no dose weighting is applied. If true, and the particles are reconstructed without dose weighting, the particle is weighted before summation.

Type: **bool**

Option is mandatory: **false**

Default value if not set: **true**

Symmetry

If provided, the average result is symmetrized with the provided symmetry (even, odd and summed volume).

Type: **string**

Option is mandatory: **false**
Default value if not set: **"**

RigidScan

Scan Psi angles with fixed angular distance (equal to PhiAngIncr).

Type: **bool**

Option is mandatory: **false**

Default value if not set: **false**

SaveFilteredReference

Indicates if additionally to the reference volume, a volume low pass filtered to the estimated resolution is saved, too.

Type: **bool**

Option is mandatory: **false**

Default value if not set: **false**