Cost matrix description:

This function takes in the detected objects and calculates the cost of potentially linking them between consecutive frames.

Parameter Descriptions:

Each particle can have some of the three motion models depending on the checked options:
(1) Random motion, *i.e.* no position propagation.
(2) Motion "forward" with constant velocity.
(3) Motion "backward" with opposite velocity.
"Forward" and "backward" are arbitrary directions, and are simply the opposite of each other.

Allow directed motion position propagation linear motion position propagation: If unchecked, only "random motion" is used, i.e. no position propagation. If checked, particle positions are first propagated to the next frame before searching for potential links.

Allow instantaneous direction reversal
If checked, each particle can have any of the three motion models described above. If unchecked, only "random motion" and "forward motion are allowed"

Checking/unchecking these options will be propagated to the cost function of Step 2.

Brownian Search radius: Define **Lower Bound** and **Upper Bound**. NOTE: The lower bound does NOT mean that a particle has to move at least that number of pixels, it simply sets a lower bound on the search radius. The particle can still move anywhere from zero pixels up to its search radius.

Multiplication Factor for Brownian Search Radius Calculation: Factor by which displacement standard deviation is multiplied to estimate search radius.

Check "**Use nearest neighbor …**" to use particle density, in addition to motion, to estimate search radius. If unchecked, only motion is used.

Plot histograms of linking distances: If checked, the histogram of linking distances up to the specified frames will be plotted. This option can be used to check whether the search radius upper bound is reasonable or too small. A chopped off histogram means that the search radius upper bound is too small. HOWEVER, a histogram smoothly decaying to zero does not imply that good tracking has been achieved – one should check the tracking results by making static and dynamic plots of the tracks to make the final decision on the search radius lower and upper bounds.