

USER GUIDE

PSO_lib.m

For Wolfram Mathematica 8

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How to import?

First, set the active directory, to where the m-file is located

Example:

SetDirectory["C:/PSO"]

Then, use following import function:

Import["PSO_lib.m", "Get"]

Warning: Import: : nffil: "File not found during Import.", means that the active directory or file name wasn't set correctly.

How to use the functions?

Each function is called by its name and proper format of input parameters.

PSOBase[Cost function, Specimen]

PSOBaseCons[Cost function, Specimen, Constriction factor*]

PSOBaseWeight[Cost function, Specimen, Starting weight*, Ending weight*]

PSOBaseVmax[Cost function, Specimen, Velocity factor *]

- Velocity factor is single number, used to calculate the max velocity in each dimension, using formula: $V_{max} = (Range\ To - Range\ From) / Velocity\ Factor$

PSOAdv[Cost function, Specimen, Iterations, Number of particles, c_1 , c_2]

PSOAdvCons[Cost function, Specimen, Iterations, Number of particles, c_1 , c_2 , Constriction factor]

PSOAdvWeight[Cost function, Specimen, Iterations, Number of particles, c_1 , c_2 , Starting weight, Ending weight]

PSOAdvVmax[Cost function, Specimen, Iterations, Number of particles, c_1 , c_2 , Vector of max. velocities]

Input marked '*' is not required. Default value is used.

Specimen format

Correct specimen format: {{Type, {From, To}}, {Type, {From, To}}, ..., {Type, {From, To}}}

Only Real or Integer type and values are accepted.

Cost function format

When using self-created cost function, following rules must be obeyed.

- a) Cost function has one input – array of numbers.
- b) Output is single number, with no vector brackets.

Result format

Return value has following format: {gBest value, gBest position} where:

- gBest value is single number.
- gBest position is vector of similar length as is the dimension. Contains parameters to cost function, which will return the gBest value.

Use [[1]] or [[2]] to get only value or position of gBest.

Example:

PSOBase[Cost function, Specimen][[1]] – only value of gBest is returned.