**How to run Bonobo Optimizer Matlab code**

The code is written and tested in Matlab 2017b version. It has three .m files.

**‘MyObjectiveFunction.m’** file is used for defining the objective function to be solved. Its input is a bonobo or array of variables with dimensions. Here, is the total number of variables of the optimization problem. Output of this function is the objective value.

**‘BO.m’** is another function, where the mechanism of Bonobo Optimizer (BO) has been written through codes. The inputs of this function are population size (N), total number of variables (d), lower limit of the variables (Var\_min), upper limit of the variables (Var\_max), maximum number of iterations (max\_it), and the objective function or Cost Function. However, the outputs of this function are bestcost (i.e., the best-obtained objective value), alphabonobo (i.e., the best solution) and convergence\_curve (i.e., evolution of the best-objective value over the iterations).

In this file, a user needs to provide a few things as follows:

* **Initial probability for extra-group mating (p\_xgm\_initial)** in line no. 3. In general, a value in the range of (0.01, 0.06) may be selected through some trials-and-error method for this parameter. However, for the optimization problem with higher number of variables (), a user may set its value equal to 1/d.
* **Sharing coefficient for alpha bonobo (scab) and selected bonobo (scsb)** in line no. 4 and 5, respectively. Value of these two parameters may be set in the range of (1, 1.5) through some trials-and-error method.
* **Rate of change in phase probability (rcpp)** in line no. 6. Value of this parameter may be determined in the range of (0.003, 0.005) through some trials-and-error method.
* **Maximum value of temporary sub-group size factor (tsgs\_factor\_max)** in line no. 7. Value of this parameter may be chosen in the range of (0.03, 0.07) through some trials-and-error method.

**‘Main.m’** is the main program file, which is to be executed by the user. In this code, a user has to define a few things as follows:

* **Total number of variables (d)** of the optimization problem, in line no. 12.
* **Lower limit of the variables (Var\_min)**, in line no. 13.
* **Upper limit of the variables (Var\_max)**, in line no. 14.
* **Population size (N)**, in line no. 16. In general, N is set equal to five to ten times of the number of variables (d). However, a user may set its value in different manner too.
* **Maximum number of iterations (max\_it)**, in line no. 17.

After completing all these simple steps, user should run the **‘Main.m’** file and get the results.