**Object Library for Evolutionary Techniques (ET-Lib) Volume 2:**

**DIFFERENTIAL EVOLUTION**

**July, 2014**

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Version 2.0 of the library of Evolutionary Techniques (ET-Lib) was updated in 2013 at the Asian Institute of Technology (AIT), Thailand. The purpose of this library is to provide the researchers and students who are working on various optimization problems with a general and effective tool based on various evolutionary techniques. The second release contains the library from Version 1 (the Particle Swarm Optimization algorithm (PSO) with multiple social learning terms (GLNPSO) and PSO algorithm for Multi-Objective Optimization (M3PSO)) and the new class library for Differential Evolution.

Version 2.0 of ET-Lib includes all the necessary classes and routines which can be used to implement the PSO and DE algorithms (both single and multi-objective).

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**Release version notes**

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This is a fully functional version, with a complete manual for two key algorithms – DE and MODE. However, a few minor bugs may have escaped our extensive testing. Please contact the developers (see below) if you find any.

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**System Requirement**

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Window XP/Vista

Microsoft Visual C# 2010 with version 4.0 of .NET framework.

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**Library’s Description**

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Here is the structure of the ET library:

The files in this library are grouped into two sub-folders: ETLib DLL and Examples. The ETLib\_DLL folder contains all DLL files for all the main algorithms which can be called to solve different optimization problems. DLL files for GLNPSO algorithm and its extended versions (with animation option and advanced setting) are included in ETLib\_GLNPSO.dll, ETLib\_AniPSO.dll, ETLib\_Advanced.dll, respectively. ETLib\_M3PSO.dll includes the classes and routines for multi-objective PSO. DLL files for DE algorithm include ETLib\_DE\_Basic.dll, ETLib\_MODE.dll, ETLib\_DE\_JSP.dll, and ETLib\_MODE\_JSP.dll.

The Examples folder contains two subfolders: PSO and DE.

For PSO, the Basic Models folder contains examples which apply GLNPSO and M3PSO to solve some basic problems. These examples, though small, may provide the users with good insights of the algorithms. The Applications folder includes several real-world applications of ETLib such as Job Shop Scheduling, Traveling Salesman Problem, and Portfolio Optimization. Please refer to the “Object Library for Evolutionary Techniques (ET-Lib) - Volume 1: Particle Swarm Optimization” for detailed description of the files included in these folders.

For DE, the Basic Models folder contains examples which apply DE and MODE to solve some basic problems described in the manual. The Applications folder includes single objective and multiple-objective Job Shop Scheduling. Please refer to the “Object Library for Evolutionary Techniques (ET-Lib) -Volume 2: Differential Evolution” for detailed description of the files included in these folders.

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**Instruction on how to install ETLib with Microsoft Visual C#**

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1. Create a new solution/project
2. Select Project\Add Reference …
3. Switch to tab Browse
4. Select the location of the dll files which are most suitable for your application
5. Add “using ETLib\_\*\*\*\*\*\*.dll” at the beginning of you source code