**Object Library for Evolutionary Techniques (ET-Lib) Volume 1:   
Particle Swarm Optimization**

**April, 2010**

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The first version of the library of Evolutionary Techniques (ET-Lib) was developed in 2008 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 first release contains mainly the Particle Swarm Optimization algorithm (PSO) with multiple social learning terms (GLNPSO) and PSO algorithm for Multi-Objective Optimization (M3PSO).

The current version of ET-Lib includes all the necessary classes and routines which can be used to implement the PSO algorithm (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 – GLNPSO and M3PSO. 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# 2005, 2008 (the free Microsoft Visual C# 2008 is available to download at <http://www.microsoft.com/express/download/>.

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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 three sub-folders.: ETLib DLL, Basic Models, and Application. These DLL files in ETlib folder include the main algorithms which can be called to solve different optimization problems. The 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. In Basic Models folder, users can find 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 folders include several real-world applications of ETLib such as Job Shop Scheduling, Traveling Salesman Problem, and Portfolio Optimization. Please refer “Object Library for Evolutionary Techniques (ET-Lib) - User's Manual” 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