

## **Evolutionary Optimization for Practical Problem-Solving Tasks**

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Abstract: Many practical problem-solving tasks can be formulated as an optimization problem and solved. The resulting optimization problems pose different challenges to usual point-based optimization algorithms, such as non-linear constraints, non-differentiable objectives and constraints, mixed nature of variables, combinatorial variables, large dimensional variable space, implementational uncertainties and noise, hierarchical structure of sub-problems, dynamic nature of objectives and constraints, multiple objectives, etc. In this masterclass workshop, we introduce the principles of population-based evolutionary optimization methods and present a few popular algorithms for solving single and multi-objective problems. Related case studies will also be presented to demonstrate the usefulness of evolutionary algorithms in finding approximate solutions in practice. The latter half of the workshop will be devoted to hands- on problem solving using Matlab based evolutionary optimization codes for single and multi-objective problems.