Applied Computational Intelligence and Soft Computing

Special Issue on
Computational Intelligence for Real-World Optimization Problems with Multiple Components

CALL FOR PAPERS

Decision making process in industries and businesses is tightly connected to optimization of schedules of resources to maximize the final throughputs. The sophistication of this process in businesses has significantly increased recently mainly because they have become larger in size, more modular, and more interconnected; that means any decision should take into account a large amount of data, all the modules, and their connections. Optimization in real-world industrial cases raises lots of challenges. For example, many real-world optimization problems are composed of several components; each component might be hard to solve in isolation (see http://arxiv.org/abs/1606.06818 for further discussions). However, the dependency between these components adds even further intricacies to the problem.

Given the history of computation intelligence algorithms in real-world problems, it seems they are good candidates to address these challenges. This special issue aims at collecting original attempts to address challenges in the optimization of multicomponent real-world problems (e.g., supply chains), ranging from modeling to methods, within the framework of computational intelligence methodologies.

Potential topics include but are not limited to the following:

- Mathematical modeling of real-world problems: modeling is one of the main challenges in real-world optimization problems especially in the presence of multiple components. Candidates for this modelling include mathematical models (e.g., bilevel program), discrete event simulator, and finite state machines. This special issue encourages articles that attempt to model real-world problems with multiple components
- Methods based on computational intelligence to solve real-world problems: methods like evolutionary algorithms, cooperative coevolution, and ant colony optimization have been shown to be flexible to solve real-world optimization problems with all of the constraints, components, dynamicity, and nonlinearity. These methods are encouraged to be applied to more real-world multicomponent problems (e.g., supply chains) by this special issue
- Benchmarking of real-world problems: one of the main challenges in real-world optimization problems is the lack of benchmarks. Hence, designing artificial benchmark problems that can capture characteristics of real-world problems is of interest of this special issue
- Comparison techniques: it is usually not easy to compare optimization problems especially on a large set of benchmark problems. Hence, specific statistical measures or procedures for such comparisons are also encouraged to participate in this special issue
- Theoretical analysis: convergence, runtime, and stability analysis of computational intelligence algorithms on (simple) real-world problems is also encouraged in this special issue
- Decision support systems: any topics related to industrial decision supports such as optimal investment and bottlenecks identification are highly encouraged for this special issue

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