Meta-Heuristics for Engineering Optimisation

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Meta-heuristics (MHs) are a type of optimisers relying on randomisation and population reproduction. The methods usually employ a set of design solutions traditionally called a population for searching. MHs have several attractive features that make them more popular compared to classical gradient-based optimisers. They are simple to understand, use and code. The methods are derivative-free and capable of dealing global optimisation, thus, they can be used to solve almost any kind of optimisation problems. This talk is concerned with the use of MHs for engineering optimisation. Several practical optimisation problems in the fields of mechanical engineering and manufacturing including a strip coiling process, a wire drawing process, truss optimisation, and heat sink design are introduced. Demonstration on how to solve those optimisation problems using MHs is presented and discussed.