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## Thesis Overview:

# Hybrid Optimization Techniques for Industrial Production Planning

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Soft computing has attracted many research scientists, decision makers and practicing researchers in recent years as powerful computational intelligent techniques, for solving unlimited number of complex real-world problems particularly related to research area of optimization. Under the uncertain and turbulence environment, classical and traditional approaches are unable to obtain a complete solution with satisfaction for the real world problems on optimization. Therefore, new global optimization methods are required to handle these issues seriously. One such method is hybrid evolutionary computation, a generic, flexible, robust, and versatile framework for solving complex problems of global optimization and search in real world applications.

In this Ph. D thesis, the main significant contributions are: formulation of a new non-linear membership function using fuzzy approach to capture and describe vagueness in the technological coefficients of constraints in the industrial production planning problems [1-3]. This non-linear membership function is flexible and convenience to the decision makers in their decision making process. Secondly, a nonlinear objective function in the form of cubic function for fuzzy optimization problems is successfully solved by 15 hybrid and non-hybrid optimization techniques from the area of soft computing and classical approaches [4-7]. Among the 15 techniques, three outstanding techniques are selected based on the percentage of quality solution. An intelligent performance analysis table is tabulated to the convenience of decision makers and implementers to select the niche optimization techniques to apply in real word problem solving approach particularly related to industrial engineering problems.

Finally, it is concluded that hybrid optimization techniques are robust, less time-consuming, dependable, high quality solutions and an efficient productive tool for solving the non-linear real world problem in an industrial engineering environment. The hybrid line search with genetic algorithms and hybrid line search with simulated annealing techniques developed in this study are user friendly, easy-to-use and can serve as a teaching and research tool, besides being useful for practicing scientist in the area of industrial engineering.

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