

### Manufacturing Optimization through Intelligent Techniques (Manufacturing Engineering and Materials Processing)

Rajendran Saravanan

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Effective utilization of equipment is critical to any manufacturing operation, especially with today's sophisticated, high-cost equipment and increased global competition. To meet these challenges in the manufacturing industry, you must understand and implement the myriad conventional and intelligent techniques for different types of manufacturing problems. Manufacturing Optimization Through Intelligent Techniques covers design of machine elements, integrated product development, machining tolerance allocation, selection of operating parameters for CNC machine tools, scheduling, part family formation, selection of robot coordinates, robot trajectory planning and both conventional and intelligent techniques, providing the tools to design and implement a suitable optimization technique. The author explores how to model optimization problems, select suitable techniques, develop the optimization algorithm and software, and implement the program.

The book delineates five new techniques using examples taken from the literature for optimization problems in design, tolerance allocation; selection of machining parameters, integrated product development, scheduling, concurrent formation of machine groups and part families, selection of robot co-ordinates, robot trajectory planning and intelligent machining. All the manufacturing functions described have been successfully solved by Genetic Algorithm. Other intelligent techniques have been implemented only for solving certain types of problems: simulated annealing; design and scheduling, particle swarm optimization and ant colony optimization; tolerance allocation and tabu search; as well as machining parameters optimization.

After reading this book, you will understand the different types of manufacturing optimization problems as well as the conventional and intelligent techniques suitable for solving them. You will also be able to develop and implement effective optimization procedures and algorithms for a wide variety of problems in design manufacturing.



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