Hybrid Modeling and Optimization of Manufacturing: Combining Artificial Intelligence and Finite Element Method

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Hybrid modeling and optimization are two well-known techniques of solving engineering problems. Last decade witnessed the emergence of a number of research papers combining the two techniques. However, there was hardly any book that could explain in a simplified manner how these two techniques can be married for producing the optimum solution of engineering problems. The book by Quiza et al. fills this gap by providing a concise treatment of hybrid modeling and optimization of manufacturing processes. The book assumes no background either in artificial intelligence or finite element method. Hence, it can be used as the first book by students and practicing engineers interested in exploring the combination of artificial intelligence method and finite element method in solving the practical problems in manufacturing. Sufficient references have been provided for further study.

The book has been divided into 4 chapters. The first chapter introduces finite element method (FEM), artificial intelligence (AI) and their combination in an effective manner. Four approaches for combining FEM and AI are described viz., FEM/AI models, AI/FEM models, hybrid approaches for optimization and fuzzy FEM. Self-explanatory figures add to the beauty of treatment. The section on fuzzy FEM is relatively smaller. It would have been better to provide some papers on fuzzy FEM from manufacturing area.

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