Liang

Performance-Based Optimization of Structures

Theory and Applications

Performance-Based Optimization of Structures introduces a method to bridge the gap between structural optimization theory and its practical application to structural engineering. The Performance-Based Optimization (PBO) method combines modern structural optimisation theory with performance based design concepts to produce a powerful technique for use in structural design. This book provides the latest PBO techniques for achieving optimal topologies and shapes of continuum structures with stress, displacement and mean compliance constraints. The emphasis is strongly placed on practical applications of automated PBO techniques to the strut-and-tie modelling of structural concrete, which includes reinforced and prestressed concrete structures. Basic concepts underlying the development of strut-and-lie models, design optimization procedure, and detailing of structural concrete are described in detail. Alternative approaches to topology optimization are also introduced. The book contains numerous practical design examples illustrating the nature of the load transfer mechanism of structures.



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