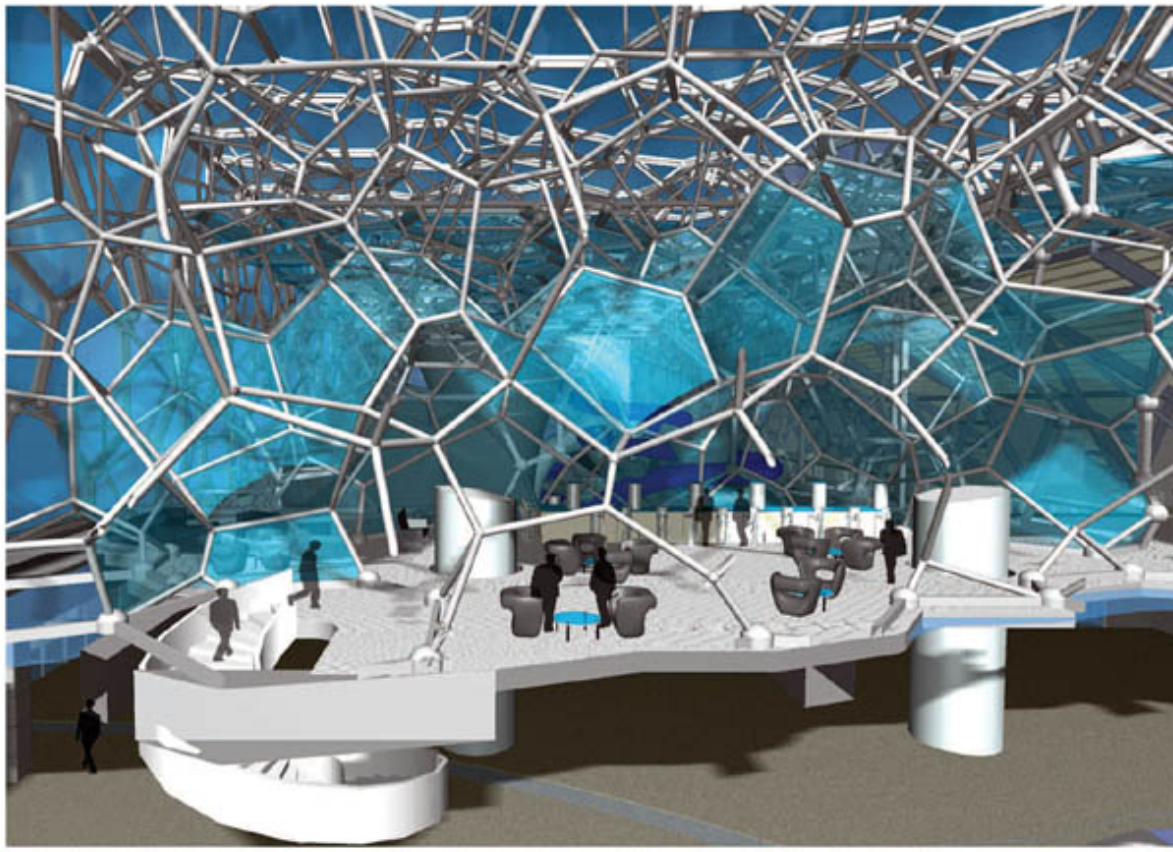

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Preface

From time to time in the history of engineering, specialist engineers have paused to look over the fence at what their colleagues are up to in parallel disciplines. This has often led to useful insights and accelerated growth in one or the other discipline. For those of us interested in the modeling of structural systems, such a cross-discipline review is very timely at this point in our history, thanks to progress in the range, versatility, and computational power of analysis software during recent years.

The purpose of the present volume is to bring together structural analysis strategies from a wide range of current industries, providing readers with a rare opportunity to make comparisons and deductions from their own particular perspectives.

The level of sophistication available to structural system modelers has accelerated rapidly since the early days of electronic computing. This trend is likely to continue with the increased availability of higher speed vector-array machines and parallel-processing facilities. This availability, in turn, invites the development of new algorithms using improved numerical methods based on more detailed understanding of real material and structural behavior.

In parallel, more work is needed on defining appropriate criteria for structural performance and safety, including the measurement and codification of these ideas for more consistent outcomes. In most areas of structural analysis, issues remain to be tackled in the simulation of loading and environmental demands and in compatibility and consistency of modeling choices so that modeling efficiency and accuracy are both enhanced in the interest of improved life cycle performance of real structures.

The present volume provides an overview of many of these issues, typically through case studies. One volume cannot pursue each issue in depth, but it can stimulate cross-fertilization of modeling approaches, of computational techniques and system representation, and of ways of viewing satisfactory performance.

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