

# Applied Simulation

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## Modeling and Analysis using *FlexSim*

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*Second Edition*

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Exercises in the book require either the Student version or Standard version of *FlexSim*

However, the free, evaluation version of *FlexSim* can be used for exercises through Chapter 6.  
Model files for the book are available in the BookDownloadFiles.zip file on the FlexSim website

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## ***Applied Simulation Modeling and Analysis using FlexSim***

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*To Janet and Jane – for your patience and support*

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# Preface

Simulation is an applied technology that is especially useful for analyzing and solving problems. Applying simulation begins by being clear on the problem definition, the reasons for simulating, and the expected outcomes. Simulation with no objective is counterproductive.

A person using simulation then must balance their understanding of the problem with their knowledge of the details of simulation: the underlying simulation concepts, application software, and the analysis methodologies that are employed. Consequently, the most effective way to learn how to successfully use simulation is through learning how to apply it.

A major challenge in teaching applied simulation is the question of how to effectively blend and balance an understanding of fundamental principles and concepts with the practical side of building simulations. The intent of this book is to help bridge that gap and improve the effectiveness of simulation courses. Not all readers of this book will become simulation experts, but hopefully they will want to utilize the technology to help them or others make better decisions. Consequently the material takes the reader through three levels of users: Occasional, Intermediate, and Advanced.

*FlexSim* was chosen for use with this text because of its ease-of-use and rich functionality that allows users to focus on simulation concepts and methods. This is not intended to be a *FlexSim* manual as the *FlexSim* Help files and tutorials are more than adequate for that purpose.

The opening chapters focus on Occasional Users and provide a base for all user levels. The chapters establish the professional practice of applied simulation: the basics, economic justification, when simulation is needed, and a methodology for defining a simulation project. The intent is to demonstrate how simulation modeling and analysis is used to understand and resolve practical problems.

The next section in the book deals with Intermediate Users, those who desire to build simulations, but do so infrequently. These chapters focus on the basics of simulation software, statistics, equipment reliability, designing experiments, and model development. Simulation software details, if desired, are available in the appendices or from the *FlexSim* Help system.

Chapters for Advanced Users introduce topics such as writing custom logic, dealing with production schedules, and simulating fluid flow. Later chapters include a discussion of simulation software architecture along with examples of more advanced applications such as distributed simulation and agent-based simulation. Appendices cover *FlexSim* application details, application notes for each exercise, and specialized application topics.





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