



# Book Selection

## Queueing Networks: A Fundamental Approach

Richard J Boucherie and Nico M van Dijk (eds)  
 Springer, New York, 2011. 818 pp., £153.00  
 ISBN: 978-1441964717 (hardback)

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 doi:10.1057/jors.2013.149

This book is devoted to fundamentals, methodological and computational aspects of queueing networks. It also provides insights that can be applied in more general networks. What is unique about this book is that it does cover a wide range of network structures starting from simple single-node networks to more complicated networks. It can be used by application-oriented professionals who deal with the modelling and analysis of queueing networks. Furthermore, it can be used as an advanced course on queueing networks for graduate students who are not familiar with the different solution methodologies available and have background in basic queueing theory.

The book consists of 15 chapters in five parts. The first part (Chapters 1–7) provides results for exact analytical networks that are in the form of product form solutions. Single station and tandem queues structures are analysed in Chapter 1. *Quasi-reversible* (order-independent) queues are analysed in Chapter 2. In Chapter 3, the Erlang loss system is analysed with focus on its insensitivity. In Chapter 4, Palm calculus and its applications to queues are discussed. In Chapter 5, networks with product form solutions are reviewed. The case of discrete time is discussed in Chapter 6, while in Chapter 7 decomposition and aggregation of multi-class queueing networks with state-dependent routing are presented.

The second part (Chapters 8–9) presents two basic approaches that can be used to obtain bounds for performance measures for intractable queueing networks. In Chapter 8, stochastic comparison and monotonicity of queueing networks

are presented. In Chapter 9, comparison results and explicit error bounds based on the underlying Markov reward processes are given. It is shown also that the first approach yields stronger results than the Markov reward process approach, especially for complex structure queueing network.

The third part of the book (Chapters 10–12) is about diffusion and fluid results that can be used for analyzing some queueing networks. In Chapter 10, the analysis by fluid limits method is used to analyse stability of join-the-shortest-queue networks. In Chapter 11, diffusion approximations are used to analyse multi-server queues. And in Chapter 12, queueing networks with Gaussian inputs are analysed in an asymptotic way.

The fourth part (Chapters 13–15) provides practical applications in the form of computational and approximation results. The mean value analysis for performance measures is presented in Chapter 13, while response time distributions are covered in Chapter 14. In Chapter 15, the queueing network analyser is described, which is a decomposition-based analysis that is widely used to analyse large open queueing networks.

What really makes this book suitable for professionals in the applications area is the last three chapters (Chapters 16–18). Applications in telecommunications are presented in Chapter 16. Applications in packet switching and hospital logistics are presented in Chapters 17 and 18, respectively.

This book is an advanced book in queueing networks and its use in modelling and analysis in applications. The audiences of this book are expected to have a reasonable background in queueing theory, calculus and probability theory. It can be very helpful for researchers working in computer science, operations research and industrial engineering. This is a clear and well-written book, it has lots of numerical examples that are helpful to better enhance the understanding of the reader.

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## Interactive Dynamic-System Simulation, Second Edition

Granino A Korn  
 Boca Raton, FL, Chapman & Hall/CRC, 2010. 204 pp., £57.99  
 ISBN: 978-1439836415 (hardback)

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The author considers his work as a ‘hands-on, practical tutorial on interactive dynamic-system modelling and simulation’ (p xv), and he cannot be closer to the truth. Certainly this book demands a particular kind of reader, one able to propose and solve differential equations; hence it does not qualify as an introductory book. In fact, its publishers have included it as the seventh volume in their *Numerical Insight* series. Having said that, the way the material is presented helps many of us to