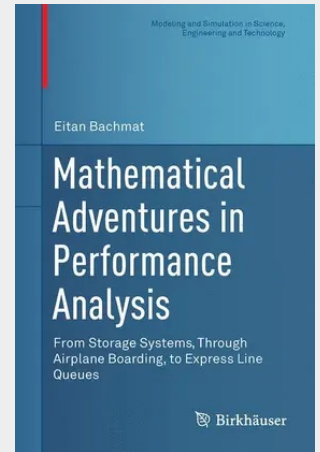


Mathematical Adventures in Performance Analysis

From Storage Systems, Through Airplane Boarding, to Express Line Queues

This book describes problems in the field of performance analysis, primarily the study of storage systems and the diverse mathematical techniques that are required for solving them. Topics covered include best practices for scheduling I/O requests to a disk drive, how this problem is related to airplane boarding, and how both problems can be modeled using space-time geometry. Also provided is an explanation of how Riemann's proof of the analytic continuation and functional equation of the Riemann zeta function can be used to analyze express line queues in a minimarket. Overall, the book displays the surprising relevance of abstract mathematics that is not usually associated with applied mathematics topics. Advanced undergraduate students or graduate students with an interest in the applications of mathematics will find this book to be a useful resource. It will also be of interest to professional mathematicians who want exposure to the surprising ways that theoretical mathematics may be applied to engineering problems. To encourage further study, each chapter ends with notes pointing to various related topics that the reader may want pursue. This mathematically rigorous work was noted in the news section of the journal Nature, and in popular media such as New Scientist, The Wall Street Journal, The Guardian, and USA Today.

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