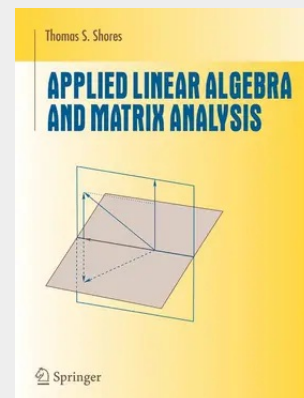


Applied Linear Algebra and Matrix Analysis

This new book offers a fresh approach to matrix and linear algebra by providing a balanced blend of applications, theory, and computation, while highlighting their interdependence. Intended for a one-semester course, Applied Linear Algebra and Matrix Analysis places special emphasis on linear algebra as an experimental science, with numerous examples, computer exercises, and projects. While the flavor is heavily computational and experimental, the text is independent of specific hardware or software platforms. Throughout the book, significant motivating examples are woven into the text, and each section ends with a set of exercises.

This book is about matrix and linear algebra, and their applications. For many students the tools of matrix and linear algebra will be as fundamental in their professional work as the tools of calculus; thus it is important to ensure that students appreciate the utility and beauty of these subjects as well as the mechanics. To this end, applied mathematics and mathematical modeling ought to have an important role in an introductory treatment of linear algebra. In this way students see that concepts of matrix and linear algebra make concrete problems workable. In this book we weave significant motivating examples into the fabric of the text. I hope that instructors will not omit this material; that would be a missed opportunity for linear algebra! The text has a strong orientation toward numerical computation and applied mathematics, which means that matrix analysis plays a central role. All three of the basic components of linear algebra — theory, computation, and applications — receive their due. The proper balance of these components gives students the tools they need as well as the motivation to acquire these tools. Another feature of this text is an emphasis on linear algebra as an experimental science; this emphasis is found in certain examples, computer exercises, and projects. Contemporary mathematical software make ideal “labs” for mathematical experimentation. Nonetheless, this text is independent of specific hardware and software platforms. Applications and ideas should take center stage, not software.



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