

1. Record Nr.	UNISA996508571203316
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Titolo	Krylov Subspace Methods for Linear Systems [[electronic resource]] : Principles of Algorithms / / by Tomohiro Sogabe
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2022
ISBN	9789811985324 9789811985317
Edizione	[1st ed. 2022.]
Descrizione fisica	1 online resource (233 pages)
Collana	Springer Series in Computational Mathematics, , 2198-3712 ; ; 60
Disciplina	518.1
Soggetti	Numerical analysis Mathematical models Algorithms Numerical Analysis Mathematical Modeling and Industrial Mathematics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Introduction to Numerical Methods for Solving Linear Systems -- Some Applications to Computational Science and Data Science -- Classification and Theory of Krylov Subspace Methods -- Applications to Shifted Linear Systems -- Applications to Matrix Functions.
Sommario/riassunto	This book focuses on Krylov subspace methods for solving linear systems, which are known as one of the top 10 algorithms in the twentieth century, such as Fast Fourier Transform and Quick Sort (SIAM News, 2000). Theoretical aspects of Krylov subspace methods developed in the twentieth century are explained and derived in a concise and unified way. Furthermore, some Krylov subspace methods in the twenty-first century are described in detail, such as the COCR method for complex symmetric linear systems, the BiCR method, and the IDR(s) method for non-Hermitian linear systems. The strength of the book is not only in describing principles of Krylov subspace methods but in providing a variety of applications: shifted linear systems and matrix functions from the theoretical point of view, as well as partial differential equations, computational physics, computational particle physics, optimizations, and machine learning from a practical

point of view. The book is self-contained in that basic necessary concepts of numerical linear algebra are explained, making it suitable for senior undergraduates, postgraduates, and researchers in mathematics, engineering, and computational science. Readers will find it a useful resource for understanding the principles and properties of Krylov subspace methods and correctly using those methods for solving problems in the future.
