Título:

Autor: **Precio:** $983.83

Editorial: **Año:** 2006

Tema: **Edición:** 1ª

Sinopsis   **ISBN:** 9780898716139

Computational scientists often encounter problems requiring the solution of sparse systems of linear equations. Attacking these problems efficiently requires an in-depth knowledge of the underlying theory, algorithms, and data structures found in sparse matrix software libraries. Here, Davis presents the fundamentals of sparse matrix algorithms to provide the requisite background. The book includes CSparse, a concise downloadable sparse matrix package that illustrates the algorithms and theorems presented in the book and equips readers with the tools necessary to understand larger and more complex software packages.

With a strong emphasis on MATLAB® and the C programming language, Direct Methods for Sparse Linear Systems equips readers with the working knowledge required to use sparse solver packages and write code to interface applications to those packages. The book also explains how MATLAB performs its sparse matrix computations.

Audience This invaluable book is essential to computational scientists and software developers who want to understand the theory and algorithms behind modern techniques used to solve large sparse linear systems. The book also serves as an excellent practical resource for students with an interest in combinatorial scientific computing.

About the Author Timothy A. Davis is a Professor in Computer and Information Science and Engineering at the University of Florida. He is the author of a suite of sparse matrix packages that are widely used in industry, academia, and government research labs, and related articles in SIAM, ACM, and IEEE journals. He is the co-author of a well-used introduction to MATLAB, the MATLAB Primer (Chapman & Hall/CRC Press, 2005). He is a member of the editorial boards of the IEEE Transactions on Parallel and Distributed Systems, and Computational Optimization and Applications.

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