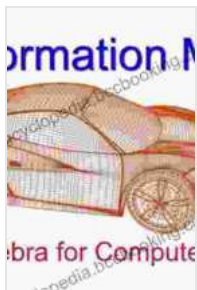


Linear Algebra Through Computer Science Applications: A Comprehensive Guide

Linear Algebra: The Foundation of Modern Computing Linear algebra, a branch of mathematics that deals with vectors, matrices, and linear transformations, has become an indispensable tool in the field of computer science. It provides the mathematical framework for many fundamental concepts and algorithms used in computer graphics, machine learning, artificial intelligence, and other cutting-edge technologies.

Linear Algebra Through Computer Science Applications To help students and practitioners master this essential subject, the book "Linear Algebra Through Computer Science Applications" offers a comprehensive and accessible to linear algebra, focusing on its practical applications in the field of computer science. Written by experts in the field, this book provides a deep understanding of the theoretical foundations of linear algebra while also demonstrating its practical relevance in real-world applications.

Key Features



Coding the Matrix: Linear Algebra through Computer Science Applications

★★★★☆ 4.4 out of 5

Language : English

File size : 16163 KB

Screen Reader : Supported

Print length : 324 pages

Lending : Enabled



- **Comprehensive Coverage:** The book covers all the core concepts of linear algebra, including vectors, matrices, linear transformations, eigenvalues and eigenvectors, and more.
- **Computer Science Applications:** Each chapter includes numerous examples and exercises that illustrate how linear algebra is used in various computer science domains, such as computer graphics, image processing, data analysis, and optimization.
- **Interactive Learning:** The book's website provides interactive online tools and resources, such as Wolfram Alpha widgets, that allow readers to visualize and manipulate linear algebra concepts in real time.
- **Rigorous and Accessible:** The book strikes a balance between mathematical rigor and accessibility, making it suitable for both undergraduate students and professionals who need a solid understanding of linear algebra.

Chapter Outline Chapter 1: to Linear Algebra

- Vectors in \mathbb{R}^n
- Matrices and Linear Combinations
- Linear Transformations
- Vector Spaces

Chapter 2: Matrix Operations

- Matrix Arithmetic
- Matrix Multiplication
- Inverse Matrices
- Orthogonal Matrices

Chapter 3: Systems of Linear Equations

- Solving Systems Using Gaussian Elimination
- Cramer's Rule
- Vector Spaces and Subspaces

Chapter 4: Eigenvalues and Eigenvectors

- Eigenvalues and Eigenvectors
- Diagonalization
- Applications in Computer Graphics

Chapter 5: Computer Graphics Applications

- Transformations and Homogeneous Coordinates
- Perspective Projection
- Ray Tracing

Chapter 6: Image Processing Applications

- Image Representation

- Filtering and Convolution
- Edge Detection

Chapter 7: Data Analysis Applications

- Principal Component Analysis (PCA)
- Linear Discriminant Analysis (LDA)
- Clustering

Chapter 8: Optimization Applications

- Linear Programming
- Convex Optimization
- Applications in Machine Learning

Advantages of Using "Linear Algebra Through Computer Science Applications"

- **Strong theoretical foundation:** Provides a rigorous treatment of linear algebra concepts.
- **Practical applications:** Illustrates how linear algebra is used in various computer science domains.
- **Interactive learning experience:** Offers online tools and resources for visualization and experimentation.
- **Suitable for diverse learners:** Accessible to both students and professionals.

- **Comprehensive and up-to-date:** Covers all the essential topics in linear algebra and its applications in computer science.

Whether you're a student pursuing a degree in computer science, an aspiring data scientist, or a professional seeking to expand your knowledge, "Linear Algebra Through Computer Science Applications" is an invaluable resource. It provides a comprehensive and accessible to linear algebra, with a focus on its practical applications in the field of computer science.

For Students:

- Provides a strong foundation for understanding advanced computer science concepts.
- Illustrates how linear algebra is used in various areas of computer science, making it a valuable tool for solving real-world problems.
- Offers interactive online resources that enhance the learning experience.

For Professionals:

- Updates your knowledge of linear algebra and its applications in computer science.
- Provides a comprehensive reference for professionals working in related fields.
- Offers a deeper understanding of the mathematical foundations of machine learning, image processing, and other cutting-edge technologies.

"Linear Algebra Through Computer Science Applications" is an essential guide for anyone who wants to master linear algebra and its applications in the field of computer science. Its comprehensive coverage, practical examples, and interactive learning experience make it an invaluable resource for students, professionals, and anyone who wants to expand their knowledge in this area.



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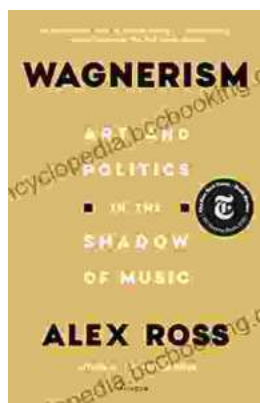
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