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Best Approximation In Inner Product Spaces (CMS Books In Mathematics)



Synopsis

This is the first systematic study of best approximation theory in inner product spaces and, in particular, in Hilbert space. Geometric considerations play a prominent role in developing and understanding the theory. The only prerequisites for reading the book is some knowledge of advanced calculus and linear algebra.

Book Information

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Customer Reviews

Frank Deutsch writes this remarkably self-contained work on the most fundamental aspects of approximation theory in vector spaces with inner products. Deutsch starts this work by describing the basic problems of approximation theory: what is the best line fit (linear regression), what is the best solution to an over-determined system of equations, how to approximate a real continuous function with a polynomial, how to solve basic control system problems, and computing the best approximation to a surface with convexity constraints. He simply explains how to characterize and solve these problems with approximation theory while gently introducing graduate level analysis. The reader will learn the basics of orthogonality, Hilbert Spaces, compactness, dual spaces, Fourier analysis, Gram-Schmidt orthonormalization, Zorn's Lemma, and dual spaces with applications of all these concepts to concrete approximation problems. He concludes the text with four chapters of very recent research on common computer algorithms, strong CHIP, and the convexity of Chebyshev Sets. This book is a great introduction to approximation theory and modern analysis. I

highly recommend it to any advanced undergraduate mathematics student or to any graduate student studying operations research, electrical engineering, or computer science (esp. numerical analysis).

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