# Adaptive Filtering: Fundamentals of Least Mean Squares with MATLAB®

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Adaptive filters are used in many diverse applications, appearing in everything from military instruments to cellphones and home appliances. **Adaptive Filtering: Fundamentals of Least Mean Squares with MATLAB®** covers the core concepts of this important field, focusing on a vital part of the statistical signal processing area—the least mean square (LMS) adaptive filter.

This largely self-contained text:

- Discusses random variables, stochastic processes, vectors, matrices, determinants, discrete random signals, and probability distributions
- Explains how to find the eigenvalues and eigenvectors of a matrix and the properties of the error surfaces
- Explores the Wiener filter and its practical uses, details the steepest descent method, and develops the Newton's algorithm
- Addresses the basics of the LMS adaptive filter algorithm**,** considers LMS adaptive filter variants, and provides numerous examples
- Delivers a concise introduction to MATLAB®, supplying problems, computer experiments, and more than 110 functions and script files

Featuring robust appendices complete with mathematical tables and formulas, **Adaptive Filtering: Fundamentals of Least Mean Squares with MATLAB®** clearly describes the key principles of adaptive filtering and effectively demonstrates how to apply them to solve real-world problems.

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