ADAPTIVE FILTERING PRIMER with MATLAB[®]

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Preface

This book is written for the applied scientist and engineer who wants or needs to learn about a subject but is not an expert in the specific field. It is also written to accompany a first graduate course in digital signal processing. In this book we have selected the field of adaptive filtering, which is an important part of statistical signal processing. The adaptive filters have found use in many and diverse fields such as communications, control, radar, sonar, seismology, etc.

The aim of this book is to present an introduction to optimum filtering as well as to provide an introduction to realizations of linear adaptive filters with finite duration impulse response. Since the signals involved are random, an introduction to random variables and stochastic processes are also presented.

The book contains all the material necessary for the reader to study its contents. An appendix on matrix computations is also included at the end of the book to provide supporting material. The book includes a number of MATLAB[®] functions and m-files for practicing and verifying the material in the text. These programs are designated as Book MATLAB Functions. The book includes many computer experiments to illustrate the underlying theory and applications of the Wiener and adaptive filtering. Finally, at the end of each chapter (except the first introductory chapter) numerous problems are provided to help the reader develop a deeper understanding of the material presented. The problems range in difficulty from undemanding exercises to more elaborate problems. Detailed solutions or hints and suggestions for solving all of these problems are also provided.

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