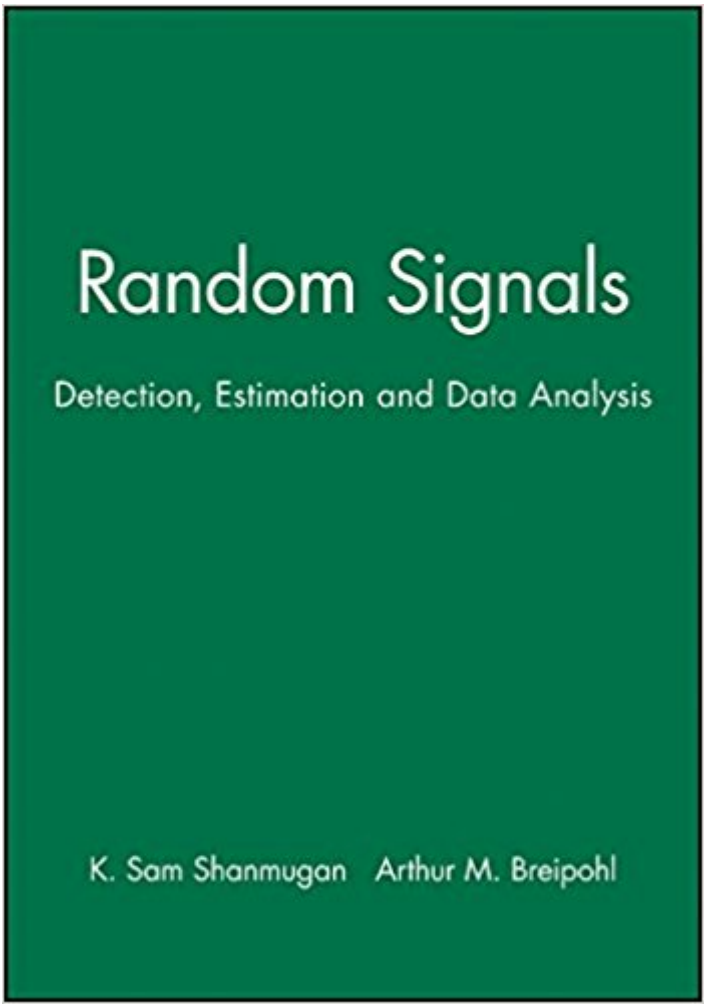
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Random Signals: Detection, Estimation And Data Analysis



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Synopsis

Random Signals, Noise and Filtering develops the theory of random processes and its application to the study of systems and analysis of random data. The text covers three important areas: (1) fundamentals and examples of random process models, (2) applications of probabilistic models: signal detection, and filtering, and (3) statistical estimation--measurement and analysis of random data to determine the structure and parameter values of probabilistic models. This volume by Breipohl and Shanmugan offers the only one-volume treatment of the fundamentals of random process models, their applications, and data analysis.

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Customer Reviews

Random Signals, Noise and Filtering develops the theory of random processes and its application to the study of systems and analysis of random data. The text covers three important areas: (1) fundamentals and examples of random process models, (2) applications of probabilistic models: signal detection, and filtering, and (3) statistical estimation--measurement and analysis of random data to determine the structure and parameter values of probabilistic models. This volume by Breipohl and Shanmugan offers the only one-volume treatment of the fundamentals of random process models, their applications, and data analysis.

This is a well written treatment of random processes, filtering, detection, estimation and statistics. I am currently reading Chapter 8 but I’d like to summarize what I’ve noticed thus far....Chapter 2 is really long. The issue is that it is intended to serve as a review so the student is understood to have

a basic grounding in probability theory which negates the purpose of the long winded review given. I did appreciate the section on nonlinear transformations of random variables and the section on (Gaussian) random vectors as they were covered much better than I had seen in my basic probability bookÂ Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers.Chapter 3 again is long winded side but at least this is somewhat defendable as this is arguable the core material of the book.I feel like the approximation section (2.7) and the series expansion (3.9) should be moved to later in the book.Chapter 4 is very nice, easy to read especially for someone with some exposure to linear systems theory. More importantly of perfect length and depth.Chapter 5 on moving average (MA), autoregressive (AR) and ARMA might very well be in a good place pedagogically to introduce the subject but they weren't explained exactly as to what they are used for (which I believe comes in Chapter 8). I skimmed the section on point processes and read Gaussian Processes thoroughly, also finely written.Chapter 6 is nicely done although I wish several more examples with correlated random variables have been worked (I think there was only one). Also defining intermediate or derived random variables to simplify decision rules would have been advisable. As my professor mentioned he totally assume synchronization of the receiver I wish he had gone in to some detail about the finer points here.Chapter 7,8,9 to be updated laterAppendixA. Fourier Transform Table is lacking a few of the more useful transforms.D. Gaussian Probabilities are only given in terms of the Q function (a.k.a. the standard normal complementary cumulative distribution function or complementary error function) I wish the standard normal cumulative distribution function (or error function) has also been provided especially for working problems in the detection chapter. It would have been much more convenient then trying to remember the transformation between the two each time.

The book is good and covers all the basics on random processes for the engineering perspective.There are a few things that I missed on the book like mean-square calculus and more theory on detection.Good book for understanding the basic principles on a broad spectrum of random signals.

If you like your signals well organized, do not buy this book. Otherwise, you'll enjoy it.

delivery was pretty late, but the book was of high quality

Though it is a used book, it looks like new in it.Good as described.Great deal. Ideal text for

stochastic systems.

I’ve read the statistical signal processing and stochastic processes books by Kay, Papoulis, Srinath and Stark & Woods, and this is by far the best book that covers both subject areas in a logical fashion. The text is very clearly written, mathematical notation is easy to follow, and example problems are very worthwhile. I’m currently a PhD student using this book to prepare for my qualification exams, and it’s really helping me master the difficult subject of estimation and detection theory.Though the book does not get much into measure spaces and some of the abstract theoretical fundamentals, it’s an excellent engineering reference that’s ideal for an introductory class in the subject. My only complaint is that the book is not hardcover.

I agree with the other reviews that this is one of the best books for studying random processes, especially in the context of DSP. I used the book in a graduate level "statistical signal processing" course at the University of London and I found it extremely useful.It covers everything from the definition of a sample space, AR and MA processes, periodograms to optimal Wiener filter theory. The examples are very clear and they accompany each of the chapters. One point to notice is that you do need to know something about Fourier transforms and also have basic familiarity with probability.Highly recommended to anyone in the DSP field.

This is one of the best books around for studying Random Processes ! The author has also provided a very good introduction to Detection, Estimation and Modelling of Stochastic Processes. I found this book very useful and I’d strongly suggest this book for an introductionary level graduate course. If you want to build a strong foundation in Random Signal Theory, this book is the way to go.. Other advanced texts like Simon Haykin’s "Adaptive Filter Theory" will be a lot easier to understand once you study this book thoroughly and work out the exercise problems.

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