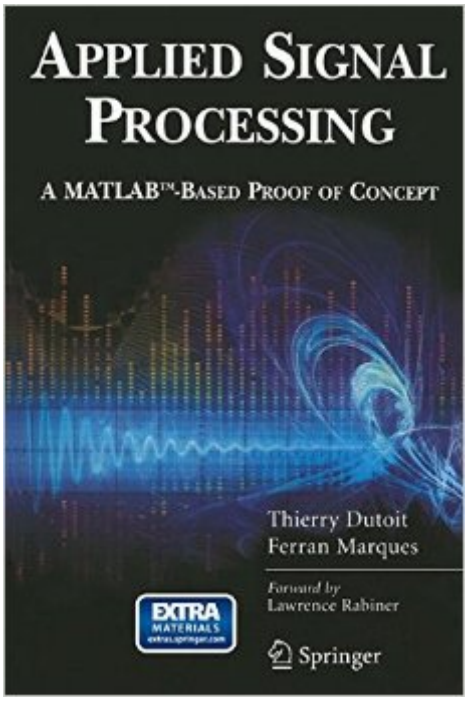
Applied Signal Processing: A MATLABTM-Based Proof Of Concept (Signals And Communication Technology (Paperback))



Synopsis

Applied Signal Processing: A MATLAB-Based Proof of Concept benefits readers by including the teaching background of experts in various applied signal processing fields and presenting them in a project-oriented framework. Unlike many other MATLAB-based textbooks which only use MATLAB to illustrate theoretical aspects, this book provides fully commented MATLAB code for working proofs-of-concept. The MATLAB code provided on the accompanying online files is the very heart of the material. In addition each chapter offers a functional introduction to the theory required to understand the code as well as a formatted presentation of the contents and outputs of the MATLAB code.Each chapter exposes how digital signal processing is applied for solving a real engineering problem used in a consumer product. The chapters are organized with a description of the problem in its applicative context and a functional review of the theory related to its solution appearing first. Equations are only used for a precise description of the problem and its final solutions. Then a step-by-step MATLAB-based proof of concept, with full code, graphs, and comments follows. The solutions are simple enough for readers with general signal processing background to understand and they use state-of-the-art signal processing principles. Applied Signal Processing: A MATLAB-Based Proof of Concept is an ideal companion for most signal processing course books. It can be used for preparing student labs and projects.

Book Information

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Customer Reviews

This is an excellent book. The target audience is clearly signal processing engineers that want to learn more about applied speech, audio, image and video processing. The approach taken by the authors is clearly application driven, which is great for understanding complex systems such as hidden Markov models, or Markov random fields. The chapters are very progressive. For example in the chapter on automatic speech recognition, the authors focus on a simple example of a 6-word imaginary language cleverly chosen to show the importance of using the time-evolution of speech and the language grammar. They begin by showing how you can try to recognize words without taking the time-evolution into account, simply by looking at the distribution of the formants which are modeled as Gaussian mixtures (GMM). They show that using this technique, words such as "we" and "you" are indistinguishable (because both contain the sounds ’oo’ and ’ee’, but in the opposite order). They then introduce the concept of hidden Markov Models (HMM) to show how the time-evolution of the speech signal can be used to distinguish between the two words. They explain in a very clean manner and demonstrate how the parameters of a HMM can be iteratively estimated from the signal during training, then used during the recognition phase. They show that the system still can’t distinguish the two words "hear" and "here" because they sound identical, then demonstrate how adding a simple language grammar can be helpful at that point (and you learn about bi-grams etc). All the chapters are laid out in this intuitive and user-friendly manner. I especially enjoyed reading the chapter about mpeg video-encoding, which contains multiple illustrations of intra-frame and inter-frame coding, and show very simply how motion vectors are used to implement motion-compensated coding. Even if you don’t open the matlab companion CD (which I haven’t done yet!), the book is a great, easy read. I recommend it without reservations!

Signal Processing (3rd Edition) (Prentice-Hall Signal Processing Series) Digital Signal Processing: with Selected Topics: Adaptive Systems, Time-Frequency Analysis, Sparse Signal Processing Digital Signal Processing: Signals, Systems, and Filters Millimeter-Wave Antennas: Configurations and Applications (Signals and Communication Technology) Automatic Speech Recognition: A Deep Learning Approach (Signals and Communication Technology) Speech and Audio Signal Processing: Processing and Perception of Speech and Music Applied Digital Signal Processing: Theory and Practice Biosignal and Medical Image Processing (Signal Processing and Communications) Handbook of Neural Networks for Speech Processing (Artech House Signal Processing Library) By Sanjit K. Mitra - Digital Signal Processing: A Computer-Based Approach: 3rd (third) Edition Digital Signal Processing Technology: Essentials of the Communications Revolution Computer Speech Technology (Artech House Signal Processing Library) Elena Bablenis Haveles BS Pharm Pharm D's Applied Pharmacology 6th (Sixth) edition(Applied Pharmacology for the Dental Hygienist [Paperback])(2010)