Digital Signal Processing Using MATLAB for Students and Researchers

By John W. Leis

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Quickly Engages in Applying Algorithmic Techniques to Solve Practical Signal Processing Problems

With its active, hands-on learning approach, this text enables readers to master the underlying principles of digital signal processing and its many applications in industries such as digital television, mobile and broadband communications, and medical/scientific devices. Carefully developed MATLAB® examples throughout the text illustrate the mathematical concepts and use of digital signal processing algorithms. Readers will develop a deeper understanding of how to apply the algorithms by manipulating the codes in the examples to see their effect. Moreover, plenty of exercises help to put knowledge into practice solving real-world signal processing challenges.

Following an introductory chapter, the text explores:

- Sampled signals and digital processing
- Random signals
- Representing signals and systems
- Temporal and spatial signal processing
- Frequency analysis of signals
- Discrete-time filters and recursive filters

Each chapter begins with chapter objectives and an introduction. A summary at the end of each chapter ensures that one has mastered all the key concepts and techniques before progressing in the text. Lastly, appendices listing selected web resources, research papers, and related textbooks enable the investigation of individual topics in greater depth.

Upon completion of this text, readers will understand how to apply key algorithmic techniques to address practical signal processing problems as well as develop their own signal processing algorithms. Moreover, the text provides a solid foundation for evaluating and applying new digital processing signal techniques as they are developed.

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Editorial Review

Review
"Intended for undergraduate or graduate students in engineering or related disciplines, this introductory volume examines key theories in signal processing and presents this information optimized for use with MATLAB technical computing software." (Book News, 1 October 2011)

About the Author
John Leis, PhD, is Associate Professor of Electrical and Computer Engineering at the University of Southern Queensland. He has authored many technical papers in areas involving signal processing and networking. Dr. Leis's interests include signal processing for data compression and coding, medical signal processing, and advanced instrumentation using signal processing algorithms. He has collaborated internationally on various research projects. Dr. Leis has taught the subject material extensively in Australia and also Singapore. He is a Senior Member of the Institution of Electrical & Electronic Engineers and a Member of the Association for Computing Machinery.

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