Discrete-Time Speech Signal Processing: Principles and Practice

By Thomas F. Quatieri

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Essential principles, practical examples, current applications, and leading-edge research.

In this book, Thomas F. Quatieri presents the field's most intensive, up-to-date tutorial and reference on discrete-time speech signal processing. Building on his MIT graduate course, he introduces key principles, essential applications, and state-of-the-art research, and he identifies limitations that point the way to new research opportunities.

Quatieri provides an excellent balance of theory and application, beginning with a complete framework for understanding discrete-time speech signal processing. Along the way, he presents important advances never before covered in a speech signal processing text book, including sinusoidal speech processing, advanced time-frequency analysis, and nonlinear aeroacoustic speech production modeling. Coverage includes:

- Speech production and speech perception: a dual view
- Crucial distinctions between stochastic and deterministic problems
- Pole-zero speech models
- Homomorphic signal processing
- Short-time Fourier transform analysis/synthesis
- Filter-bank and wavelet analysis/synthesis
- Nonlinear measurement and modeling techniques

The book's in-depth applications coverage includes speech coding, enhancement, and modification; speaker recognition; noise reduction; signal restoration; dynamic range compression, and more. *Principles of Discrete-Time Speech Processing* also contains an exceptionally complete series of examples and Matlab exercises, all carefully integrated into the book's coverage of theory and applications.

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