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Nota di contenuto	Foreword -- Preface -- 1 Introduction -- 1.1 Research and Applications in Academia and Industry -- 1.2 Challenges in Distant Speech Recognition -- 1.3 System Evaluation -- 1.4 Fields of Speech Recognition -- 1.5 Robust Perception -- 1.6 Organizations, Conferences and Journals -- 1.7 Useful Tools, Data Resources and Evaluation Campaigns -- 1.8 Organization of this Book -- 1.9 Principal Symbols used Throughout the Book -- 1.10 Units used Throughout the Book -- 2 Acoustics -- 2.1 Physical Aspect of Sound -- 2.2 Speech Signals -- 2.3 Human Perception of Sound -- 2.4 The Acoustic Environment -- 2.5 Recording Techniques and Sensor Configuration -- 2.6 Summary and Further Reading -- 2.7 Principal Symbols -- 3 Signal Processing and Filtering Techniques -- 3.1 Linear Time-Invariant Systems -- 3.2 The Discrete Fourier Transform -- 3.3 Short-Time Fourier Transform -- 3.4 Summary and Further Reading -- 3.5 Principal Symbols -- 4 Bayesian Filters -- 4.1 Sequential Bayesian Estimation -- 4.2 Wiener Filter -- 4.3 Kalman Filter and Variations -- 4.4 Particle Filters -- 4.5 Summary and Further Reading -- 4.6 Principal Symbols -- 5 Speech Feature Extraction -- 5.1 Short-Time Spectral Analysis -- 5.2 Perceptually Motivated Representation -- 5.3 Spectral

Sommario/riassunto

A complete overview of distant automatic speech recognition The performance of conventional Automatic Speech Recognition (ASR) systems degrades dramatically as soon as the microphone is moved away from the mouth of the speaker. This is due to a broad variety of effects such as background noise, overlapping speech from other speakers, and reverberation. While traditional ASR systems underperform for speech captured with far-field sensors, there are a number of novel techniques within the recognition system as well as techniques developed in other areas of signal processing that can mitigate the deleterious effects of noise and reverberation, as well as separating speech from overlapping speakers. Distant Speech Recognitionpresents a contemporary and comprehensive description of both theoretic abstraction and practical issues inherent in the distant ASR problem. Key Features: *Covers the entire topic of distant ASR and offers practical solutions to overcome the problems related to it *Provides documentation and sample scripts to enable readers to construct state-of-the-art distant speech recognition systems *Gives relevant background information in acoustics and filter techniques, *Explains the extraction and enhancement of classification relevant speech features *Describes maximum likelihood as well as discriminative parameter estimation, and maximum likelihood normalization techniques *Discusses the use of multi-microphone configurations for speaker tracking and channel combination *Presents several applications of the methods and technologies described in this book *Accompanying website with open source software and tools to construct state-of-the-art distant speech recognition systems This reference will be an invaluable resource for researchers, developers, engineers and other professionals, as well as advanced students in speech technology, signal processing, acoustics, statistics and artificial intelligence fields.