

1. Record Nr.	UNINA9910139950103321
Autore	Tashev Ivan J. (Ivan Jelev)
Titolo	Sound capture and processing : practical approaches / / Ivan J. Tashev
Pubbl/distr/stampa	Chichester, U.K. : , : Wiley, , 2009 [Piscataway, New Jersey] : , : IEEE Xplore, , [2009]
ISBN	1-282-23748-9 9786612237485 0-470-99444-4 0-470-99443-6
Descrizione fisica	1 online resource (389 p.)
Classificazione	ST 306
Disciplina	621.3828
Soggetti	Speech processing systems Sound - Recording and reproducing - Digital techniques Signal processing - Digital techniques
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	About the Author -- Foreword -- Preface -- Acknowledgements -- 1 Introduction -- 1.1 The Need for, and Consumers of, Sound Capture and Audio Processing Algorithms -- 1.2 Typical Sound Capture System -- 1.3 The Goal of this Book and its Target Audience -- 1.4 Prerequisites -- 1.5 Book Structure -- 1.6 Exercises -- 2 Basics -- 2.1 Noise: Definition, Modeling, Properties -- 2.2 Signal: Definition, Modeling, Properties -- 2.3 Classification: Suppression, Cancellation, Enhancement -- 2.4 Sampling and Quantization -- 2.5 Audio Processing in the Frequency Domain -- 2.6 Bandwidth Limiting -- 2.7 Signal-to-Noise-Ratio: Definition and Measurement -- 2.8 Subjective Quality Measurement -- 2.9 Other Methods for Quality and Enhancement Measurement -- 2.10 Summary -- Bibliography -- 3 Sound and Sound Capturing Devices -- 3.1 Sound and Sound Propagation -- 3.2 Microphones -- 3.3 Omnidirectional and Pressure Gradient Microphones -- 3.4 Parameter Definitions -- 3.5 First-order Directional Microphones -- 3.6 Noise-canceling Microphones and the Proximity Effect -- 3.7 Measurement of Microphone Parameters -- 3.8 Microphone Models -- 3.9 Summary -- Bibliography -- 4 Single-

channel Noise Reduction -- 4.1 Noise Suppression as a Signal Estimation Problem -- 4.2 Suppression Rules -- 4.3 Uncertain Presence of the Speech Signal -- 4.4 Estimation of the Signal and Noise Parameters -- 4.5 Architecture of a Noise Suppressor -- 4.6 Optimizing the Entire System -- 4.7 Specialized Noise-reduction Systems -- 4.8 Practical Tips and Tricks for Noise Suppression -- 4.9 Summary -- Bibliography -- 5 Sound Capture with Microphone Arrays -- 5.1 Definitions and Types of Microphone Array -- 5.2 The Sound Capture Model and Beamforming -- 5.3 Terminology and Parameter Definitions -- 5.4 Time-invariant Beamformers -- 5.5 Channel Mismatch and Handling -- 5.6 Adaptive Beamformers -- 5.7 Microphone-array Post-processors -- 5.8 Specific Algorithms for Small Microphone Arrays -- 5.9 Summary -- Bibliography -- 6 Sound Source Localization and Tracking with Microphone Arrays. 6.1 Sound Source Localization -- 6.2 Sound Source Localization from a Single Frame -- 6.3 Post-processing Algorithms -- 6.4 Practical Approaches and Tips -- 6.5 Summary -- Bibliography -- 7 Acoustic Echo-reduction Systems -- 7.1 General Principles and Terminology -- 7.2 LMS Solution for Acoustic Echo Cancellation -- 7.3 NLMS and RLS Algorithms -- 7.4 Double-talk Detectors -- 7.5 Non-linear Acoustic Echo Cancellation -- 7.6 Acoustic Echo Suppression -- 7.7 Multichannel Acoustic Echo Reduction -- 7.8 Practical Aspects of the Acoustic Echo-reduction Systems -- 7.9 Summary -- Bibliography -- 8 De-reverberation -- 8.1 Reverberation and Modeling -- 8.2 De-reverberation via De-convolution -- 8.3 De-reverberation via Suppression -- 8.4 De-reverberation with Multiple Microphones -- 8.5 Practical Recommendations -- 8.6 Summary -- Bibliography -- Index.

Sommario/riassunto

Sound Capture and Processing: Practical Approaches, Ivan Tashev, Microsoft Research, USA Provides state-of-the-art algorithms for sound capture, processing and enhancement Sound Capture and Processing: Practical Approaches covers the digital signal processing algorithms and devices for capturing sounds, mostly human speech. It explores the devices and technologies used to capture, enhance and process sound for the needs of communication and speech recognition in modern computers and communication devices. This book gives a comprehensive introduction to basic acoustics and microphones, with coverage of algorithms for noise reduction, acoustic echo cancellation, dereverberation and microphone arrays; charting the progress of such technologies from their evolution to present day standard. Sound Capture and Processing: Practical Approaches . Brings together the state-of-the-art algorithms for sound capture, processing and enhancement in one easily accessible volume . Provides invaluable implementation techniques required to process algorithms for real life applications and devices . Covers a number of advanced sound processing techniques, such as multichannel acoustic echo cancellation, dereverberation and source separation . Generously illustrated with figures and charts to demonstrate how sound capture and audio processing systems work . An accompanying website containing Matlab code to illustrate the algorithms This invaluable guide will provide audio, R&D and software engineers in the industry of building systems or computer peripherals for speech enhancement with a comprehensive overview of the technologies, devices and algorithms required for modern computers and communication devices. Graduate students studying electrical engineering and computer science, and researchers in multimedia, cell-phones, interactive systems and acousticians will also benefit from this book.
