



Speech Quality Assessment And Evaluation

B Lingard



Speech Quality Assessment And Evaluation:

Voice and Speech Quality Perception Ute Jekosch, 2005-08-02 Foundations of Voice and Speech Quality Perception starts out with the fundamental question of How do listeners perceive voice and speech quality and how can these processes be modeled Any quantitative answers require measurements This is natural for physical quantities but harder to imagine for perceptual measurands This book approaches the problem by actually identifying major perceptual dimensions of voice and speech quality perception defining units wherever possible and offering paradigms to position these dimensions into a structural skeleton of perceptual speech and voice quality The emphasis is placed on voice and speech quality assessment of systems in artificial scenarios Many scientific fields are involved This book bridges the gap between two quite diverse fields engineering and humanities and establishes the new research area of Voice and Speech Quality Perception

Integral and Diagnostic Intrusive Prediction of Speech Quality Nicolas Côté, 2011-05-06 This work deals with the instrumental measurement methods for the perceived quality of transmitted speech These measures simulate the speech perception process employed by human subjects during auditory experiments The measure standardized by the International Telecommunication Union ITU called Wideband Perceptual Speech Quality Evaluation WB PESQ is not able to quantify all these perceived characteristics on a unidimensional quality scale the Mean Opinion Score MOS scale Recent experimental studies showed that subjects make use of several perceptual dimensions to judge about the quality of speech signals In order to represent the signal at a higher stage of perception a new model called Diagnostic Instrumental Assessment of Listening quality DIAL has been developed It includes a perceptual and a cognitive model which simulate the whole quality judgment process Except for strong discontinuities DIAL predicts very well speech quality of different speech processing and transmission systems and it outperforms the WB PESQ

Dimension-based Quality Modeling of Transmitted Speech Marcel Wältermann, 2013-01-03 In this book speech transmission quality is modeled on the basis of perceptual dimensions The author identifies those dimensions that are relevant for today s public switched and packet based telecommunication systems regarding the complete transmission path from the mouth of the speaker to the ear of the listener Both narrowband 300 3400 Hz as well as wideband 50 7000 Hz speech transmission is taken into account A new analytical assessment method is presented that allows the dimensions to be rated by non expert listeners in a direct way Due to the efficiency of the test method a relatively large number of stimuli can be assessed in auditory tests The test method is applied in two auditory experiments The book gives the evidence that this test method provides meaningful and reliable results The resulting dimension scores together with respective overall quality ratings form the basis for a new parametric model for the quality estimation of transmitted speech based on the perceptual dimensions In a two step model approach instrumental dimension models estimate dimension impairment factors in a first step The resulting dimension estimates are combined by a Euclidean integration function in a second step in order to provide an estimate of the total impairment

Speech Enhancement

Philipos C. Loizou, 2013-02-25 With the proliferation of mobile devices and hearing devices including hearing aids and cochlear implants there is a growing and pressing need to design algorithms that can improve speech intelligibility without sacrificing quality Responding to this need Speech Enhancement Theory and Practice Second Edition introduces readers to the basic problems of speech enhancement and the various algorithms proposed to solve these problems Updated and expanded this second edition of the bestselling textbook broadens its scope to include evaluation measures and enhancement algorithms aimed at improving speech intelligibility Fundamentals Algorithms Evaluation and Future Steps Organized into four parts the book begins with a review of the fundamentals needed to understand and design better speech enhancement algorithms The second part describes all the major enhancement algorithms and because these require an estimate of the noise spectrum also covers noise estimation algorithms The third part of the book looks at the measures used to assess the performance in terms of speech quality and intelligibility of speech enhancement methods It also evaluates and compares several of the algorithms The fourth part presents binary mask algorithms for improving speech intelligibility under ideal conditions In addition it suggests steps that can be taken to realize the full potential of these algorithms under realistic conditions What's New in This Edition Updates in every chapter A new chapter on objective speech intelligibility measures A new chapter on algorithms for improving speech intelligibility Real world noise recordings on accompanying CD MATLAB code for the implementation of intelligibility measures on accompanying CD MATLAB and C C code for the implementation of algorithms to improve speech intelligibility on accompanying CD Valuable Insights from a Pioneer in Speech Enhancement Clear and concise this book explores how human listeners compensate for acoustic noise in noisy environments Written by a pioneer in speech enhancement and noise reduction in cochlear implants it is an essential resource for anyone who wants to implement or incorporate the latest speech enhancement algorithms to improve the quality and intelligibility of speech degraded by noise Includes a CD with Code and Recordings The accompanying CD provides MATLAB implementations of representative speech enhancement algorithms as well as speech and noise databases for the evaluation of enhancement algorithms

Evaluation of Text and Speech Systems Laila Dybkjær, Holmer Hemsén, Wolfgang Minker, 2007-05-07 In its nine chapters this book provides an overview of the state of the art and best practice in several sub fields of evaluation of text and speech systems and components The evaluation aspects covered include speech and speaker recognition speech synthesis animated talking agents part of speech tagging parsing and natural language software like machine translation information retrieval question answering spoken dialogue systems data resources and annotation schemes With its broad coverage and original contributions this book is unique in the field of evaluation of speech and language technology This book is of particular relevance to advanced undergraduate students PhD students academic and industrial researchers and practitioners

Speech and Audio Processing in Adverse Environments Eberhard Hänsler, Gerhard Schmidt, 2008-07-22 Users of signal processing systems are never satisfied with the system they currently use They are

constantly asking for higher quality faster performance more comfort and lower prices Researchers and developers should be appreciative for this attitude It justifies their constant effort for improved systems Better knowledge about biological and physical interrelations coming along with more powerful technologies are their engines on the endless road to perfect systems This book is an impressive image of this process After Acoustic Echo 1 and Noise Control published in 2004 many new results lead to Topics in 2 Acoustic Echo and Noise Control edited in 2006 Today in 2008 even more new findings and systems could be collected in this book Comparing the contributions in both edited volumes progress in knowledge and technology becomes clearly visible Blind methods and multi-input systems replace humble low complexity systems The functionality of new systems is less and less limited by the processing power available under economic constraints The editors have to thank all the authors for their contributions They cooperated readily in our effort to unify the layout of the chapters the terminology and the symbols used It was a pleasure to work with all of them Furthermore it is the editors concern to thank Christoph Baumann and the Springer Publishing Company for the encouragement and help in publishing this book

Sensory Evaluation of Sound Nick Zacharov, 2018-12-07 Sensory Evaluation of Sound provides a detailed review of the latest sensory evaluation techniques specifically applied to the evaluation of sound and audio This three part book commences with an introduction to the fundamental role of sound and hearing which is followed by an overview of sensory evaluation methods and associated univariate and multivariate statistical analysis techniques The final part of the book provides several chapters with concrete real world applications of sensory evaluation ranging from telecommunications hearing aids design and binaural sound via the latest research in concert hall acoustics through to audio visual interaction Aimed at the engineer researcher university student or manager the book gives insight into the advanced methods for the sensory evaluation with many application examples Introduces the fundamental of hearing and the value of sound Provides a firm theoretical basis for advanced techniques in sensory evaluation of sound that are then illustrated with concrete examples from university research through to industrial product development Includes chapters on sensory evaluation practices and methods as well as univariate and multivariate statistical analysis Six application chapters covering a wide range of concrete sensory evaluation study examples including insight into audio visual assessment Includes data analysis with several associated downloadable datasets Provides extensive references to the existing research literature text books and standards

Academic Press Library in Signal Processing, 2013-09-14 This fourth volume edited and authored by world leading experts gives a review of the principles methods and techniques of important and emerging research topics and technologies in Image Video Processing and Analysis Hardware Audio Acoustic and Speech Processing With this reference source you will Quickly grasp a new area of research Understand the underlying principles of a topic and its application Ascertain how a topic relates to other areas and learn of the research issues yet to be resolved Quick tutorial reviews of important and emerging topics of research in Image Video Processing and Analysis Hardware Audio Acoustic and Speech Processing Presents core principles

and shows their application Reference content on core principles technologies algorithms and applications Comprehensive references to journal articles and other literature on which to build further more specific and detailed knowledge Edited by leading people in the field who through their reputation have been able to commission experts to write on a particular topic

Springer Handbook of Speech Processing Jacob Benesty, M. M. Sondhi, Yiteng Huang, 2007-11-22 This handbook plays a fundamental role in sustainable progress in speech research and development With an accessible format and with accompanying DVD Rom it targets three categories of readers graduate students professors and active researchers in academia and engineers in industry who need to understand or implement some specific algorithms for their speech related products It is a superb source of application oriented authoritative and comprehensive information about these technologies this work combines the established knowledge derived from research in such fast evolving disciplines as Signal Processing and Communications Acoustics Computer Science and Linguistics Simulating Conversations for the Prediction of Speech Quality Thilo Michael, 2023-06-30 This book discusses the simulation of conversations through a novel approach of predicting speech quality based on the interactions of two simulated interlocutors The author describes the setup of a simulation environment that is capable of simulating human dialogue on the speech level The impact of delay and bursty packet loss on VoIP conversations is investigated and modeled for the use in the simulation Based on parameters extracted from simulated conversations the author proposes extensions to the E model a parametric model standardized by the International Telecommunications Union in order to predict the quality of the simulated conversations The author shows that predictions based on the simulated conversations outperform models that rely on the transmission parameters alone **AETA 2013: Recent Advances in Electrical Engineering and Related Sciences** Ivan Zelinka, Vo Hoang Duy, Jaesang Cha, 2013-11-01 Over the past decades fault diagnosis FDI and fault tolerant control strategies FTC have been proposed based on different techniques for linear and nonlinear systems Indeed a considerable attention is deployed in order to cope with diverse damages resulting in faults occurrence Quality of Telephone-Based Spoken Dialogue Systems Sebastian Möller, 2005-12-28 Quality of Telephone Based Spoken Dialogue Systems is a systematic overview of assessment evaluation and prediction methods for the quality of services such as travel and touristic information phone directory and messaging or telephone banking services A new taxonomy of quality of service is presented which serves as a tool for classifying assessment and evaluation methods for planning and interpreting evaluation experiments and for estimating quality A broad overview of parameters and evaluation methods is given both on a system component level and for a fully integrated system Three experimental investigations illustrate the relationships between system characteristics and perceived quality The resulting information is needed in all phases of system specification design implementation and operation Although Quality of Telephone Based Spoken Dialogue Systems is written from the perspective of an engineer in telecommunications it is an invaluable source of information for professionals in signal processing communication acoustics computational linguistics

speech and language sciences human factor design and ergonomics VoIP Technologies Shigeru Kashiara,2011-02-14
This book provides a collection of 15 excellent studies of Voice over IP VoIP technologies While VoIP is undoubtedly a powerful and innovative communication tool for everyone voice communication over the Internet is inherently less reliable than the public switched telephone network because the Internet functions as a best effort network without Quality of Service guarantee and voice data cannot be retransmitted This book introduces research strategies that address various issues with the aim of enhancing VoIP quality We hope that you will enjoy reading these diverse studies and that the book will provide you with a lot of useful information about current VoIP technology research *Fundamentals of Voice-Quality*

Engineering in Wireless Networks Avi Perry,2007 Publisher description Signals and Images Rosângela Fernandes Coelho,Vitor Heloiz Nascimento,Ricardo Lopes de Queiroz,João Marcos Travassos Romano,Charles Casimiro Cavalcante,2018-09-03 Signals and Images Advances and Results in Speech Estimation Compression Recognition Filtering and Processing cohesively combines contributions from field experts to deliver a comprehensive account of the latest developments in signal processing These experts detail the results of their research related to audio and speech enhancement acoustic image estimation video compression biometric recognition hyperspectral image analysis tensor decomposition with applications in communications adaptive sparse interpolated filtering signal processing for power line communications bio inspired signal processing seismic data processing arithmetic transforms for spectrum computation particle filtering in cooperative networks three dimensional television and more This book not only shows how signal processing theory is applied in current and emerging technologies but also demonstrates how to tackle key problems such as how to enhance speech in the time domain improve audio quality and meet the desired electrical consumption target for controlling carbon emissions Signals and Images Advances and Results in Speech Estimation Compression Recognition Filtering and Processing serves as a guide to the next generation of signal processing solutions for speech and video coding hearing aid devices big data processing smartphones smart digital communications acoustic sensors and beyond

Advances in Digital Speech Transmission Prof Rainer Martin,Prof Ulrich Heute,Prof Christiane Antweiler,2008-02-28
Speech processing and speech transmission technology are expanding fields of active research New challenges arise from the anywhere anytime paradigm of mobile communications the ubiquitous use of voice communication systems in noisy environments and the convergence of communication networks toward Internet based transmission protocols such as Voice over IP As a consequence new speech coding new enhancement and error concealment and new quality assessment methods are emerging Advances in Digital Speech Transmission provides an up to date overview of the field including topics such as speech coding in heterogeneous communication networks wideband coding and the quality assessment of wideband speech Provides an insight into the latest developments in speech processing and speech transmission making it an essential reference to those working in these fields Offers a balanced overview of technology and applications Discusses topics such as

speech coding in heterogeneous communications networks wideband coding and the quality assessment of the wideband speech Explains speech signal processing in hearing instruments and man machine interfaces from applications point of view Covers speech coding for Voice over IP blind source separation digital hearing aids and speech processing for automatic speech recognition Advances in Digital Speech Transmission serves as an essential link between the basics and the type of technology and applications prospective engineers work on in industry labs and academia The book will also be of interest to advanced students researchers and other professionals who need to brush up their knowledge in this field

Multidimensional Analysis of Conversational Telephone Speech Friedemann Köster, 2017-07-18 This book presents a new diagnostic information methodology to assess the quality of conversational telephone speech For this a conversation is separated into three individual conversational phases listening speaking and interaction and for each phase corresponding perceptual dimensions are identified A new analytic test method allows gathering dimension ratings from non expert test subjects in a direct way The identification of the perceptual dimensions and the new test method are validated in two sophisticated conversational experiments The dimension scores gathered with the new test method are used to determine the quality of each conversational phase and the qualities of the three phases in turn are combined for overall conversational quality modeling The conducted fundamental research forms the basis for the development of a preliminary new instrumental diagnostic conversational quality model This multidimensional analysis of conversational telephone speech is a major landmark towards deeply analyzing conversational speech quality for diagnosis and optimization of telecommunication systems

Multimedia Quality of Experience (QoE) Chang Wen Chen, Periklis Chatzimisios, Tasos Dagiuklas, Luigi Atzori, 2016-01-19 Multimedia Quality of Experience QoE Current Status and Future Requirements Multimedia Quality of Experience QoE Current Status and Future Requirements discusses the current status of QoE Quality of Experience research providing guidelines on QoE assessment and management practice Moreover it covers many different aspects of QoE research including definitions standardization ITU ETSI IEEE IETF measurement management and architectures In addition the authors bring together contributions from recognized experts worldwide in the area of subjective and objective QoE video assessment Discusses the current status of QoE research reporting the latest advances from various standardization bodies Provides guidelines on QoE assessment and management practice Explores methods means and architectures of QoE Considers future requirements of QoE

Communication Acoustics Ville Pulkki, Matti Karjalainen, 2015-01-27 In communication acoustics the communication channel consists of a sound source a channel acoustic and or electric and finally the receiver the human auditory system a complex and intricate system that shapes the way sound is heard Thus when developing techniques in communication acoustics such as in speech audio and aided hearing it is important to understand the time frequency space resolution of hearing This book facilitates the reader's understanding and development of speech and audio techniques based on our knowledge of the auditory perceptual mechanisms by introducing the physical signal

processing and psychophysical background to communication acoustics It then provides a detailed explanation of sound technologies where a human listener is involved including audio and speech techniques sound quality measurement hearing aids and audiology Key features Explains perceptually based audio the authors take a detailed but accessible engineering perspective on sound and hearing with a focus on the human place in the audio communications signal chain from psychoacoustics and audiology to optimizing digital signal processing for human listening Presents a wide overview of speech from the human production of speech sounds and basics of phonetics to major speech technologies recognition and synthesis of speech and methods for speech quality evaluation Includes MATLAB examples that serve as an excellent basis for the reader s own investigations into communication acoustics interaction schemes which intuitively combine touch vision and voice for lifelike interactions

Human and Automatic Speaker Recognition over Telecommunication Channels

Laura Fernández Gallardo, 2015-08-17 This work addresses the evaluation of the human and the automatic speaker recognition performances under different channel distortions caused by bandwidth limitation codecs and electro acoustic user interfaces among other impairments Its main contribution is the demonstration of the benefits of communication channels of extended bandwidth together with an insight into how speaker specific characteristics of speech are preserved through different transmissions It provides sufficient motivation for considering speaker recognition as a criterion for the migration from narrowband to enhanced bandwidths such as wideband and super wideband

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