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ROBUSTNESS IN LANGUAGE AND SPEECH TECHNOLOGY

Edited by Jean-Claude Jansque and Georges van Noord



Robustness In Languages And Speech Technology

Jean-Claude Junqua, Gertjan van Noord



Robustness In Languages And Speech Technology:

Robustness in Language and Speech Technology Jean-Claude Junqua, Gertjan van Noord, 2001-02-28 In this book we address robustness issues at the speech recognition and natural language parsing levels with a focus on feature extraction and noise robust recognition adaptive systems language modeling parsing and natural language understanding This book attempts to give a clear overview of the main technologies used in language and speech processing along with an extensive bibliography to enable topics of interest to be pursued further It also brings together speech and language technologies often considered separately Robustness in Language and Speech Technology serves as a valuable reference and although not intended as a formal university textbook contains some material that can be used for a course at the graduate or undergraduate level

Robustness in Language and Speech Technology Jean-Claude Junqua, Gertjan van Noord, 2013-03-09 In this book we address robustness issues at the speech recognition and natural language parsing levels with a focus on feature extraction and noise robust recognition adaptive systems language modeling parsing and natural language understanding This book attempts to give a clear overview of the main technologies used in language and speech processing along with an extensive bibliography to enable topics of interest to be pursued further It also brings together speech and language technologies often considered separately Robustness in Language and Speech Technology serves as a valuable reference and although not intended as a formal university textbook contains some material that can be used for a course at the graduate or undergraduate level

Robustness in Automatic Speech Recognition Jean-Claude Junqua, Jean-Paul Haton, 2012-12-06 Foreword Looking back the past 30 years we have seen steady progress made in the area of speech science and technology I still remember the excitement in the late seventies when Texas Instruments came up with a toy named Speak and Spell which was based on a VLSI chip containing the state of the art linear prediction synthesizer This caused a speech technology fever among the electronics industry Particularly applications of automatic speech recognition were rigorously attempted by many companies some of which were start ups founded just for this purpose Unfortunately it did not take long before they realized that automatic speech recognition technology was not mature enough to satisfy the need of customers The fever gradually faded away In the meantime constant efforts have been made by many researchers and engineers to improve the automatic speech recognition technology Hardware capabilities have advanced impressively since that time In the past few years we have been witnessing and experiencing the advent of the Information Revolution What might be called the second surge of interest to commercialize speech technology as a natural interface for man machine communication began in much better shape than the first one With computers much more powerful and faster many applications look realistic this time However there are still tremendous practical issues to be overcome in order for speech to be truly the most natural interface between humans and machines

Latent Semantic Mapping Jerome R. Bellegarda, 2022-05-31 Latent semantic mapping LSM is a generalization of latent semantic analysis LSA a paradigm

originally developed to capture hidden word patterns in a text document corpus In information retrieval LSA enables retrieval on the basis of conceptual content instead of merely matching words between queries and documents It operates under the assumption that there is some latent semantic structure in the data which is partially obscured by the randomness of word choice with respect to retrieval Algebraic and or statistical techniques are brought to bear to estimate this structure and get rid of the obscuring noise This results in a parsimonious continuous parameter description of words and documents which then replaces the original parameterization in indexing and retrieval This approach exhibits three main characteristics Discrete entities words and documents are mapped onto a continuous vector space This mapping is determined by global correlation patterns and Dimensionality reduction is an integral part of the process Such fairly generic properties are advantageous in a variety of different contexts which motivates a broader interpretation of the underlying paradigm The outcome LSM is a data driven framework for modeling meaningful global relationships implicit in large volumes of not necessarily textual data This monograph gives a general overview of the framework and underscores the multifaceted benefits it can bring to a number of problems in natural language understanding and spoken language processing It concludes with a discussion of the inherent tradeoffs associated with the approach and some perspectives on its general applicability to data driven information extraction

Contents I Principles Introduction Latent Semantic Mapping LSM Feature Space Computational Effort Probabilistic Extensions II Applications Junk E mail Filtering Semantic Classification Language Modeling Pronunciation Modeling Speaker Verification TTS Unit Selection III Perspectives Discussion Conclusion Bibliography

Robust Speech Michael Grimm,Kristian Kroschel,2007-06-01 This book on Robust Speech Recognition and Understanding brings together many different aspects of the current research on automatic speech recognition and language understanding The first four chapters address the task of voice activity detection which is considered an important issue for all speech recognition systems The next chapters give several extensions to state of the art HMM methods Furthermore a number of chapters particularly address the task of robust ASR under noisy conditions Two chapters on the automatic recognition of a speaker s emotional state highlight the importance of natural speech understanding and interpretation in voice driven systems The last chapters of the book address the application of conversational systems on robots as well as the autonomous acquisition of vocalization skills

Intelligent Tutoring Systems Stefano A. Cerri,Guy Gouarderes,Fabio Paraguacu,2007-10-23 This book constitutes the refereed proceedings of the 6th International Conference on Intelligent Tutoring Systems ITS 2002 held in Biarritz France and San Sebastian Spain in June 2002 The 93 revised full papers presented together with 5 invited papers and 16 posters were carefully reviewed and selected from 167 full paper submissions The papers address all current issues in the interdisciplinary field of intelligent tutoring systems The book offers topical sections on agents architectures Web authoring learning dialogue evaluation narrative and motivation and emotions

Computational Linguistics in the Netherlands 2000 ,2016-08-29 This volume provides a selection of the papers

which were presented at the eleventh conference on Computational Linguistics in the Netherlands Tilburg 2000 It gives an accurate and up to date picture of the lively scene of computational linguistics in the Netherlands and Flanders The volume covers the whole range from theoretical to applied research and development and is hence of interest to both academia and industry The target audience consists of students and scholars of computational linguistics and speech and language processing Linguistics Computer Science Electrical Engineering

Computational Linguistics in the Netherlands 2000 Walter Daelemans, 2001 This volume provides a selection of the papers which were presented at the eleventh conference on Computational Linguistics in the Netherlands Tilburg 2000 It gives an accurate and up to date picture of the lively scene of computational linguistics in the Netherlands and Flanders The volume covers the whole range from theoretical to applied research and development and is hence of interest to both academia and industry The target audience consists of students and scholars of computational linguistics and speech and language processing Linguistics Computer Science Electrical Engineering

Multi-source, Multilingual Information Extraction and Summarization Thierry Poibeau, Horacio Saggion, Jakub Piskorski, Roman Yangarber, 2012-08-14 Information extraction IE and text summarization TS are powerful technologies for finding relevant pieces of information in text and presenting them to the user in condensed form The ongoing information explosion makes IE and TS critical for successful functioning within the information society These technologies face particular challenges due to the inherent multi source nature of the information explosion The technologies must now handle not isolated texts or individual narratives but rather large scale repositories and streams in general in multiple languages containing a multiplicity of perspectives opinions or commentaries on particular topics entities or events There is thus a need to adapt existing techniques and develop new ones to deal with these challenges This volume contains a selection of papers that present a variety of methodologies for content identification and extraction as well as for content fusion and regeneration The chapters cover various aspects of the challenges depending on the nature of the information sought names vs events and the nature of the sources news streams vs image captions vs scientific research papers etc This volume aims to offer a broad and representative sample of studies from this very active research field

Robust Speech Recognition of Uncertain or Missing Data Dorothea Kolossa, Reinhold Haeb-Umbach, 2011-07-14 Automatic speech recognition suffers from a lack of robustness with respect to noise reverberation and interfering speech The growing field of speech recognition in the presence of missing or uncertain input data seeks to ameliorate those problems by using not only a preprocessed speech signal but also an estimate of its reliability to selectively focus on those segments and features that are most reliable for recognition This book presents the state of the art in recognition in the presence of uncertainty offering examples that utilize uncertainty information for noise robustness reverberation robustness simultaneous recognition of multiple speech signals and audiovisual speech recognition The book is appropriate for scientists and researchers in the field of speech recognition who will find an overview of the state of the art in robust speech recognition professionals working in

speech recognition who will find strategies for improving recognition results in various conditions of mismatch and lecturers of advanced courses on speech processing or speech recognition who will find a reference and a comprehensive introduction to the field The book assumes an understanding of the fundamentals of speech recognition using Hidden Markov Models

Knowledge-Based Information Retrieval and Filtering from the Web Witold Abramowicz, 2013-03-09 Knowledge Based Information Retrieval and Filtering from the Web contains fifteen chapters contributed by leading international researchers addressing the matter of information retrieval filtering and management of the information on the Internet The research presented deals with the need to find proper solutions for the description of the information found on the Internet the description of the information consumers need the algorithms for retrieving documents and indirectly the information embedded in them and the presentation of the information found The chapters include Ontological representation of knowledge on the WWW Information extraction Information retrieval and administration of distributed documents Hard and soft modeling based knowledge capture Summarization of texts found on the WWW User profiles and personalization for web based information retrieval system Information retrieval under constricted bandwidth Multilingual WWW Generic hierarchical classification using the single link clustering Clustering of documents on the basis of text fuzzy similarity Intelligent agents for document categorization and adaptive filtering Multimedia retrieval and data mining for E commerce and E business A Web based approach to competitive intelligence Learning ontologies for domain specific information retrieval An open decentralized architecture for searching for and publishing information in distributed systems

Robust Speech Recognition in Embedded Systems and PC Applications Jean-Claude Junqua, 2006-04-18 Robust Speech Recognition in Embedded Systems and PC Applications provides a link between the technology and the application worlds As speech recognition technology is now good enough for a number of applications and the core technology is well established around hidden Markov models many of the differences between systems found in the field are related to implementation variants We distinguish between embedded systems and PC based applications Embedded applications are usually cost sensitive and require very simple and optimized methods to be viable Robust Speech Recognition in Embedded Systems and PC Applications reviews the problems of robust speech recognition summarizes the current state of the art of robust speech recognition while providing some perspectives and goes over the complementary technologies that are necessary to build an application such as dialog and user interface technologies Robust Speech Recognition in Embedded Systems and PC Applications is divided into five chapters The first one reviews the main difficulties encountered in automatic speech recognition when the type of communication is unknown The second chapter focuses on environment independent adaptive speech recognition approaches and on the mainstream methods applicable to noise robust speech recognition The third chapter discusses several critical technologies that contribute to making an application usable It also provides some design recommendations on how to design prompts generate user feedback and develop speech user interfaces The fourth chapter

reviews several techniques that are particularly useful for embedded systems or to decrease computational complexity. It also presents some case studies for embedded applications and PC based systems. Finally the fifth chapter provides a future outlook for robust speech recognition emphasizing the areas that the author sees as the most promising for the future. Robust Speech Recognition in Embedded Systems and PC Applications serves as a valuable reference and although not intended as a formal University textbook contains some material that can be used for a course at the graduate or undergraduate level. It is a good complement for the book entitled Robustness in Automatic Speech Recognition Fundamentals and Applications co-authored by the same author.

Robust Automatic Speech Recognition Jinyu Li, Li Deng, Reinhold Haeb-Umbach, Yifan Gong, 2015-10-30 Robust Automatic Speech Recognition: A Bridge to Practical Applications establishes a solid foundation for automatic speech recognition that is robust against acoustic environmental distortion. It provides a thorough overview of classical and modern noise and reverberation robust techniques that have been developed over the past thirty years with an emphasis on practical methods that have been proven to be successful and which are likely to be further developed for future applications. The strengths and weaknesses of robustness enhancing speech recognition techniques are carefully analyzed. The book covers noise robust techniques designed for acoustic models which are based on both Gaussian mixture models and deep neural networks. In addition a guide to selecting the best methods for practical applications is provided. The reader will gain a unified deep and systematic understanding of the state of the art technologies for robust speech recognition. Learn the links and relationship between alternative technologies for robust speech recognition. Be able to use the technology analysis and categorization detailed in the book to guide future technology development. Be able to develop new noise robust methods in the current era of deep learning for acoustic modeling in speech recognition. The first book that provides a comprehensive review on noise and reverberation robust speech recognition methods in the era of deep neural networks. Connects robust speech recognition techniques to machine learning paradigms with rigorous mathematical treatment. Provides elegant and structural ways to categorize and analyze noise robust speech recognition techniques. Written by leading researchers who have been actively working on the subject matter in both industrial and academic organizations for many years.

Recent Advances in Robust Speech Recognition Technology Javier Ramirez, Juan Manuel Gorriiz, 2011. No detailed description available for *Recent Advances in Robust Speech Recognition Technology*.

Computational Linguistics, 2001. [Survey of the State of the Art in Human Language Technology](#) Giovanni Battista Varile, Antonio Zampolli, 1997. Originally published in 1997 this book is concerned with human language technology. This technology provides computers with the capability to handle spoken and written language. One major goal is to improve communication between humans and machines. If people can use their own language to access information working with software applications and controlling machinery the greatest obstacle for the acceptance of new information technology is overcome. Another important goal is to facilitate communication among people. Machines can help to translate texts or spoken input from one human language to the other. Programs that

assist people in writing by checking orthography grammar and style are constantly improving This book was sponsored by the Directorate General XIII of the European Union and the Information Science and Engineering Directorate of the National Science Foundation USA Techniques for Noise Robustness in Automatic Speech Recognition Tuomas Virtanen,Rita Singh,Bhiksha Raj,2012-11-28 Automatic speech recognition ASR systems are finding increasing use in everyday life Many of the commonplace environments where the systems are used are noisy for example users calling up a voice search system from a busy cafeteria or a street This can result in degraded speech recordings and adversely affect the performance of speech recognition systems As the use of ASR systems increases knowledge of the state of the art in techniques to deal with such problems becomes critical to system and application engineers and researchers who work with or on ASR technologies This book presents a comprehensive survey of the state of the art in techniques used to improve the robustness of speech recognition systems to these degrading external influences Key features Reviews all the main noise robust ASR approaches including signal separation voice activity detection robust feature extraction model compensation and adaptation missing data techniques and recognition of reverberant speech Acts as a timely exposition of the topic in light of more widespread use in the future of ASR technology in challenging environments Addresses robustness issues and signal degradation which are both key requirements for practitioners of ASR Includes contributions from top ASR researchers from leading research units in the field *Real World Speech Processing* Jhing-Fa Wang,Sadaoki Furui,Bing-Hwang Juang,2013-03-14 Real World Speech Processing brings together in one place important contributions and up to date research results in this fast moving area The contributors to this work were selected from the leading researchers and practitioners in this field The work originally published as Volume 36 Numbers 2 3 of the Journal of VLSI Signal Processing Systems for Signal Image and Video Technology will be valuable to anyone working or researching in the field of speech processing It serves as an excellent reference providing insight into some of the most challenging issues being examined today Universal Access in Human-Computer Interaction Margherita Antona,Constantine Stephanidis,2023-07-08 This two volume set constitutes the refereed proceedings of the 17th International Conference on Universal Access in Human Computer Interaction UAHCI 2023 held as part of the 25th International Conference HCI International 2023 in Copenhagen Denmark during July 23 28 2023 The total of 1578 papers and 396 posters included in the HCII 2022 proceedings was carefully reviewed and selected from 7472 submissions The UAHCI 2023 proceedings were organized in the following topical sections Part I Design for All Methods Tools and Practice Interaction Techniques Platforms and Metaphors for Universal Access Understanding the Universal Access User Experience and Designing for Children with Autism Spectrum Disorders Part II Universal Access to XR Universal Access to Learning and Education Assistive Environments and Quality of Life Technologies New Era for Robust Speech Recognition Shinji Watanabe,Marc Delcroix,Florian Metze,John R. Hershey,2017-10-30 This book covers the state of the art in deep neural network based methods for noise robustness in distant speech recognition applications It provides

insights and detailed descriptions of some of the new concepts and key technologies in the field including novel architectures for speech enhancement microphone arrays robust features acoustic model adaptation training data augmentation and training criteria The contributed chapters also include descriptions of real world applications benchmark tools and datasets widely used in the field This book is intended for researchers and practitioners working in the field of speech processing and recognition who are interested in the latest deep learning techniques for noise robustness It will also be of interest to graduate students in electrical engineering or computer science who will find it a useful guide to this field of research

Robustness In Languages And Speech Technology Book Review: Unveiling the Magic of Language

In a digital era where connections and knowledge reign supreme, the enchanting power of language has are more apparent than ever. Its ability to stir emotions, provoke thought, and instigate transformation is really remarkable. This extraordinary book, aptly titled "**Robustness In Languages And Speech Technology**," compiled by a very acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound affect our existence. Throughout this critique, we will delve to the book is central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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