



Automatic Speaker Recognition System

**Amita Dev, Arun Sharma, S. S.
Agrawal, Ritu Rani**



Automatic Speaker Recognition System:

Automatic Speaker Recognition System for Telephone Speech Chiwei Che,1998 **Automatic Speech & Speaker Recognition** N. Rex Dixon,Thomas B. Martin,1979 **Development of a Text-independent Automatic Speaker Recognition System** Tumisho Billson Mokgonyakne,2021 Automatic Speaker Recognition System Alan Higgins,Joe Naylor,ITT DEFENSE COMMUNICATIONS DIV SAN DIEGO CA.,1984 The Defense Communications Division of ITT ITTDCD has developed an automatic speaker recognition ASR system that meets the functional requirements defined in NRL s Statement of Work This report is organized as follows Chapter 2 is a short history of the development of the ASR system both the algorithm and the implementation Chapter 3 describes the methodology of the system testing while Chapter 4 summarizes the test results In Chapter 5 we discuss some further testing that was performed using the GFM test material Conclusions derived from the contract work are given Chapter 6 Speech recognition JES **Text-independent, Automatic Speaker Recognition System Evaluation with Males Speaking Both Arabic and English** Safi S. Alamri,2015

Automatic Speaker Recognition Using Statistical Models William J. J. Roberts,Defence science and technology organisation canberra (Australia),Electronics and Surveillance Research Laboratory (Australia),1998 This report describes the automatic identification of speakers from their voices This process has application in forensics and in voice actuated security systems The implementation and theoretic underpinnings of a statistical based speaker recognition system are presented in addition to the performance of the system on standard speech corpora In a speaker verification experiment the system yielded an error rate of under 5 per cent when identical microphones are used for testing and training **Hardware Implementation of an Automatic Speaker Recognition System Using Artificial Neural Networks** Viresh Moonasar,2002 *Automatic Speech and Speaker Recognition* Chin-Hui Lee, Frank K. Soong, Kuldip K. Paliwal,2012-12-06

Research in the field of automatic speech and speaker recognition has made a number of significant advances in the last two decades influenced by advances in signal processing algorithms architectures and hardware These advances include the adoption of a statistical pattern recognition paradigm the use of the hidden Markov modeling framework to characterize both the spectral and the temporal variations in the speech signal the use of a large set of speech utterance examples from a large population of speakers to train the hidden Markov models of some fundamental speech units the organization of speech and language knowledge sources into a structural finite state network and the use of dynamic programming based heuristic search methods to find the best word sequence in the lexical network corresponding to the spoken utterance Automatic Speech and Speaker Recognition Advanced Topics groups together in a single volume a number of important topics on speech and speaker recognition topics which are of fundamental importance but not yet covered in detail in existing textbooks Although no explicit partition is given the book is divided into five parts Chapters 1 2 are devoted to technology overviews Chapters 3 12 discuss acoustic modeling of fundamental speech units and lexical modeling of words and

pronunciations Chapters 13 15 address the issues related to flexibility and robustness Chapter 16 18 concern the theoretical and practical issues of search Chapters 19 20 give two examples of algorithm and implementational aspects for recognition system realization Audience A reference book for speech researchers and graduate students interested in pursuing potential research on the topic May also be used as a text for advanced courses on the subject

Automatic Speaker and Speech Recognition Joke Badejo, Tunji Ibiyemi, 2013 Automatic speech recognition and speaker recognition have a lot of applications in personal identification access control and in the new man machine interface paradigm The existing applications in voice activated embedded systems solve the problem of recognition of the spoken words only or the problem of recognition of a speaker through the words uttered only The goal of this project therefore is the development of a robust algorithm for both speech recognition and speaker verification An example of a target application of this work is speech dialing of mobile phones with a speaker verification front end in order to effect access control In view of the memory and computational constraints of embedded systems the dynamic time warping algorithm is used This project only considers isolated spoken digits The developed algorithm is coded in C language and can be ported to firmware for Arabic numeral digit recognition with a speaker verification front end for an embedded system like mobile phones The system produced a FAR of 13.33% and a FRR of 24.3% for a total of 70 true claims and 30 false claims It also had a word accuracy of 96.7%

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

Forensic Speaker Recognition Amy Neustein, Hemant A. Patil, 2011-10-05 Forensic Speaker Recognition Law Enforcement and Counter Terrorism is an anthology of the research findings of 35 speaker recognition experts from around the world The volume provides a multidimensional view of the complex science involved in determining whether a suspect's voice truly matches forensic speech samples collected by law enforcement and counter terrorism agencies that are associated with the commission of a terrorist act or other crimes While addressing such topics as the challenges of forensic case work handling speech signal degradation analyzing features of speaker recognition to optimize voice verification system performance and designing voice applications that meet the practical needs of law enforcement and counter terrorism agencies this material all sounds a common theme how the rigors of forensic utility are demanding new levels of excellence in all aspects of speaker recognition The contributors are among the most eminent scientists in speech engineering and signal processing and their work represents such diverse countries as Switzerland

Sweden Italy France Japan India and the United States Forensic Speaker Recognition is a useful book for forensic speech scientists speech signal processing experts speech system developers criminal prosecutors and counter terrorism intelligence officers and agents

Finding Difficult Speakers in Automatic Speaker Recognition Lara Lynn Stoll, 2011

The task of automatic speaker recognition wherein a system verifies or determines a speaker's identity using a sample of speech has been studied for a few decades. In that time a great deal of progress has been made in improving the accuracy of the system's decisions through the use of more successful machine learning algorithms and the application of channel compensation techniques and other methodologies aimed at addressing sources of errors such as noise or data mismatch. In general errors can be expected to have one or more causes involving both intrinsic and extrinsic factors. Extrinsic factors correspond to external influences including reverberation noise and channel or microphone effects. Intrinsic factors relate inherently to the speaker himself and include sex age dialect accent emotion speaking style and other voice characteristics. This dissertation focuses on the relatively unexplored issue of dependence of system errors on intrinsic speaker characteristics. In particular I investigate the phenomenon that some speakers within a given population have a tendency to cause a large proportion of errors and explore ways of finding such speakers. There are two main components to this thesis. In the first I establish the dependence of system performance on speakers building upon and expanding previous work demonstrating the existence of speakers with tendencies to cause false alarm or false rejection errors. To this end I explore two different data sets: one that is an older collection of telephone channel conversational speech and one that is a more recent collection of conversational speech recorded on a variety of channels including the telephone as well as various types of microphones. Furthermore in addition to considering a traditional speaker recognition system approach for the second data set I utilize the outputs of a more contemporary approach that is better able to handle variations in channel. The results of such analysis repeatedly show variations in behavior across speakers both for true speaker and impostor speaker cases. Variation occurs both at the level of speech utterances wherein a given speaker's performance can depend on which of his speech utterances is used as well as on the speaker level wherein some speakers have overall tendencies to cause false rejection or false alarm errors. Additionally I observe speaker behavior where the speaker tends to produce false alarms as the target is correlated with wolfish behavior where the speaker tends to produce false alarms as the impostor. On the more recent data set 50% of the false rejection and false alarm errors are caused by only 15-25% of the speakers. The second component of this thesis investigates a straightforward approach to predict speakers that will be difficult for a system to correctly recognize. I use a variety of features to calculate feature statistics that are then used to compute a measure of similarity between speaker pairs. By ranking these similarity measures for a set of impostor speaker pairs I determine those speaker pairs that are easy for a system to distinguish and those that are difficult to distinguish. A variety of these simple distance measures could successfully select both easy and difficult to distinguish speaker pairs as evaluated by differences in detection cost and false alarm.

probability across a large number of systems. Of those tested, the best feature measure at finding the most and least difficult to distinguish speaker pairs was the Euclidean distance between vectors of the mean first, second, and third formant frequencies. Even greater success was attained by the Kullback-Liebler (KL) divergence between pairs of speaker-specific GMMs. Furthermore, an examination of the smallest and biggest distances as computed by the KL divergence revealed individual speaker tendencies to consistently fall among the most or least difficult to distinguish speaker pairs. I then developed an approach for finding those individual speakers who will be difficult for the system using a set of feature statistics calculated over regions of speech. In particular, a support vector machine (SVM) classifier is trained to distinguish between difficult and easy speaker examples in order to produce an overall measure of speaker difficulty as a target or impostor. The resulting precision and recall measures were over 0.8 for difficult impostor speaker detection and over 0.7 for difficult target speaker detection. Depending on the application, the detection threshold can be tuned to improve precision, recall, or specificity in order to best suit the needs of a particular task. The same approach can be taken with single conversation sides as with a set of conversation sides corresponding to the same speaker, since the input feature statistics can be calculated over any number of speech samples.

Speaker Recognition Bandar Hezam, 2023-12-06 Bachelor Thesis from the year 2019 in the subject Engineering Computer Engineering grade A National University of Malaysia. Apu course Mechatronics language English abstract: Voice recognition is a computer software program or hardware device with the ability to decode the human voice. Voice recognition is a system that allows for a secure method of authenticating speakers; the system works in such a way that it generates a speaker model during the enrollment phase, which is based on the speaker's characteristics. The system testing phase typically involves making a claim on the identity of an unknown speaker using the given speech characteristics and the trained models. However, speaker identification is known to be one among the two categories of speaker recognition systems because speaker recognition can be categorized also as speaker verification, whereas the main difference between both speaker identification and speaker verification is to ensure that the person speaking and claiming to be is fully verified, while speaker identification makes multiple decisions by comparing the person speaking with the one trained or stored in the database as an attempt to identify the speaker. The interest of the assignment is speaker identification; therefore, speaker identification is the main focus for this study.

Behavioral Biometrics for Human Identification: Intelligent Applications Wang, Liang, Geng, Xin, 2009-08-31. This edited book provides researchers and practitioners a comprehensive understanding of the state of the art of behavioral biometrics techniques, potential applications, successful practice, and available resources. Provided by publisher.

The Acoustics of Crime Harry Hollien, 2013-06-29. There are many reasons for writing a book; this one was conceived and developed mainly for two. First, a new area has emerged from within the forensic sciences, that of forensic phonetics. As with all new specialties, it is necessary to define its boundaries, justify its importance, and compile a list of the elements it encompasses. This book attempts to outline these several relationships. Second, over the past

decade I have become fascinated with forensics in general and the rapidly expanded subarea of forensic phonetics in particular. Admittedly the latter field is one that is not as yet sufficiently appreciated and much more needs to be known about its nature and extent. Yet I have found it to be a most enjoyable area of study and my attempts to describe its domains were quite informative. It was especially interesting to struggle with the interfaces between forensic phonetics and related fields and discover how they overlap. Only a few comments will be made about the book's contents here in the preface. For one thing they are described in some detail in the first chapter.

Computer Networks Andrzej Kwiecien, Piotr Gaj, Piotr Stera, 2013-05-27. This book constitutes the refereed proceedings of the 20th International Conference on Computer Networks CN 2013 held in Lwówek Śląski, Poland, in June 2013. The 58 revised full papers presented were carefully reviewed and selected for inclusion in the book. The papers in these proceedings cover the following topics: computer networks, network architectural issues, Internet and wireless solutions, teleinformatics and communications, new technologies, queueing theory and queueing networks, innovative applications, networking in e-business, security aspects of hardware and software, industrial systems, quantum and bioinformatics, cloud networking and services.

Two Day International Conference on Data Science and Information Ecosystem'21 Dr. M. Thangaraj, Dr. K. S. Gomathi, *ThinkQuest 2010* S. J. Pise, 2011-08-31. This proceedings is a representation of decades of research, teaching and application in the field. Image Processing, Fusion and Information Technology areas, Digital radio Communication, Wimax, Electrical engg, VLSI approach to processor design, embedded systems design are dealt in detail through models and illustrative techniques.

Artificial Intelligence and Speech Technology Amita Dev, Arun Sharma, S. S. Agrawal, Ritu Rani, 2024-11-23. This two volume set CCIS 2267 and 2268 constitutes the refereed proceedings of 5th International Conference on Artificial Intelligence and Speech Technology AIST 2023 held in Delhi, India during December 26-27, 2023. The 71 papers presented in two volumes were carefully reviewed and selected from 235 submissions. Part I focuses on Speech Technology using AI and Part II focuses on AI innovations for CV and NLP. These volumes are organized in the following topical sections: Part I: Trends and Applications in Speech Processing, Recent Trends in Speech and NLP, Emerging trends in Speech Processing, Advances in Computational Linguistics and NLP. Part II: Recent Trends in Machine Learning and Deep Learning, Analysis using Hybrid technologies with Artificial Intelligence, Exploring New Horizons in Computer Vision, Research Applications of Machine Learning and Deep Learning.

Automatic Speech Recognition and Understanding, 2003.

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