WOLFGANG WAHLSTER (ED.)

# Verbmobil: Foundations of Speech-to-Speech Translation



Fang Chen, Kristiina Jokinen

**Verbmobil: Foundations of Speech-to-Speech Translation** Wolfgang Wahlster, 2000-07-31 Verbmobil is the result of eight years of intensive research in a large speech to speech translation project executed by a consortium comprising nineteen academic and four industrial partners. The system that was developed by more than 100 researchers and engineers handles dialogs in three business oriented domains with translation between three languages German English and Japanese Verbmobil deals with spontaneous speech which includes realistic repair phenomena and uses deep semantic analysis to recognize a speaker's slips and to translate what he tried to say rather than what he actually said This book gives the first comprehensive overview of the results of this unique and seminal project in human language technology Contributions by leading scientists in speech and language technology look at the component technologies that make Verbmobil the most advanced speech to speech translation system worldwide and a landmark project in the history of natural language processing **Verbmobil: Foundations of Speech-to-Speech Translation** Wolfgang Wahlster, 2010-12-15 In 1992 it seemed very difficult to answer the question whether it would be possible to develop a portable system for the automatic recognition and translation of spon taneous speech Previous research work on speech processing had focused on read speech only and international projects aimed at automated text translation had just been terminated without achieving their objectives Within this context the German Federal Ministry of Education and Research BMBF made a careful analysis of all national and international research projects conducted in the field of speech and language technology before deciding to launch an eight year basic research lead project in which research groups were to cooperate in an interdisciplinary and international effort covering the disciplines of computer science computational linguistics translation science signal processing communication science and artificial intelligence At some point the project comprised up to 135 work packages with up to 33 research groups working on these packages The project was controlled by means of a network plan Every two years the project sit uation was assessed and the project goals were updated An international scientific advisory board provided advice for BMBF A new scientific approach was chosen for this project coping with the com plexity of spontaneous speech with all its pertinent phenomena such as ambiguities self corrections hesitations and disfluencies took precedence over the intended lex icon size Another important aspect was that prosodic information was exploited at all processing stages

**Verbmobil: Foundations of Speech-to-Speech Translation** Wolfgang Wahlster,2013-04-17 In 1992 it seemed very difficult to answer the question whether it would be possible to develop a portable system for the automatic recognition and translation of spon taneous speech Previous research work on speech processing had focused on read speech only and international projects aimed at automated text translation had just been terminated without achieving their objectives Within this context the German Federal Ministry of Education and Research BMBF made a careful analysis of all national and international research projects conducted in the field of speech and language technology before deciding to launch an eight

year basic research lead project in which research groups were to cooperate in an interdisciplinary and international effort covering the disciplines of computer science computational linguistics translation science signal processing communi cation science and artificial intelligence At some point the project comprised up to 135 work packages with up to 33 research groups working on these packages The project was controlled by means of a network plan Every two years the project sit uation was assessed and the project goals were updated An international scientific advisory board provided advice for BMBF A new scientific approach was chosen for this project coping with the com plexity of spontaneous speech with all its pertinent phenomena such as ambiguities self corrections hesitations and disfluencies took precedence over the intended lex icon size Another important aspect was that prosodic information was exploited at all processing stages Knowledge Systems and Translation Helle V. Dam, Jan Engberg, Heidrun Gerzymisch-Arbogast, 2011-12-22 It is generally agreed that knowledge plays an important role in translation and interpreting and that it should therefore be of central concern to translation and interpreting studies However there is no general agreement about what is actually meant by the term knowledge in this context nor about in exactly what ways it is relevant Also present day translation and interpreting studies offer only a limited amount of research specifically dedicated to knowledge systematization and other knowledge related issues This book is one of the first to systematically and exclusively address the question of knowledge in translation and interpreting It is a collection of papers by leading scholars both from the field of translation and interpreting and from adjacent fields where knowledge also plays an important role such as linguistics and computer science The experts present a wide variety of conceptions of knowledge and a number of different approaches to the study of knowledge in translation and interpreting some of them draw on concepts such as scenes and frames mental spaces and semantic networks some discuss knowledge systems from an ontological point of view and some present more general concepts of knowledge in translation and interpreting Along the same lines some of the contributors deal mainly with theoretical and conceptual aspects others focus on methodological issues and again others report on empirical studies What brings them together however is their common focus on the interface between knowledge and translation interpreting and their main achievement is that by joining forces they manage to present to their readers a state of the art report which offers both a clearer delimitation of the concept of knowledge and a better understanding of its role in translation and interpreting SmartKom: Foundations of Multimodal <u>Dialogue Systems</u> Wolfgang Wahlster, 2006-09-05 With contributions by leading scientists in the field this book gives the first comprehensive overview of the results of the seminal SmartKom project one of the most advanced multimodal dialogue Grammatical theory: From transformational grammar to constraint-based approaches (Fifth revised systems worldwide edition) Stefan Müller, 2023-01-23 This book introduces formal grammar theories that play a role in current linguistic theorizing Phrase Structure Grammar Transformational Grammar Government Binding Generalized Phrase Structure Grammar Lexical Functional Grammar Categorial Grammar Head Driven Phrase Structure Grammar Construction Grammar

Tree Adjoining Grammar The key assumptions are explained and it is shown how the respective theory treats arguments and adjuncts the active passive alternation local reorderings verb placement and fronting of constituents over long distances The analyses are explained with German as the object language The second part of the book compares these approaches with respect to their predictions regarding language acquisition and psycholinguistic plausibility. The nativism hypothesis which assumes that humans posses genetically determined innate language specific knowledge is critically examined and alternative models of language acquisition are discussed The second part then addresses controversial issues of current theory building such as the question of flat or binary branching structures being more appropriate the question whether constructions should be treated on the phrasal or the lexical level and the question whether abstract non visible entities should play a role in syntactic analyses It is shown that the analyses suggested in the respective frameworks are often translatable into each other The book closes with a chapter showing how properties common to all languages or to certain classes of languages can be captured Head-Driven Phrase Structure Grammar Stefan Müller, Anne Abeillé, Robert D. Borsley, Jean-Pierre Koenig, 2024-11-07 Head Driven Phrase Structure Grammar HPSG is a constraint based or declarative approach to linguistic knowledge which analyses all descriptive levels phonology morphology syntax semantics pragmatics with feature value pairs structure sharing and relational constraints In syntax it assumes that expressions have a single relatively simple constituent structure This volume provides a state of the art introduction to the framework Various chapters discuss basic assumptions and formal foundations describe the evolution of the framework and go into the details of the main syntactic phenomena Further chapters are devoted to non syntactic levels of description. The book also considers related fields and research areas gesture sign languages computational linguistics and includes chapters comparing HPSG with other frameworks Lexical Functional Grammar Categorial Grammar Construction Grammar Dependency Grammar and Minimalism **Grammatical theory** Stefan Müller, This book introduces formal grammar theories that play a role in current linguistic theorizing Phrase Structure Grammar Transformational Grammar Government Binding Generalized Phrase Structure Grammar Lexical Functional Grammar Categorial Grammar Head Driven Phrase Structure Grammar Construction Grammar Tree Adjoining Grammar The key assumptions are explained and it is shown how the respective theory treats arguments and adjuncts the active passive alternation local reorderings verb placement and fronting of constituents over long distances The analyses are explained with German as the object language The second part of the book compares these approaches with respect to their predictions regarding language acquisition and psycholinguistic plausibility The nativism hypothesis which assumes that humans posses genetically determined innate language specific knowledge is critically examined and alternative models of language acquisition are discussed The second part then addresses controversial issues of current theory building such as the question of flat or binary branching structures being more appropriate the question whether constructions should be treated on the phrasal or the lexical level and the question whether abstract non visible

entities should play a role in syntactic analyses It is shown that the analyses suggested in the respective frameworks are often translatable into each other The book closes with a chapter showing how properties common to all languages or to certain classes of languages can be captured The licensing and usage of topic drop in German Lisa Schäfer,2025-06-10 This book is concerned with the licensing and usage of the elliptical construction topic drop in German The term topic drop refers to the omission of the preverbal constituent in declarative verb second sentences for example the omission of the subject ich I in the sentence Bin gleich zur ck Am right back Topic drop exists in most of the Germanic verb second languages and typically occurs in spoken language and text types such as SMS chats notes etc While much of the previous research has focused on individual specific properties of topic drop often adopting a purely theoretical perspective this book presents a systematic investigation of both the syntactic properties and usage conditions of topic drop based on empirical evidence from a corpus study and 12 acceptability rating studies The first part of the book investigates the licensing of topic drop in particular its restriction to the preverbal prefield position. The results of four rating studies on topic drop in different prefield configurations lead to a refined prefield condition based on proposals by Rizzi 1994 and Freywald 2020 that is independent of topicality Moreover they inform the discussion on the most suitable syntactic analysis of topic drop supporting a PF deletion approach The second part of the book presents and tests an information theoretic account of topic drop usage that builds on the Uniform Information Density hypothesis Levy Jaeger 2007 In a corpus study and seven rating studies several potential usage factors are investigated including grammatical person and verb predictability The results provide initial evidence suggesting that topic drop usage can be explained by general processing principles The prefield constituent is omitted when it is redundant and realized overtly when it facilitates the processing of the following verb This information theoretic explanation is based on independently evidenced processing mechanisms bundles isolated claims from the theoretical literature and allows for a unified analysis of topic drop with other types of ellipsis and reduction

Verb-Particle Explorations Nicole Dehé, Ray Jackendoff, Andrew McIntyre, Silke Urban, 2012-02-13 The contributions in this book are a representative cross section of recent research on verb particle constructions. The syntactic semantic morphological and psycholinguistic phenomena associated with the constructions in English Dutch German and Swedish are analyzed from the various different theoretical viewpoints. \*\*Grammatical theory: From transformational grammar to constraint-based approaches\*\* Stefan Müller, 2023-01-04 This book introduces formal grammar theories that play a role in current linguistic theorizing Phrase Structure Grammar Transformational Grammar Government Binding Generalized Phrase Structure Grammar Lexical Functional Grammar Categorial Grammar Head Driven Phrase Structure Grammar ConstructionGrammar Tree Adjoining Grammar The key assumptions are explained and it is shown how the respective theory treats arguments and adjuncts the active passive alternation local reorderings verb placement and fronting of constituents over long distances. The analyses are explained with German as the object language.

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different goals presenting a multifaceted view of cognitive science This volume includes all papers posters and summaries of symposia presented at the leading conference that brings cognitive scientists together. The theme of this year s conference was the social cultural and contextual elements of cognition including topics on collaboration cultural learning distributed cognition and interaction Natural Language Processing and Computational Linguistics 2 Mohamed Zakaria Kurdi, 2018-02-28 Natural Language Processing NLP is a scientific discipline which is found at the intersection of fields such as Artificial Intelligence Linguistics and Cognitive Psychology This book presents in four chapters the state of the art and fundamental concepts of key NLP areas Are presented in the first chapter the fundamental concepts in lexical semantics lexical databases knowledge representation paradigms and ontologies The second chapter is about combinatorial and formal semantics Discourse and text representation as well as automatic discourse segmentation and interpretation and anaphora resolution are the subject of the third chapter Finally in the fourth chapter I will cover some aspects of large scale applications of NLP such as software architecture and their relations to cognitive models of NLP as well as the evaluation paradigms of NLP software Furthermore I will present in this chapter the main NLP applications such as Machine Translation MT Information Retrieval IR as well as Big Data and Information Extraction such as event extraction sentiment analysis and opinion mining Computing with Instinct Yang Cai, 2011-03-03 Simplicity in nature is the ultimate sophistication The world's magnificence has been enriched by the inner drive of instincts the profound drive of our everyday life Instinct is an inherited behavior that responds to environmental stimuli Instinctive computing is a computational simulation of biological and cognitive instincts which influence how we see feel appear think and act If we want a computer to be genuinely secure intelligent and to interact naturally with us we must give computers the ability to recognize understand and even to have primitive instincts This book Computing with Instincts comprises the proceedings of the Instinctive Computing Workshop held at Carnegie Mellon University in the summer of 2009 It is the first state of the art survey on this subject The book consists of three parts Instinctive Sensing Communication and Environments including new experiments with in vitro biological neurons for the control of mobile robots instinctive sound recognition texture vision visual abstraction genre in cultures human interaction with virtual world intuitive interfaces exploitive interaction and agents for smart environments **Speech Technology** Fang Chen, Kristiina Jokinen, 2010-07-01 This book gives an overview of the research and application of speech technologies in different areas One of the special characteristics of the book is that the authors take a broad view of the multiple research areas and take the multidisciplinary approach to the topics One of the goals in this book is to emphasize the application User experience human factors and usability issues are the focus in this book Text, Speech and Dialogue Václav Matoušek, Pavel Mautner, Tomáš Pavelka, 2005-08-25 TheInternationalConferenceTSD 2005 the8theventin theseriesonText Speech and Dialogue which originated in 1998 presented state of the art technology and recent achievements in the eld of natural language processing It declared its intent

to be an interdisciplinary forum intertwining research in speech and language processing with its applications in everyday practice. We feel that the mixture of different approaches and applications offered a great opportunity to get acquainted with the current act ities in all aspects of language communication and to witness the amazing vitality of researchers from developing countries too. The nancial support of the ISCA Intertional Speech Communication Association enabled the wide attendance of researchers from all active regions of the world Thisyear sconferencewaspartially oriented towards multimodal human computer interaction. HCI which can be seen as the most attractive topic of HCI at the present time. In this way we are involved in a rich complex of communicative activity facial expressions hand gestures direction of gaze to name but the most obvious ones. The interpretation of each user utteranced epends on the context prosody facial expressions e.g. brows raised brows and gaze both raised and gestures. Hearers have to adapt to the speaker e.g. maintaining the theme of the conversation smiling etc. Research into the interaction of these channels is however limited often focusing on the interaction between a pair of channels. Six significant scientic cresults achieved in this area in the USA Japan Switzerland Germany. The Netherlands and the Czech Republic were presented by keynote speakers in special plenary sessions. Further approx

Advances in Natural Language Processing Tapio Salakoski, Filip Ginter, Sampo Pyysalo, Tapio Pahikkala, 2006-08-10 This book constitutes the refereed proceedings of the 5th International Conference on Natural Language Processing FinTAL 2006 held in Turku Finland in August 2006 The book presents 72 revised full papers together with 1 invited talk and the extended abstracts of 2 invited keynote addresses The papers address all current issues in computational linguistics and monolingual and multilingual intelligent language processing theory methods and applications ECAI 2012 C. Bessiere, 2012-08-15 Artificial intelligence AI plays a vital part in the continued development of computer science and informatics The AI applications employed in fields such as medicine economics linguistics philosophy psychology and logical analysis not forgetting industry are now indispensable for the effective functioning of a multitude of systems This book presents the papers from the 20th biennial European Conference on Artificial Intelligence ECAI 2012 held in Montpellier France in August 2012 The ECAI conference remains Europe s principal opportunity for researchers and practitioners of Artificial Intelligence to gather and to discuss the latest trends and challenges in all subfields of AI as well as to demonstrate innovative applications and uses of advanced AI technology ECAI 2012 featured four keynote speakers an extensive workshop program seven invited tutorials and the new Frontiers of Artificial Intelligence track in which six invited speakers delivered perspective talks on particularly interesting new research results directions and trends in Artificial Intelligence or in one of its related fields The proceedings of PAIS 2012 and the System Demonstrations Track are also included in this volume which will be of interest to all those wishing to keep abreast of the latest developments in the field of AI

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