Efficient Parsing for Natural Language

A Fast Algorithm for Practical Systems

Masaru Tomita

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RD Boyd

Efficient Parsing For Natural Language:

    Efficient Parsing for Natural Language Masaru Tomita,1985-09-30 Parsing Efficiency is crucial when building practical natural language systems Ibis is especially the case for interactive systems such as natural language database access interfaces to expert systems and interactive machine translation Despite its importance parsing efficiency has received little attention in the area of natural language processing In the areas of compiler design and theoretical computer science on the other hand parsing algorithms 3 have been evaluated primarily in terms of the theoretical worst case analysis e g lXn and very few practical comparisons have been made This book introduces a context free parsing algorithm that parses natural language more efficiently than any other existing parsing algorithms in practice Its feasibility for use in practical systems is being proven in its application to Japanese language interface at Carnegie Group Inc and to the continuous speech recognition project at Carnegie Mellon University This work was done while I was pursuing a Ph D degree at Carnegie Mellon University My advisers Herb Simon and Jaime Carbonell deserve many thanks for their unfailing support advice and encouragement during my graduate studies I would like to thank Phil Hayes and Ralph Grishman for their helpful comments and criticism that in many ways improved the quality of this book I wish also to thank Steven Brooks for insightful comments on theoretical aspects of the book chapter 4 appendices A B and C and Rich Thomason for improving the linguistic part of tile book the very beginning of section 1 1 <u>Handbook of Natural Language Processing</u> Nitin Indurkhya,Fred J. Damerau,2010-02-22 The Handbook of Natural Language Processing Second Edition presents practical tools and techniques for implementing natural language processing in computer systems Along with removing outdated material this edition updates every chapter and expands the content to include emerging areas such as sentiment analysis New to the Second EditionGreater **Handbook of Natural Language Processing** Robert Dale,Hermann Moisl,Harold Somers,2000-07-25 This study explores the design and application of natural language text based processing systems based on generative linguistics empirical copus analysis and artificial neural networks It emphasizes the practical tools to accommodate the selected system **NATURAL LANGUAGE PROCESSING** BHARATI AKSHAR,VINEET CHAITANYA,SANGAL, RAJEEV,1995-01-01 This book presents a Paninian perspective towards natural language processing It has three objectives 1 to introduce the reader to NLP 2 to introduce the reader to Paninian Grammar PG which is the application of the original Paninian framework to the processing of modern Indian languages using the computer 3 to compare Paninian Grammar PG framework with modern Western computational grammar frameworks Indian languages like many other languages of the world have relatively free word order They also have a rich system of case endings and post positions In contrast to this the majority of grammar frameworks and designed for English and other positional languages The unique aspect of the computational grammar describes here is that it is designed for free word order languages and makes special use of case endings and post positions Efficient parsers for the grammar are also described The computational grammar is likely to be

suitable for other free word order languages of the world Second half of the book presents a comparison of Paninian Grammar PG with existing modern western computational grammars It introduces three western grammar frameworks using examples from English Lexical Functional Grammar LFG Tree Adjoining Grammar TAG and Government and Binding GB The presentation does not assume any background on part of the reader regarding these frameworks Each presentation is followed by either a discussion on applicability of the framework to free word order languages or a comparison with PG framework **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 **Natural Language Processing and Computational Linguistics** Mohamed Zakaria Kurdi,2016-08-17 Natural language processing NLP is a scientific discipline which is found at the interface of computer science artificial intelligence and cognitive psychology Providing an overview of international work in this interdisciplinary field this book gives the reader a panoramic view of both early and current research in NLP Carefully chosen multilingual examples present the state of the art of a mature field which is in a constant state of evolution In four chapters this book presents the fundamental concepts of phonetics and phonology and the two most important applications in the field of speech processing recognition and synthesis Also presented are the fundamental concepts of corpus linguistics and the basic concepts of morphology and its NLP applications such as stemming and part of speech tagging The fundamental notions and the most important syntactic theories are presented as well as the different approaches to syntactic parsing with reference to cognitive models algorithms and computer applications **Linguistics Today ⬚ Facing a Greater Challenge** Piet van Sterkenburg,2004-10-13 Every five years the Permanent International Committee of Linguists CIPL organises a world congress for linguists And every five years the Committee faces the challenge of presenting a programme at the highest possible level The CIPL Executive Committee decided for the Congress planned for 2003 in Prague to focus on four major topics which play an important role in today s linguistic debate 1 Typology 2 Endangered Languages 3 Methodology and Linguistics including fieldwork and 4 Language and the mind Leading experts have introduced the four themes in their plenary lectures in the course of the congress which served as a basis for the articles presented in the current volume This book should be a welcome tool for all linguists wishing to find their way quickly in current developments A CD Rom containing the full proceedings of the Prague Congress is included <u>A Computational Model of Natural Language</u>

Communication Roland R. Hausser,2006-08-02 The ideal of using human language to control machines requires a practical theory of natural language communication that includes grammatical analysis of language signs plus a model of the cognitive agent with interfaces for recognition and action an internal database and an algorithm for reading content in and out This book offers a functional framework for theoretical analysis of natural language communication and for practical applications of natural language processing   *Extended Finite State Models of Language* Andras Kornai,1999-09-13 This book and CD ROM cover the breadth of contemporary finite state language modeling from mathematical foundations to developing and debugging specific grammars   **Natural Language Processing** Ela Kumar,2013-12-30 Covers all aspects of the area of linguistic analysis and the computational systems that have been developed to perform the language analysis The book is primarily meant for post graduate and undergraduate technical courses   **Computational Intelligence: A Compendium** John Fulcher,2008-05-28 Computational Intelligence A Compendium presents a well structured overview about this rapidly growing field with contributions from leading experts in Computational Intelligence The main focus of the compendium is on applied methods tried and proven as being effective to realworld problems which is especially useful for practitioners researchers students and also newcomers to the field This state of handbook style book has contributions by leading experts

The Handbook of Computational Linguistics and Natural Language Processing Alexander Clark,Chris Fox,Shalom Lappin,2013-04-24 This comprehensive reference work provides an overview of the concepts methodologies and applications in computational linguistics and natural language processing NLP Features contributions by the top researchers in the field reflecting the work that is driving the discipline forward Includes an introduction to the major theoretical issues in these fields as well as the central engineering applications that the work has produced Presents the major developments in an accessible way explaining the close connection between scientific understanding of the computational properties of natural language and the creation of effective language technologies Serves as an invaluable state of the art reference source for computational linguists and software engineers developing NLP applications in industrial research and development labs of software companies   *Framework and Resources for Natural Language Parser Evaluation* Tuomo Kakkonen,2007

Attention and Performance XII Max Coltheart,2016-09-19 Originally published in 1987 this volume presented a comprehensive state of the art account of what was known about the psychology of reading at the time All the fundamental aspects of reading are considered visual attention visual feature analysis visual masking letter and word recognition priming effects eye movements in reading phonological processing working memory and reading parsing sentence comprehension and text integration The subject of reading is approached from a variety of different theoretical perspectives including cognitive psychology connectionism neuropsychology and linguistics This broad and comprehensive review will still be of value for undergraduate and graduate teaching as well as research workers engaged in experimental or theoretical investigations of any aspect of the psychology of reading   *Automata and Computability Insights* Anasooya

Khanna,2025-02-20 Automata and Computability Insights is a foundational textbook that delves into the theoretical underpinnings of computer science exploring automata theory formal languages and computability Authored by Dexter C Kozen this book provides a deep understanding of these concepts for students researchers and educators Beginning with a thorough introduction to formal languages and automata the book covers finite automata regular languages context free languages and context free grammars It offers insightful discussions on pushdown automata and their expressive power The book also explores decidability and undecidability including the Halting Problem and decision procedures providing a profound understanding of computational systems limitations and capabilities Advanced topics such as quantum computing oracle machines and hypercomputation push the boundaries of traditional computational models The book bridges theory and real world applications with chapters on complexity theory NP completeness and parallel and distributed computing This interdisciplinary approach integrates mathematical rigor with computer science concepts making it suitable for undergraduate and graduate courses Automata and Computability Insights is a valuable reference for researchers presenting complex topics clearly and facilitating engagement with numerous exercises and examples It equips readers with the tools to analyze and understand the efficiency of algorithms and explore open problems in theoretical computation *Language as a Complex System* Gemma Bel-Enguix,M. Dolores Jiménez-López,2009-12-14 Language is one of the most challenging issues that remain to be explained from the physiological and psychological points of view As a complex system its formal modelling and simulation present important difficulties Models proposed up to now have not been able to give either a coherent explanation of natural language or a satisfactory computational model for the processing of natural language To investigate natural language we need to cross traditional academic boundaries in order to solve the different problems related to language This book is an attempt to connect and integrate several academic disciplines and technologies in the pursuit of a common task the study of language The main goal of the book is to boost the interchange of knowledge and viewpoints between specialists who working on linguistics biology or computation have an interest in bringing their methods together in order to provide innovative and challenging tools and formalisms to approach and improve theories and models on languages The subject of this book will attract researchers from many fields who are interested in natural or artificial languages and want to enrich their scientific research with theories methods and ideas coming from different disciplines People dealing with linguistics computer science formal language theory and biology may find in this book new and challenging ideas

Formal Languages and Applications Carlos Martin-Vide,2004-03-05 Formal Languages and Applications provides an overall course aid and self study material for graduates students and researchers in formal language theory and its applications The main results and techniques are presented in an easily accessible way accompanied with many references and directions for further research This carefully edited monograph is intended to be the gate to formal language theory and its applications and is very useful as a general source of information in formal language theory *Practical Aspects of*

Declarative Languages Manuel Carro,Ricardo Peña,2010-01-07 This book constitutes the refereed proceedings of the 12th International Symposium on Practical Aspects of Declarative Languages PADL 2010 held in Madrid Spain in January 2010 colocated with POPL 2010 the Symposium on Principles of Programming Languages The 22 revised full papers presented together with 2 invited talks were carefully reviewed and selected from 58 submissions The volume features original work emphasizing novel applications and implementation techniques for all forms of clarative concepts including functions relations logic and constraints The papers address all current aspects of declarative programming they are organized in topical sections on non monotonic reasoning answer set programming types parallelism and distribution code quality assurance domain specific languages programming aids constraints and tabling agents   *Natural Language Processing – IJCNLP 2004* Keh-Yih Su,Jun'ichi Tsujii,Jong-Hyeok Lee,Oi Yee Kwong,2005-01-31 This book constitutes the thoroughly refereed post proceedings of the First International Joint Conference on Natural Language Processing IJCNLP 2004 held in Hainan Island China in March 2004 The 84 revised full papers presented in this volume were carefully selected during two rounds of reviewing and improvement from 211 papers submitted The papers are organized in topical sections on dialogue and discourse FSA and parsing algorithms information extractions and question answering information retrieval lexical semantics ontologies and linguistic resources machine translation and multilinguality NLP software and applications semantic disambiguities statistical models and machine learning taggers chunkers and shallow parsers text and sentence generation text mining theories and formalisms for morphology syntax and semantics word segmentation NLP in mobile information retrieval and user interfaces and text mining in bioinformatics   Summary of Awards ,1991

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