The constantly changing landscape of Computational Linguistics challenges experts and practitioners to stay apprized of the field’s most up-to-date research. That is why Information Science Reference is pleased to offer this three-volume reference collection that will empower students, researchers, and academicians with a strong understanding of critical issues within Computational Linguistics by providing both broad and detailed perspectives on cutting-edge theories and developments in the field. This collection is designed to act as a single reference source on conceptual, methodological, technical, and organizational issues, as well as provide insight into emerging trends and future opportunities within the discipline.

Computational Linguistics: Concepts, Methodologies, Tools, and Applications is organized into six distinct sections that provide comprehensive coverage of important topics. The sections are (1) Fundamental Concepts and Theories, (2) Development and Design Methodologies, (3) Tools and Technologies, (4) Utilization and Application, (5) Organizational and Social Implications, and (6) Emerging Trends. The following paragraphs provide a summary of what readers may expect from this invaluable reference tool.

Section 1, “Fundamental Concepts and Theories,” introduces this work with a discussion of some background considerations of Computational Linguistics. The first chapter, MLW and Bilingualism by Daniela López De Luise and Débora Hisgen, deals with language acquisition and how children in particular learn a new language. Subsequent chapters, such as Writing from and with Community Knowledge by María Paula Ghiso, Patricia Martínez-Alvarez, and Bessie P. Dernikos; Leadership and the Function of Discourse on International Political Economy by Pinar Altıok Gurel, Recep Yılmaz, Nevin Özgür Cambaz, and Nurten Yılmaz; and Linguistic Certainty in Managerial Announcements by Elizabeth Demers and Julia Yu, further explore some of the basic tenants of this field, information that will be explored in-depth throughout this multi-volume reference. Finally, the section concludes with A Domain-Specific Language for High-Level Parallelization by Ritu Arora, Purushotham Bangalore, and Marjan Mernik, which introduces another facet of Computational Linguistics: the language of the machine.

Section 2, “Development and Design Methodologies,” continues from the first section to explore some of the ways in which the principles of Computational Linguistics can be utilized in a real-world context. The opening chapters of this section discuss domain-specific languages and other concerns of Computational Linguistics in the computer science field, for example, Formal Semantics for Metamodel-Based Domain Specific Languages by Paolo Arcaini, Angelo Gargantini, Elvina Riccobene, and Patrizia Scandurra; Design Patterns and Design Principles for Internal Domain-Specific Languages by Sebastian Günther; and An Exploration about Krashen’s Input Hypothesis in the Computer Network Environment by Cui Junyuan. Teaching machines to think and communicate is a useful endeavor in helping researchers to understand precisely how humans process language in everyday contexts. Additional chapters in this section describe the foundations of language learning programs, many of which are based on computer software and applications (see Using Social Network-Mediated Bridging Activities to Develop Socio-Pragmatic Awareness in Elementary Korean by Jonathon Reinhardt and Jieun Ryu, and Laying
the Ground for Online English as a Second or Foreign Language (ESL/EFL) Composition Courses and University Internationalization by Estela Ene, for example). The final chapter in this section, Advanced Question-Answering and Discourse Semantics by Patrick Saint-Dizier introduces a new platform for analyzing discourse, a topic that will be discussed further in the next section.

Section 3, “Tools and Technologies,” investigates modern Computational Linguistics and how computers can assist individuals in learning, analyzing, and summarizing a wide range of communications. For instance, the first chapter, Second Language Learners’ Spoken Discourse by Catia Cucchiarini and Helmer Strik describes how speech recognition and computer-assisted language learning software can be used to improve self-directed learning in language acquisition. Additional language learning tools are explored throughout this section, notable chapters including The Opinions and Attitudes of the Foreign Language Learners and Teachers Related to the Traditional and Digital Games by Levent Uzun, M. Tugba Yildiz Ekin, and Erdogan Kartal; A Customizable Language Learning Support System Using Ontology-Driven Engine by Jingyun Wang, Takahiko Mendori, and Juan Xiong; and LingoBee Mobile App by Emma Procter-Legg, Sobah Abbas Petersen, and Annamaria Cacchione. Technology can be used for applications beyond language learning, however, and Tools for the Automatic Generation of Ontology Documentation by Silvio Peroni, David Shotton, and Fabio Vitali, and “Statistical Machine Translation by Lucia Specia describe two such applications in professional environments.

Section 4, “Utilization and Application,” draws on information and concepts presented in the previous sections to identify the best uses for these principles of Computational Linguistics. The section begins with an application in machine translation, with the chapter Parsing Bangla Grammar Using Context Free Grammar by Al-Mahmud, Bishnu Sarker, and K. M. Azharul Hasan. Additionally, readers can find information on new approaches to knowledge management (Classifying Consumer Comparison Opinions to Uncover Product Strengths and Weaknesses by Kaiquan S. J. Xu, Wei Wang, Jimmy Ren, Jin S. Y. Xu, Long Liu, and Stephen Liao), data mining (Multi-Objective Genetic and Fuzzy Approaches in Rule Mining Problem of Knowledge Discovery in Databases by Harihar Kalia, Satchidananda Dehuri, and Ashish Ghosh), and effective online communication (A Semantic Approach to LinkedIn Profiles by Ilias Kapareliotis and Patricia Crosbi), among others. One particularly interesting approach is the comparison between spoken language and music described in Representing Music as Work in Progress by Gerard Roma and Perfecto Herrera, the chapter that also concludes this section.

Section 5, “Organizational and Social Implications,” describes a particular subset of applications of Computational Linguistics: those meant to assist and enhance human lives. The opening chapters in this section, such as Re/Designing Online Platforms by Citizen Designers and its Contribution to the Digital Writing and Research by Rajendra Kumar Panthee and Building Collaborations between University Pre-Service Student-Teachers and English Language Students through a Socially Mediated Network by Dustin De Felice and Luz María Ortiz Alcocer describe how linguistic tools can be used to enhance social and professional interactions over long distances. Additionally, identifying the best methods for teaching students a new language is imperative to the success of coming generations in an increasingly globalized society, a concern tackled by chapters such as Effective Teaching Practices for Academic Literacy Development of Young Immigrant Learners by Cate Crosby and They Can’t Fix What They Can’t Hear by Peter Fadde. Finally, the section concludes with two chapters on human/computer communication and language processing: Abstraction of Computer Language Patterns by Jaroslav Porubán, Ján Kollár, and Miroslav Sabo, and Towards a Bio-Inspired Theoretical Linguistics to Model Man-Machine Communication by Gemma Bel-Enguix and M. Dolores Jiménez-López.
Section 6, “Emerging Trends,” explores the future of Computational Linguistics and how a greater understanding of how human beings process, use, and learn languages can help to improve communication in a variety of contexts. The first chapters in this section investigate how computers use language—both machine language and natural, human languages—and how an understanding of language processing in computers can help to make online interactions and research more intimate and accessible. Kansei Evaluation of Product Recommendation Based on a Partial Comparison Process by Jing-Zhong Jin and Yoshiteru Nakamori, Data Hiding for Text and Binary Files by Hioki Hirohisa, and A Preliminary Study of Neuro-Linguistic Programming in Nonprofit Organizations by Eric Kong and Mark Farrell are primary examples of the main focus of this section. Additional chapters explore education and human language learners, such as Words that Fascinate the Listener by Felix Weninger, Pascal Staudt, and Björn Schuller, and Usage-Based Instruction by Serafima Gettys, but the concluding chapters in this section, Learning Words by Imitating by Thomas Cederborg and Pierre-Yves Oudeyer, and Learning Words from Experience by Annette M. E. Henderson and Mark A. Sabbagh, are indicative of the future of Computational Linguistics research: learning how to make language and communication work for us.

As a comprehensive collection of research on current findings related to the development of interdisciplinary technologies, Computational Linguistics: Concepts, Methodologies, Tools, and Applications provides researchers, administrators, and all audiences with a complete understanding of the latest advances, applications, and concepts in Computational Linguistics. Although the primary organization of the contents in this multi-volume work is based on its six sections, offering a progression of coverage on the important concepts, methodologies, technologies, applications, social issues, and emerging trends, the reader can also identify specific content by utilizing the extensive indexing system found at the end of each volume. Given the vast number of issues concerning usage, successes and failures, policies, strategies, and applications of Computational Linguistics in countries around the world, Computational Linguistics: Concepts, Methodologies, Tools, and Applications addresses the demand for a resource that encompasses the most pertinent research on the technologies being employed to globally bolster the knowledge and implementation of Computational Linguistics.