

Foreword

Artificial Intelligence (AI) is the branch of Computer Science that builds computing artifacts that display intelligence. This intelligence is often defined as displaying the types of behavior that humans display, and computationally, that typically means solving exponentially hard problems using only polynomial resources. The application of AI to real-world problems is a driving force that underlies AI research, and applied AI systems must succeed within the resource constraints. It is in this setting that Applied Natural Language Processing (ANLP) exists. Natural Language Processing (NLP) is one of the oldest fields of AI, generally considered to have started in the 1950s alongside AI itself. Early efforts to apply NLP revealed the complexity and difficulty of the general task of processing natural language, in terms of input processing, capturing meaning, linking to other AI components, and producing satisfactory natural language output. Much progress has been made, and today we are commonly expected to “converse” with computing systems using (limited) natural language. This progress in the application of NLP has led to the identification of ANLP as a distinct sub-field, with a focus on the identification, investigation, and solution to real-life language-related issues.

This volume serves to provide an overview and a survey of the state-of-the-art in ANLP. This is achieved through an examination of the foundations of NLP that have contributed to ANLP, a review of several successful ANLP applications, and a selection of work describing new research results in ANLP. The foundations include question answering, text summarization, information extraction, dialogue, and programming practices for ANLP. The applications (i.e., ANLP) refer to educational systems, text assessment tools, and various approaches to measuring psychological features. New results include work on intelligent tutoring systems, user interfaces, quality analysis, extraction of semantics, and identification of linguistic styles. The contributions to the volume come from established and recognized ANLP researchers and practitioners, with a wide range of viewpoints and skill-sets. As a result, this volume is truly comprehensive, and will be a starting point for much further work.

The future will place increasing demands on ANLP, as an increasingly savvy public demand increasingly natural (language) interfaces to computing devices and online data sources. Intelligent processing of user input and requests, effective querying of textual databases, and the generation of results in a natural (language) form, will necessarily become common-place. Research and development of such capabilities fall into the purview of ANLP. The principles and practices described in this volume will provide starting points and inspiration. As such, this volume can be used for a graduate class in the area, for independent study by research students and faculty, and by a more general AI audience as an introduction to the field. Because ANLP is inherently inter-disciplinary, the book is sufficiently diverse to accommodate departments of Computer Science, Cognitive Science, and Linguistics, and yet at the same time to be cohesive enough to bring researchers and students from these departments together.

It is interesting to note the history that led to this volume. ANLP conferences were originally linked to the Association for Computational Linguistics (ACL) Conference and the International Conference on Computational Linguistics (COLING), in the years 1983 to 2000. After a hiatus, the conference in 2006 re-emerged as a track of the International FLAIRS (Florida Artificial Intelligence Research Society) Conference, where it flourished. The success of the ANLP track at FLAIRS led directly to this book, and the FLAIRS setting provided a source for contributions that straddle the boundaries of conventional fields. This is therefore, in some sense, a unique opportunity to get to grips with the exciting field of Applied Natural Language Processing, in one collected set of readings.

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