DOWNLOAD PDF NATURAL LANGUAGE UNDERSTANDING AND LOGIC PROGRAMMING, II

Chapter 1 : Natural Language Understanding and Logicâ€¦ -

Natural language semantics and pragmatics are now two major fields in linguistics, philosophy, artificial intelligence and computational linguistics. With the development of large and efficient Prolog interpreters and compilers and with the expansion of the theoretical aspects of logic programming.

ELIZA worked by simple parsing and substitution of key words into canned phrases and Weizenbaum sidestepped the problem of giving the program a database of real-world knowledge or a rich lexicon. Yet ELIZA gained surprising popularity as a toy project and can be seen as a very early precursor to current commercial systems such as those used by Ask. In , William A. Woods introduced the augmented transition network ATN to represent natural language input. ATNs and their more general format called "generalized ATNs" continued to be used for a number of years. In the s and s the natural language processing group at SRI International continued research and development in the field. A number of commercial efforts based on the research were undertaken, e. However, with the advent of mouse driven, graphic user interfaces Symantec changed direction. A number of other commercial efforts were started around the same time, e. However, this is not natural-language understanding. According to John Searle , Watson did not even understand the questions. Natural language processing has made inroads for applications to support human productivity in service and ecommerce but this has largely been made possible by narrowing the scope of the application. There are thousands of ways to request something in a human language which still defies conventional natural language processing. Many real world applications fall between the two extremes, for instance text classification for the automatic analysis of emails and their routing to a suitable department in a corporation does not require in depth understanding of the text, [19] but needs to deal with a much larger vocabulary and more diverse syntax than the management of simple queries to database tables with fixed schemata. Throughout the years various attempts at processing natural language or English-like sentences presented to computers have taken place at varying degrees of complexity. Some attempts have not resulted in systems with deep understanding, but have helped overall system usability. For example, Wayne Ratliff originally developed the Vulcan program with an English-like syntax to mimic the English speaking computer in Star Trek. Vulcan later became the dBase system whose easy-to-use syntax effectively launched the personal computer database industry. Hence the breadth and depth of "understanding" aimed at by a system determine both the complexity of the system and the implied challenges and the types of applications it can deal with. The "breadth" of a system is measured by the sizes of its vocabulary and grammar. The "depth" is measured by the degree to which its understanding approximates that of a fluent native speaker. At the narrowest and shallowest, English-like command interpreters require minimal complexity, but have a small range of applications. Narrow but deep systems explore and model mechanisms of understanding, [22] but they still have limited application. Systems that attempt to understand the contents of a document such as a news release beyond simple keyword matching and to judge its suitability for a user are broader and require significant complexity, [23] but they are still somewhat shallow. Systems that are both very broad and very deep are beyond the current state of the art. Components and architecture[edit] Regardless of the approach used, most natural-language-understanding systems share some common components. The system needs a lexicon of the language and a parser and grammar rules to break sentences into an internal representation. The construction of a rich lexicon with a suitable ontology requires significant effort, e. The interpretation capabilities of a language-understanding system depend on the semantic theory it uses. Competing semantic theories of language have specific trade offs in their suitability as the basis of computer-automated semantic interpretation. This is generally achieved by mapping the derived meaning into a set of assertions in predicate logic , then using logical deduction to arrive at conclusions. Therefore, systems based on functional languages such as Lisp need to include a subsystem to represent logical assertions, while logic-oriented systems such as those using the language Prolog generally rely on an extension of the built-in logical representation

framework. A large variety of examples and counter examples have resulted in multiple approaches to the formal modeling of context, each with specific strengths and weaknesses.

Chapter 2 : Logic programming - Wikipedia

The papers focus on the application of logic to the study of natural language, in syntax, semantics and pragmatics, and the effect of these studies on the development of logic. In the last decade, the dynamic nature of natural language has been the most interesting challenge for logicians.

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Review of "Natural language understanding and logic programming, II: proceedings of the second international workshop" by Veronica Dahl and Patrick Saint-Dizier.

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Abstract. Logic programming has been used in many natural language understanding applications, mainly in the areas of analysis, metagrammatical formalisms, logical treatment of linguistic problems, and meaning representations for naturla language.

Chapter 9 : Natural-language understanding - Wikipedia

The unification problem and several variants are presented. Various algorithms and data structures are discussed. Research on unification arising in several areas of computer science is surveyed, these areas include theorem proving, logic programming, and natural language processing.