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Natural Language Processing Using Artificial Intelligence

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Abstract

Artificial Intelligence (AI) is the ability of a computer (machine) to perform tasks commonly associated with intelligent beings. There are numerous applications of the artificial intelligence. NATURAL LANGUAGE PROCESSING (NLP) is among the forthcoming application of AI. The goal of the Natural Language Processing is to design and build software system that will analyze, understand, and generate languages that humans use naturally, in order that you may be able to address your computer as if you were addressing another person. Natural Language Processing is the use of computer programs to process written and spoken language to translate languages, to get information from the web, to carry conversations with machines, and to create advertisements and so on. Pragmatic applications of natural language processing are AI computer linguistics, database access, data retrieval, text categorization, extracting information from text etc. Still, no such fully operating system has developed, however research is going on. And it may be done soon. Some basic systems have already been developed: ELIZA, INTELLISHRINK, and AMALGAM etc.

I. INTRODUCTION

Artificial Intelligence is the science and engineering of creating intelligent machines, particularly intelligent computer programs. It is associated with the comparable undertaking of utilizing computers to comprehend human insight, but AI does not have to bind itself to techniques that are biologically observable. As a hypothesis within the philosophy of mind, artificial intelligence (or AI) is the view that human intellectual mental state is often duplicated in computing machinery. In like manner, an intelligent system is nothing but an IP system. NATURAL LANGUAGE PROCESSING (NLP) is one of the upcoming utilization of AI. The objective of the

Natural Language Processing (NLP) is to outline and assemble software that will analyze, understand, and generate dialects that humans use naturally, with the goal in the end that you will be able to address your computer as though you were tending to someone else. This objective is arduous to reach. Understanding any language implies, along with other things, acknowledging what concepts a word or expression remains for and knowing how to interface those concepts together in a purposeful way. Ironically regular language, the image system that is simplest for humans to learn and utilize, is toughest for a computer to ace. Long after machines have demonstrated fit for modifying large matrices with speed and grace, despite everything they fail to master the basics of our oral and written languages.

II. COMPONENTS OF NPL SYSTEM

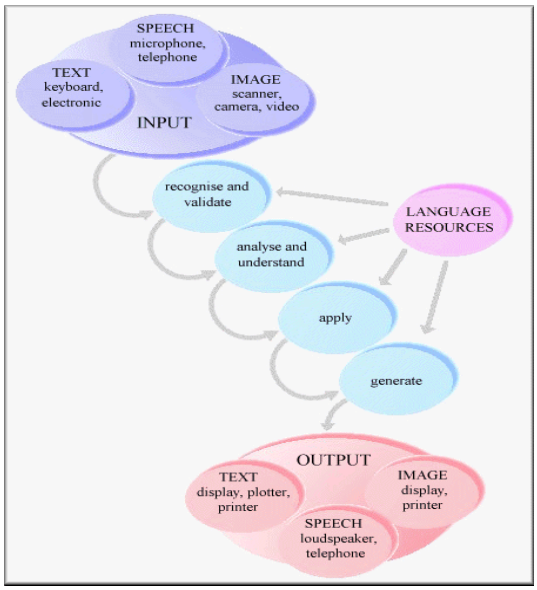

Figure 1: Model of Language Enabled System

Fig.1 represents a model of a Language Enabled System. Inside this general model there are, obviously, a variety of configurations. Depending on the use of the science, not everyone of the segment is needed. The rudimentary processes of Natural Language Processing are shown in the outline above. These are extensively concerned with:

1. Entering data into the computer, using dialogue, printed content or handwriting, or content either keyed in or inserted electronically.
2. Perceiving the language of the material, recognizing separate words, for instance, recording it in visual form and corroborating it.
3. Building a comprehension of the gist of the material, to the suitable level for the specific application.

4. Using this comprehension in usages such as transformation (e.g. oral to text), data recovery, or linguistic translation.
5. Engendering the medium for exhibiting the findings of the application, showing the outcome to human users by means of a show of some kind: a print out or a plot; on a loud speaker or the telephone.

III. ARCHITECTURE OF NPL SYSTEM

By far an immense part of human linguistic interaction occurs as speech. Composed dialect is a moderately recent invention and still assumes a less focal part than speech in most exercises. Be that as it may be, processing written language is less demanding, in some courses, than preparing a dialogue. For instance, to fabricate a program that understands oral communication, we require every one of the facilities of a composed language understand and also enough additional information to deal with all noise and ambiguities of the audio signal. In this manner, it is helpful to separate the whole language processing into two undertakings:

1. Processing written content, utilizing lexical, syntactic, and semantic learning of the dialect and in addition the required certifiable data.
2. Processing vocal communication, using all the data required in plus additional knowledge about phonology and also enough added data to deal with the further ambiguities that emerge in speech.

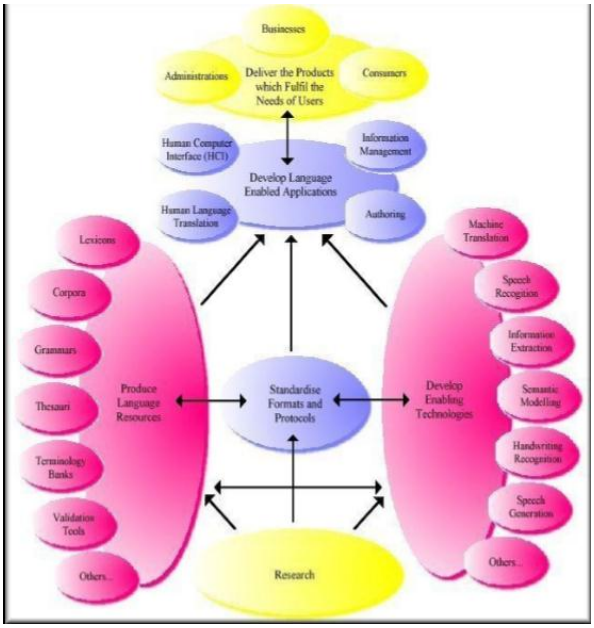

Figure 2: Architecture of NLP System

The diagram above delineates the chain of activities which are associates with Language Engineering, from research to the discharge of language-empowered and language upgraded products and administration to end-clients. The procedure of research and development prompts to the advancement of techniques, the generation of resources, and the improvement of standards. These are the fundamental building blocks. Language Engineering is applicable at two levels. At the first level there are various non-specific classes of use, such as:

1. language interpretation
2. data interpretation (multi-lingual)
3. authoring (multi-lingual)
4. human/machine interface (multi-lingual speech and text)

At the second level, these empowering applications are connected to genuine issues over the social and financial spectrum. In this way, for example:

1. Information administration can be utilized in an information service, as the reason for breaking down solicitations for data and coordinating the demand against a database of content or pictures, to choose the data precisely.
2. Authoring tools are ordinarily used in word handling systems yet can likewise be used to produce text, for example, business letters in foreign languages, as well as in coexistence with data administration, to give document administration facilities
3. Human linguistic interpretation is at present used to give translator workbenches and automated translation in restricted domains.
4. Most applications can conveniently be given characteristic natural language user interfaces, including speech, to enhance their convenience.

A. Main Steps in the Process

1. Morphological Analysis: Individual words are examined into their segments, and non word tokens, for example, accentuation, are isolated from the words.
2. Syntactic analysis: Linear successions of words are changed into structures that show how the words identify to each other. Some word grouping might be rejected in the event that they violate the linguistic rules for how words may be conjunct. For instance, an English syntactic analyzer would dismiss the sentence "Child the go the school."
3. Semantic Analysis: The structures made by the syntactic analyzer are assigned significance. Simply put, a mapping is made between the syntactic structures and the articles in the undertaking domain. Structures for which no such mapping is conceivable might be rejected. For example, in several universes, the sentence "Colorless green ideas talk violently" would be dismissed as semantically abnormal.

4. Discourse Integration: The significance of an individual sentence may rely upon the sentences that go before it and may impact the meaning of the sentences that tails it. For example, the word "that" in the sentence, “Jack wanted that”, relies on the earlier discourse setting, while the term "Jack" may impact the meaning of later sentences.
5. Pragmatics Analysis: The structure depicting the information exchanged is reinterpreted to figure out what was really implied. For example, the sentence "Do you cognize what place it is?" ought to be deciphered as a request to be told the location.

IV. COMPARISON OF NLP SYSTEM

S. N.	SYSTEM NAME	DOMAIN	LANGUAGE	APPROACH ES	YEAR
1	GINLIDB	NATURAL	NATURAL	LEXICAL ANALYSIS	2009
2	PNLIDB	ARGICULTURE	PUNJABI-SQL-PUNJABI	SHALLOW PARSER	2010
3	HNLIDB	EMPLOYEE	HINDI-SQL-HINDI	SHALLOW PARSER	2011
4	PORTABLE NLIDB	NATURAL	CPG FRAMEWORK	LINGUISTIC SEMANTICS	2012

V. ADVANTAGES OF NLP SYSTEM

The advantages to be gained from flourishing Natural Language Processing are enormous. They include :

1. Improved administration from our public services and public service agencies.
2. Wide accessibility of data through simpler utilization of computer framework and Information Services.
3. Enhanced ability to contend in worldwide markets.
4. Saving time by using smart computer systems as our operators.
5. Enhancement in the quality of data recorded in information frameworks.
6. Better screening of information when we recquire it.
7. More fruitful global co-operation.
8. Advanced safety through 'hands-free' operation of hardware.
9. Higher security through voice verification methods.

VI. CONCLUSION

The complete procedure of the natural language processing framework, at numerous places had made the work less arduous. Just by our indigenous language (any dialect) we can coordinate the robot, which can do communication with computer and there is no need of a man to function as a translator for the communication between two persons who don't recognize any common language. However, current program have not achieved this level but they might reach there very soon. Language innovations can be applied to an extensive variety of issues in business and administration to deliver better, more fruitful result. They can likewise be utilized in education, to aid the disabled, and to convey new services both to association and to consumers. There are various territories where the effect is significant such as contending in a worldwide market, providing services directly through telebusiness, supporting electronic trade, upgrading entertainment, ease and creativity.

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[7] Rada Mihalce, Hugo Liu, and Henry Lieberman Computer Science Department, University of North Texas rada@cs.unt.edu Media Arts and Sciences, Massachusetts Institute of Technology. NLP (Natural Language Processing) for NLP (Natural Language Programming).