

Artificial Intelligence In Linguistics -A Review Article.

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Abstract- Artificial intelligence technology provides number of applications. Lot of changes are going on with the help of AI technology. It improves the basic skills of people. With the help of AI technology societies can be built. Up to what extent benefits can be achieved depends on human beings. Artificial intelligence has great potential. It leads to efficient economy. Many researchers can innovate new things with the help of AI. Larger firms may also have an advantage because they can increase the productivity and can provide customers or users quality products or services. Smaller firms and start-ups in particular may not have as ready access to sufficient data to train advanced AI algorithms and may find it difficult to compete. AI facilitates advancements in market. It helps to provide quick customer service. Data-driven decisions are taken very efficiently. It provides better security for the data. AI helps organization to reach its potential. AI in the digital era, helps to handle huge data. It can be used to help detect fraud or money laundering, the possibility of reusing drugs for new diseases in healthcare, language translation. Any language is a set of alphabets and words. To get the meaning of it proper understanding is essential. The artificial neural networks are built like the human brain, with neuron nodes connected together like a web. AI tools provides automation of relevant process. Tools use image recognition or speech recognition.

Keywords- Artificial Intelligence, Linguistics, neural networks, digitization

Introduction

Artificial Intelligence (AI) is becoming an important part of our lives. There are many day to day applications of AI such as healthcare, manufacturing linguistics etc. In healthcare AI is used for performing operations in a better way. In manufacturing industries also based on AI analytics productivity can be improved. Complex tasks can now take less time to complete. Artificial intelligence (AI) traditionally refers to an artificial creation of human-like intelligence that can learn, reason, plan, perceive, or process natural language. AI can be converted into value and opportunity. AI not only changes businesses but also communities and lives. AI tool is designed to perform specific tasks within a domain (e.g. language translation). AI support to people for their work with intelligence. In India, lot of changes are going on with the help of AI technology. People can obtain variety of benefits. AI is also useful for linguistics. It provides ways for improving expertise and resources for learning foreign language. It makes the process easier to select relevant options. It saves the time. It gives quick feedback. Virtual tutor helps learners to study at remote places.

Traditional Language Learning

Language is a communication media. With the help of language we can express our views or ideas effectively.

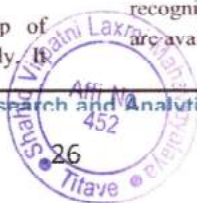
consists of alphabets which forms words. With the help of vocabulary, meaningful sentences can be formed based on grammar. Traditionally language learning had been done using classroom sessions with the help of instructions given by a teacher.

Use of Technology

In the digitization world language learning is also not an exception. Latest technology is used for guiding language. Content is designed based on expertise of a learner. Based on improvement it will suggest next course or level. Relevant material will be recommended for learning any language. It will facilitate personalized learning. Technology provides advanced methods for teaching learning process. We can develop basic skills and also advancements or latest trends. It provides the details very effectively. Now technology has powerful impact in urban as well as rural area.

Effectiveness of AI for Language Learning

Artificial intelligence provides variety of tools for language learning. These tools have been designed based on image recognition or speech recognition. Chatbots or various apps are available for variety of local or foreign languages.



The Existing Work

Christopher D. Manninga, et al studied Emergent linguistic structure in artificial neural networks trained by self-supervision(13 April 2020) discussed the knowledge of linguistic based on artificial neural networks.^[1] Self-supervision technique is used. Language understanding requires the use of rich hierarchical structures. Methods for identifying linguistic hierarchical structure are developed.

Yuko Taniguchi, et al^[2] (2020) discussed a study of the possibilities of text mining and machine learning for score evaluation and review content. In this study it is discussed that because of Internet, online shopping is becoming easier. The Variety of products are available. Customers provides reviews of products. These reviews are used by other customers to make decision of purchase. In this study review contents are analyzed with text mining.

Silvia Pokrivcakova^[3] (December 2019) studied Preparing teachers for the Application of AI-Powered technologies in Foreign Language Education. Nowadays it is essential to do effective changes in the teaching-learning process. With the help of AI, machine learning and other technologies it is possible to provide training for foreign languages. By integrating new technologies, quality of education can be improved.

Tran Tin Nghi et al (December 2019) studied Applying AI Chat bot for Teaching a Foreign Language :An Empirical Research Role of new tools such as chat bots is very important for interaction.^[4] Foreign language learning will be easier with AI chat bots. There is a good opportunity for teachers.

Dr. Sandip P.Gawate^[5] (November 2019) studied Artificial Intelligence(AI) Based Instructional Programs in Teaching - Learning of English Language. As AI has variety of applications in different fields it can provide lot of benefits for teaching learning activities for English language. Chatbots can play important role in communication. AI system must provide most of the functions to improve teaching - learning process.

In this research paper T. Tanguchi, D. Mochihashi (24 Jun 2019) studied Survey on frontiers of language and robotics. Through language communication can be established effectively. Language understanding and its application in real-world is very important service for robotics, because our social environment is full of rich and dynamic linguistic interactions. Service robots must understand language and then complete tasks based on understanding people's utterances and contexts, e.g. situation and culture. Seven frontiers that were visited are mentioned for future studies.^[6]

Tal Linzen Johns Hopkins University^[7] studied What can linguistics and deep learning contribute to each other

Response to Pater (2019) It is discussed how language and deep learning can benefit each other. Linguists can contribute to research on neural networks for language technologies by providing infrastructure for modeling human sentence processing and for evaluating the necessity of particular constraints on language acquisition.

Christopher D. Manning Stanford University^[8] studied Computational Linguistics and Deep Learning Deep Learning is used for natural language understanding, which aims to give machines the power to understand not just individual words but entire sentences and paragraphs.

Antonio Hernández-Blanco et al (12 May 2019)^[9] studied A Systematic Review of Deep Learning Approaches to Educational Data Mining. EDM includes machine learning, data mining, and statistical methods to detect patterns in large collections of educational data.

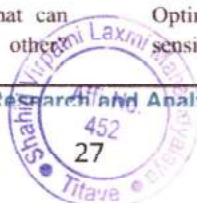
In this research paper, Karl Moritz Hermann^[10] Google DeepMind University of Oxford studied Teaching Machines to Read and Comprehend Making machines to read natural language documents is complex task. Large scale training and test datasets is required for reading. It provides supervised reading comprehension data. It is based on deep neural networks that learn to read real documents and answer complex questions.

Angela Fan Mike Lewis Yann Dauphin^[11] studied Strategies for Structuring Story Generation Writers prepared plans or sketches for long stories. New models are introduced. Context-sensitive names and references are used.

Sebastian Schuster et al studied Cross-Lingual Transfer Learning for Multilingual Task Oriented Dialog 1810.13327v2 [cs.CL] 1 Apr 2019 These are multiple task-oriented^[12] conversational AI systems. Identification of user intents is possible. Data collection requires more time. These models are developed with the help of multilingual training data. It is difficult to train data.

Yuval Noah Harari-21^[13] Lessons for the 21st Century(Aug 2018) focuses on predictions about AI technology. He mentioned AI impact on job market. Need of reinvention of jobs and content of teaching is analyzed. Importance of Value added information, emotional intelligence and mental resilience is specified. His work is praised by thought leaders Barak Obama, Bill Gates, Mark Zuckerberg and Sir Richard Branson.

Bernd Bohnet Morphosyntactic Tagging with a Meta-BiLSTM Model over Context Sensitive Token Encodings arXiv:1805.08237v1 [cs.CL] 21 May 2018 Recurrent neural network models with sentence-level context for initial character and word-based representations are analyzed. Optimal results are obtained by integrating these context sensitive representations through trained models.^[14]



Emma Strubell et al studied Linguistically-Informed Self-Attention for Semantic Role Labeling. Linguistically-informed self-attention is discussed. It is a model that includes rich linguistic information for semantic role labeling. Different training techniques are used.^[15]

Angeliki Lazaridou et al Deep Mind studied Emergence of linguistic communication from referential games with symbolic and pixel input In this research contemporary deep learning methods and by training reinforcement-learning neural network agents on referential communication games. Here agents were trained in symbolic environments. Agents are able to learn raw pixel data, and more challenging, realistic input representation.^[16]

Joshua Underwood^[17] (2017) studied Exploring AI Language Assistants with Primary EFL Students. In this study, students engagement with AI language assistants is analyzed. Increase of Performance of students is noticed with AI assistants.

In this research paper, Lotze, Netaya^[18] studied AI in Language Learning(2016) She is a linguistic specialist. Latest technologies are helpful for teaching and learning foreign languages. Variety of apps are available such as GUI based, dialogue based systems. Systems can fulfill the specific requirements only and leads to errors or limitations after some extent.

Rose Luckin, Wayne Holmes^[19] (2016) Intelligence Unleashed discussed the use of AI for education field. Now, there is a need of adaptive learning environments.

Lei Yu, Karl Moritz Hermann et al^[20] Deep Learning for Answer Sentence Selection 1412.1632v1 [cs.CL] 4 Dec 2014 .It consists of answer sentence for question. Using distributed representations. Questions with answers are matched by considering semantic encoding .Our approach does not require any feature engineering nor does it involve specialist linguistic data. This model is used for different domains and languages. Experimental results on a standard benchmark .Model is simple. It matches state of the art performance on the answer sentence selection task.

Tomas Kocisky et al^[21]Hermann Learning Bilingual Word Representations by Marginalizing Alignments Department of Computer Science University of Oxford . A probabilistic model is designed. It simultaneously learns alignments and distributed representations for bilingual data. Word alignments are marginalized with semantic context. A cross-lingual classification is used.

Daniel Cer et al^[22] studied Universal Sentence Encoder In this study transformer and DAN based universal encoding models provide sentence level embeddings. If training data is limited transfer learning is most helpful when limited performance is good. The accuracy and model complexity of encoding models is different.

Yann LeCun et al^[23] studied Deep learning. With the help of deep learning computational models provides multiple processing layers to represent data with abstraction. There is lot of improvement in speech recognition, image recognition, and other domains. Deep learning handle large datasets to provide relevant details.

Utuku Kose et al^[24] E-Learning Experience with AI Supported Software: An International Application on English Language Courses specified the importance of E-learning. Details regarding interface for different users, evaluation process and student survey is included in this study.

Tom Youngy^[25] (2018) studied Recent Trends in Deep Learning Based Natural Language Processing. In this study deep learning models and are discussed. These are helpful for NLP tasks. Deep learning importance in past, present and in coming days is discussed.

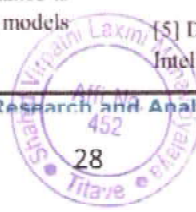
Conclusion

Technology definitely supports the development. Artificial intelligence technology provides improvement in every sector such as healthcare, education. Linguistics is also not an exception. AI helps to learn new language and to obtain expertise. People get benefit from speech recognition or image recognition.

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