

ARTIFICIAL INTELLIGENCE

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ABSTRACT

This research includes an excessive review and functioning of existing artificial intelligence programs using modern Machine Learning that deals with people doing their chores and small works with the help of machines made with Deep Learning and AI. It will also tell about the need and importance of AI in our daily lives. The most utilized materials and strategies were with the help of online coding courses and Google which made it easy for me to learn AI. This research also shows the results of this AI model – Virtual Assistant which helps people in making their work easy and effortless. These modern problems and calculations inspired me towards Computer science. This research and program-making showed me that it is high time now for people to accept the truth and existence of artificial intelligence. This research concluded the importance of AI as supportive technology in our daily works and it will be impossible to live in some years without this wonderful gift of science.

Keywords - Artificial Intelligence, Machine Learning, Virtual Assistant, Deep Learning, Computer Science

INTRODUCTION

Artificial Intelligence (AI) research advances are emerging technology and also a need of the hour today. It is a field whose goal is to make activities automatic and more efficient than presently require the human brain. AI is the field of computer science that designs smart machines and computer programs. AI is considered to be a branch of computer science that stands for methods involving super-complex problems that cannot be solved by direct calculations or mathematics methods that are taking the computer systems to a human-like approach to problems. This technology is an upcoming concept for the young generation especially now because these days technocrats are creating systems that can think and do things almost like humans. Artificial intelligence makes the basis for all computer science learning which will be the future of all complex decision-making. Computers are extremely efficient at calculating these difficult permutations to arrive at the best result. AI and its logical evolution of machine learning and deep learning are the foundational future of mankind. Computer science defines AI research as the study of computer systems: any device that takes actions, which maximize its chance of successfully achieving its goals. A more accurate definition characterizes AI as a computer system's ability to correctly interpret external data, to learn from such data with the help of Machine learning. A typical AI program analyzes its data structures and takes actions that maximize its chance of success. Some common examples of AI are things like a prediction program that can be used to predict stock market trading which will return exponential returns and increase the probability of earning more money, housing prices that will provide people with a price according to the area and facilities.

Virtual Assistant -

One of the most common and used artificial intelligence programs which I made was the Virtual Assistant and Voice Assistant program which can be either in your phone/laptop or a physical device at your home which will help you in doing your chores, telling you the updated news about the world, and some Google searches which this assistant can do for you and you just have to ask a question to him and you will get the answer in some fraction of seconds. A Virtual assistant can perform many tasks including phone calls, managing your email account, setting reminders or, telling you about the weather. Voice assistants are quickly evolving these days to provide more capabilities and value to users which will lead to a better user experience platform. If speech recognition and natural language processing advances, then a virtual assistant's ability to understand and perform requests will also

get better. And as voice recognition technology improves, virtual assistant use will move deeper into the business work of big MNC's and account management work. Upcoming voice assistants are engineered with a lot of advanced pc operative systems, which can permit associate degree AI Assistant to know and do multistep requests and perform a lot of complicated tasks which can be helpful to the human race, like creating travel reservations for someone or programming appointments for him sort of a real secretary. AI is at a forefront of a new era of computing, Cognitive Computing. It's a replacement reasonably computing that may be terribly totally different from the programmable systems that preceded it. As different as those systems were from the computer systems of a century ago, conventional computing solutions are based on rules and logic.

MATERIALS AND METHODS

Materials –

This miraculous Virtual Assistant was made by one of the most popular coding languages of the world that is Python which is an interpreted, high-level and general-purpose programming language and is widely used for making small and big scale Machine learning and Deep learning programs because it supports multiple programming paradigms, including structured, object-oriented and functional programming. I learned Machine learning and Artificial Intelligence from one of the best courses which inspired me to make a project like this. And also a very good core processor pc is needed to make this smoothly. The libraries which I used in this program were SpeechRecognition, pyttsx3, PyAudio, WolframAlpha, smtplib, web browser which helped me a lot in building this program.

Methods –

- Virtual assistants are built on a complex pipeline of AI technology: First, a Wake word (WW) detector runs on the device, listening for the user to say a particular word or phrase to activate the assistant. It's also possible to activate the assistant in other ways, like a push-to-talk button. Then Automatic Speech Recognition (ASR) converts spoken audio from the user into a text transcription. Natural Language Understanding (NLU) takes the text of what the user said and checks their algorithm in a way that's actionable which will provide the user with a better experience. This component understands that users can make the same request in a mountain of different ways that should all have the same result. The Dialogue Manager (DM) decides what to say back to the user, whether to take any action and complete the request of the user and handles any conversation for an accurate user experience.
- The technology in this complex structure needs to deal with the ambiguity of natural language processing. Hence, with many defined rules, it's based on machine learning and deep learning – a group of AI algorithms that learn their behavior from data instead of being explicitly programmed. This will make assistants learn how people speak and be able to generalize to new speakers or new queries. The operating systems that build virtual assistants require massive amounts of data, which is fed by artificial intelligence (AI) platforms, including machine learning, deep learning, natural language processing, and speech recognition platforms. At the end, when the user interacts with a voice assistant, the AI programming uses complex algorithms to learn from data input and become better at predicting the user's needs.
- Figure – 1 shows that how the server of an Artificial Intelligence Virtual Assistant works and how it is connected with many things simultaneously like maintaining the user's data with the security server, and some stored information at information server, STT(Speech to text), and TTS(Text to speech) server which

listens to user's voice and converts it to speech and then converts it back to audio for giving it to the user, also some AI assistants are connected with mobile devices with Bluetooth.

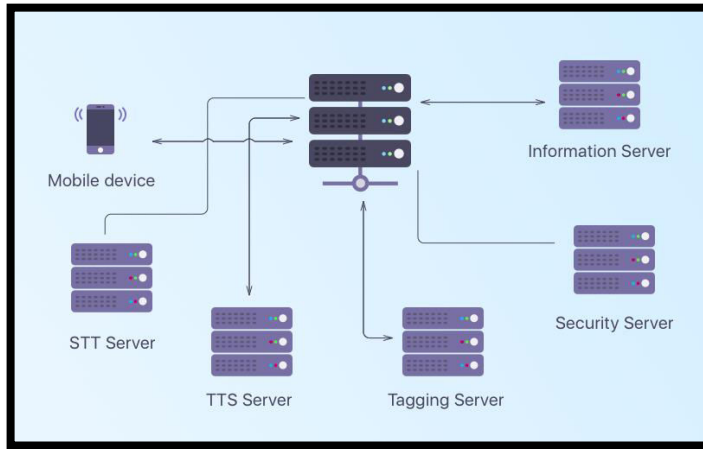


Figure – 1

- Also, one important method was to ensure machine learning and deep learning algorithms which teaches the virtual assistant about responding to the user. Because it also helps in storing the user data and makes the AI assistant better day by day.
- Figure – 2 shows the cycle of working of an AI Virtual Assistant which depicts the coordination process of all the things needed for this assistant helpful to people. It shows the cycle starting from Wake word to Automatic Speech Recognition and to the main process Language Understanding. After it understands what the user wants, Dialogue Management is done and then the text to Speech is converted.

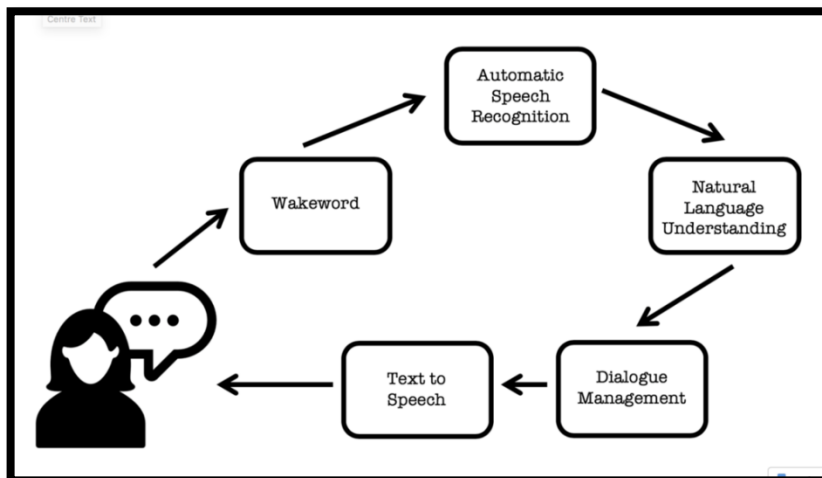


Figure – 2

DISCUSSION

Virtual assistants are built on a complex pipeline of AI technology: First, a Wake word (WW) detector runs on the device, listening for the user to say a particular word or phrase to activate the assistant. It's also possible to activate

the assistant in other ways, sort of a push-to-talk button. Then Automatic Speech Recognition (ASR) converts spoken audio from the user into a text transcription and then the virtual assistant understands the user's query and tackles it with algorithms.

The traditional problems and goals of AI research include reasoning, knowledge representation, planning, learning, linguistic communication processing, perception, and therefore the ability to maneuver and manipulate objects. Approaches include mathematical problems, computational intelligence, and traditional symbolic AI. Several tools square measure utilized in AI, together with versions of search and mathematical improvement, artificial neural networks, and strategies supported statistics, chance, and political economy. The AI field draws upon computing, information engineering, mathematics, psychology, philosophy, and lots of other fields. The AI field attracts upon applied science, info engineering, mathematics, psychology, philosophy, and lots of different fields. The sector was supported on the belief that human intelligence "can be thus exactly delineated that a machine may be created to simulate it". This raises philosophical arguments relating to the mind and conjointly the ethics of creating artificial beings endowed with human-like intelligence, these problems are unit explored by story, fiction, and philosophy since antiquity. Some folks additionally take into account AI to be a danger to humanity if it progresses intensely. Others believe that AI, in contrast to previous technological revolutions, can produce a risk of massive unemployment. Within the 21st century, AI techniques have practiced a revival following synchronous advances in pc power, massive amounts of data, and theoretical and sensible understanding; and AI techniques became a very important part of the technology business, serving to resolve many troublesome problems in a subject, code engineering, and analysis and in saving the humanity. The objective of those assistants is to also free their users from menial work like making appointments and buying items online. This is problematic on a minimum of two fronts: it suggests the user has longer for supposedly more important work. Secondly, it makes a critical statement about the worth of the type of secretarial work performed, first by real women and now by digitalized women, within the digital future. AI could be a knowledge base science with multiple approaches, but advancements in machine learning and deep learning unit of measurement creating a paradigm shift only concerning each sector of the tech business.

RESULTS

AI Virtual Assistant improves the efficiencies of our workplaces and can augment the work humans can do. When AI takes over repetitive or dangerous tasks, it frees up the human workforce to do the work they are better equipped for - tasks that involve creativity and empathy among others. Society will gain countless hours of productivity with just the introduction of our daily work completed by the machines and AI influencing our living standards not to mention the other ways it will improve on-the-job productivity. Freed up from stress, humans will be able to spend their time in a variety of other ways. When implemented properly, visitors on your website can enjoy a great user experience and that will make them come back for more. One way to realize that's to predict is what they're sorting out. When they're typewriting the name of any product, your website ought to gift them with the choices of the merchandise whose names match those letters so that they can simply have to be compelled to select. Artificial intelligence has yielded the emergence of numerous health facilities. These apps help with mild diagnoses and prescriptions. Once they're typewriting the name of any product, your website ought to gift them with the choices of the merchandise whose names match those letters so that they can simply have to be compelled to select. They solely got to input the symptoms and their medical record on the apps. The ailment will be diagnosed. But the biggest problem humanity will face is that AI will replace humans in almost every field and people will lose their jobs because of robots and virtual assistants coming which will lead to shifting from labor-intensive to machine intensive.

ACKNOWLEDGEMENT

Moreover, Artificial intelligence (AI) is currently enhancing tools and instruments used day by day in cities and campuses around the world. From web search engines, transportable options, and apps, to transport and manage appliances, for instance, the advanced set of algorithms and code that power Apple's Siri may be a typical example of computer science solutions that became a part of everyday experiences. The regulation of AI is that the development of public sector policies and laws for promoting and control computer science (AI); it's thus associated with the broader regulation of algorithms. The regulatory and policy landscape for AI is a rising issue in jurisdictions globally. Regulation is taken into account necessary to encourage AI and manage associated risks. Regulation of AI through mechanisms like review boards may also be seen as social suggests that to approach the AI management downside. However conjointly once some analysis, specialists warn several jobs could also be machine-driven within the next few decades which many of the new jobs might not be "accessible to individuals with average capability", even with preparation. Economists entail that within the past technology has attended increase instead of cut back total employment, however, acknowledge that "we're in unknown territory" with AI.

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