

TOP AI TECHNOLOGIES IN 2023

1. NATURAL LANGUAGE GENERATION (NLG)

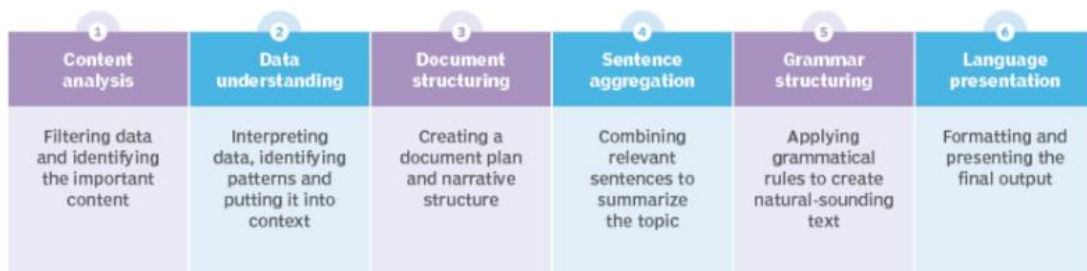
Natural language generation (NLG) is a well-known AI application that involves using algorithms to automatically generate written or spoken content based on data inputs. This process utilizes a variety of techniques in natural language processing (NLP) and natural language understanding (NLU), with the ultimate goal of facilitating communication between humans and machines. NLG allows machines to produce text that mimics human language and interact with humans in a more natural and intuitive manner. NLG research typically focuses on developing software programs that provide context to data points. Advanced NLG software can efficiently analyze large amounts of numerical data, identify patterns, and present the information in a way that is easily understandable for humans.

THE METHODOLOGY OF NLG:

The six steps involved in natural language generation are:

Content analysis, Data understanding, Document structuring, Sentence aggregation, Grammatical structuring, Language presentation.

6 steps to natural language generation



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APPLICATIONS OF NLG:

1. E-commerce: Utilizing NLG, it is possible to generate automated product descriptions and other types of content for e-commerce websites, thereby enhancing the overall user experience.

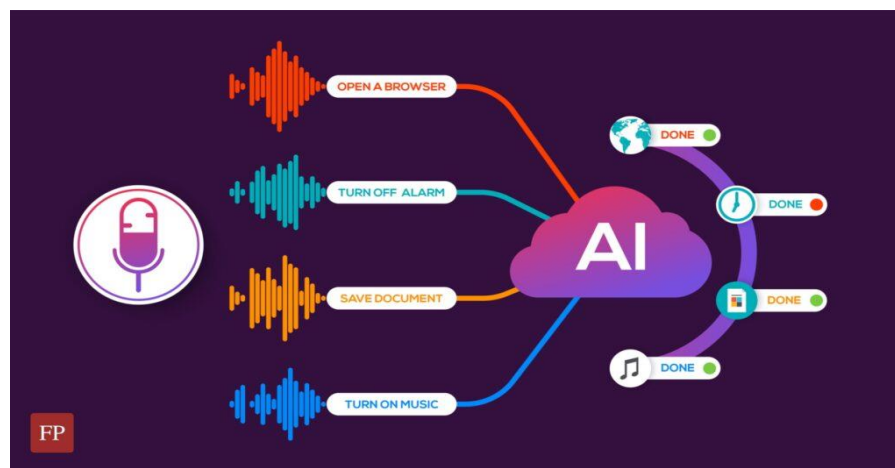
2. Marketing: It is possible to leverage NLG to automatically produce customized marketing content, such as emails or social media posts, using customer data.

3. Healthcare: By using NLG, it is feasible to create medical records such as patient reports and other relevant documents, which can enhance the precision and speed of medical record management.

4. Customer service: NLG can be used to generate automated responses to customer inquiries, such as frequently asked questions (FAQs), which can save time and improve efficiency.

2. SPEECH RECOGNITION

Speech recognition is an interdisciplinary field that involves computer science and computational linguistics to develop methods and technologies for computers to recognize and translate spoken language into text. This technology is also referred to as automatic speech recognition (ASR), computer speech recognition (CSR), or speech to text (STT). The opposite of speech recognition is known as speech synthesis. Some speech recognition systems require “training” (also called “enrollment”) where an individual reads text or vocabulary into the system, fine-tuning recognition of their speech for increased accuracy. Systems without training are “speaker-independent,” while those with training are “speaker dependent.” Speech recognition has various applications, including voice user interfaces, call routing, appliance control, keyword searches, data entry, document preparation, speaker identification, speech-to-text processing, and aircraft control. Voice recognition, also known as speaker identification, is the process of identifying a person by their voice. This can be useful in speech recognition systems that have been trained on a particular speaker’s voice, or in security systems where the speaker’s identity needs to be verified. Speech recognition technology has a rich history of major innovations. Today, it benefits from recent advancements in deep learning and big data. These advances are reflected in the widespread industry adoption of various deep learning methods for designing and deploying speech recognition systems.



Applications of 'Speech Recognition' in day-to-day life

APPLICATIONS OF 'SPEECH RECOGNITION':

Voice assistants: Siri, Alexa, and Google Assistant are digital assistants that utilize speech recognition to understand voice commands and perform actions like sending messages, setting reminders, and making phone calls.

Education: Speech recognition technology can enhance education by providing students with text-to-speech and speech-to-text tools, as well as by supporting language learning applications.

Healthcare: Speech recognition is used in healthcare to transcribe medical dictations, and to assist patients with disabilities in communicating with healthcare professionals.

Customer service: Companies utilize speech recognition technology to develop automated customer service systems that allow customers to interact with a computerized system via voice instead of typing.

3. ChatGPT

In November 2022, OpenAI introduced ChatGPT, an AI chatbot that utilizes OpenAI's GPT-3 family of large language models. The chatbot has undergone fine-tuning through both supervised and reinforcement learning techniques. ChatGPT is a highly versatile chatbot that can perform functions beyond the typical human conversation. It can write and debug computer programs, compose music and essays, answer test questions at a level above the average human, write poetry and song lyrics, emulate a Linux system, simulate a chat room, play games, and even simulate an ATM. ChatGPT sets itself apart from other chatbots by having the ability to recall previous prompts from the same ongoing conversation.

OpenAI acknowledges several limitations of ChatGPT, including the potential for incorrect or nonsensical responses (known as artificial intelligence hallucination) and the risk of over-optimization due to the reward model's design with human oversight (Goodhart's law). ChatGPT also has limited knowledge beyond 2021 and cannot express political opinions or engage in activism. Upon its prototype release on November 30, 2022, ChatGPT gained widespread attention for its ability to provide detailed and articulate responses on various subjects.



ChatGPT Logo

MICROSOFT INTEGRATES BING WITH CHATGPT:

Microsoft is of the opinion that AI has the potential to revolutionize the conventional search engine experience. In pursuit of this goal, Microsoft plans to combine its search engine, 'Bing', with the advanced tool 'ChatGPT' from OpenAI. This integration is aimed at providing users with a comprehensive conversation-based search experience, wherein they can explore not only the current information but also its related aspects. The user can then have a full-length conversation with the chatbot, till their queries are resolved. Through this effort, Microsoft is poised to challenge Google's dominance in the realm of search engines.

Applications of ChatGPT:

Education: ChatGPT can serve as a virtual teaching assistant, offering students prompt answers to their questions, study tips, practice exercises, and writing assignment feedback.

Health care: It has the potential to function as a mental health chatbot, providing guidance and support to individuals dealing with mental health challenges.

Customer service: ChatGPT has the potential to offer customer service support across multiple industries, such as retail, banking, and healthcare.

Language translation: Its ability to translate text between different languages makes it a valuable asset for facilitating international communication.

4. **ROBOTIC PROCESS AUTOMATION (RPA):**

RPA is a technology used for business process automation. It relies on software robots or AI/digital workers to perform tasks. Unlike traditional automation tools that require a list of actions developed by a software developer, RPA systems watch the user perform the task in the application's GUI and repeat those actions. This makes automation more accessible for products without APIs. RPA tools automate interactions with the GUI similarly to graphical user interface testing tools, but can handle data between multiple applications, such as extracting data from an email and typing it into a bookkeeping system.



RPA, along with other emerging technologies, is anticipated to stimulate a fresh surge of productivity and efficiency advancements across the worldwide workforce. The trend towards robotic automation has geographical implications, as the adoption of robotic process automation (RPA) has the potential to significantly transform the cost structure of the services industry. This could lead to lower prices and better outcomes, as well as greater opportunities for personalized services. By incorporating empathy into robot design, these technological advances have the potential to make a positive impact on society.

Harvard Business Review reports that many companies adopting RPA have promised their employees that automation will not lead to job losses. Instead, workers are redeployed to perform more stimulating tasks. According to an academic study, knowledge workers embrace automation and view robots as teammates. The study also found that RPA technology can achieve more work and productivity with the same number of people, rather than leading to lower headcount. However, some analysts believe that RPA poses a threat to the business process outsourcing (BPO) industry. The argument is that RPA enables companies to bring back processes from offshore locations to local data centers, which could create high-value jobs for skilled process designers but reduce opportunities for low-skilled workers offshore. Nevertheless, this idea has been challenged by another academic study, which argues that RPA is unlikely to bring back many jobs from offshore.

Applications of RPA:

Robotic Process Automation (RPA) has a wide range of applications in various industries, including:

Healthcare: Administrative tasks such as managing patient records, processing claims, and scheduling appointments can be automated using RPA.

Customer Service: By automating tasks like processing orders, managing tickets, and responding to inquiries, RPA can enhance customer service.

Human Resources: Automating tasks such as screening candidates, onboarding, and processing payroll can be accomplished by RPA.

Supply Chain Management: Tasks such as processing orders, tracking shipments, and managing inventory can be automated.

Manufacturing sector: Automating tasks such as managing inventory, scheduling production, and ensuring quality control can be accomplished by RPA.

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