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Artificially Intelligent Personal Assistant Systems

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ABSTRACT: This paper explores the integration of advanced machine learning techniques in data management on local devices and at the same time getting the best possible information from previous data entries to assist users in decision-making and enhancing their task performance in day-to-day activities. This study highlights the need and ways to implement artificial intelligence at the local level to enhance user functionality. This paper describes the advanced implications of artificial intelligence in human life. It also highlights the fields where AI can contribute to human day-to- day life ranging from basic chatting to advanced assistance and conducting routine jobs as well as complex tasks on its own.

Keywords : virtual assistant, NLP, artificial intelligence, knowledge warehouse.

INTRODUCTION

Nowadays human beings are exposed to lots of digital and electronic devices and for common people thesedevices are just containers that cannot organize or arrange themselves according to user relations with the items in them, although some existing technologies only provide web quest assistance and do not have any relevance with user personal routines and requirements.

Without knowing the user's feelings and memories the assistance does not have any meaning of its own. Thus, an Artificial intelligence-based device assistant will help to attach meaning to user requests. Artificial intelligence-based assistants will help to assist users with some meaningful information which ultimately reduces human efforts in day-to-day life. This research also drives motivation from Jarvis, a natural language processing based fictional user interface (Khobragade, 2013). An AI-based intelligent assistant is a program written to manage various types of data and information regarding the user and his environment on a particular device or interconnected devices. The data or information on the device will be either entered by the user itself or captured and maintained by an intelligent system to help the user in regular day-to-day activities, in decision-making. It will also be capable of analyzing other information resources such as web space through user devices and some dedicated warehouses on user commands. This intelligent system will listen to commands from its authorized user in the form of speech or text and in correspondence to those commands it will generate an output response in the form of speech, text, Statistics,or any required file from the device. This intelligent program will also be able to run image analysis, and features like face recognition and behavior analysis.

TASK PERFORMED BY THIS INTELLIGENT SYSTEM

1. Managing local files and data: This system will analyze the user behavior pattern on day-to-day engagement with various files and according to this behavior analysis system will organize the contents on the local device ultimately these relational files and folders will help to generate the required response based upon analysis done by various machine learning algorithms on data set maintained within or outside the local machine.

2. Performing data analysis on input data: This system will be capable of performing various tasks like face recognition, behavior analyses in a live environment, or any documented scenario like images, videos, etc.

3. Chatbot/virtual assistant: This intelligent system will also be able to interact with human beings and provide appropriate assistance is their general problems based on its own intelligence supported by datasets of past experiences just like human beings (Adamopoulou & Moussiades 2020).

4. Internet Applications: This system will help users to run various internet-based tasks like web browsing for weather reports, booking, reading, internet calls, etc. and users can perform all the above-mentioned tasks just by a voice command using voice portals which perform NLP to get the required response from the browser.

EXISTING TECHNOLOGY

There is no real-world software system that matches

all the above-mentioned capabilities in a single shell. However, there are several AI-driven virtual assistants and smart home systems that share some similarities with this concept.

1. Amazon Alexa: Alexa is a virtual assistant developed by Amazon, and it powers devices such as Amazon Echo. It uses natural language processing to understand and respond to voice commands, and it can perform various tasks, including setting reminders, answering questions, and controlling smart home devices (Kepuska & Bohouta 2018).

2. Google Assistant: Google Assistant is an AI-powered virtual assistant developed by Google. It is integrated into various Google products and can perform tasks based on voice commands, such as providing weather updates, setting alarms, or controlling smart home devices (Kepuska & Bohouta 2018).

3. Apple Siri: Siri is Apple's virtual assistant, available on iPhones, iPads, Macs, and other Apple devices. It can under- stand natural language commands and assist with tasks like sending messages, making calls, and providing information (Kepuska & Bohouta 2018).

4. Chat GPT: It is a type of artificial intelligence language model. A product of OpenAI based on the GPT-3.5 architecture. It is a large language model designed to understand and generate human-like text based on the input it receives. Its purpose is to assist users by providing information, answering questions, generating creative content, and engaging in conversation on a wide range of topics (Kalla & Smith 2023).

DIFFERENCE BETWEEN EXISTING MODELS AND PROPOSED TECHNOLOGY

Existing Technology: Existing systems are either used for natural language understanding and generation or performing some basic tasks like setting reminders or controlling some smart home devices up to a very basic level and all these tasks are not integrated in a unit shell.

Proposed System: This system will represent a highly classy artificial intelligence system that can perform various tasks, from controlling technology to understanding natural language and executing complex commands. Real-world implementations of this program would cover a broad range of applications, from automation to personalized assistance.

Training Data and Pre-training: Existing Technology: Models like ChatGPT are trained on diverse internet text, and GPT models are pre-trained on a large corpus of data and then fine-tuned for specific tasks. GPT-3, for example, has 175 billion parameters.

Proposed System: The proposed model is not explicitly based on training data. Any system like the proposed model would require extensive training and fine-tuning on relevant datasets for specific tasks.

Capabilities

Existing Technology: Existing technologies either primarily focused on natural language conversation and text generation.

Proposed System: The proposed system will evolve as a highly advanced AI with capabilities that go beyond natural language processing, including interfacing with technology, understanding context, and performing diverse tasks.

WORKING MECHANISM OF PROPOSED SYSTEM AND ARCHITECTURE OVERVIEW

Phase 1- Activation: Wake-Up Command: In this phase, the intelligent system is brought into active state, by a specific phrase or keyword. This triggers the system to start listening for user input.

Phase 2- Input Recognition: The intelligent system uses speech recognition technology to convert the user's spoken words into text. This phase is critical for understanding user instructions and requests.

Phase 3-Natural Language Processing (NLP): Intent Recognition: NLP procedures are applied to understand the user's intent and to abstract related in- formation from the input. This involves various steps in the following order lexical analysis, syntax analysis also known as parsing, semantic analysis, intermediate code generation, query optimization, and finally query generation (Chowdhary & Chowdhary 2020).

Phase 4- Job Execution: Command Execution: Once the user's requirements are determined, the assistant determines the suitable action to take. This may involve controlling IOT devices, accessing internal or external databases, web quests, APIs, or carrying out any predefined tasks.

Phase 5- Scrolling Knowledge Warehouses: This system will rely heavily on a database containing datasets of a wide range of information about a wide range of topics. This knowledge base is continuously updated by feedback systems so that datasets get more refined with time and expand over time.

Phase 6 - Learning and Adaptation: Machine Learning: To improve performance with time, this system will engage various machine learning algorithms on data generated by users through any actions or responses to those actions. These algorithms allow the assistant to learn from user interactions and adapt to evolving patterns. Adaptation phase: In this learning and adaption phase the system will also focus on organizing local devices as mentioned in the intro part to give meaning to each entity in the local device.

Phase 7- User Interaction: Multimodal Output: This system can respond to users through various modes, including voice, text, and potentially visual interfaces. The output will be designed to be user-friendly and contextually relevant.

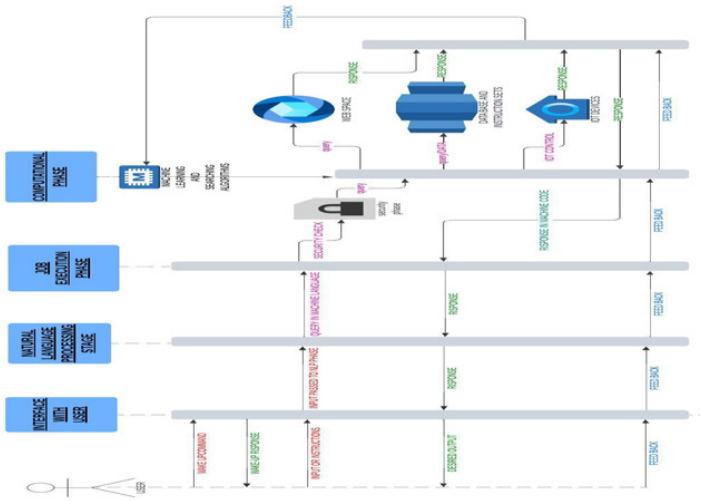

Fig. 1. Control Flow Diagram.

CONCLUSION

This paper describes the advanced implications of artificial intelligence in human life and the involvement of such smart programs on ground level can help humans to focus on much bigger problems while taking such advanced systems as a base to conduct other basic routines. Such an intelligent system will improve work efficiency by providing sharp information, and logic-based assistance to humans. Such a system finds a large application in every field like engineering, business, medical, etc.

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