

A Study of Conversational Agents in the Context of Continual Learning

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Abstract

The current state of **AI** and chatbots exhibit remarkable advancements in recent years. Artificial Intelligence (**AI**) has revolutionized various industries, and the domain of chatbots has particularly witnessed significant growth. Chatbots, powered by **AI** technologies, have evolved from basic rule-based systems to sophisticated conversational agents capable of understanding natural language and engaging in meaningful interactions with users. They have become integral components of customer service, providing automated assistance, personalized recommendations, and streamlined communication. **AI** has empowered chatbots with machine learning algorithms and natural language processing capabilities, enabling them to learn and adapt to user preferences, improving the overall user experience.

Furthermore, AI-driven chatbots have found applications beyond customer service, such as virtual assistants, language translation, and information retrieval. They leverage AI techniques like neural networks, deep learning, and reinforcement learning to comprehend context, emotion, and intent. This advancement has been fueled by the availability of large datasets, enhanced computing power, financial investments and breakthroughs in algorithm development. However, there are still multiple open challenges in natural language processing, context understanding and awareness, handling ethical issues and privacy. Continuous research and innovation are essential for overcoming these obstacles and opening new horizons for AI and conversational technologies. The industry goals and promises relate to improved user interactions and personalized experiences, pushing the boundaries of human-computer communication.

A prominent feature of chatbots is a multifaceted technology that **can not only** synthesize information from sources like online search engines and digital encyclopedias, but also **engage in human-like interactions** and **replace other applications** such as calendars, tracking systems, budget management systems, personal journals, or treatment plans. It may serve as an AI assistant that learns from the user's history and behavior.

However, its development raises fundamental philosophical questions such as **the point** at which the system can replace the human user, its capacity to pass the Turing test, its utilization in the absence of human interaction, and its role in the long-term **propagation of knowledge**.

We start from the hypothesis that gathering knowledge is the foundation of understanding and there is a direct relation between understanding, learning and intelligence which combined with the ability of a system to acquire data and **learn continually**, may lead to the emergence of a form of self-awareness.

As the technology of building **abstract models** for natural language and general semantics continues to evolve, it is relevant to examine the relationship between the dimensions and structure of the neural network, the number of neurons/layers, the amount of accumulated data over time, and the relation between hardware-capacity and the learning rate.

The scope of the current study is to delve into the intersection of software with the profound questions surrounding consciousness, aiming to unravel humanity's understanding of fundamental concepts like free will, observer, subjectivity, and the very nature of reality itself. Through this exploration, we expect to gain deeper insights into these complex areas and contribute to the broader understanding of the human experience.