Chapter 14
Application of Cognitive Computing in Healthcare

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ABSTRACT

Cognitive systems mimic the functions of the human brain and improves decision-making to harness the power of big data in multiple application areas. It generates a model that reacts by sensing, understanding natural language, and providing a response to stimulus naturally rather than traditional programmable systems. Cognitive computing is trained to process large unstructured datasets imposing machine learning techniques to adapt to different context and derive value from big data. Using a custom chat box or search assistant to interact with human in natural language which can understand queries and explains data insights. This chapter also touches on the challenges of cognitive computing to demonstrate insights that are similar to those of humans.

INTRODUCTION

Cognitive computing depicts innovation stages that, extensively, depend on the logical orders of artificial intelligence and signal processing. These stages envelop machine learning, reasoning, natural language processing, speech recognition and vision, human– PC communication, among other technologies. At current scenario, there is no broadly settled upon definition for cognitive computing in either the scholarly community or industry.

As a wide range, the term cognitive computing has been utilized to allude to new equipment or potentially programming that impersonates the working of the human mind and enhances human basic leadership. In this sense, cognitive computing is another kind of computing with the objective of more exact models of how the human cerebrum/mind detects, reasons, and reacts to every stimulus. Cognitive computing applications connect information investigation and versatile page displays (AUI) to change content for a specific kind of group of onlookers. All things considered, Cognitive computing applications endeavor to be more emotional and more prominent by plan (Anandakumar & Umamaheswari, 2018).

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Drawn out to future, the expanding multifaceted nature of medication and wellbeing, administrations raise wellbeing costs overall significantly. Progressions in pervasive processing applications in blend with the utilization of modern wise sensor systems may give a premise to help. While the keen wellbeing idea can possibly encourage the idea of the rising P4-solution (preventive, participatory, prescient, and customized), such innovative prescription delivers a lot of high-dimensional, pitifully organized informational indexes and monstrous measures of unstructured data. All these innovative methodologies alongside "enormous information" are transforming the therapeutic sciences into an information concentrated science. To keep pace with the developing measures of complex information, brilliant healing center methodologies are a rule without bounds, requiring setting mindful reckoning alongside cutting edge communication ideal models in new physical-advanced biological communities. In such a framework the restorative specialists are reinforced by their keen versatile therapeutic collaborators on dealing with their surges of information semi-naturally by following the human-on top of it idea. In the meantime, patients are upheld by their health assistants to encourage a more beneficial life, health and prosperity.

RELATED WORKS

The intense increase of population worldwide is challenging the existing healthcare systems. With the advancement of new technology, smart home environments are used for monitoring the patients and also enabling patients to remain in the home for their comfort. In this paper, a Cloud-Based Smart Home Environment (CoSHE) for home human services is proposed. CoSHE gathers physiological, movement and audio signals through wearable sensors and gives information about patients' daily activities. This allows healthcare experts to think about day by day activities, behavioral changes and monitor rehabilitation. A smart home environment is set up with natural sensors to give related information. The sensor information is captured and sent to a private cloud, which gives ongoing information access to remote healthcare experts. Our contextual analysis demonstrates that we can effectively coordinate relevant data to human wellbeing information and this thorough data can help betterment of human wellbeing (Pham, Mengistu, Do & Sheng, 2018).

In the recent decades, the advancement in medical and computer technologies provided a great interest for both academia and industry. But most healthcare systems fail in emergency situations of patients and are incapable to give a customized resource services for users. To address this issue, the Edge-Cognitive-Computing-based (ECC-based) smart-healthcare framework is proposed in this paper. This framework uses cognitive computing to observe and examine the user's physical health. It additionally modifies the computing resource allocation of the entire edge computing network extensively as per the risk hazard of each user. The investigations demonstrate that the ECC-based healthcare framework gives a better user experience and simplifies the computing resources sensibly, and in addition altogether enhancing in the survival rates of patients in a sudden crisis (Chen, Li, Hao, Qian & Humar, 2018).

Human context recognition (HCR) from wearable sensor networks plays an important role for many healthcare applications since it offers consistent monitoring capability of both individual and natural parameters. In any case, these frameworks still face a major energy issue (Haldorai & Ramu, 2018). In reality, in healthcare applications, sensors are utilized to catch information about daily activities of patients for monitoring the health issues. Therefore, persistent sampling and communication tasks quickly reduce sensors' battery reserves, and regular battery substitution are not advantageous. Accordingly, there is a