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The Human Brain Versus Computer: Which is Smarter?

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ABSTRACT: Our thoughts, movements, memories, and decisions are all controlled by the brain, which is the hub of the human neurological system. The complexity of the human brain has increased with evolution, and many of its fascinating characteristics are still poorly understood by researchers. When it comes to mathematical computations, quantitative analysis, and game show questions, computers may be able to consistently outperform human brains, but that does not imply that computers are generally smarter. Humans are more adept at drawing conclusions about a new situation by remembering prior experiences. Qualitative analysis and emotional intelligence are skills that humans possess. The article examines a few topics pertaining to the human brain's capacity for information. The amount of information that can be stored in the brain and its capacity for retaining and reproducing text and auditory information are evaluated and estimated based on the fact that the unit of information measurement is a bit. The potentials of the computer have been examined in order to simulate the recognition of pictures that occurs in the human brain. A theory is put out that real-time modeling of these processes is challenging to implement given the capabilities of today's computers. A Comparative Study of Human and Computer Intelligence Intellect in Humans and Computers: A Comparative Analysis Human vs. Computer Intelligence: An Evaluation of Cognitive Abilities An Investigation into the Relative Intelligence of Humans and Computers Human Intelligence and Computer Intelligence: A Comparative Analysis of Human and Machine Intelligence Comparison between Humans and Computers: An Empirical Study An Examination of the Capabilities of Human and Artificial Intelligence Human and Computer Intelligence: A Comparative Study of Cognitive Functions The Great Debate: Human Intelligence vs. Artificial Intelligence

KEYWORDS: Human Brain, Computer system human brain, image processing, transmission of information, information processing, assessment of quantity of information, metadata capacities of the human brain.

I. INTRODUCTION

The human brain is a tissue of vast complexity in terms of the cell types it comprises. Conventional approaches to classifying cell types in the human brain at single cell resolution have been limited to exploring relatively few markers and therefore have provided a limited molecular characterization of any given cell type [1]. The 2020's decade will likely witness an unprecedented development and deployment of neurotechnology for human rehabilitation, personalized use, and cognitive or other enhancement. New materials and algorithms are already enabling active brain monitoring and are allowing the development of biohybrid and neuromorphic systems that can adapt to the brain. Novel brain-computer interfaces (BCIs) have been proposed to tackle a variety of enhancement and therapeutic challenges, from improving decision-making to modulating mood disorders. While these BCIs have generally been developed in an open-loop modality to optimize their internal neural decoders, this decade will increasingly witness their validation in closed-loop systems that are able to continuously adapt to the user's mental states [2]. Based on the fact that the measure of unit information is bit, the volume of information that can be stored in the brain and its capacity for keeping and reproducing text and audio information are evaluated and calculated. An analysis of the computer potentials to model the process of recognizing images that take place in the human brain has been performed. A hypothesis that real-time modelling of these processes is difficult to realize with the current parameters of the computers is presented [3]. With the help of science and technology, digital media expressions continue to innovate, which has entered a new era and driven the development of computer-computer interaction technology. In the field of visual interaction art design and related technologies, the development of visual interaction and related field applications are still less studied [4].

The Human Brain Versus Computer: Which is Smarter?

There are arguments concerning whether machines are more intelligent than humans due to the continuous development of computers and artificial intelligence (AI). With computers becoming increasingly adept at handling intricate jobs, the question of which thing is more intelligent emerges. In order to answer this question, a thorough examination of the cognitive abilities of computers and humans is being done in this study.

It's crucial to remember that comparing computers and human brains is a difficult task. Creative thinking, emotional comprehension, intuition, and complicated decision-making are just a few of the many cognitive abilities that the human brain is capable of. It is an extraordinarily complex organ. In contrast, computers are superior in data analysis, processing speed, and accuracy.

Human Brain

Human brain organoids are three-dimensional tissues that are generated in vitro from pluripotent stem cells and recapitulate the early development of the human brain [5]. Most living beings are able to perform actions that can be considered intelligent or, at the very least, the result of an appropriate reaction to changing circumstances in their environment. However, the intelligence or intellectual processes of humans are vastly superior to those achieved by all other species [6].

1. Processing Power: The processing power of the human brain is thought to be significantly greater than that of any machine. It is thought to have 86 billion neurons, each of which is able to establish thousands of connections with other neurons. Efficient pattern recognition and parallel processing are made possible by this network.
2. Adaptability: Throughout a person's life, the brain can learn new things and reorganize itself. It is a very adaptive organ. We call this neuroplasticity. It can alter its own composition and operation in reaction to new information, experiences, and changes in its surroundings.
3. Creativity and Intuition: The brain is well known for its capacity for creative thought, intuitive leaping, and coming up with original ideas by connecting seemingly unrelated pieces of information.
4. Emotional Intelligence: Because of their emotional intelligence, humans are able to recognize, analyze, and interpret feelings in both other people and themselves. This ability requires the comprehension of nuanced social cues as well as sophisticated brain processing.
5. Contextual Understanding: The human brain excels in comprehending context,
6. Understanding difficult situations, and interpreting data in the context of a larger understanding.
7. Energy Efficient: When compared to computers, the brain is incredibly energy-efficient, requiring comparatively little energy to function.

Disadvantages:

1. Limited Processing Speed and Memory: In comparison to current computers, the processing speed and memory capacity of the human brain are limited. Large-scale computations and memory-intensive operations can be difficult for it to handle.
2. Subjectivity and Cognitive Biases: Emotions, subjective interpretations, and biases can all affect how people think. This may cause one to make poor decisions and judgment.
3. Vulnerability to Fatigue and Emotions: The human brain is susceptible to both fatigue and emotional changes, which can have an adverse effect on its consistency and performance.
4. Delayed Learning and Replication: It can be difficult to effectively duplicate skills across large populations due to humans' propensity for delayed learning and the need for intensive training.

Computer

Computer is a device that may be configured to automatically perform a series of logical or mathematical operations. Known as programs, modern digital electronic computers are capable of carrying out broad ranges of tasks.

1. Processing Speed: Computers are excellent at calculating quickly and carrying out commands extremely quickly. Billion calculations can be completed by modern computers every second.
2. Accuracy: When doing activities that call for consistency and precision, computers accomplish them with extreme accuracy. They are immune to human error brought on by passion, preoccupation, or weariness.
3. Storage Capacity: Large volumes of data may be reliably and swiftly stored and retrieved by computers due to their enormous storage capacity.
4. Automation and Repetition: Computers are perfect for jobs that require automation and repetitive processes. They are able to work on the same task repeatedly without getting tired.

5. Data Processing: Massive data sets can be processed and analyzed by computers with ease, allowing them to spot patterns, trends, and correlations that humans might find difficult to see.
6. Multitasking: Computers are capable of multitasking effectively, carrying out several tasks at once without experiencing a drop in performance.

Disadvantages:

1. Absence of Intuition and Creativity: True intuition and creativity are absent from computers. They are limited to producing responses using pre-established data and methods.
2. Lack of Ability to Understand Context and Common Sense: Just like people, computers have trouble comprehending humor, sarcasm, context, and common-sense reasoning.
3. Dependency on Programming: Humans provide the instructions and programming that computers need. They are unable to think outside of the constraints imposed by their programming.
4. Moral and Ethical Decision-Making: Moral and ethical reasoning are absent from computers. They are limited to using data and algorithms to make decisions without fully appreciating the ramifications.

II. METHODOLOGY

This review aims to provide a comprehensive analysis of existing literature comparing the cognitive abilities of the human brain to computational systems. This will involve systematically reviewing and analyzing existing literature on the topic from various sources such as academic journals, books, and online databases. Keywords including "human brain," "computational models," "cognitive abilities," and related terms will be used to ensure the breadth and depth of coverage.

The inclusion criteria will encompass peer-reviewed articles, conference papers, and book chapters published in English, with a focus on studies that directly compare human cognitive performance with computational models. The selected literature will be critically evaluated to assess the methodologies employed, including neurocognitive assessments, computational simulations, and neuroimaging techniques.

Data extraction will involve synthesizing key findings regarding the similarities and differences between human cognition and computational systems, considering factors such as task performance, computational efficiency, and neural correlates. Ethical considerations will focus on the ethical conduct of the original studies, including informed consent procedures and participant confidentiality.

Limitations of the review will be addressed, including potential publication bias and the inherent limitations of the studies reviewed. Through this comprehensive review, the aim is to offer insights into the state-of-the-art research comparing human cognitive abilities to computational systems, thereby contributing to a deeper understanding of cognition and artificial intelligence.

III. RESULTS AND DISCUSSION

Every criterion specified in the approach will be used to present the findings. The findings will highlight the advantages and disadvantages of the human brain and computers in many cognitive domains. The consequences of these discoveries for domains including artificial intelligence (AI) research, improving human cognition, and machine intelligence ethics will all be covered in the talk.

The brain is the center of the human nervous system, controlling our thoughts, movements, memories, and decisions. With evolution, the human brain has become more and more complicated; many of its interesting properties are still not well understood by scientists. Computers might be able to beat human brains every time when it comes to mathematical calculations, quantitative analysis, and game show questions, but that doesn't mean they're smarter overall. Humans are better at analyzing new situations by recalling past experiences and making inferences about a new challenge. Humans are capable of qualitative analysis and emotional intelligence [7].

IV. CONCLUSION

The researchers argue that language learning is closely associated with human intelligence, human neural networks and no computers or software can claim to replace or replicate those functions of human brain [8]. Although the human brain and computers both demonstrate remarkable cognitive capacities, they have unique advantages that stem from their fundamental characteristics. While computers are superior in processing speed, memory capacity, and accurate computations, the human brain is superior in creativity, emotional intelligence, and complex problem solving. Whichever creature is "smarter" may depend on

the circumstances and be determined subjectively. In the end, this research highlights the distinctive characteristics of both machine intelligence and human intelligence, leading to a more comprehensive understanding of intelligence.

In conclusion, there are certain advantages and disadvantages exclusive to both the human brain and computers. The two are superior in different areas, making the comparison of who is "smarter" more difficult. The human brain excels in adaptability, creativity, emotional intelligence, and the ability to absorb complex and unstructured information, but computers are superior in processing speed, memory, and precision.

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