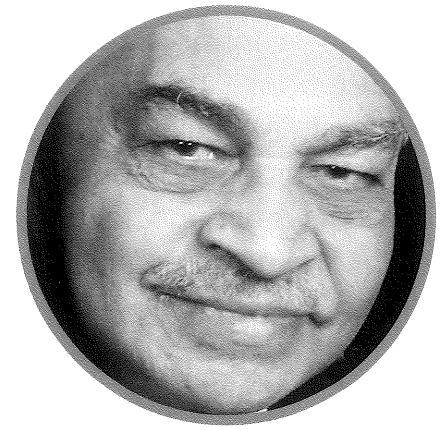


# Will AI Replace Human Intelligence?



While there is much talk about how artificial intelligence may serve as an alternative to the human brain, **K R K Moorthy** is of the belief that such a thing will never happen in the immediate future.

**WE** find the media buzz with talk about artificial intelligence (AI). But I have strong reason to believe that AI cannot take over the functions of the human brain. Our brain and nervous system are under the automatic control of the mind. The mind is not the brain. The mind is abstract in nature and refers to the faculties and activities of thought, cognition, intellectual functions and consciousness. The brain is a concrete and physical part of the body. The mind, in fact, uses the brain as an instrument.

Any man-made system

like artificial intelligence can only copy the brain, not the mind. For this to happen, accurate programming is required to make the system function accurately. Yet, even this can fall short for a number of reasons. At any given time, the brain has infinite degrees of freedom. Decision-making is one degree of freedom that meets the requirements of the situation in the most adequate manner. Studies indicate that decision-making is aimed at producing the result that is most consistent with the prevailing motivation.

The brain has the ability to recognise the particular features of events and to

assess the suitability of results obtained earlier in similar situations to the present. This search and comparisons with earlier knowledge or experience is one of the most remarkable abilities of the brain, since our behaviour is virtually a continuum of major and minor results. The nervous system performs such comparisons continuously.

When there is a minor difference between the prediction and the result, the brain instantly decides using past experience and intuition. The basic properties of natural intelligence cannot be understood unless neurophysiology develops new tools and methodology to unravel the many secrets of the way the brain functions. The replacement of human brain with robots is impossible. The brain is

not easy to match, let alone surpass. The brain contains 10,000 million nerves and 100,000 supporting cells.

Each neuron (impulse-conducting cells that constitute the brain, spinal column and nerves) is connected to thousands of others which make an unimaginable network. The brain's configuration is beyond description and definitely beyond easy comprehension. The brain is built of proteins and nucleic acids as a result of millions of years of evolution by trial and error mutation and through natural selection operating under the pressure for survival. The computer, on the other hand, is built over the last few decades through purposeful development by humans operating under pressure to produce something to serve man more efficiently.

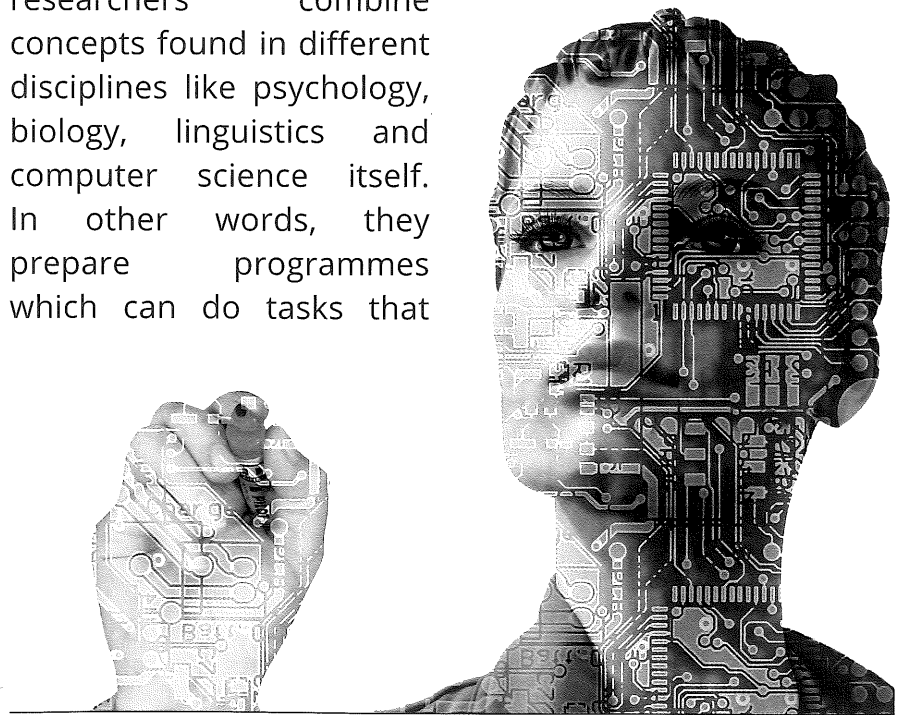
The computer is designed to do arithmetic. Any problem, however complex, can be broken down to a series of well-defined operations that can be solved by a computer, without error and in micro seconds. The

human brain, on the other hand, is extremely poor in arithmetic. It needs outside help even to solve simple problems. However, humans can do many things which the computer cannot. We do not know how we do some of the things and therefore the problem of making robots behave in a human fashion is almost impossible.

However, there is considerable research at present to see whether the computer can solve an unstructured problem, which we believe only humans can do. This is creating artificial intelligence. To do this, researchers combine concepts found in different disciplines like psychology, biology, linguistics and computer science itself. In other words, they prepare programmes which can do tasks that

have never been done automatically by machines. Therefore, creating artificial intelligence involves an examination of the process by which human beings perceive, assimilate and analyse data, reason abstractly, adapt and communicate, and then reproduce such behaviour in computers.

A computer can become a 'thinking machine' only if the psychologist is clever enough to provide it with the real principles that guide human thought. The difference between a thinking machine and a thinking man is that the computer intelligence is



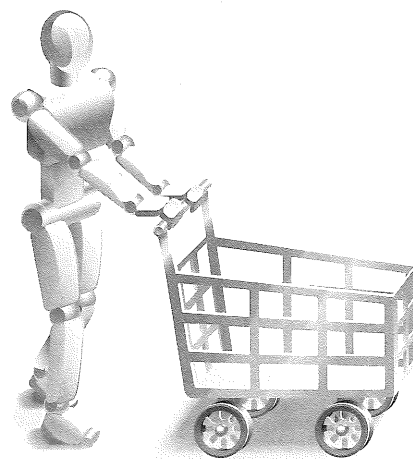
'non-human' – it does not grow, has no emotional base, and is poorly motivated. It cannot make social decisions due to its inability to do 'human thinking'. For higher order logical type of thinking and judgment, and for vague ideas and many other things, the machine is a long way from competing with the brain.

Artificial intelligence (technology) and the human brain (mental activity) are based essentially on two different kinds of connections among the elements in the system. Artificial intelligence, like mathematics, is disjunctive or discrete as the statisticians would like to call it. It is made of 'separate parts that are united into a whole using a method'. This factor characterises the structure and functioning of the 'whole' system. The stages and elements involved in the natural thought process are never disjunctive. The stages overlap and criss-cross.

There is continuity in the development of conscious and unconscious thoughts. The choice of an alternative

is the 'result' of this process and not the process itself. A living organism emerges from a single fertilised egg cell, which further evolves by differentiation in a single continuous process of development. Machines are created by man in exactly the opposite way – by deliberate planned assembly of inherently separate pre-fabricated parts which are static in nature. Artificial in the real sense is impossible to create due to this fundamental difference.

In the broadest sense, real thinking is to solve problems. Such problems are of two types: a) reproducible problems in which conditions, means



**With the human mind in control, robots can take over the routine tasks**

and methods are adequate to achieve the result and b) creative problems where the available conditions, means and methods (e.g. algorithms) are incomplete and the missing link must be provided by the system itself as it interacts with the environment and by using past experience. Solutions to most problems require both reproducible and creative thinking. Natural intelligence helps living systems, like animals and man, to solve both types of problems.

The most promising area is that of a hybrid man-machine system where man does the creative thinking and the machine carries out the programme. Even here, there is no clear-cut division between the creative and non-creative role of man. Expert systems have started to replace traditional programming. There are many knowledge specialists, but intelligent machines require general knowledge. The future may solve these problems. Fantastic things like talking and thinking robots will perhaps happen in the next 200 to 300 years.