



Dr. Bharat S. Rawal

**Capitol Technology
University**

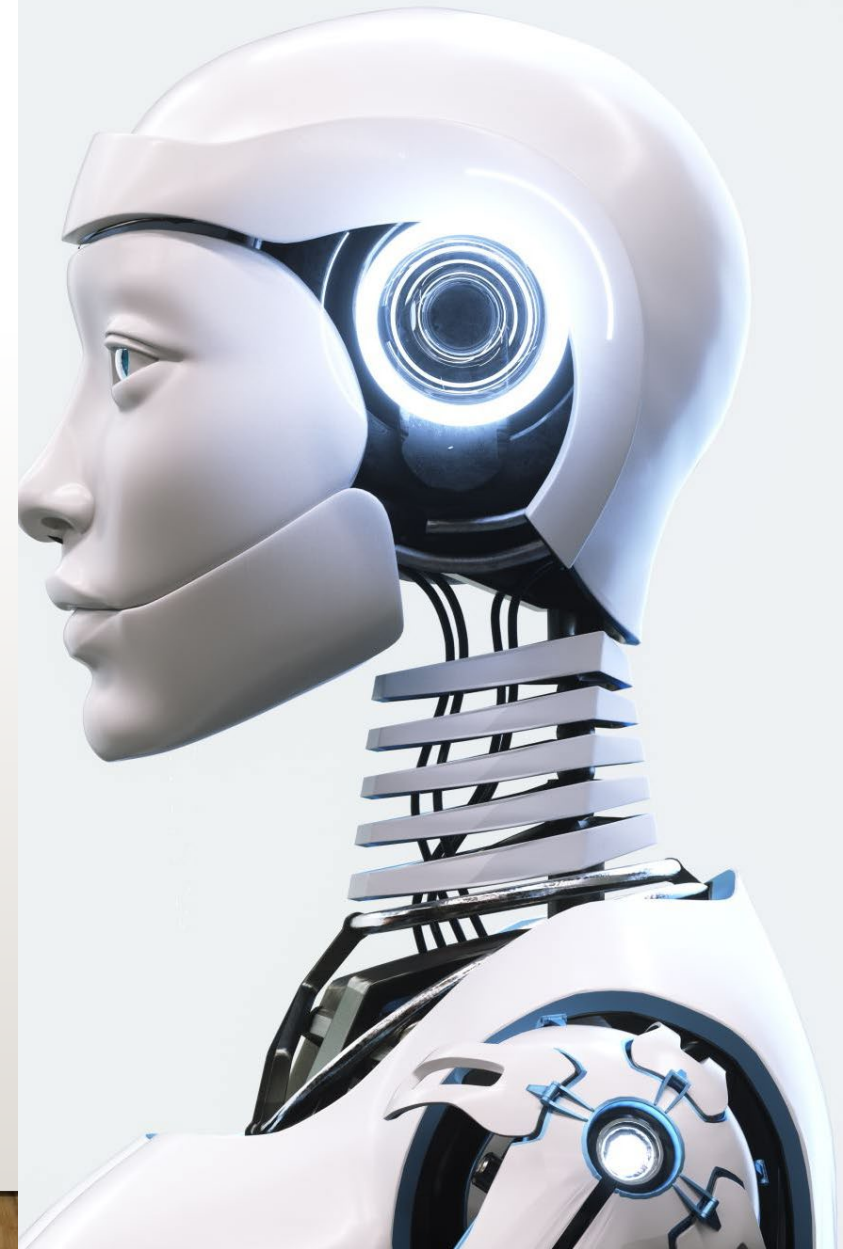
Cyberizations Future Of Artificial Intelligence In IoT And Cyberizations: A Global Perspective

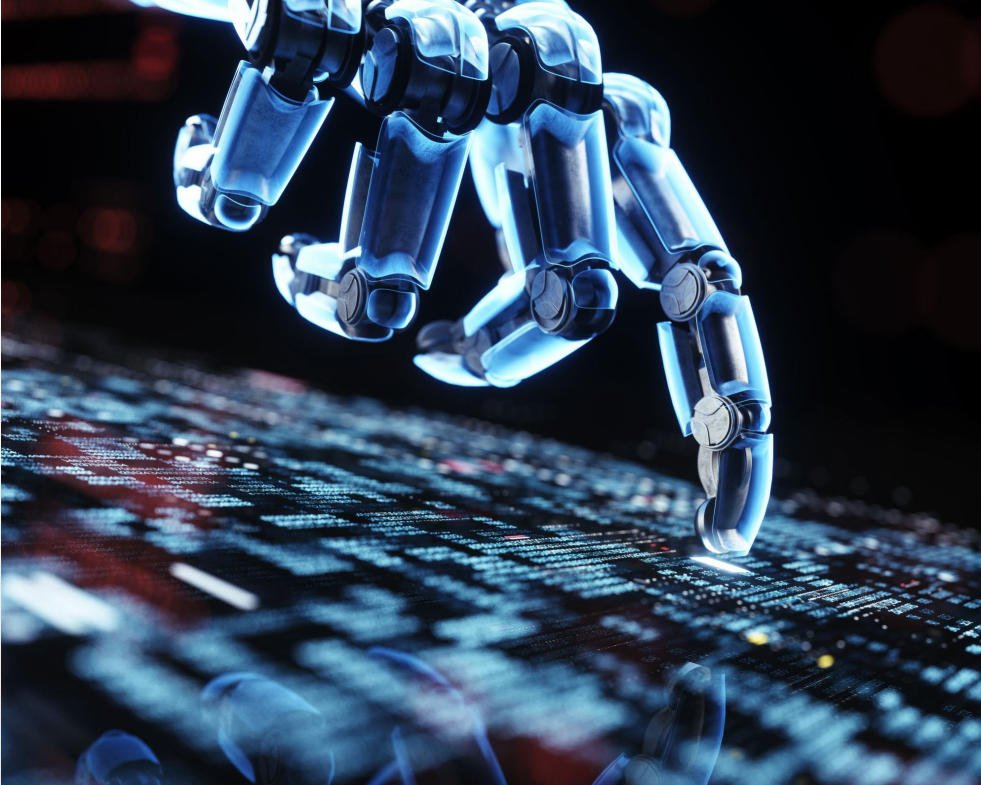
Currently, the total number of devices related to IoT has reached around 20 billion units worldwide and this number is expected to be doubled next year. It is considered to be the biggest technological expansion in the history of mankind, it will create cities that will be controlled by AI and IoT.

Technologies like Artificial Intelligence (AI), Machine Learning, Deep Learning, Internet of Things (IoT), and many more have acquired a major part of our day-to-day lives and have made it very easy. Artificial Intelligence is making machines intelligent in contrast to the natural intelligence shown by human beings and other animals.

Machine learning is the application of artificial intelligence which provides machines the ability to learn through experience instead of programming them explicitly. It helps the machines to act cognitively which can be further used in reading, interpreting, and utilizing heaps of data.

Another important technology is the Internet of Things (IoT) which facilitates the networks of devices like actuators, software, electronic appliances, sensors, etc. to communicate with each other



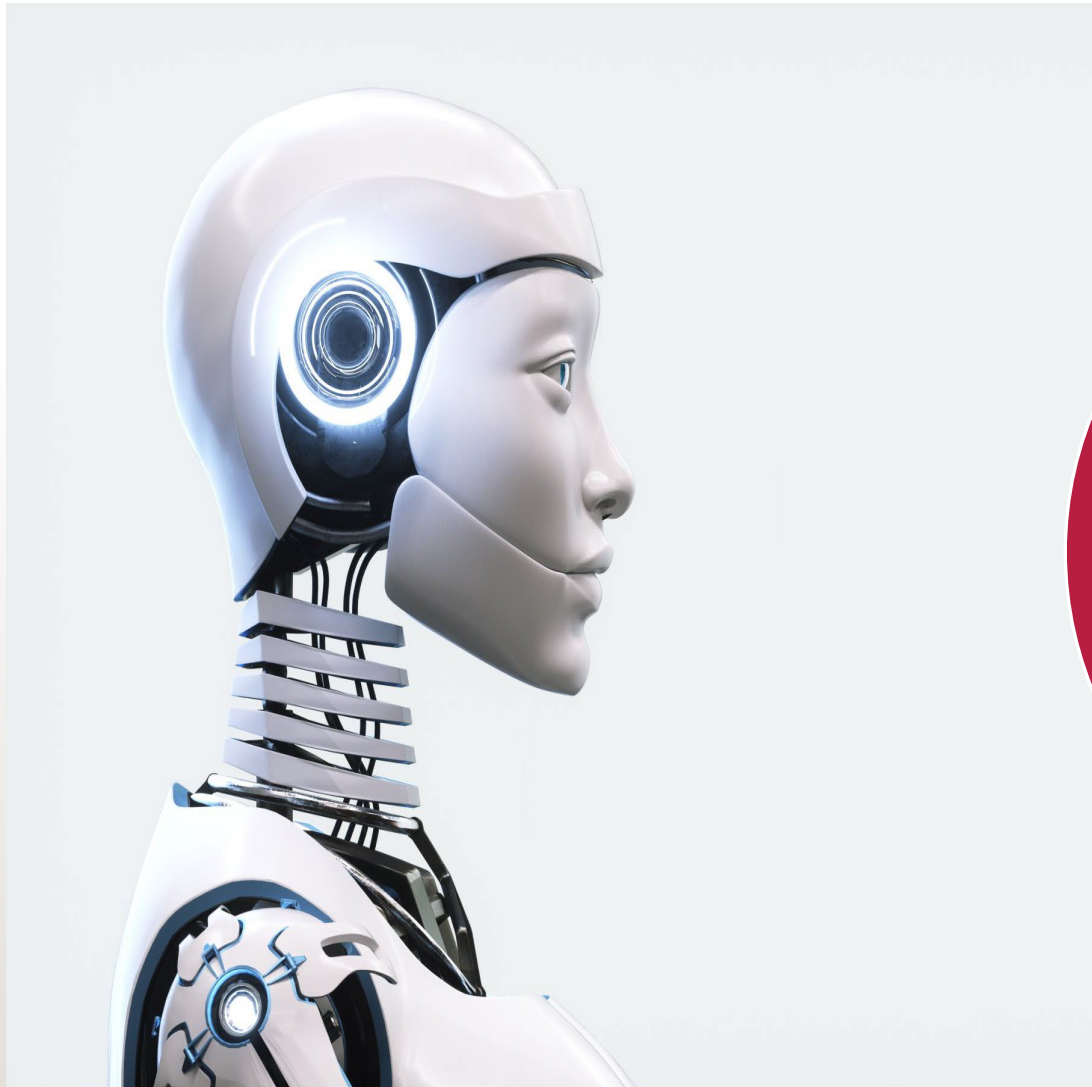


It is as served that in today's world, technology is playing an important role in our lives and has a huge impact on the way we communicate, live, and work.

With the increase in the use of IoT and AI many innovative things have been unveiled across various industries and the count is still increasing. The combination of IoT with AI can be used to teach decision-making to machines. Although these two technologies are in their stage of infancy, they have helped in the creation of a new category called Artificial Sensors.

Artificial Intelligence and IoT combined with real organs from a cybernetic organism or cyborg. It is a concept of a man-machine mixture that helps in restoring or enhancing the ability of a body part by integrating some technology or artificial component with that body part..

These smart artificial organs act as a substitute for real organs having various capabilities like scanning the body, detecting, and transmitting the diagnostic data to machines. Such artificial organs are already being used and they perform the required functions for diagnosing the internal organs.



Artificial Reality, sensors, cyborgs, and more can all individually be discovered as unique types of innovation that pair the internet with the human brain. Although, it will make our life very easy and more comfortable but will arise a lot of security issues. The internet as a stand-alone tool itself, is striving for security how it can be secure when embedded in the human body?

The internet as a stand-alone tool itself, is striving for security how it can be secure when embedded in the human body?

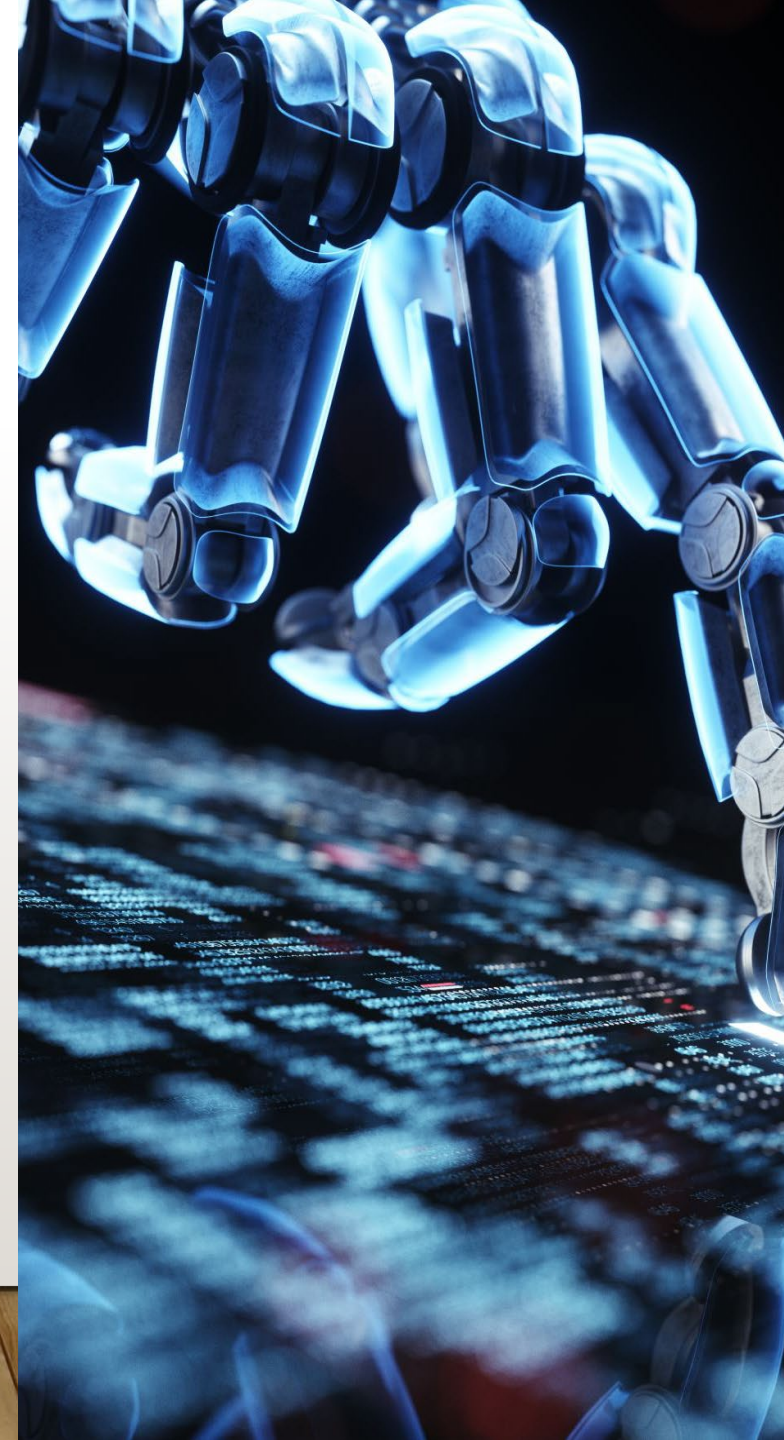
The cyberization process replaces parts of the brain – minimally or majorly depending on the individual's wishes to be “more or less artificial” – with nanotechnological robots, robots of an incredibly miniscule scale. [4]



Following the well-known concepts of computerization and informatization, an emerging era of cyberization, which is considered a reformation of the present physical, social and mental worlds, has become a hotly discussed trend in the new cyber world.

Cyberization refers to using communication and computer technologies to interconnect computers and various electronic terminal devices distributed in different locations.

It allows users to share software, hardware, and data resources according to certain network protocols. Cyberization has greatly improved the practical utility of computers and has been widely applied in transportation, finance, business management, education, telecommunications, commerce, and so on in our daily life [1,2].





During the cyberization process, a large number of real things will conjugatively map to various kinds and levels of cyber existence in cyber world. It is said that cyberization has already taken place in a variety of fields along with the development of several emerging computing paradigms and information communication technologies, such as ubiquitous/pervasive computing, social computing, and networking, wearable technologies, etc.

Specifically, with the rapid growth of the Internet of Things and cognitive cyber-physical systems, more and more digital things or cyber entities, are engaged or generated in the integrated cyber world.

Emerging technologies in smart environments, such as smart computing and smart objects, become very significant, promising, and enabling issues in cyberization, to enhance the efficiency of sensing, processing, and communication in the conjugations of physical, social, and mental worlds.

Accordingly, cyber technology is playing an important role in developing effective methods of resource management, data acquisition, and pattern recognition across cyber-related systems and applications.

All of these provide us opportunities to explore smart computing methodologies and computational intelligence algorithms, in order to facilitate the cyberization process in the cyber world.



Cyber-social networks have significantly improved social relationships among mobile users across device-to-device communications. According To Wang et al., “A Detailed Review of D2D Cache in Helper Selection” [3], the authors present a survey work which focuses on Device-to-Device helper selection techniques according to three basic categories, including the network frame, computing method, and social-aware attribute.

Differing from other surveys which mainly consider the energy consumption and latency minimization in D2D networks, they discuss the selection of D2D helper based on different network architectures, such as content distribution networks, peer-to-peer networks, and named data networks, cellular networks, and vehicular ad-hoc networks.

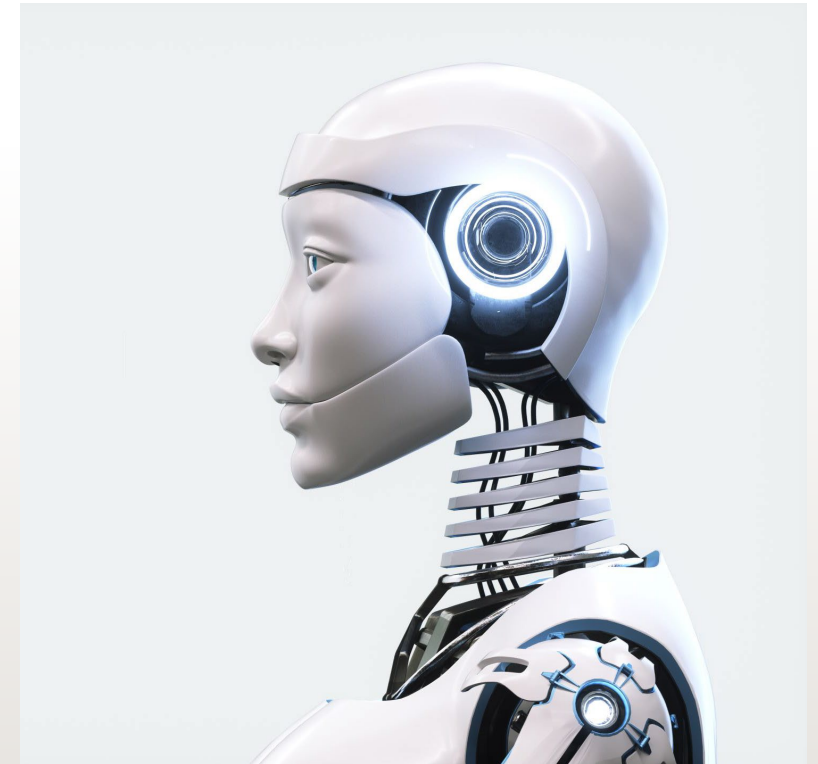
In particular, a variety of computing paradigms are taken into account to classify D2D helper selection techniques, such as mobile cloud computing, fog computing, and mobile edge computing.

Cryptography plays a significant role in powering today's intertwined connection of computers in the form of encryption. With no one to check the validity of packets streaming over the internet, encryption adds a layer of assurance promising the sender's packet to be delivered correctly.

The development of the Rivest-Shamir-Adleman (RSA) algorithm was demonstrated to be computationally difficult to brute-force by classical computers within polynomial time NP . Such encryption algorithms pave their path to become the backbone of blockchain-based technologies – cryptocurrency, smart contracts, decentralized applications, and eventually to empowering the next iteration of the World Wide Web – Web3.0.

The concept of a quantum computer was first theorized by Dr. Richard Feynman in the year 1981 when conventional computers failed to simulate quantum systems. Quantum computers are computing systems operating based on the concept of quantum information.

Unlike classical binary-operated computers, storing information in one of the two possible states, these computers operate based on Qubits – a unit of information used in quantum computers.





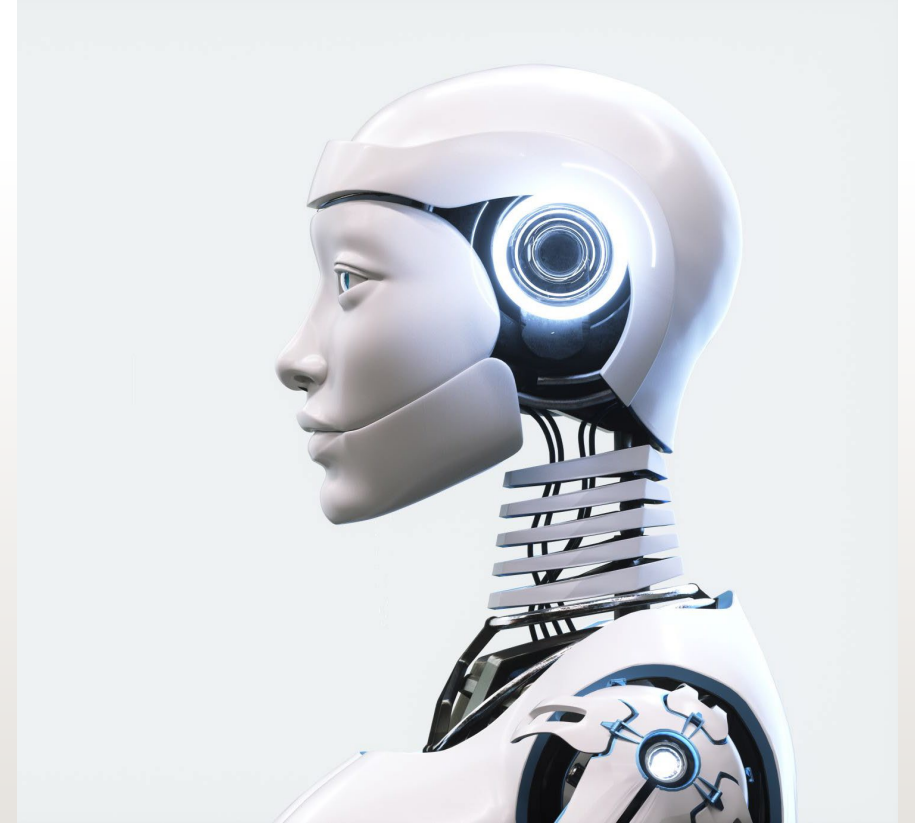
Qubit abides by the mysterious laws of quantum phenomena of superposition in tandem with quantum entanglement and quantum interference. Hence, the superposition allows the qubit to take on any value of either 0 or 1, including the state in-between. The characteristics of the qubits attribute a quantum computer to solve any problem deemed unfeasible in polynomial time, by classical computers, to be in a matter of hours.

Implementation of a Quantum Computer: Quantum computers manifest an equivalent architecture to a classical computer. Additionally, quantum computers abide by the fundamental postulates of quantum information.

Hence, it is necessary to build such systems capable of naturally being in an entangled state. Introduce a quantum bit, a two-state device manifesting all the properties of quantum mechanics.

The ensemble spawning from the entangled state is further exploited to benefit the computation that may take eons to process, to be done in a matter of seconds to hours.

The qubit system is represented by the notation of $|0\rangle$ and $|1\rangle$, where a single qubit occupies a two-dimensional complex-vector space. Whereas two-state qubit device $a|00\rangle + b|01\rangle + c|10\rangle + d|11\rangle$ would occupy a four-dimensional complex-vector space. Hence, a generalized form for the n qubits system can be represented by a 2^n Hilbert space.



Zhou, X., Delicato, F.C., Wang, K.I.K. et al. Smart computing and cyber technology for cyberization. *World Wide Web* **23**, 1089–1100 (2020). <https://doi.org/10.1007/s11280-019-00773-y>

Hu, R., Yan, Z., Ding, W., Yang, L.T.: A survey on data provenance in IoT. *World Wide Web*. 1–23 (2019). <https://doi.org/10.1007/s11280-019-00746-1>

Tong Wang, Yunfeng Wang, Xibo Wang, and Yue Cao, “A Detailed Review of D2D Cache in Helper Selection,” *World Wide Web* (2019)

Folley-Regusters, Scheherazade. ““Ghost in the Shell: SAC” Portrays Our Future.” (2030).

Questions ?????

