ABSTRACT

Older Industrial cyborgs were expensive, had legacy architecture and were developed on proprietary software controlled by robot manufacturers, which means older cyborgs cannot be modified or scaled by end users. Moreover, previous cyborgs were very expensive, lacked self-learning capabilities, unable to navigate and perform tasks independently, and failed to interact intelligently with humans. Advancements in technology led to the availability of sophisticated and cost-effective embedded systems, and open-source code propelled innovative implementation of Artificial Intelligence *(AI)*, Machine Learning *(ML)*, and Machine Vision *(MV)*.

In this research, a small prototype of a smart industrial cyborg (*Smart IC)* is simulated by incorporating advanced technologies such as *AI, ML* & *MV* to accomplish omnidirectional movement, autonomous navigation & localization, automation of work, objects & colors recognition etc. Light Detection & Ranging *(LIDAR)* & Simultaneous Localization & Mapping (*SLAM)* functionalities delivered autonomous mobility, intelligently self-navigating through obstacles, or following a predefined path. Advanced technologies also helped in successfully identifying objects and recognizing colors and shapes. Automation of industrial work was also realized. Bluetooth and wi-fi hotspots enabled mobile devices such as laptops and cellphones to remotely take control of Robotic Limb & Robotic Vehicle operations.

Therefore, my hypothesis is valid that if smart embedded technologies are incorporated in the design of industrial cyborgs, then it will help in fulfilling human manpower shortage, stabilizing operational costs, increasing efficiency, and cutting overhead costs as smart cyborgs can efficiently, diligently and independently work 24/7 to mass produce, which in turn will keep the prices low for end consumers.