

COMPARATIVE STUDY OF NANO TECHNOLOGY & COMPUTER VISION

Siji Antony¹, Angith Panicker², Nimisha Shaji³, Revathi S Kumar⁴, Aby Rose Varghese⁵.
^{1,2,3,4} UG –Student scholar, Kristu Jyoti College Of Management & Technology, Chethipuzha, Kurisummood P .O ,Changanacherry, kerala
⁵Assistant professor, Kristu Jyoti College Of Management & Technology, Chethipuzha, Kurisummood P .O ,Changanacherry, kerala

ABSTRACT

Nanotechnology is the useful creation of materials, system and devices through the operation on matter on an atomic molecular level in the length scale of nanometer size. Computer vision is a field of artificial intelligence (AI) that helps computers and systems to acquire meaningful information from different visual inputs and take measures or guidance. In this paper we propose a comparative study of applications of Nanotechnology and Computer vision in medical field.

Keywords: AI, medical field, applications.

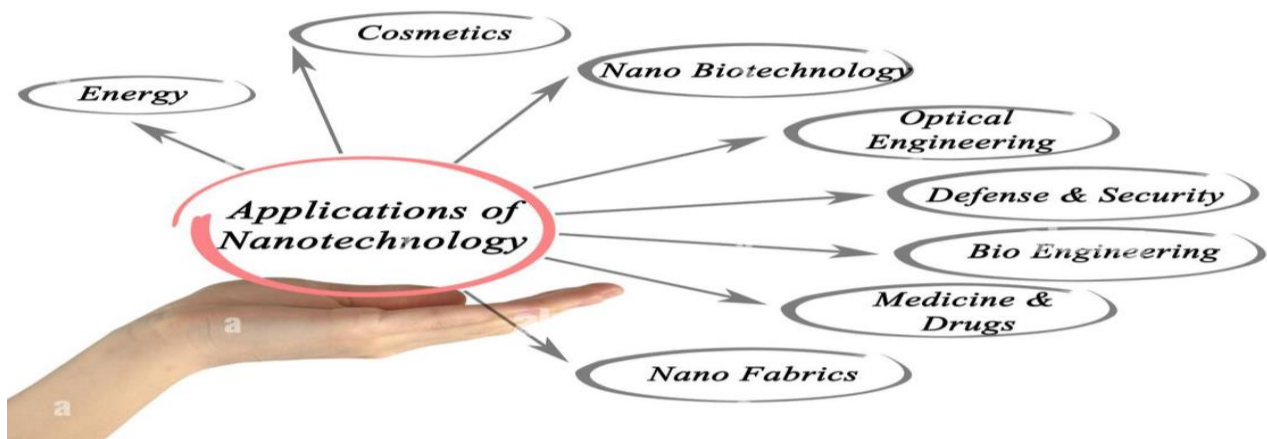
Introduction

Nanotechnology is the technology for controlling materials on an atomic or molecular scale. It is the area of research and innovation to engineer things. Generally, materials and device on the scale of atoms and molecules. An nano meter is the one -billionth of the meter: ten times the diameter of the hydrogen atom. At that measures, the standard command of science no longer exists. It can increase the efficiency of energy consumption, helps cleaning the nature and to finding the solution for major health problems.

Computer Vision is the area of (AI) that control images and video analysis. It is a area that includes data processing, analyzing and awareness of image in general high dimensional data from the real world in order to produce numerical and symbolical information. It is a technology of science and machine that help to obtain informations from images.

The biological and medical research community of the world is focusing on how nanotechnology and computer vision can make drugs more cheaper and effective, reduce side effect of drugs. By using nanotechnology and computer vision in medical field make more possibility to find out the causes of disease in an efficient way.

Why Nanotechnology?



Nanoscience and Nanotechnology involves the ability to see and to control individual atoms and molecules.

Nano science or technology is used to diagnosing the diseases, to treat or prevent them at earlier stage.

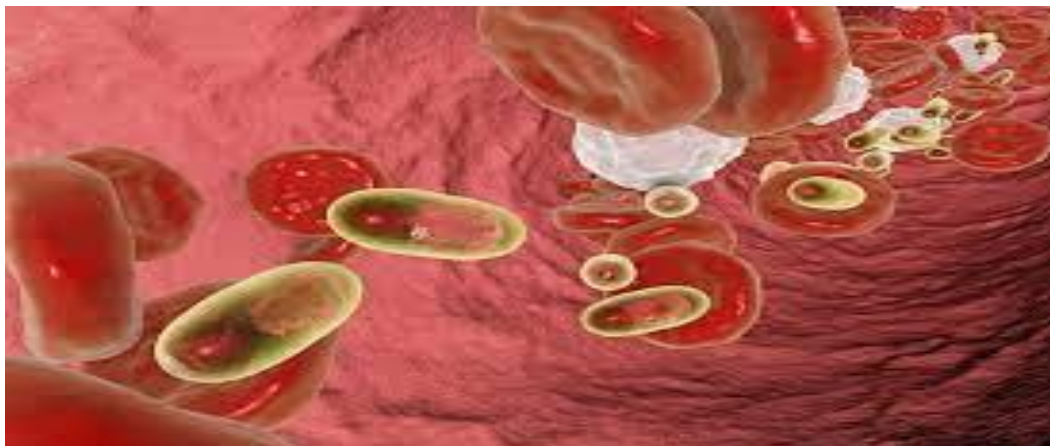
Nanomedicine is the science and technology of diagnosing ,treating and preventing disease and traumatic injury using nano scale structured materials,drug delivery for cancer treatment by enhancing build-ups of cytotoxicity in tumor tissue, specificity in tumor targeting, reducing cytotoxic side effects on normal cells reducing systemic side effect,increasing drug solubility,and increasing maximum tolerated dose, of relieving pain and of preserving and improving human health, biotechnology,genetic engineering and eventually complex machine systems and nanorobots.

Applications of nanotechnology in medical fields:

- Drugs delivery
- Surgery
- Cancer Treatment
- Covid -19
-

DRUGS DELIVERY

In nanotechnology the nano particles are use for site specific drugs delivery. In nanotechnology the required drugs dose is used an side effects are lowered. Significantly as active agent in deposite in the morbid region only.This approaches can reduces the costs and pain of the patients. nanotechnology reduces the drugs consumptions and treatment expensives,make the treatments patients cost effective.



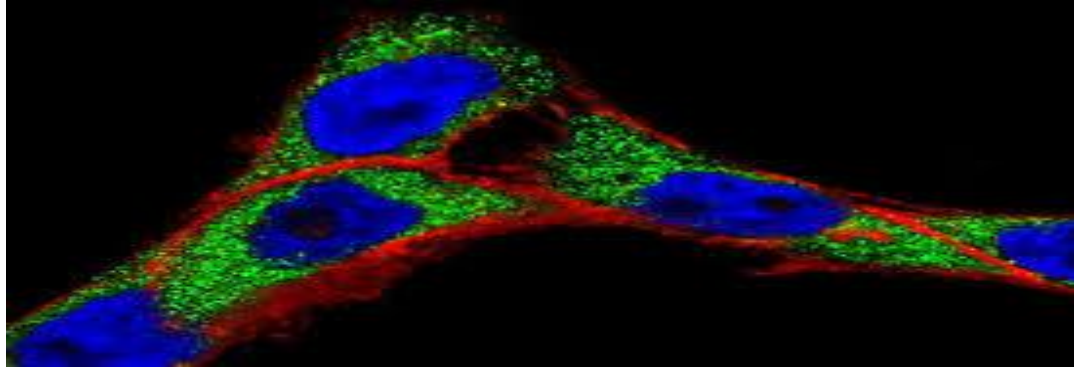
SURGERY

With the support of nano technology,minute surgeries can be done with the helps of machines. Microsurgeries on any parts of the human body.Rather than hurting a large amount of body.Nanotechnology uses minute instrument that would be reduce and accurate targeting only the area where operations should be done,and there is the smaller chance of any mistakes.Surgery can also be done on tissue, genitics and cellular level.



CANCER TREATMENT

Nano technology is also used in the treatment of cancer. Nano particles have high surface area to volume ratio. Iron nano particles or gold shells play an important role in cancer treatment. Now a days nanotechnology takes place of chemotherapy in cancer treatment. It should reduce the side effects than current treatment of radiation in chemotherapy.



COVID -19

During the covid pandemic nanotechnology laser-based photonics test are used to detect the covid - 19 from saliva first. By using nano approach we first developed (PPE) ,which is used to prevent the spread of viruses. Nanotechnology develop an effective disinfectants and surface coating PPE and safe mask. This tecnology help doctors and scientist and researches to find out the effective shield(vaccine) to fight against the virus.

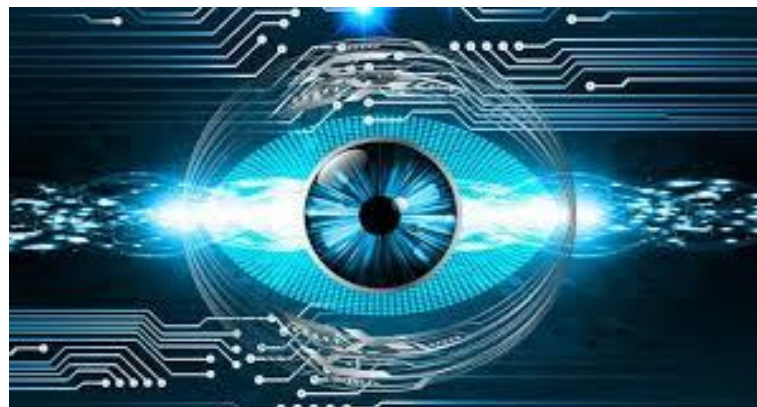
COMPUTER VISION

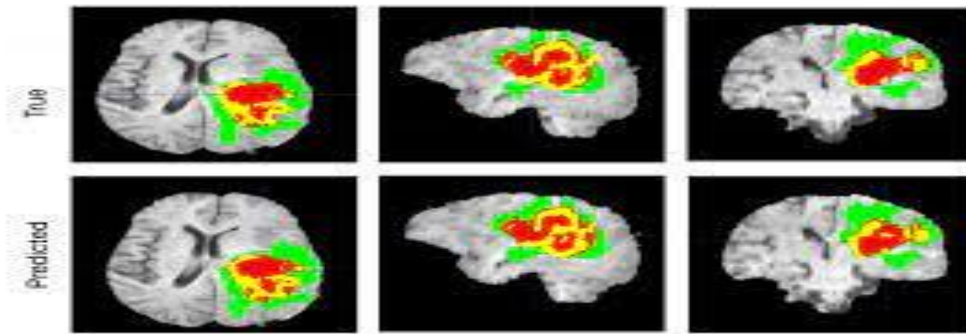
Computer vision is the area of machine learning using artificial intelligence. It controls the machine using softwares ,this software is controlled by the humans. By 20th century computer vision play an important role in all the fields. It is mostly helpful for human -beings .By this technology human achieve many invention complicated major /minor operations which are not done by the surgeon is done by Computer vision(AI). Computer vision is capable for handling micro size particals.

Application of computer vision

- Medical Imaging
- Patient monitoring
- Computer based surgery
- cancer

Medical imaging





Medical imaging is a specific term that covers technology used to create images of the human body. This helps in study and diagnosis. It includes (MRI, CT-SCAN, X-RAY) all of these are controlled by computer.

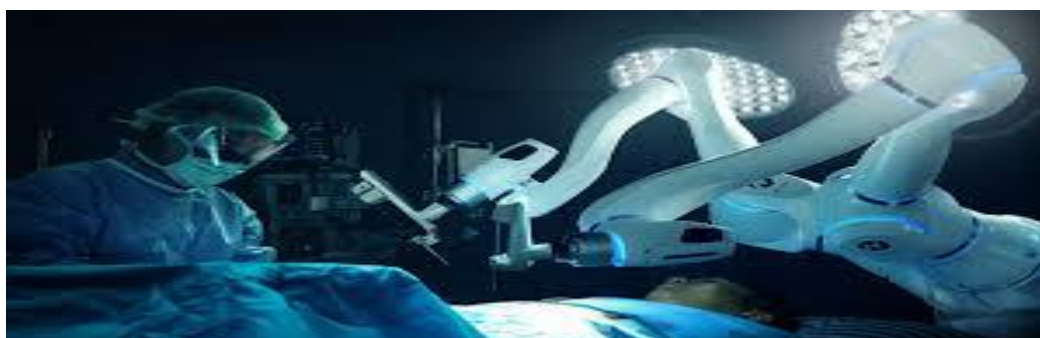
Patient monitoring

Modern computer-related patient monitoring devices allow heart rate, respiratory activity, blood pressure and other critical signs to be controlled automatically. It cuts down the time spent on routine tests in doctor offices.



Computer-assisted surgery

Computers are used in surgical procedures. One of the important developments in this area is robotically-assisted surgery (RAS). This allows surgeons to complete the operation with the help of computer software. The surgeon controls the device to complete the operation.



CANCER

Rather than nanotechnology computer vision has also an important role in cancer treatment. By using the (AI) we can detect the cancer cells in an early stage. AI has special technology to detect the cancer cells faster way.



Conclusion

Through this comparison of nanotechnology and computer vision we are trying to arrive at a conclusion that nanotechnology has greater achievement in medical field like disease treatment is possible to a great extent. But there is a limitation of using nano technology, without computer vision nanotechnology can not come into existence. In specific area of medical field. Computer vision has a greater chance in medical field than nanotechnology it handle all the operation that a nano technology can't do. So there is more chance in computer vision in future to handle such a complicated tasks. By our comparison we conclude in future computer vision is more useful in the medical field.

Reference

- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2890134/>
- <https://www.spandidos-publications.com/10.3892/br.2021.1418>
- <https://www.engpaper.com/free-research-paper-nanotechnology.htm>
- <https://www.ibm.com/in-en/topics/computer-vision>
- <https://www.journals.elsevier.com/computer-vision-and-image-understanding>
- <https://www.springer.com/journal/11263>