



Roles of Artificial Intelligence in Healthcare and Agriculture: A Review

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ABSTRACT:

This research paper explores the transformative impact of AI in healthcare and agriculture. AI is a revolutionary technology. Which has the power to revolutionize the healthcare industry such as personalized treatment, robotic surgery, patient care, virtual diagnosis, accurate diagnostics and efficient data management. In the field of agriculture, AI power system can optimize pest control, resources management and crop production such as watering and spraying fertilizers through drones, plants health monitoring, pest control, automated seeding and weeding. This paper examines the applications of AI in both industries/sectors such as medical imaging, predictive analytics and autonomous farming machinery. He also discusses the practical and ethical challenges of AI implementation such as data privacy, regulatory compliance, job displacement, impact of AI in human and bias in algorithm. Ultimately, the paper highlights the potential for AI to enhance efficiency and outcomes in healthcare and agriculture while emphasizing the need for responsible and equitable adoption of AI technologies

Artificial intelligence is a branch of computer science which a transformative paradigm in Computer Science. Artificial Intelligence is already being used in variety of applications including machine learning, deep learning ,natural language processing, Facial recognition ,fingerprint recognition ,iris recognition ,palm recognition . Artificial Intelligence is used to develop new products and services, automated repetitive tasks performed by human. It increases productivity and efficiency of any task as compare human.

Keywords: Artificial Intelligence, Machine Learning, Deep Learning, Natural Language Processing.

INTRODUCTION:

AI is an emerging field which has given a transformative force to both healthcare and agriculture by offering unique and innovative solution of existing problem or challenges in these critical sectors.

AI technology has the potential to revolutionize the healthcare industry such as patient care, predictive analysis, effective diagnostics, patient care. By analyzing the data, providing personalized treatment and prescription to the patient. By analyzing the patient's previous medical data, it detects future diseases and helps doctors in providing personalized medicines and treatment accordingly. In agriculture sector, AI provides valuable insight to farmers by collecting real time data. The AI powered system can optimize farmers' resources, improve crop yield and manage environmental impact. AI offers many advantages in both healthcare and agriculture, its adoption also presents ethical, legal, and practical challenges. Artificial Intelligence is a branch of computer science that enables machines to learn, understand, think, and reason,

which can be seen in the form of human intelligence. Artificial Intelligence aims to make machines capable of performing tasks that normally require the human brain, such as learning and problem solving.

Artificial Intelligence includes a variety of tools and techniques, including machine learning, neural networks, natural language processing, computer vision, and more. These techniques and tools apply Milk AI in various sectors, such as health, finance, education, etc.

Artificial intelligence solutions can enable farmers not to only reduce wastage, but also improve quality and ensure faster market access for the produce

1. AI IN HEALTHCARE :

AI plays a very important place in the field of medicine .With the help of AI, applications and sophisticated machines are being made which can detect dangerous diseases such as cancer, TB, AIDS, brain haemorrhage dengue, etc. artificial intelligence can help to analyze chronic conditions with the help of lab reports and other medical data to ensure early diagnosis.

In the domain of healthcare, AI is facilitating breakthroughs in medical imaging, drug discovery, and treatment planning, promising improved patient outcomes and cost reductions

AI has accelerated the diagnostic process, aiding doctors in identifying and diagnosing diseases according to accurate results.

Nowadays in health care sector, robots are being used for robotic surgery, it is a powerful tool for surgeons. In robotic surgery, a doctor sitting in any corner of the world can perform surgery on a patient in another country. In robotic surgery, the surgeon controls the robotic arms using a console and miniature joystick. While AI systems strive to translate movements precisely, subtle fluctuations are unavoidable as hands tire. Still, scaling and smoothing motions permits surgeons amplified yet gentle guidance within narrowed vessels. Optioned thus, surgeons leverage magnification and modification by AI, facilitating perspicuous perception of paramount parts ordinarily perceptible solely through razing flesh. Where vision is augmented, inflicting lacerations lessens. Through collaboration, computer and clinician combine capacities, as technology tenders tiny tugs transmuted and tissues tracked, surgeons see usually unseen - internal workings laid bare beneath dexterous, delicate direction.

Medical imaging is a technology of artificial intelligence which creates the image of the human body which helps in diagnosing the medical health of the patient. Due to which the doctor gets to know in a better way about the problem occurring in the patient. Diagnosis seems to be done in a much better way. Machines like X ray, MRI, CT scan are used in medical imaging.

There are more than 70+ robotic surgery centers in India and more than 500 trained surgeons who have performed more than 12800 robotic surgeries in the last 12 years. Robotic surgery helps doctors in performing complex operations and procedures with accuracy and precision.

Robotic surgery increases the flexibility and control of procedures that may be difficult to achieve with traditional surgical procedures.

USE OF AI IN HEALTHCARE

- Developing new drugs and treatments
- Diagnosing diseases
- Personalizing treatment plans
- Monitoring patients

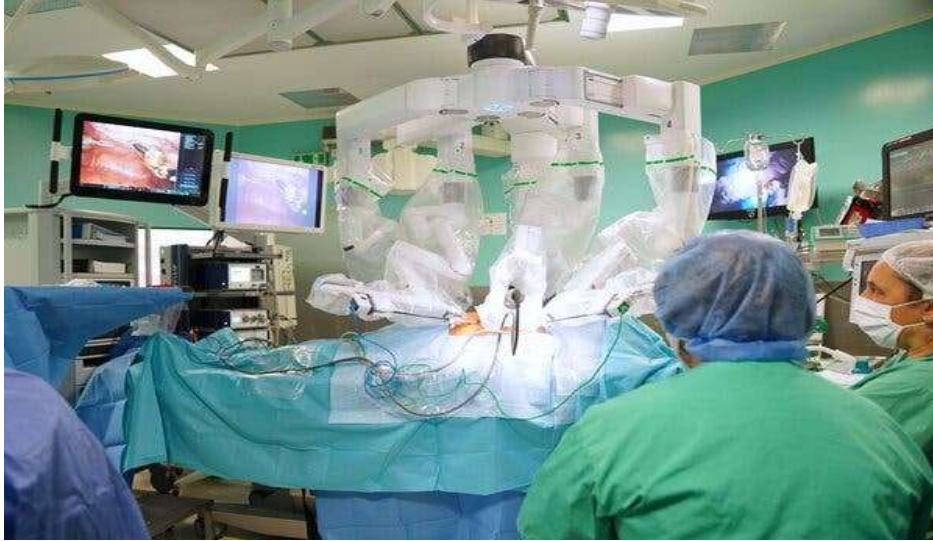


Fig.1: Robotic Surgery



Fig.2: AI Staff to support Patient

Advantages

- **Provides real time data :** AI enable the collection and analysis of real time patient data.it helps in enhance the monitoring of vital sign,disease progressions and effectiveness of treatment
- **Streaming tasks:** AI automates many time consuming tasks like data entry ,appointment scheduling.
- **Saves time and resources:** AI driven automation system lead to increased operational efficiency ,reducing the time and resources required for various healthcare tasks.
- **Assist research:** AI accelerates medical research by analyzing vast medical data sets , identifying patterns and predicting outcomes.

Disadvantages

- **Unemployment:** AI automate certain healthcare tasks it may lead the workforce displacement that may leads unemployment .
- **Inaccuracies:** In healthcare, even minor inaccuracies could have significant consequences, emphasizing the need for continuous improvement and validation of AI models
- **Security risks :** AI system completely works on the data which can make it face security issues. Cyber security will be needed to make AI safe and sustainable.
- **Need human surveillance:** In AI human surveillance still essential because surgery robots can operate logically while surgeons are required to observe vital behaviors which help in diagnosis and prevent medical complications during the surgery.

2. AGRICULTURE:

The projected growth of global population by 2050 is about to reach 10 billion. So it places a significant pressure on the agriculture industry to increase crop production and maximize yields. The contribution of agriculture sector in India's GDP is 20.19% .

But as population increases, we will have to increase agricultural production. Agriculture is the backbone of the human civilization.

Agriculture is the one of the most important industry of the global economy and very essential for food security for the growing population. However agriculture sector is facing some challenges such as climate change, water scarcity etc.

AI technology is evolving day by day so we can use some AI technology to solve and find the solution of these challenges. AI use some algorithm and provide valuable insights to farmers to manage agricultural resources, making effective decision, reduce waste and increase productivity of farmers.

Nowadays, AI is also being used a lot in the field of agriculture. In agriculture, ARTIFICIAL INTELLIGENCE used for crop and soil monitoring, Insect and plant diseases detection , Livestock health monitoring ,Intelligent spraying , Automatic weeding, Aerial survey and imaging, Produce grading and sorting etc.

Robotics plays very crucial role in agriculture sector, robotics is another field where Artificial Intelligence applications are commonly used. Robots powered by AI use real-time updates to sense obstacles in its path and pre-plan.

way that it tries to make it so that it can do its work on its own and when people are made human, it can also make the work easy. In simple language, this human Some robots help in automating the tasks. Some robots help in surgery, some robots help in making the work of workers in its journey instantly. With the help of robots, farmers can do field mapping and data collection and with the help of robots, they can do autonomous planting of seeds and with the help of AI powered drones, they can monitor the health of crops and soil for making better decisions and they can perform maintenance tasks like watering and spray fertilizers

The use of AI in agriculture is projected to grow from \$1 billion in 2020 to \$4 billion in 2026. However, the implementation of AI in agriculture can also lead to job displacement by automating farming tasks.



Fig.3: Seeding Robot



Fig.4: Fertilization Spray using Drone

Advantages:

- **Improved crop management and yield:** In the field of agriculture, AI powered systems are used to harvest data from different resources such as weather, weather patterns, soil moisture level, crop growth rate. It provides insights to farmers which help in crop health and growth.
- **Pest and disease detection and control:** Artificial Intelligence (AI) has become a game-changer in the field of agriculture, specially in pest and disease detection and control.
- **Automation of labor-intensive task:** A major advantage of AI in the field of agriculture is its ability to automate labor intensive tasks. AI has not been implemented in the field of agriculture. It helps to speed up process, reduce the need for low skilled labor and increase efficiency.
- **Enhanced crop monitoring and remote sensing:** In agriculture, AI collects data from various resources and processes it on digital platforms. It utilizes processed data to facilitate complex tasks such as harvesting, health monitoring, pest control, and disease detection.

- **Efficient resource utilization:** Implementation of AI in agriculture industry may helps in the efficient and best utilization agricultural resource such as water pesticides and herbicides.
- **Climate-resilient Agriculture:** AI analysis real-time agricultural data and make predictive analysis using the data and helping farmers make informed decision and also plays significant role in climate resilient agriculture.

Disadvantages:

- **High initial investment costs:** Implementing AI systems in the field of agriculture seems to require a lot of financial resources, which may create barriers for small scale farmers and agriculture businesses.
- **Dependence on technology and expertise:** AI provides us valuable insights and recommendations by analyzing data. It requires high level technical expertise to operate and maintain it. Farmers who do not have the necessary skills and knowledge may struggle to use AI effectively.
- **Job displacement:** AI is rapidly transforming the agriculture sector by automating several tasks, reducing risks and providing farmers easy and efficient farming. It helps farmers to measures the quality of the soil .the farmers and suggests them nutrients so that the quality of the soil can be improved.
- **Challenges in AI integration:** integration of AI in agriculture sector is very difficult and also challenging because it require high level infrastructure, advance technology and lots of funds.
- **Limited access for small scale farmers:** AI has power to revolutionize the whole agriculture industry but it also has its drawbacks. It is not affordable for small scale framers. Because implementation and maintenance of AI technology's in agriculture can be extensive .
- **Data privacy and security risks:** The use of artificial intelligence (AI) in agriculture poses potential risks related to data privacy and security. The risks include cyber attacks, data leaks, and unauthorized access to personal information.

3. **Benefits of Artificial Intelligence:** There are following advantages of AI in the real world scenario are as under:

1. Personalized Experiences
2. Improve Decision Making
3. Language translation
4. Enhanced Efficiency and productivity
5. Automation of repetitive tasks
6. Enhanced security
7. Autonomous vehicles
8. Improve customer engagement

4. **Cons of Artificial Intelligence:** There are following disadvantages of AI in the real world scenario are as under:

1. Bias and fairness
2. Lack of transparency
3. Security concerns

4. Job displacement
5. Privacy issue
6. Social isolation
7. Autonomous system
8. Regulatory challenges

5. CONCLUSION:

AI has rapidly transformed many industries, including healthcare and agriculture. AI has the potential to revolutionize industries by analyzing large amounts of data, finding patterns in it, making predictions. In healthcare, AI helps medical professionals in diagnosis, treatment planning, drug discovery. In agriculture sector, AI provides valuable insight to farmers by collecting real time data. he. AI powered system can optimize farmers' resources, improve crop yield and manage environmental impact.

Nowadays, Artificial Intelligence (AI) is like a superhero in the world of technology, making human life easier by enhancing speed, intelligence, and safety. In today's world, AI functions as a personal assistant for humans.

AI is revolutionizing both health care and agriculture sectors, it is not only making the processes efficient and effective but it is also saving resources.

AI is a game changer in medicine and farming, with its efficient, strong and resource preserving practices. Nevertheless, some of the challenges related to using AI here include data privacy and security issues, job displacement as well as training. However, health care and agriculture are going through a positive change due to AI. This technological development assures better days ahead for patients, farmers and indeed the whole society. To sum up, we can use AI to move towards better health care systems along with sustainable agricultural activities that promote prosperity.

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