AI-Driven Innovations in Healthcare and Food Systems: Machine Learning, Nanocarrier Drug Delivery, Computational Methods, Cybersecurity, Quality Assurance, and Intelligent Food Production

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Abstract

Artificial intelligence (AI) is transforming the healthcare and food systems to allow predictive analytics, individualized interventions, and optimization of operations. The AI applications that can be used in healthcare include machine learning, nanocarrier drug delivery, and computational modeling that improve the diagnostics, treatment planning, quality assurance, and cybersecurity. AI leads to precision agriculture, livestock monitoring, supply chain efficiency, and consumer engagement in food production, and knowledge management and decision support are supported by technologies such as ChatGPT. This review presents the adoption of AI in these industries, future trends, and the vision of the future. The integration of AI technologies has the potential to make health and nutrition more sustainable, accurate and data-driven, forming the future of AI.

Keywords: AI, Machine Learning, Nanocarrier Drug Delivery, Computational Methods, Precision Agriculture

Introduction

Artificial intelligence (AI) has been changing the healthcare sphere at an impressive rate, introducing more accurate, effective, and personalized healthcare services. Machine learning (ML) has become one of the foundations of complex healthcare data analysis and extracting actionable information through AI technologies [1]. Machine learning refers to those algorithms that learn through data in order to perform predictions, classify patterns, and assist in decisions without being explicitly programmed. This capability in healthcare has far-reaching consequences in the fields of diagnostics, treatment design, patient surveillance, and operational effectiveness [2].

Medical imaging and diagnostics is one of the most important areas of application of ML in healthcare. It is possible to identify subtle patterns and anomalies in small images that the human eye might not identify with because the algorithms are trained on thousands of images. As an example, early-stage cancers, diabetic retinopathy, and neurological conditions are now accurately detected by using ML models [3]. The tools also contribute to the speed and reliability of diagnosis, which leads to better patient outcome. In addition, radiomics has been developed with the help of deep learning, which is a branch of ML, in which quantitative characteristics of imaging data are used to predict disease progression and therapy response [4].

The other domain that ML is good at is patient care predictive analytics. Machine learning models can predict the development of diseases, the probability of readmission, and possible complications by examining electronic health records (EHRs), lab results, and vital signs. This forecasting ability enables clinicians to apply preventive measures, customize the treatment plans, and distribute the resources more effectively. ML-based risk stratification has turned out to be a priceless personal care management tool in chronic diseases like diabetes, heart diseases, or chronic kidney disease [5].

Also, ML assists in finding drugs and personalized therapy. Algorithms have the potential to study chemical compounds, genomic data, and clinical trial results to rediscover promising drugs and also help to optimize treatment regimes. Combined with nanocarrier drug delivery systems, machine learning can be used to predict drug efficacy, dose optimization and reduce adverse events, leading to precision medicine [6]. In addition to clinical uses, ML improves the operation and quality of healthcare. It streamlines the hospital operations, forecasts the demand of any patient, oversees the stock and also detects areas where the hospital is inefficient. Moreover, ML helps maintain cybersecurity by identifying abnormal network use or possible intrusion, and this is especially crucial to the protection of sensitive patient information in an ever-digitized healthcare environment [7].

The use of machine learning in healthcare despite its potential is associated with issues such as data privacy, algorithmic bias, and having a strong validation. The safe and effective adoption of the VR must involve ethical considerations, openness in the decision-making, and collaboration across disciplines. Machine learning is a revolutionary influence in healthcare, which enhances diagnostics, predictive care, drug development, operational efficiency, and cybersecurity. Its further development is likely to offer more individualized, precise, and available medical care, and it is one of the foundations of the contemporary health informatics [8].

Nanocarrier Drug Delivery AI-Based Healthcare.

The nanocarrier-based drug delivery systems are one of the newest approaches to the modern medicine, which tries to increase its therapeutic effectiveness, reduce side-effects, and provide a chance of targeted treatment. A large variety of systems based on nanoscale carriers, including liposomes, polymeric nanoparticles, dendrimers, and metallic nanoparticles, are used to deliver drugs to diseased tissues bypassing the shortcomings of traditional drug delivery [9]. Artificial intelligence (AI), and especially machine learning, has played a huge role in increasing the design, optimization, and functionality of such nanocarrier systems, which have become the foundation of precision medicine [10].

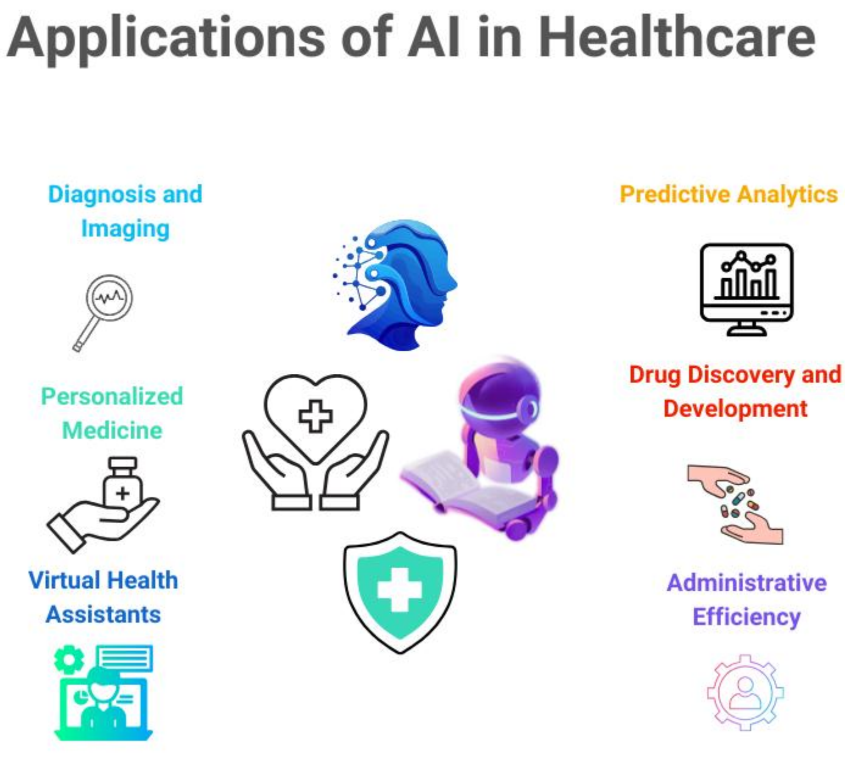

Figure: 1 showing applications of AI in healthcare

The significant benefit of nanocarriers is that they ensure targeted and controlled release of drugs. Nanocarriers have the potential to reduce off-target toxicity in contrast to traditional systemic therapies which use non-specific distribution of drugs across the body by targeting particular locations, including tumors or inflamed tissues, within the body. Indicatively, liposomal preparations of chemotherapeutic agents have proved to have less side effects in the systemic framework but retain their therapeutic effect [11]. The behavior of nanocarriers in the body (e.g., biodistribution, pharmacokinetics, and cellular uptake) can be predicted by AI algorithms, which can support the rational development of a more efficient delivery system [12].

Another field where AI-driven nanocarrier research is applicable is the field of personalized medicine. Machine learning models can be used to optimize nanocarrier composition, size, surface modification, and drug loading at the individual level by analyzing patient-specific data such as genomics, proteomics, and metabolic profiles to treat individual patients. By doing so, clinicians are able to design therapies in ways that will have the highest level of efficacy and the least amount of adverse reactions, particularly in complex conditions such as cancer, autoimmune diseases and neurological conditions [13].

Additionally, AI helps in predictive modeling in interactions between drugs and nanocarriers. Computational tools are able to provide a simulation of the interaction between drugs and nanocarriers at the molecular scale, predict the release kinetics and predict possible toxicity. Such predictive properties decrease the phase of experimentation by long-term trials speeding up the process of preclinical development of nanomedicines and reducing the cost of research [14].

There are also intersections between nanocarrier systems and diagnostic and theranostic systems. Some nanoparticles may be able to carry therapeutic agents as well as giving them an imaging characteristic which allows real time tracking of treatment response. The analysis of images based on AI also provides additional opportunities to measure the distribution and effectiveness of nanoparticles and make changes to therapy dynamically [15]. Although they have potential, there are challenges of stability, immunogenicity, large scale manufacturing and regulatory approval. AI is essential to overcome these factors by maximizing formulation resulting, forecasting stability during physiological factors, and reproducibility [16].

AI-powered and computational nanocarrier drug delivery systems provide new possibilities in terms of precision therapy, delivery of drugs to targeted areas, and personalized medicine. These systems will transform the field of healthcare by offering safer, more effective, and patient-specific therapies of various diseases by applying nanotechnology to machine learning and predictive modeling [17].

Computational Methods in AI-Driven Healthcare

Modern healthcare informatics relies on computational approaches that allow analyzing complex biologic, clinical, and operational data to enhance the patient outcomes, optimize the medical processes, and hasten the research. Such practices cover a broad range of such techniques, such as data mining, predictive modeling, bioinformatics, systems biology, and network analysis, all of which enable healthcare professionals to make data-driven decisions [18]. The use of artificial intelligence (AI) and especially machine learning and deep learning has further contributed to the effect of the computational methods, making healthcare a more specific, predictive, and personalized field [19].

Predictive analytics in patient care is one of the most revolutionary uses of the methods of computation. Through the analysis of massive electronic health records (EHRs), laboratory outcomes, and demographic information, algorithms predict the disease progression, risk of readmission, and treatment outcomes. As an illustration, predictive models are able to indicate patients who are at risk of developing complications like sepsis, heart failure, or diabetes-related emergencies and the clinician is able to intervene beforehand [20]. Machine learning can help improve these predictions because it can identify subtle trends in heterogeneous data that could be hidden to human clinicians.

Computational processes have transformed the process of drug discovery and development in so far as time and cost have been minimized. Molecular docking, in silico modeling and virtual screening allow the researcher to discover promising drug candidates and predict their respective interactions with their targets protein before they proceed to laboratory work. The simulations based on AI can also be used to optimize the drug formulations such as the delivery systems through nanocarriers to enhance bioavailability, toxicity, and therapeutic activity [21].

Another important field where computational techniques have proven useful is bioinformatics especially in genomics and proteomics. Genome analysis is done using computational tools that identify mutations that are related to diseases, predict gene expression patterns, and identify potential therapeutic targets. The analyses help make personalized medicine, in which treatment is developed based on the genetic profile of an individual [22]. Moreover, computational methods using networks can be used to explain complicated interactions and pathways of molecules and learn new insights into the mechanisms of diseases [23].

Healthcare operations and quality assurance are also improved through the use of computational methods. The workflows in the hospital, resources and patient scheduling can be optimized using algorithms resulting in efficient healthcare delivery. Moreover, computation programs are essential in cybersecurity, where the network traffic is monitored to identify any anomaly, avert breaches or unprotected sensitive patient information [24].

Although potentially transformative, computational techniques in healthcare have such issues as the heterogeneity of the data, privacy, and the necessity to thoroughly validate AI models. The organization of multidisciplinary teams of clinicians, data scientists, and bioinformatical workers is necessary to address these challenges to make sure that computational tools are correct, interpretable, and utilized ethically [25]. AI-driven computational methods are transforming the work of healthcare by allowing predictive analytics, speeding up drug discovery, facilitating personalized medicine, optimizing operations, and providing data protection. Their further development is assured of efficient, accurate and patient-centered medical solutions [26].

Artificial Intelligence in Healthcare Cybersecurity

With the continued digitization of healthcare, the concept of cybersecurity has become a key concern that needs to be considered to maintain confidentiality, integrity, and availability of sensitive patient data. The implementation of electronic health records (EHRs), telehealth services, wearables, and AI-controlled diagnostics have significantly improved the sphere of healthcare delivery and increased the area of attack by cybercriminals [27]. Securing healthcare information is not merely a regulatory obligation stipulated by the law, like HIPAA and GDPR, but a necessity to preserve patient trust and avoid the possible life-threatening inconveniences [28].

Healthcare cybersecurity presents a challenge and a solution to AI and computational techniques. On the one hand, more advanced cyber-attacks, such as ransomware, phishing, and data breaches, are getting more and more serious and are using AI techniques to circumvent standard protection. The machine learning algorithms can be used by hackers to detect vulnerabilities in their systems, write persuasive phishing emails, or predict the networking behavior to use the vulnerabilities [29]. Conversely, AI can be used to enhance the security of cyberspace by using it to detect and analyze threats in real time, detect anomalies, perform predictive risk analysis, and respond to incidents. As an example, network traffic patterns, user behavior, and system logs can be analyzed by machine learning models and reveal suspicious activity that can be used to indicate an ongoing attack [30].

Intrusion detection and prevention can be listed among the primary ways of using AI in healthcare cybersecurity. Conventional security systems usually are dependent on set up rules that might fail to identify new or emerging threats. However, AI-powered systems are able to learn on the side of historical information and constantly evolve to detect new patterns of attacks. This preemptive ability is essential in a healthcare setting where system failure or data breach may have a direct effect on patient safety [31].

Data protection and privacy is another field of development where AI assists in cybersecurity. The AI models can be combined with techniques like encryption, federated learning, and differential privacy to make sure that no sensitive patient information can be exposed despite the model being used to conduct predictive analytics or machine learning training. This will enable healthcare organizations to use AI to conduct sophisticated analytics without jeopardizing privacy [32]. Moreover, AI-based cybersecurity is used to ensure compliance and risk management. Monitoring and reporting tools are automated and assist organizations to be compliant with regulatory requirements, analyze vulnerability, and allocate resources to high-risk areas. When cybersecurity is incorporated into the wider AI-based healthcare environment, healthcare institutions will be able to develop a more robust infrastructure that will be able to survive cyber-attacks without compromising the efficiency of service delivery [33].

Nevertheless, the challenges of adversarial attacks on artificial intelligence models, the complexity of implementing AI in existing systems, and a lack of professionals with cybersecurity-related skills are still present. To help resolve these problems, there must be a continuous investment in technology, training of staff and cross-disciplinary working of IT, clinical and administrative teams [34]. AI-based cybersecurity in healthcare is necessary to protect patient data, ensure continuous operations, and provide confidence in digital health systems. Healthcare organizations can create resilient, secure, and robust infrastructures that can support the future of digital medicine through proactive threat detection, data protection, and regulatory compliance through the use of AI [35].

Quality Assurance in AI-Driven Healthcare

Quality assurance (QA) is one of the pillars of the successful healthcare provision, and it dictates that healthcare services comply with the set standards of safety, effectiveness, and patient satisfaction. With AI as a platform of healthcare, QA does not only include the common clinical and operational standards, but also the assessment and confirmation of AI systems themselves. With the AI and machine learning algorithms that are becoming more and more part of the diagnostics, treatment planning, and operational choices, the question of their accuracy, reliability, and ethical application is at the forefront of high standards of care [36].

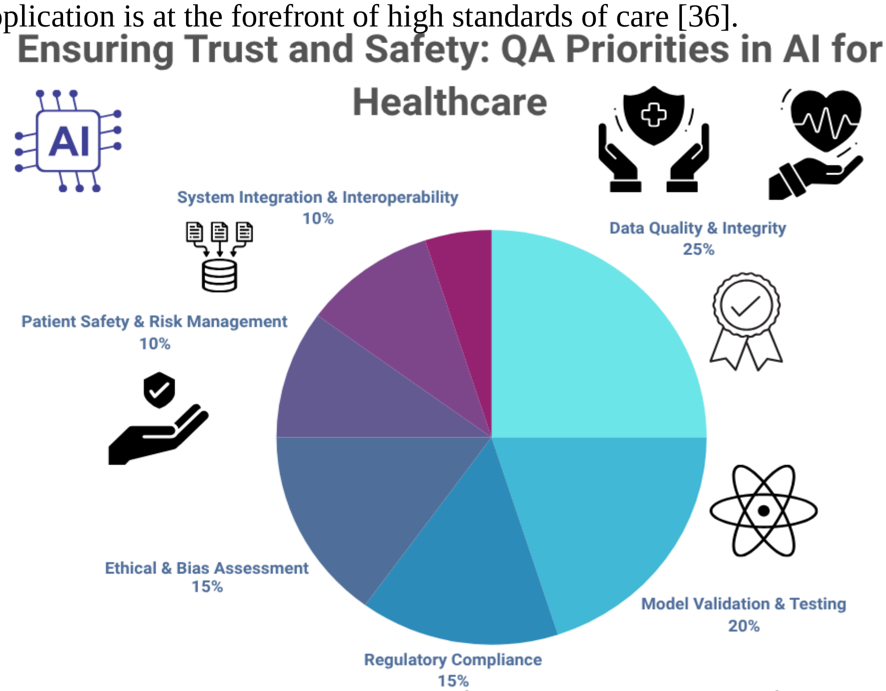

Figure: 2 showing ensuring trust and safety QA priorities in AI for healthcare

Algorithms validation and performance monitoring is one of the major uses of quality assurance in AI based healthcare. The use of AI models is commonly trained using large datasets, yet differences in the demographics of patients, practice, and quality of data may influence performance. Strict QA measures consist of testing algorithms on a variety of datasets, estimating predictive accuracy, false positive and false negative rates and monitoring performance continually after deployment. This will make sure that AI-based tools continue to assist clinicians on making safe and effective decisions [37].

The other important component of QA is clinical workflow integration. The most precise AI system might not work, as it does not follow the practice of healthcare providers or produces outputs, which are challenging to comprehend. The QA protocols are based on assessing the usability, the implementation with the electronic health records (EHRs) and the congruence with clinical guidelines [38]. Enhancements in AI can also be enhanced by seeking feedback on AI development by healthcare specialists and patients to make sure that these systems are efficient and feasible in practice [39].

Besides this, risk management and regulatory compliance are parts of QA in AI-driven healthcare. The AI use should be compliant to the national and international standards, including ISO 13485 of medical equipment, HIPAA of medical data protection, and FDA/EMA regulations on software as a medical device (SaMD). Quality assurance systems evaluate the adherence to these regulations, reduce the possible risks and prepare documentation that is to be used in the audit and approvals [40].

The quality of data is also essential, since AI models are very sensitive to errors, biases, and inconsistency of input data. Data cleaning, standardization, and validation are part of the process of QA, as they are needed to guarantee that AI outputs are dependable and do not have systematic bias. It is particularly critical in the case of predictive analytics, individualized medicine, and the research of the population health when the misleading data may produce biased suggestions and unfair results [41]. It is also through continuous learning and system improvement that QA falls under. The field of AI-driven healthcare is dynamic, and it needs to be reassessed on a regular basis to ensure that it is accurate due to the ongoing changes in medical knowledge, technologies, and patients. The maintenance of high-quality, safe, and patient-centered care is maintained through continuous monitoring, feedback loops, and retraining algorithms [42].

To sum up, quality assurance in AI-assisted healthcare is a complex task that includes the validation of algorithms, integration of the workflow, compliance with regulations, information protection, and ongoing improvement. An intense adoption of the QA policies will help healthcare organizations to be confident that AI technologies will produce increased patient outcomes, improve safety, and promote the highest levels of clinical excellence [43].

AI in Food Production and ChatGPT Uses

The field of food production is changing as artificial intelligence (AI) revolutionizes the industry and makes it smarter, more efficient, and sustainable. AI technologies are now used across crop management and livestock monitoring to the optimization of supply chains and consumers to achieve higher productivity, waste reduction and food safety. Large language models like ChatGPT are among the emerging innovations that can be used in the food industry in knowledge management, decision support, and consumer interaction [44].

Precision agriculture is one of the significant uses of AI in food production. Machine learning applications use sensor data, satellite data, drone data, and IoT data to optimize irrigation, fertilization, and pest control. Predictive analytics are used to make farmers anticipate the weather, identify diseases early, as well as identify the optimal harvest periods, leading to increased production and limited damage to the surrounding environment [45]. Robots and autonomous machinery that are powered by AI are also beneficial as they optimize the work of planting, harvesting, and sorting, with a minimum of human intervention.

In the livestock and aquaculture industries, AI is applied in animal health, growth rates, and feeding habits observation. Sensors and computer vision are able to identify early stages of disease or stress and, consequently, timely interventions can be implemented to enhance animal welfare and productivity. The predictive models also optimize the feed formulations where fewer costs are incurred but the nutritional value was not compromised [46].

Another area of importance of AI in supply chains is optimization. Algorithms are used to optimize production schedules, transportation routes, and demand patterns to ensure minimal food spoilage, lower cost of logistics, and delivery on time. Monitoring and predictive maintenance of equipment in real-time are also used to ensure the efficiency of the operation at processing facilities and warehouses [47].

Megabots such as ChatGPT are finding more and more uses as a tool in information management and consumer interaction. ChatGPT can be useful in food production research by summarizing research, producing reports, and suggesting data-driven solution strategies. In the case of businesses, it aids in customer care, dietary advice, recipe suggestions, and advertising messages, filling the gap in technical information and the interpretation that the end user can comprehend. ChatGPT may also contribute to educational programs and give farmers, supply chain managers and consumers tangible information in natural language, making intricate information more understandable [48].

In spite of the potential, AI integration in food systems has several challenges, including data heterogeneity, privacy threats, small-scale producers not having easy access to technology, and the necessity of solid validation of AI AI predictions. To overcome such challenges, various stakeholders in the food value chain (technologists, agricultural experts, policymakers and stakeholders) should work together to effectively address the challenges [49].

To conclude, AI is transforming the world of food production through the improvement of precision agriculture, livestock management, efficiency in supply chains and consumer interaction. These efforts are supplemented with the use of such tools as ChatGPT that offers intelligent information processing, communication, and decision support. These AI-driven innovations in combination will offer a more productive, responsive, and sustainable food system in line with the increasing demands of the global populations [50].

Future Perspectives of AI in Healthcare and Food Systems

Artificial intelligence (AI) in health services and food systems has an extremely bright future, as it is likely to bring revolutionary changes to them, redefining efficiency, customization, and sustainability. With AI technologies increasingly progressing, including machine learning and deep learning, as well as large language models such as ChatGPT, it is likely that their implementation in these areas will lead to smarter decision-making, prediction, and better results of patients, consumers, and even producers [51].

More personalized and predictive medicine will be more of a reality in the future in the healthcare field. Genomic, proteomic, metabolomic, and lifestyle data will be combined in AI algorithms to customize the treatment plans of individual patients. Predictive analytics will forecast the development of the disease, streamline preliminary interventions, and enhance chronic disease management [52]. The system of AI-driven nanocarrier drug delivery will be more accurate and less toxic, so therapy becomes more effective and minimizes its side effects. Moreover, robot work by using AI technologies and virtual assistants will help clinicians with complex operations, diagnostics, and monitoring of the patient, which will make the workflow more efficient and eliminate human error [53].

Simultaneously, health informatics and computational methods will only extend their reach allowing real-time analysis of data and dynamic modeling of the disease progression and a continuous quality assurance of healthcare operations. Artificial intelligence (AI) would be deployed together with Internet of Medical Things (IoMT) devices to ensure continuous contact with the patients, whereas AI-based cybersecurity would also be necessary to ensure that sensitive medical information is not compromised by more advanced threats [54].

In food systems, sustainable, data-driven, and resilient production will focus more on the future. The AI will enhance high-precision farming, resource utilization, mitigate the environmental effects, and enhance agricultural productivity. There will be the use of predictive modeling in smart supply chains to reduce food waste, minimize logistics, and guarantee food safety. Knowledge verification will increasingly rely on large language models such as ChatGPT, which will help farmers, food scientists, and consumers make decisions, provide nutritional advice, and educate [55].

The interdisciplinary innovations brought about by the intersection of AI in the healthcare and food industries can also be applied to nutrigenomics, personalized nutrition, wellness monitoring with AI assistance, and others. These technologies will enable individuals and community to make informed lifestyle and support with public health initiatives. Issues such as ethical aspects, algorithmic discrimination, data security, regulatory constraints, and fair access to AI applications will continue to be a problem [56].

The future of AI will be not only about technological progress but also about collective governance, open practice, and human design so that AI could benefit all social groups. The Future Research of AI in healthcare and food systems is directed to more specific, efficient, sustainable, and personal world, where AI technologies would support human expertise, enhance results, and establish robust and flexible systems, which can respond to multifaceted challenges in the XXI century world [57].

Conclusion

Artificial intelligence (AI) has become a revolutionary element in various fields with the most significant opportunities being in the sphere of healthcare and food systems where its implementation can bring unprecedented efficiency, personalization, and sustainability. The intersection of AI technologies, such as machine learning and deep learning, or even large language models, like ChatGPT, with modern healthcare practices and food production systems can transform how we handle the disease, apply therapeutic interventions, and manage the operations of the healthcare system, as well as how we use the resources. The fact that AI has been used in applications related to predictive analytics, nanocarrier drug delivery, precision agriculture, supply chain optimization, and much more highlights the variety of AI and its ability to solve complicated, data-driven problems in both industries.

Artificial intelligence in healthcare transforms the process of diagnostics, treatment, and patient management by allowing predictive, accurate, and individual intervention. The machine learning models have the capability of reviewing large amounts of electronic health records, imaging data, and genomic data, to detect disease trends, and forecast complications and prescribe tailored treatment plans. The nanocarrier drug delivery systems further improve these capabilities, and using AI guided nanocarriers enhances targeted therapy and reduces adverse effects as well as accelerates the creation of precision medicine. Computational tools such as bioinformatics, network analysis, and predictive modeling are still central to transforming complex biological and clinical data into actionable information and AIs are used to deliver quality assurance that healthcare is reliable, accurate, and consistent with regulatory requirements. In addition, the concept of cybersecurity has gained an irreplaceable scope in AI-assisted healthcare as it guarantees the patient data stays safe to an ever more advanced cybersecurity threat and helps in the integrity and continuity of medical services.

Simultaneously, AI is re-defining the food production and supply chain management, which are motivated by efficiency, sustainability, and responsiveness. The machine learning algorithms, drones, IoT sensors, remote sensing technologies allow precision agriculture to support farmers to optimize irrigation, fertilization, and pest control with minimal environmental, impact-inducing effects. Monitoring systems based on AI are useful in livestock and aquaculture to monitor the health, growth, and nutrition of animals to maintain productivity and animal welfare. There is also optimization of supply chain in real-time with AI, food waste reduction, logistical support, and quality and safety of food products are also consistent. Big language models such as ChatGPT expand the usefulness of AI in the form of intelligent information processing, knowledge management, and decision support to producers and consumers, bringing the gap between technical knowledge and practice.

In the future, AI in healthcare and food systems is expected to further change the direction, which will even more significantly transform the field. The combination of AI and IoMT devices, wearable sensors, and advanced imaging technologies in the medical field will allow tracking patients around the clock, identifying diseases early, and designing treatment plans. AI in food will progress to sustainable production, predictive analytics to support climate resilient food, and personalized nutrition based on health data of consumers. Further, new synergies in healthcare-food production will be generated through interdisciplinary uses (nutrigenomics, precision nutrition, AI-assisted wellness platform, etc.), thereby leading to better public health and food insecurity in the world.

In spite of these transformative potentials, there are a number of challenges. Ethics, mathematical bias, data privacy, fair access, and regulatory adherence should be strictly taken care of to make sure AI is used safely, transparently, and responsibly. The healthcare professionals, agricultural experts, policymakers, technologists, and researchers will need to collaborate to overcome these challenges and maximize the potential of AI and benefit it to society.

In summary, AI is not an instrument but a driver to the systematic innovation in healthcare and the food system. Its project allows more precise diagnostics, individual therapeutics, effective operations, sustainable agriculture, and increased consumer interaction. AI is capable of bringing together data, calculations and human knowledge to establish a future in which health care is more accurate, food systems are more stable and decisions are smarter. The ever-evolving technologies will create paradigm shift towards a healthier, more sustainable, and well-equipped world to address the challenges of the 21st century that are complex. Considerable, moral, and fair application of AI will eventually accrue to its triumph in revolutionizing these vital areas so that the advantages that it promises individuals, communities, and society are achieved in totality.

References

[1]. Singh A. Human-Computer Interaction: A Review of Usability, Design, and Accessibility Trends. Global Research Repo. 2025 Sep 9;1(2):362-87.

[2]. Javeedullah M. Empowering Patients through Health Informatics: Trends, Challenges, and Opportunities. Global Research Repo. 2025 Sep 3;1(2):1-7.

[3]. Shehzad K, Munir A, Ali U. Modern Trends in Food Production: the Role of AI in Smart Food Factories. Global Journal of Emerging AI and Computing.;1(2):1-30.

[4]. Dave P, Jani R, Chakraborthy GS, Jani KJ, Upadhye V, Kahrizi D, Mir MA, Siddiqui S, Saeed M, Upadhyay TK. Phytosomes: A promising delivery system for anticancer agents by using phytochemicals in cancer therapy. Cellular and Molecular Biology. 2023 Dec 20;69(14):1-8.

[5]. Faiyazuddin M, Chaudhari Y, Chaudhari M, Gholap AD, Sundaram G, Alam MI, Webster TJ. Navigating Nanotechnology Healthcare Horizons: A Comprehensive Review of IoT and SIoT Evolution for Patient-Centric Perspectives. Journal of Biomedical Nanotechnology. 2024 Dec 1;20(12):1791-803.

[6]. Kabeer MM. Leveraging AI for Process Optimization: The Future of Quality Assurance in Lean Six Sigma. American Journal of Artificial Intelligence and Computing. 2025 May 7;1(1):87-103.

[7]. Dave P, Raval B, Dudhat K. Cubosomes: Next-Generation Nanocarriers for Versatile Drug Delivery System for Cancer Therapy and Other Applications. Biomedical Materials & Devices. 2025 Jun 5:1-32.

[8]. Singh A. Artificial Intelligence and Its Expanding Role in Computer Science. American Journal of Artificial Intelligence and Computing. 2025 Sep 20;1(2):226-40.

[9]. Javeedullah M. Healing with Data: The Power and Promise of Health Informatics. Global Research Repo. 2025 Sep 9;1(2):310-29.

[10]. Shehzad K. Predictive AI Models for Food Spoilage and Shelf-Life Estimation. Global Trends in Science and Technology. 2025 Feb 17;1(1):75-94.

[11]. Bacha A, Zainab H. AI for Remote Patient Monitoring: Enabling Continuous Healthcare outside the Hospital. Global Journal of Computer Sciences and Artificial Intelligence. 2025 Jan 23;1(1):1-6.

[12]. Kabeer MM. AI in Lean Six Sigma: A Review of Industrial Implementations, Benefits, and Barriers. Global Science Repository. 2024 Jan 10;1(1):137-61.

[13]. Javeedullah M, Zeb S. Privacy, Policy, and Progress: Reviewing the Regulatory Landscape in Health Informatics. Global Research Repo. 2025 Sep 3;1(2):112-28.

[14]. Singh A. Foundations and Frontiers in Theoretical Computer Science: A Review of Key Concepts and Open Problems. Global Research Repo. 2025 Sep 3;1(2):154-82.

[15]. Bacha BA, Ahmad S, Ahmad R, Ahmad I. Coherent manipulation of vectorial soliton beam in sodium like atomic medium. Chaos, Solitons & Fractals. 2024 May 1;182:114856.

[16]. Singh A. A Survey of Foundational Concepts and Emerging Frontiers in Computer Science. Global Research Repo. 2025 Sep 9;1(2):279-309.

[17]. Ekpan FM, Ori MO, Samuel HS, Egwuatu OP. The synergy of AI and Drug delivery: A Revolution in Healthcare. International Journal of Advanced Biological and Biomedical Research. 2024 Jan 1;12(1):45-67.

[18]. Khanna A, El Barachi M, Jain S, Kumar M, Nayyar A, editors. Artificial intelligence and machine learning in drug design and development. John Wiley & Sons; 2024 Jul 18.

[19]. Dave P, Kariya S, Dudhat K. Tailoring and optimizationn of nifedipine controlled release organogel via quality by design approach. Journal of Pharmaceutical Innovation. 2024 Aug;19(4):47.

[20]. Kabeer MM. Synergizing AI and Lean Six Sigma: A Comprehensive Review of Smart Quality Assurance Systems. Global Science Repository. 2024 Jan 5;1(1):116-36.

[21]. Singh A. Exploring Innovations across Computer Science Disciplines. Global Research Repo. 2025 Sep 9;1(2):330-61.

[22]. Mazumdar H, Chakraborty C, Sathvik MS, Jayakumar P, Kaushik A. Optimizing pix2pix gan with attention mechanisms for ai-driven polyp segmentation in iomt-enabled smart healthcare. IEEE Journal of Biomedical and Health Informatics. 2023 Oct 31.

[23]. Shehzad K, Munir A, Ali U. AI-Powered Food Contaminant Detection: A Review of Machine Learning Approaches. Global Journal of Computer Sciences and Artificial Intelligence.;1(2):1-22.

[24]. Bacha A. Unveiling Frontiers: Hybrid Algorithmic Frameworks for AI-Driven Mental Health Interventions. AlgoVista: Journal of AI and Computer Science. 2025;2(1):1-8.

[25]. Malik YG. Artificial Intelligence in Food Systems: Expanding Horizons across Healthcare, Cybersecurity, and Generative AI. Global Food Research. 2025 Aug 28;1(1):45-71.

[26]. Khan M, Bacha A. Neural Pathways to Emotional Wellness: Merging AI-Driven VPSYC Systems with EEG and Facial Recognition. Global Trends in Science and Technology. 2025 Jan 26;1(1):53-62.

[27]. Shehzad K, Ali U, Munir A. Computer vision for food quality assessment: Advances and challenges. Available at SSRN 5196776. 2025.

[28]. Sherani AM, Bacha A. Pioneering Advances in AI-Driven Detection and Therapy for Mental Health Challenges. Global Insights in Artificial Intelligence and Computing.;1(1):57-67.

[29]. Kabeer MM. Utilizing Machine Learning for Continuous Process Improvement in Lean Six Sigma. Global Trends in Science and Technology. 2025 May 7;1(2):49-63.

[30]. Shah HH, Bacha A. Leveraging AI and Machine Learning to Predict and Prevent Sudden Cardiac Arrest in High-Risk Populations. Global Journal of Universal Studies. 2024 Dec 15;1(2):87-107.

[31]. Javeedullah M. Future of Health Informatics: Bridging Technology and Healthcare. Global Trends in Science and Technology. 2025 Apr 4;1(1):143-59.

[32]. Singh A. Intelligent Machines: Shaping the Future of Computer Science and Society. Global Research Repo. 2025 Sep 9;1(2):254-78.

[33]. Khan M, Bacha A. AI-Driven Cybersecurity in Healthcare: The Transformative Potential of Generative AI. Global Research Repo. 2025 Nov 3;1(3):157-81.

[34]. Shehzad K, Ali U, Munir A. Role of AI in Food Production and Preservation. Global Insights in Artificial Intelligence and Computing. 2025 Feb 19;1(2):1-7.

[35]. DAVE P, PATEL D, RAVAL B, JANI R. SOLID SUPERSATURABLE SMEDDS: A POLYMERIC PRECIPITATION INHIBITOR TO ENHANCE SOLUBILITY AND BIOAVAILABILITY.

[36]. Neoaz N, Bacha A, Khan M, Sherani AM, Shah HH, Abid N, Amin MH. AI in Motion: Securing the Future of Healthcare and Mobility through Cybersecurity. Asian Journal of Engineering, Social and Health. 2025 Jan 29;4(1):176-92.

[37]. Kabeer MM. Automation Meets Accuracy: A Deep Dive into AI for Quality Assurance. Global Research Repo. 2025 Oct 25;1(3):138-56.

[38]. Abdalzaher MS, Krichen M, Shaaban M, Fouda MM. Quality-Focused Internet of Things Data Management: A Survey, Perspectives, Open Issues, and Challenges. IEEE Internet of Things Journal. 2025 Sep 24.

[39]. Bacha A. Artificial Intelligence in Healthcare, Cybersecurity, Machine Learning, and Food Processing: A Cross-Industry Review. American Journal of Artificial Intelligence and Computing. 2025 Jul 24;1(2):87-104.

[40]. Singh A. Fifty Years of Computer Science: Trends, Milestones, and Emerging Challenges. Global Research Repo. 2025 Sep 9;1(2):230-53.

[41]. Javeedullah M. Using Health Informatics to Streamline Healthcare Operations. American Journal of Artificial Intelligence and Computing. 2025 Apr 7;1(1):24-44.

[42]. Dave P, Raval B, Pujara N, Gohil T. FORMULATION AND EVALUATION OF ORAL SUPERSATURABLE SELF MICRO EMULSIFYING DRUG DELIVERY SYSTEM ITRACONAZOLE.

[43]. Singh A. From Algorithms to AI: A Comprehensive Review of Core Concepts in Computer Science. Global Research Repo. 2025 Sep 3;1(2):129-53.

[44]. Malik A, Solaiman B. AI in hospital administration and management: Ethical and legal implications. Research Handbook on Health, AI and the Law. 2024 Jul 16:20-40.

[45]. Liu Y, Cao X, Chen T, Jiang Y, You J, Wu M, Wang X, Feng M, Jin Y, Chen J. A survey of embodied ai in healthcare: Techniques, applications, and opportunities. arXiv preprint arXiv:2501.07468. 2025 Jan.

[46]. Javeedullah M. Predictive Modeling in Health Informatics: A Review of Applications in Population and Personalized Health. Global Science Repository. 2024 Jan 1;1(1):1-7.

[47]. Dave P, Patel D, Raval B. An oral organogel-novel approach for controlled drug delivery system. International Journal of Drug Delivery Technology. 2022;12(1):437-5.

[48]. Samad A, Jamal A. Transformative Applications of ChatGPT: A Comprehensive Review of Its Impact across Industries. Global Journal of Multidisciplinary Sciences and Arts. 2024;1(1):26-48.

[49]. Javeedullah M. Integrating Health Informatics into Modern Healthcare Systems: A Comprehensive Review. Global Journal of Universal Studies. 2025 Apr 15;2(1):1-21.

[50]. Bacha A, Shah HH. AI-Enhanced Liquid Biopsy: Advancements in Early Detection and Monitoring of Cancer through Blood-based Markers. Global Journal of Universal Studies. 2024 Dec 15;1(2):68-86.

[51]. Singh A. Evolution of Computer Science: A Historical and Technological Overview. American Journal of Artificial Intelligence and Computing. 2025 Jul 23;1(2):62-86.

[52]. Harry A. Integrating AI, Deep Learning, and Robotics: Transforming Healthcare, Cyber Security, and Food Systems for A Sustainable Future. Global Journal of Emerging AI and Computing.;1(2):51-72.

[53]. Pendy B. Revolutionizing Healthcare, Cyber Security, and Food Systems: the Power of AI, Deep Learning, and Robotics for A Sustainable Future. Global Journal of Emerging AI and Computing.;1(2):73-94.

[54]. Alomari G. AI and ChatGPT Innovations in Healthcare Cybersecurity, Computer Science, Poultry Science, and Food Production. American Journal of Artificial Intelligence and Computing. 2025 Aug 26;1(2):183-206.

[55]. Edison G. Advancing Healthcare and Food Security: The Role of Artificial Intelligence and ChatGPT in Cybersecurity, Poultry Science, and Sustainable Food Production. Global Trends in Science and Technology. 2025 Aug 29;1(4):1-24.

[56]. Seyedhamzeh M, Houshmandyar S, Hamidi M. Smart Drug Delivery Systems: Technological Advancements, Clinical Challenges, and Future Perspectives. Nanoscale and Advanced Materials. 2025 Aug 1;2(2):121-36.

[57]. Pendy B. A Cross-Disciplinary Review of Artificial Intelligence and ChatGPT in Healthcare, Cybersecurity, Poultry Science, Food Production, and Computer Science. Journal of Research and Multidisciplinary Explorations. 2025 Aug 21;1(1):7-17.