International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 3s,2025
https://theaspd.com/index.php

Real-Time Medical Diagnosis Using Artificial Intelligence

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Abstract
A system that involves improving health-related services to satisfy patients' clinical needs is referred to as healthcare. Patients, clinicians, physicians, researchers, and the medical industry all try their hardest to maintain and rebuild health data in the healthcare system. Due to the remarkable advancements in technology, data is expanding daily in all sectors, including healthcare, which necessitates an increasing number of data mining applications. However, healthcare companies are generating a lot of healthcare data as a result of the healthcare system's digitization. All medical records stored in digital format are collectively referred to as healthcare data. Comprehensive information on a patient's medical history, prescription notes from doctors, clinical reports, etc., may be included. High dimensionality, volume, and diversity characterize all of these data. These days, making healthy decisions is difficult due to the growing complexity of healthcare data. The main areas of research that improve a person's capacity to make the right choices in an effort to optimize the outcome of any working field include machine learning, data mining, and statistical techniques. The rate at which humans can analyze data is significantly lower than the amount of data that is saved. This is especially crucial in the healthcare industry because there are comparatively fewer people accessible to analyze healthcare data.
Keywords: *AI, medical, health, prediction*

1. INTRODUCTION

Compared to human beings, AI systems are unencumbered by prejudices and fatigue, so they create fewer diagnostic mistakes. [1]. The clinical expert judgment, awareness and ethics of doctors and nurses continue to be essential features of in-hospital care. ML is of extremely important in data analysis and optimization these days. Data analysis speed has been dramatically enhanced, which assists to decide quicker. AI methods are utilized in Agriculture to enhance the accuracy and discover the solution of problems with the help of complex algorithms. AI & ML recently became a new generation technology in all the areas, where the complex problem has been resolved, and provides the new chance to discover new ways to solve the complex problem and take the technology to the next level by automating things. The medical disease detection analysis has been performed based on the ML methods. As per the review, the image classification type model with labelled dataset is to be prepared. The labelled data are gathered from the cotton field from various part of Northern India [2]. On the basis of this review, app architecture was planned which adhere to the single responsibility, open closed, liskov substitution, interface segregation and dependency inversion principles and form the foundation of the app development [9]. Ultimately, the prediction model is built with the two the ways – Apple's native method using the Create Mac application and using the TensorFlow open-source platform [3]. The model is multi-layered with the `Adam` optimizer and `relu` as an activation field. Hyper parameters are also trained to enhance the accuracy. The ML model is then modeled into Core ML model, and it is utilized in iOS app development [13]. Apple's native framework is utilized to communicate with the model in the iOS project. The application is available even in offline mode, that is, this research eliminates the use of internet to identify the diseases.

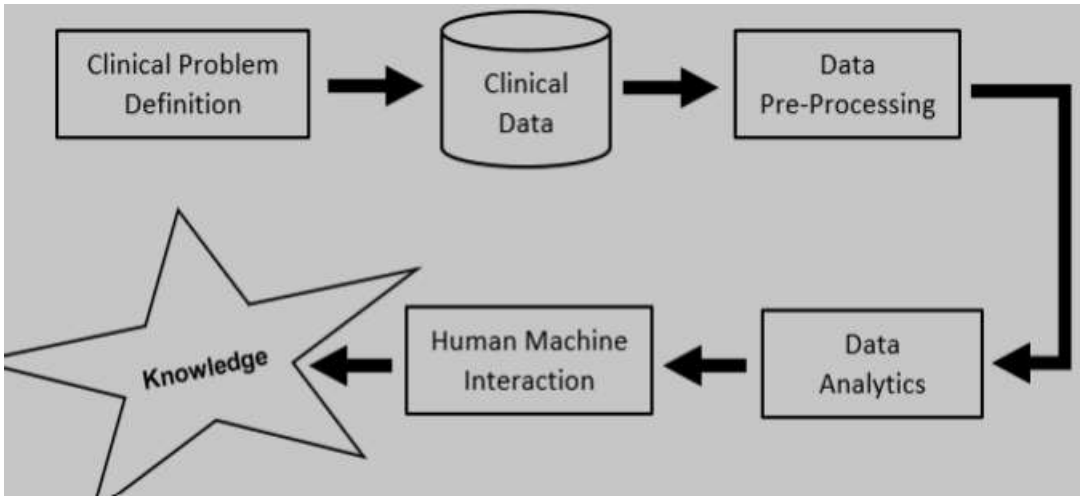

Figure 1: Design process

By spotting anomalies in images, AI revolutionizes medical imaging. NLP supports evidence-based medicine by extracting information from clinical notes [4]. By offering expert analysis and real-time access to a wealth of medical knowledge, artificial intelligence (AI) is revolutionizing healthcare and influencing surgery, drug discovery, and virtual health assistants. Early detection and better treatment outcomes depend on timely and precise diagnosis of medical diseases. Using AI for this purpose has various benefits, including early disease detection, personalized treatments, and speed and accuracy of diagnostics [6].

2. METHODOLOGY

Artificial Intelligence is inherently a multi-disciplinary field which includes machine learning, computational theory, searching, probability, and neurobiology etc. It has a lot to do with gathering homogeneity data from a vast amount of data, offer learning ability of any type of data such as numeric, images and video. Learning a data can offer a prior knowledge to explore and extract relevant information. Medical industry today suffers a lot in pre-screening the human diseases for extending their lifespan. Prescreening is used in many medical applications. We can see the tangible impact of AI to improve patient outcomes as well as overall efficiency of healthcare systems, highlighting its valuable contribution towards shaping the future of medicine. Personalized medicine, the cutting-edge health strategy, has been further propagated by the inclusion of AI for the identification of medical conditions. Personalized medicine is supported by AI in a variety of aspects by merging with EHRs, performing drug discovery with AI, and also having an effective role with the human touch in healthcare.

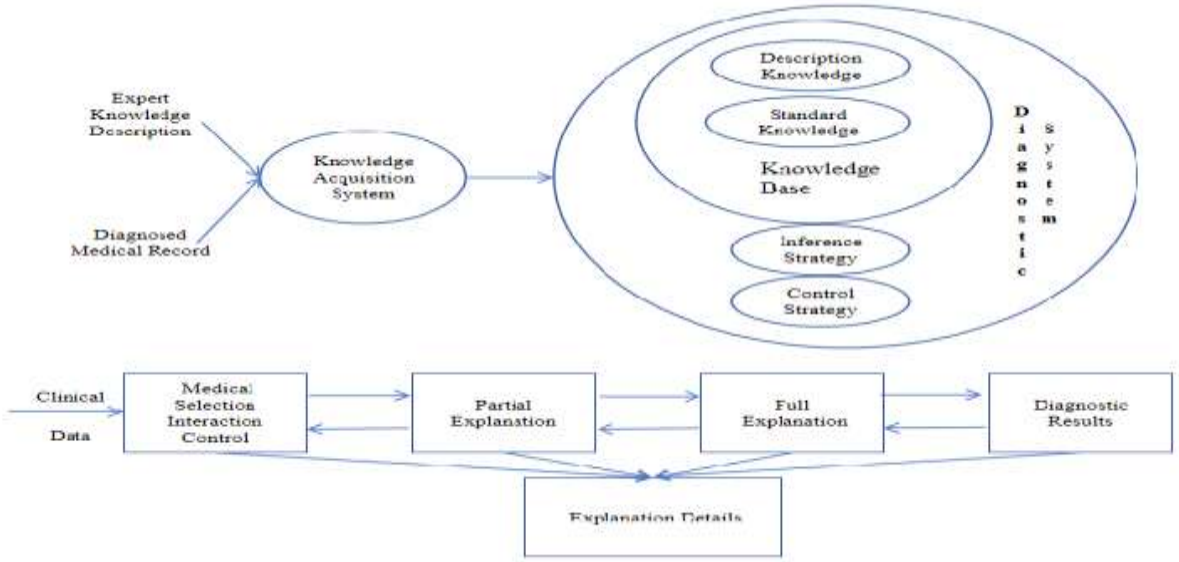

Figure 2: Sample Designed framework (source: web)

AI-based drug discovery platforms employ machine learning algorithms to scan large databases that hold chemical structures and genomic data. These accelerate the identification of potential medication candidates and their effectiveness in treating specific patient groups. These findings have the potential to transform pharmaceutical research and development, making it more cost-effective and efficient [5]. The enormous amount of data being created and stored frequently surpasses human data analysis capabilities, making it difficult to manually extract insights. Here's where machine learning and artificial intelligence can help close the gap [11]. The lack of data analysis specialists in the healthcare industry emphasizes the necessity of computerized Medical Disease Diagnosis Systems (MDDSs). By assisting doctors in making well-informed judgments, these semi-automatic devices can improve patient care. This will improve the quality of healthcare, enhance disease diagnosis and overall lower the healthcare expenditures [10]. The current research is primarily concerned with healthcare data classification/prediction problems using machine learning (supervised) techniques. To solve classification issues in healthcare, a variety of learning algorithms can be coupled with data mining techniques. The ultimate goal is to enhance patient outcomes by increasing diagnostic speed, accuracy, and dependability.

3. RESULTS AND DISCUSSION

AI enhances healthcare workers' abilities rather than replaces them in the modern healthcare system. For instance, radiologists use AI to analyse medical images more quickly and accurately, increasing productivity.

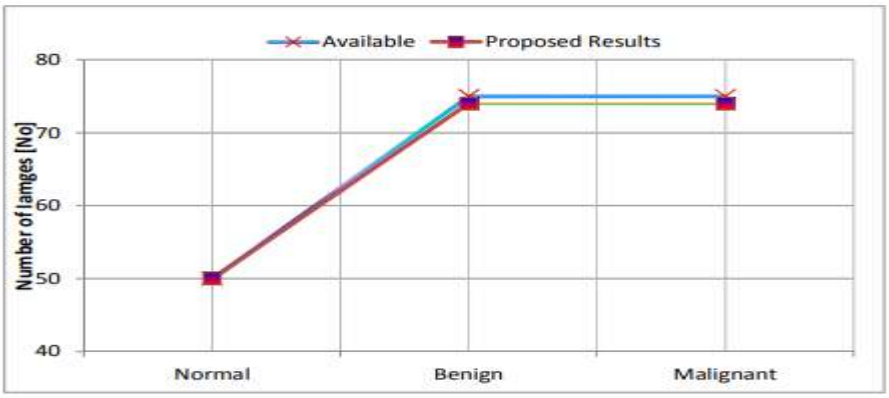

Figure 3: Classification performance of proposed approach

AI has greatly improved the precision and effectiveness of diagnosis across a variety of medical professions, driven by large patient data sets and developments in machine learning. It promises better healthcare results by identifying early disease signals in medical imaging and analysing genetic markers for individualized treatment plans [7].

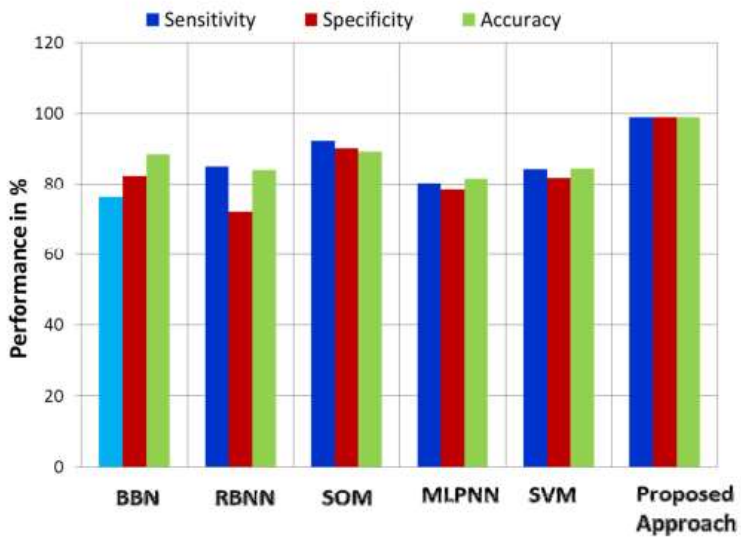

Figure 4: Performance evaluation of proposed approach comparing with existing systems

AI has the ability to save lives through early detection, as seen by its remarkable performance, particularly in cancer diagnosis. Research shows that when dermatologists and AI collaborate, skin problems can be diagnosed more accurately [8]. According to a poll, 80% of professionals in the life sciences and pharmaceutical industries are already using AI to find new drugs. This collaboration utilizes both healthcare professionals' and AI's strengths [12].

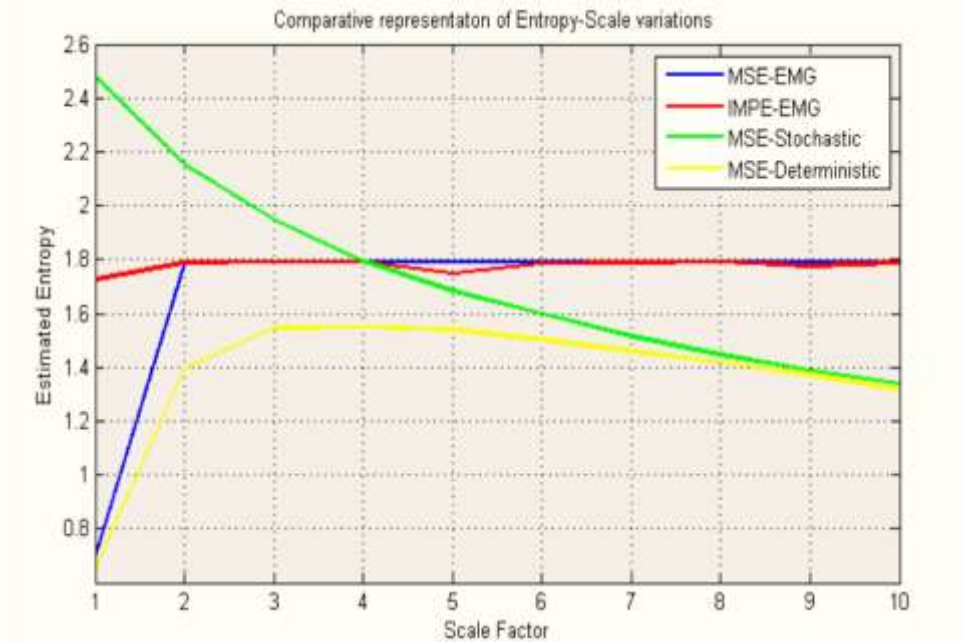

Figure 5: Entropy-Scale variation

Healthcare professionals' strengths are enhanced by AI's ability to analyse vast amounts of data and spot subtle patterns [14]. Despite AI's enormous potential, caution must be exercised to ensure that patient trust, ethics, and data security are all in place. Thus, we can support a healthcare system that maintains the vital human element of patient care while utilizing AI's advantages to improve diagnosis and care [15].

4. CONCLUSION

In conclusion, healthcare has already been significantly impacted by the use of AI in medical condition diagnosis, and this impact is only expected to grow in the future. An important step toward customized medicine is the use of AI techniques to find new chemicals for cancer treatment. A system that enhances health-related services to satisfy people's clinical demands is referred to as healthcare. In order to preserve and recover health, patients, physicians, clinicians, researchers, and the medical industry work together, with an emphasis on maintaining medical records. The need for data mining applications has grown as a result of the healthcare industry's and other industries' rapid data expansion. For people to make well-informed decisions and optimize results across a range of fields, machine learning, data mining, and statistical techniques are essential.

REFERENCES

1. Tien, James M. "Internet of things, real-time decision making, and artificial intelligence." *Annals of Data Science* 4 (2017): 149-178.

2. Kadhum, A. N., & Kadhum, A. N. (2024). Identifying People Wearing Masks in the Wild by Yolov7 Algorithm. International Academic Journal of Science and Engineering, 11(1), 229–236. https://doi.org/10.9756/IAJSE/V11I1/IAJSE1126

3. Al-Antari, Mugahed A. "Artificial intelligence for medical diagnostics—existing and future aI technology!." Diagnostics 13, no. 4 (2023): 688.

4. Bhattacharya, R., & Kapoor, T. (2024). Advancements in Power Electronics for Sustainable Energy Systems: A Study in the Periodic Series of Multidisciplinary Engineering. In Smart Grid Integration (pp. 19-25). Periodic Series in Multidisciplinary Studies.

5. Luo, Huiyan, Guoliang Xu, Chaofeng Li, Longjun He, Linna Luo, Zixian Wang, Bingzhong Jing et al. "Real-time artificial intelligence for detection of upper gastrointestinal cancer by endoscopy: a multicentre, case-control, diagnostic study." The Lancet Oncology 20, no. 12 (2019): 1645-1654.

6. Madhusudhana Rao, K., Kishore, M. N. D., Yogesh, M. P., Saheb, S. K. A., & Hemanth, K. (2021). Triple frequency microstrip patch antenna using ground slot technique. National Journal of Antennas and Propagation, 3(2), 1–5.

7. Islam, Md Mohaimenul, Guo-Hung Li, Tahmina Nasrin Poly, and Yu-Chuan Li. "Deepdrg: Performance of artificial intelligence model for real-time prediction of diagnosis-related groups." In Healthcare, vol. 9, no. 12, p. 1632. MDPI, 2021.

8. Mukti, I. Z., Khan, E. R., & Biswas, K. K. (2024). 1.8-V Low Power, High-Resolution, High-Speed Comparator with Low Offset Voltage Implemented in 45nm CMOS Technology. Journal of VLSI Circuits and Systems, 6(1), 19–24. https://doi.org/10.31838/jvcs/06.01.03

9. Hashimoto, Rintaro, James Requa, Tyler Dao, Andrew Ninh, Elise Tran, Daniel Mai, Michael Lugo et al. "Artificial intelligence using convolutional neural networks for real-time detection of early esophageal neoplasia in Barrett's esophagus (with video)." Gastrointestinal endoscopy 91, no. 6 (2020): 1264-1271.

10. Sundhar, C., & Archana, D. (2014). Automatic screening of fundus images for detection of diabetic retinopathy. International Journal of Communication and Computer Technologies, 2(1), 29-35.

11. Mori, Yuichi, Shin-ei Kudo, Masashi Misawa, Yutaka Saito, Hiroaki Ikematsu, Kinichi Hotta, Kazuo Ohtsuka et al. "Real-time use of artificial intelligence in identification of diminutive polyps during colonoscopy: a prospective study." Annals of internal medicine 169, no. 6 (2018): 357-366.

12. Rahman, Muhammad Zia Ur, Ali Hassan Raza, Abeer Abdulaziz AlSanad, Muhammad Azeem Akbar, Rabia Liaquat, Muhammad Tanveer Riaz, Lulwah AlSuwaidan, Halah Abdulaziz Al-Alshaikh, and Hatoon S. Alsagri. "Real-time artificial intelligence-based health monitoring, diagnosing and environmental control system for COVID-19 patients." Mathematical Biosciences and Engineering 19, no. 8 (2022): 7586-7605.

13. Chen, Po-Hsuan Cameron, Krishna Gadepalli, Robert MacDonald, Yun Liu, Shiro Kadowaki, Kunal Nagpal, Timo Kohlberger et al. "An augmented reality microscope with real-time artificial intelligence integration for cancer diagnosis." Nature medicine 25, no. 9 (2019): 1453-1457.

14. Tsai, X., & Jing, L. (2025). Hardware-based security for embedded systems: Protection against modern threats. Journal of Integrated VLSI, Embedded and Computing Technologies, 2(2), 9–17. https://doi.org/10.31838/JIVCT/02.02.02

15. Tang, L., Chen, Y., & Zhou, J. (2025). Reconfigurable computing architectures for edge computing applications. SCCTS Transactions on Reconfigurable Computing, 2(1), 1–9. https://doi.org/10.31838/RCC/02.01.01