

Eng 121 Sample Student Essay 3 Final Copy

Almost any sophisticated medical operation can now be done by a surgeon who may not even be in the country of the patient. Medical technology has made spectacular advances. Robots now perform near miracles by performing operations not possible with large clumsy surgeon's hands. They are uncannily accurate and reach places not even seen with the naked eye. A few months ago, the world suddenly began to appreciate artificial intelligence as OpenAI's ChatGPT became popular. Soon after, it was misused by students to avoid doing their assignments. It quickly got a bad reputation. However, artificial intelligence, when used appropriately, is very useful to the advancement of the world. Specifically, a branch of artificial intelligence called machine learning is impacting the world positively. **The healthcare industry has found many uses in machine learning and is implementing it widely.**

ML (Machine Learning) can be defined as a field of Artificial Intelligence that is concerned with developing computer systems to learn and adapt by analysing data and using algorithms. This technology has greatly enhanced the accuracy and speed of a diagnosis. The algorithms are written to learn from vast data sets which in this case refer to medical images, health records, and genetic information. As it analyzes this data, it can detect anomalies that may be missed due to human error. Often, it provides such diagnostic solutions faster and more accurately than humans. **Ahsan, M.M.** in his postdoctoral research paper has stated that "Diseases such as heart disease, kidney disease, breast cancer, diabetes, Parkinson's disease, Alzheimer's disease, COVID-19, etc." (34) have been thoroughly investigated regarding diagnosis with machine learning methods". As we wait for a cure for cancer, the healthcare industry is also extensively focusing on diagnosing cancer early to prevent deaths. **Alrashed, B** a surgeon well experienced in new technology has brought to light the role ML is playing in this context by saying, "Support vector machines (SVM) and artificial neural networks are used in various cancer classification applications for the accurate diagnosis of cancer type." (88-90) Most diseases are detected using medical images from scans such as X-rays, MRIs, PET scans, and CT scans. By helping radiologists in interpreting these images, machine learning improves the chances of early detection, thus leading to better patient outcomes.

Patient outcomes also depend on the treatment methods for the diagnosed disease. The amount of documented data in patient care is vast. Analysing all this data is mastered by Machine Learning algorithms. It excels in using this data and comparing it to the genetic makeup and lifestyle choices of a specific patient. As machine learning tailors a personalised treatment plan that is most effective, it is significantly improving healthcare. For example, machine learning algorithms such as logistic regression and deep learning techniques as assisting oncologists to determine the most helpful regimen of chemotherapy based on the tumor's molecular profile and the patient's genes. **Siddique S and Chow, J.C.L.** both technical medical researches with the CDC have reported that "Machine learning was used to analyse electronic health records to evaluate the risk of suicide dependent on physical illness." (557) These patients are reached out to and usually receive suitable assistance. This is an example of Natural Language Processing, a tool of Machine Learning implemented in the healthcare industry.

Machine Learning has made the drug development process easier. **Sarkar, C**, a Professor and Head of the Department of Pharmacology at the Indira Gandhi Institute of Health and Medical Sciences. In his recently published research paper, he emphasizes that **AI and ML technology are innovative approaches that play a crucial role in drug discovery and development.** He adds, **"A multitude of AI approaches has been beneficial in the precise prognostication of ligand-protein interactions assuring augmented therapeutic effectiveness."** (432-435) The pandemic that troubled the world's proceedings from 2019 through 2022 will be spoken about in history textbooks of the future. The COVID-19 virus stopped being deadly when a vaccine was developed. Machine Learning algorithms were used to analyze the genetic sequence of the SARS-CoV-2 virus to find a weakness. By understanding the protein structures, machine learning helped vaccine developers find the components of a vaccine that were most likely to defeat the virus. Machine Learning algorithms were also used to hasten the vaccine trials by optimizing subject selection and determining the dosage of the vaccine. Machine Learning has been used to increase the production of a drug and manage the distribution of drugs for years and it did the same for the COVID-19 vaccine.

Predicting future threats to humanity is a very important field of study in medical research. Machine Learning has dipped its useful toes in predicting these threats as well. It helps healthcare workers identify individuals that are at risk of developing certain diseases. This allows them to intervene proactively and prevent the threat. **Chae, S** in his deep research into Big Data found that Long short-term memory (LSTM) and deep neural network (DNN) learning models are some of the machine learning algorithms used for predicting diseases. (23) With all this significant contribution, Machine Learning proves to be increasingly impactful in the world.

Machine Learning allows our hardworking healthcare workers to focus much needed attention on needy patients as it takes over repetitive tasks ridding them of needing to work overtime. It also frees up health care worker time to give patients more care, more time, and focused attention that might otherwise be dominated by mountains of paper work and redundancy tasks. Machine Learning is transforming healthcare. Its utility in diagnosis, treatment, drug development, and production is serving humanity and allowing us to conquer whatever challenges posed.

Work Cited

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