

Use of Artificial Intelligence in Healthcare Applications

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In this era of modern times innovative technology and unpredictability of diseases we need to prepare ourselves to fight the unknown. There are limitations to exercise the human brain through the vast boundaries, that encompass spectrum of human diseases and behavior. Therefore, supplementing our own cognitive abilities with computing would definitely be beneficial in terms of management and treatment of the human body. There is a wide scope of use in healthcare ranging from determination of a cognitive change to a simple diagnosis of a pathology slide. It is also imperative to understand the complexities of this neo-symbiotic relationship between man and machine that is governed by biologically generated parameters. Without going into the context of ethical concerns at present which are obviously most important when dealing with the human body, we have to understand the judicious use of these applications which can facilitate diagnosis and management of human diseases. Also of great concern is the right to privacy in using this technology and obviously economic and social factors that would be impacted by the use of this technology. Just as it is beyond our control to understand the full potential of mother nature, therefore, the effect of this technology on each individual human brain responses and therefore the impact and outcome of such a response on that personal life, we need to firstly ensure an overall governing body that is present which can monitor the effects of this amalgamation between the human body and the computing facility. Some of these general concerns are already being addressed at various levels now.

Precisely the uses can be enumerated as in robotic surgeries, orthopedic surgeries, data assimilation and integration, image diagnostic and pathology, clinical trials, cyber security, screening for cancers, diabetic retinopathy, preventing intensive care transfers and sepsis prevention, predicting hospital acquired infections and

readmissions and more. Therefore, it can be seen that the use of artificial intelligence can penetrate almost every organ system of the human body.

If we can just create the norms for the use of this technology appropriately and make it accessible to each healthcare personnel similar to other sectors where artificial intelligence has become useful, in bringing farm-to-fork technology in agriculture besides marketing and other industrial developments, we would be able to harness the true potential of this technological boon in healthcare. When the objective is to hand over the technology to the basic health care worker also, the best possible way is to make a single template for all organ systems like an algorithmic model that works in a binary or multiclass coding, the testing, training of the model be done with changed parameters as per the requirement of each department as for example in any normal image versus and organ specific diseased image. This model can be trained accordingly bringing the accuracy to the highest possible level. Not only will this be convenient for the treating healthcare personnel but also this template could take care of almost any organ system of the body wherever a disease-specific parameter is available.

Although it has to be understood that these Artificial Intelligence applications are to be used in complement to the diagnosis, examination and procedures done by the treating physicians or surgeons because no matter how well developed this technology is until it reaches the artificial super intelligence stage, the most reliable method would still be in the hands of a capable doctor. Hopefully, better control methods would develop before we reach this super intelligence stage. However, in higher volume cases this method can be used as a screening tool to filter out specific diseased patients especially in situations such as prevailing covid disease by the use of chest x-rays and computed tomography scans.

The very concept of determining the diagnosis of any particular disease, for example covid at present, is based on the ability of the computing algorithm to distinguish between a radiological output such as an x-ray or more specifically in present times, a computed tomography of the lung. This epidemic has been quite a threat to performing normal activities of daily living or even human life. Vaccines are playing a very important role in bringing the mortality down to less than two percent, even lower. It is going to take months or even years to completely vaccinate the world. Thus, we have to determine ways to be able to locate areas of highest incidences, outbreaks, responses to new and mutant viruses post vaccinations, recovery and early management of patients, patient to beds ratio, doctor availability and much more to be able to fight this epidemic and secure the health and safety of the population. This coordination can take help from integration and analysis of data from hospitals, institutions and models can predict the best management for the patients as well as the paramedical staff. So, besides just be able to diagnose radiological images by screening we can also use artificial intelligence in management of the patients. These covid times will pass just as previous epidemics known to the world but with time and technological advances we can learn and update ourselves to prepare for a better, safer future.

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