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Importance of Artificial Intelligence in fight against COVID-19

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Abstract- In terms of health care delivery, new technologies such as Artificial Intelligence (AI), Internet of Things (IoT), Big Data and Machine Learning need to be supported to combat and combat new diseases. We seek to assess the role of AI in understanding, planning and countering COVID-19 (Coronavirus) and other pandemics. The health sector is searching for emerging approaches to track and regulate the dissemination of COVID-19 pandemic in the context of this worldwide health crisis. AI is one technology that can track the spread of the virus easily, identify high-risk patients and is useful in the real-time control of this infection. It can also estimate death risk by a careful review of patients' previous records. AI can help us fight this virus through population testing, medical assistance, notification and infection control suggestions. This technology is an evidence-based medical resource that can improve the planning, diagnosis and recorded outcomes of the patient.

Keywords -Artificial Intelligence application, Covid-19 pandemic, Modern Strategies to deal with Covid-19, Machine Learning, Artificial Intelligence, Covid-19

Introduction - Since the outbreak of novel corona virus, scientists and researchers all over the globe are working day and night to stop this pandemic. In order to get the situation under control we need to focus majorly on identification of corona virus patients, treatment and containing the spread of virus. The emergence of Artificial Intelligence technology in the recent decade can be our greatest weapon against this pandemic. AI mimics the working of human brain cells. A set of neural networks is trained on a dataset to extract important information and correlations from complex dataset .AI has a very strong mathematical foundation. Artificial Neutral Networks have been there for a while but in the past two decades there has been a boom due to increase in computational power of computers. If neural networks are provided with data, they have the capability to learn everything all by themselves. Natural Language Processing has been used to understand the semantics and the syntax in human language. Whereas Computer Vision is used to extract latent information from the world we see around us. Recent researches to fight covid-19 include development of chatbot, voice, image analysis of CT scans, fever detection using thermal scans, data analysis of the spread of disease etc. Artificial Intelligence has been used in diverse fields including medical sciences, weather prediction, engineering, policy making etc. This research paper explores and tries understanding the recent advancements in AI and the future solutions that AI can provide us. This analysis will give us insight into the future policy making and emergence of industries around the globe.

Literature Review- AI is becoming more and more sophisticated to do what humans do, but in a more efficiently, faster and cheaper way. There is huge potential in healthcare for both AI and robotics. Like in our daily life, AI and robotics become more and more part of our eco-system of health care. Whether small or large, public or private, any kind of organization will seek new ways to work efficiently and meet the needs of its clients and employees in order to ensure a social distancing and preventing quarantine. Machinery learning technology plays an important role in ensuring that the transformation takes place through the

provision of tools for remote communication, telemedicine and food security. The use of machine-learning chatbots for non-contact screens for COVID 19 symptoms and for public questions are included in the healthcare and government institutions. This research has been done keeping in mind that this research paper can be useful to those originations who are seeking for the application of AI in COVID-19 Pandemic and can also practice them in real life.

Research Methodology-We conducted both Primary and Secondary research to give the best insight of how AI will help in COVID-19 Pandemic. Help of various Newspapers, company blogs, official sites and articles of leading consulting firms has been taken for conducting the secondary research. Primary research was carried out to know the assumption of the students for the application of AI in COVID-19. It was done by conducting a survey of 10 questions using Google Forms. To achieve the mentioned objective, we had the following research design. The sample size was 110 respondents with the following composition; 40 MBA, 55 Engineering, 5 Law and 5 Arts students.

Primary Research –Sample Size : 110

Secondary Research –Blogs, Official Sites, Newspapers, Journals and Articles published by typing keywords Applications of AI, COVID-19 and AI on Healthcare.

Secondary Research:

Understanding how COVID-19 spreads-AI is helping specialists and experts to break down enormous volumes of information to figure the spread of COVID-19, to go about as an early notice framework for future pandemics and to identify infected population. Specialists have created a model to measure the spread of COVID-19 diseases that goes undetected and the ramifications for general wellbeing, dissecting 12 districts over the globe. Utilizing AI together with the AWS Diagnostic Development Initiative, they have grown new techniques to evaluate undetected diseases – breaking down how the infection grows as it spreads through the population to gather what number of transmissions have been missed. This 'C-19 Index' is being utilized by the board associations and insurance agencies to recognize high-risk persons which can fall for this infection, also at that point calling them to share the significance of hand washing and social separating, and offering food, bathroom tissue, and other fundamental supplies so they can remain at home.

Speeding up research and treatment -AI can help to quicken the disclosure of medications to help treat COVID-19. Benevolent AI, a UK AI organization and AWS client, turned its foundation toward understanding the body's reaction to the corona virus. They propelled an examination utilizing their AI drug disclosure stage to distinguish endorsed drugs which might hinder the movement of the novel corona virus. They utilized AI to infer logical connections between qualities, illnesses and medications, prompting the proposition of a few medication mixes. In not more than a few days, Benevolent AI found that Baricitinib (a medication at present endorsed for rheumatoid joint inflammation, claimed by Eli Lilly) showed up as the strongest drug. Baricitinib is presently in late-stage clinical preliminaries with the US National Institute for Allergies and Infectious Diseases (NIAID) to research its viability and wellbeing as a likely treatment for COVID-19 patients.

Robots using AI are minimizing contact between humans -AI-based robots have been developed during ongoing months that help in the COVID-19 fight by lessening contact among patients and medicinal services laborers – limiting the danger of cross-diseases.

For instance, Chinese firms are utilizing automation and robots to perform contactless conveyance and to shower disinfectants in open zones to limit the danger of cross-contamination. Different robots are checking individuals for fever and other COVID-19 symptoms and providing hand sanitizer, froth, and gel. Robots are additionally being utilized to serve food and medication to patients and cleaning rooms to limit contact with human staff.

Contact Tracing applications -Contact-following applications are as of now in far-reaching use in Asia – in nations like China, Hong Kong, Singapore and South Korea – they are likewise now being utilized in different parts of the world, for example, India, Italy, and Israel

and are improvement in other country states proceed. They fluctuate in the manner they work but generally utilize the way that cell phone client's whereabouts are distinguishable and, in this manner,, we can identify close contact with different clients. Computer-based intelligence calculations would then be able to decide the danger of cross-contamination and afterward inform the clients of such dangers. For instance, an application is being trialed for use by the British government that works by utilizing the Bluetooth technology to distinguish other cell phone proprietors who are in nearness to one another. Similarly, an individual who isn't contaminated however in closeness to somebody that has COVID-19 manifestations could get an alert. Concerns have been raised about the utilization of contact-following applications especially concerning security and the chance of government tracking people's activities.

AI is helping with image scan analysis and reducing hospital staff workloads -Testing has become a key issue in the battle against COVID-19. Nations like South Korea and Germany have been viewed as effective in taking care of the infection as a result of the measure of testing that is done in those nations. Primary testing techniques are work concentrated and tedious so we need a faster solution to take control of the situation. AI is currently helping with different types of testing, for example, x-ray beam examining. Different AI programs are presently accessible for chest screening that can detect the anomalies in the lung CT scans and give a Covid-19 hazard assessment a lot quicker than human radiologists.

Designing proteins to block SARS-CoV-2 -Proteins are an essential structure of life, and with AI, specialists can investigate and control these structures to address longstanding issues. The MIT-IBM Watson AI Lab recently utilized AI to find that a silk protein made by bumblebees could serve as a covering for speedy to-spoil nourishments to broaden their timeframe of realistic usability. Analysts will enrol the protein-collapsing technique utilized in their bumblebee silk revelation to attempt to overcome the new corona virus. They will likely structure proteins ready to obstruct the infection from authoritative to human cells, and to combine and test their one of a kind protein manifestation in the lab.

Discovering better approaches to treat Covid-19 patients on ventilators -In a joint effort with IBM analysts Zach Shahn and Daby Sow, MIT specialists Li-Wei Lehman and Roger Mark will build up an AI apparatus to assist specialists with discovering better ventilator settings for Covid-19 patients and choose to what extent to keep them on a machine. Abbreviated ventilator use can constrain lung harm while freeing up machines for other people. To assemble their models, specialists will draw on information from patients with the intense medical condition, just as Covid-19 patients at a nearby Boston medical clinic.

Preventative technology - One of the most valuable things AI brings is its capacity to rapidly break down information and figure expectations, which is particularly helpful in occasions such as these, where corona virus is spreading quicker than culture can understand everything. Computer-based intelligence can help figure out an assortment of sources including news reports and medical clinic information, helping specialists perceive little changes that can prompt a higher forecast rate and new preventive measures. BlueDot, a Canadian firm that utilizes information to assess general wellbeing dangers is one case of how these AI abilities can be effectively placed energetically. While the US Centers for Disease Control and Prevention (CDC) was one of the first to get the message out about COVID-19 on January 6, 2020 with the World Health Organization. BlueDot had the option to share their data about the flare-up to its clients on December 31. This early disclosure was made conceivable to a great extent because of BlueDot's propelled AI innovation. As per Kamran Khan, BlueDot's author and CEO, the organization utilizes AI innovation to make an early admonition framework that can track more than 100 infections by analysing around 100,000 articles in 65 dialects consistently. It can even

accumulate information foreseeing potential infection hotspots in various areas. BlueDot will probably get data to health workers as fast as could be expected under the circumstances with the goal that they can analyse, and for this situation disengage, tainted, and conceivably infectious individuals at an early stage.

Help in Diagnosing -Another advantage that AI offers doctors is to help with diagnosing patients with corona virus. Albeit numerous CT checks and different devices have amazing imaging abilities, AI can additionally add to the exactness of these outcomes. One case of this is the Beijing start-up Infervision. Its primary item is programming that banners conceivable lung issues on CT filters, however the organization as of recently made another COVID-19 tool that has been utilized to check about 32,000 cases utilizing AI. Infervision's COVID-19 device can give a total perspective on chest CT checks, including volume and thickness, and can even spot COVID-19, which is outwardly particular from other respiratory diseases, on pictures of the lung. What's more, the product spares a lot of time, which is currently more important than any other time. A huge number of cases are being broken down every day, except the AI calculations utilized inside the product are battling with time and expanding investigation and determination speeds while at the same time diminishing the odds of cross-defilement at the emergency clinic by better screening and organizing people who are well on the way to be bearers of the infection.

Sharing information -AI is likewise helping people get appropriate information about the corona virus, which at last helps to spread information. Facebook is now working with scientists at Harvard University in Taiwan, sharing anonymized information about individuals' developments and high-goals populace thickness maps. Forecast devices like these are only one of the numerous ways that AI calculations can help battle against the spread of COVID-19. Google is additionally one of the numerous organizations attempting to create COVID-19 related devices utilizing AI. Like how Apple Watches or wellbeing applications track what number of steps you take every day or what your pulse is at a given time, Google's life-science research branch, Verily is as of now amidst building up an effective fix that people can wear. The fix enacts while being used and tracks internal temperature, which would then be able to be sent to a perfect versatile application to foresee areas that might be contracting infections like COVID-19.

Preventing misinformation - While the expanded utilization of web-based life and news is unavoidable during times of pandemics, it's critical to tune in to and read precise data about the theme. Accepting misinformation from sources that are not legitimate can place individuals at serious risk, in addition to causing undue pressure and frenzy. Google currently has a 24-hour occurrence reaction group to remain in a state of harmony with the World Health Organization and has set up an SOS alert in the Search page which connects individuals with trustworthy news sources as they occur. This incorporates wellbeing tips, definitive data from WHO, and authority PSA promotions on an assortment of online stages. Google's Trust and Safety group is additionally continually attempting to guide clients from the deception that might be circling the web, for example, paranoid fears, advertisements that exploit the infection and substance that advocates other cures rather than clinical treatment.

Recognizing who is most in danger from COVID-19 -AI has demonstrated to be important in anticipating dangers in numerous circles. With clinical hazard explicitly, AI is possibly fascinating in three key manners -

- **Infection chance or risk:** What is the danger of an individual or gathering getting COVID-19
- **Severity chance or risk:** What is the danger of an individual or gathering developing extreme COVID-19 complications or symptoms that would require hospitalization or concentrated consideration
- **Outcome chance or risk:** What is the hazard or risk that a treatment will be insufficient for someone

AI can conceivably help predict every one of the three dangers.

Foreseeing the danger of disease -Early insights show that significant hazard factors that decide how likely an individual is to contract COVID-19 include:

- Age,
- Pre-existing conditions,
- General cleanliness habits,
- Social propensities or habits,
- Number and Frequency of Human Interactions,
- Location and atmosphere,
- Socio-economic status.

Hazard research for the pandemic is still in the beginning phases. Anticipation estimates, for example, wearing covers, washing hands, and social distancing are for the most part liable to impact in general hazard also. As more and better information opens up and at present progressing examines produce results, we will probably observe more functional utilization of AI for anticipating contamination risk.

Screening patients and diagnosing COVID-19 -At the point when another pandemic hits, diagnosing people is mostly difficult or challenging. Testing for a huge scope is troublesome and tests are probably going to be costly, especially initially. Any individual who has any side effects of COVID-19 is probably going to be worried that they have got the illness, regardless of whether similar symptoms are characteristic of numerous other, possibly milder ailments as well. Rather than taking clinical examples from every patient and hanging tight for moderate, costly lab reports to return, a less difficult, quicker, and less expensive test (regardless of whether it's less exact) would be helpful in get-together information for a bigger scope. This information could be utilized for additional examination, just as for screening and triaging patients.

With regards to utilizing AI to help analyse COVID-19, promising research regions include:

- Using face outputs to recognize indications, such as temperature or fatigue
- Using wearable innovation, for example, brilliant watches to search for obvious examples in a patient's resting pulse,
- Using AI-fuelled chatbots to screen patients depending upon self-revealed side effects.

Accelerating Drug Discovery -In a pandemic, it's basic to think of an antibody, a solid symptomatic strategy, and medication for treatment – quick. Current strategies include a ton of experimentation, which requires significant investment. It can take a long time to confine even one feasible immunization drug. AI can accelerate this procedure essentially without relinquishing quality control. Scientists dealing with H7N9 found that Machine Learning empowered virtual screening and scoring led to a considerable increase in the precision of the scores.

Discovering powerful existing medications - Organizations invest a great deal of energy and cash getting new medications approved. They should be as certain as they can that these medications won't have sudden, hurtful impact. This procedure saves us, yet it also slows down the process during a pandemic exactly when we need a quicker solution. One option is to repurpose drugs that have just been tried and used to treat different illnesses. However, there are a great many medication up-and-comers, and we don't have the opportunity to test them all – so how would we identify the correct one? AI can assist us with organizing drug competitors a lot quicker via naturally:

•Building information charts and

•Predicting link between drugs and viral proteins.

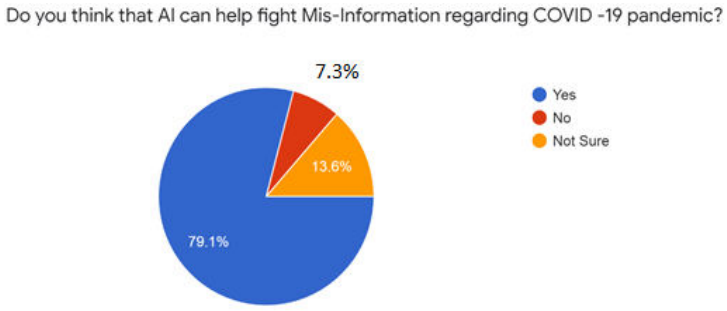
Understanding infections through proteins - Protein-protein connections (PPIs) among infections and human body cells decide our body's responses to pathogens. The infection host interactome is the whole

guide of communications between an infection's and a host's proteins. This interactome can be viewed as a diagram of how the infection taints our bodies and reproduces in our cells. Many research bunches are dealing with decreasing the tremendous scope of potential communications. AI models prepared with protein information have been effectively used to foresee the most probable infection have PPIs for HIV and H1N1 – enormously lessening the effort required to map the Virus-Host Interactome. We have realizes that a protein's structure is connected to its capacity and once this structure is comprehended, we can figure its job in the cell, and researchers can create drugs that work with the protein's one of a kind shape. Characterizing a protein's 3D structure is no simple undertaking – the scope of potential structures for a solitary protein is astronomical: a protein made from 100 amino acids has 3100 potential adaptations. What's more, there are more than one billion realized protein groupings, however we have just had the option to distinguish the structures of under 0.1% of them. Utilizing artificial neural systems, researchers have effectively constructed models that can anticipate protein structures, at last creation it doable to recognize protein structures utilizing computational strategies.

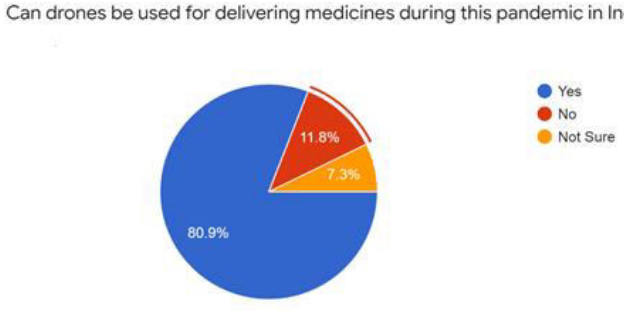
Foreseeing the danger of new pandemics -Precisely foreseeing whether a strain of flu is going to make a zoonotic jump (hopping starting with one animal category then onto the next) can help specialists and clinical experts prepare and plan accordingly. As one model, Influenza A exists in the avian populace, yet it can possibly bounce to human hosts. Specialists researching on Influenza A segregated 67,940 protein arrangements from a database. They sifted these successions so that the dataset included just those flu strains with complete arrangements of 11 flu proteins. With AI the analysts were then ready to recognize possibly zoonotic strains of flu with elevated levels of precision. More work should be done to set up forecast models for direct transmission, however realizing which strains of flu are probably going to make a jump is a significant initial phase in getting ready for the following pandemic.

India using AI -The most recent improvement of India in the utilization of AI has been the advancement of 'AarogyaSetu' App which assists with the recognition of symptoms of COVID-19 in an individual. The application passes by taking a review of each person, their name, age, earlier medical issues, and so forth. It helps in ensuring whether an individual is fit or not, confronting any side effects, the concerned individual can look for help by means of the application. It likewise recognizes whether any individual has reached an individual with corona virus prior. Adding to this, India is as of now pushing forward with utilizing robots as medical attendants in emergency clinics and air terminals in a couple of states and giving individuals masks, scanning them and spreading mindfulness in regard to the disease.

Primary Research:



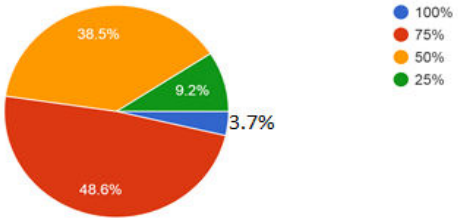
Around 80% of population thinks AI can help fight misinformation. These days people have a huge faith in technology. If a country launches an AI to detect misinformation, majority of people will support it.



A big chuck of the sample, almost 81% feel that it is feasible to supply medicines using drones. Considering the present scenario, that of an ongoing pandemic, we can say that it is the need of the hour to reduce human to human interface and contact. If drones will supply

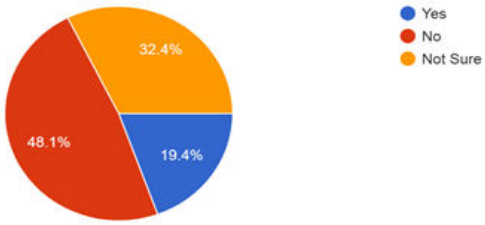
essential items at thedoorstep, people are likely to support this programme. It also shows that businesses will be willing to automate delivery for the better sales and profit.

To what extent will people trust the judgements/ conclusions made by an AI?



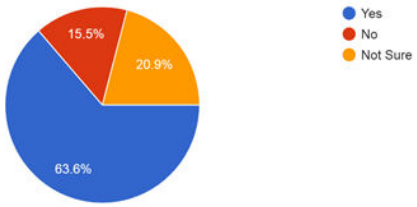
From the data collected it seems that on an average people are will not fully accept the conclusions made by AI.As most people are reluctant, it also points out to the that necessary advancements in AI predictions must be done to make the more accurate. And that a doctor's opinion may hold more truth value.

Can the human touch truly be removed for treatment of COVID 19 patients?



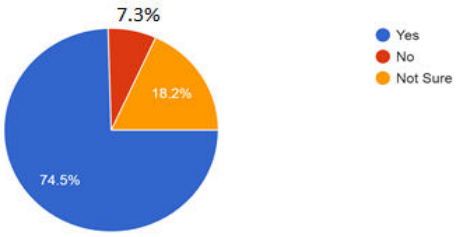
Very few people are in favour of eliminating the human touch from treatment. We expect this because firstly, efficient AI model still are in development phase and secondly, the human touch in treatment is very difficult to stimulate. Also, from a psychological and evolutionary stand point, we are essentially social beings and human interaction signifies not only diagnostic solution but also mental and emotional reassurance, which is a factor missing in the present AI models. This is the reason that AI consultations are still not popular.

Can AI be used for monitoring and auto medicine administration of COVID 19 patients?



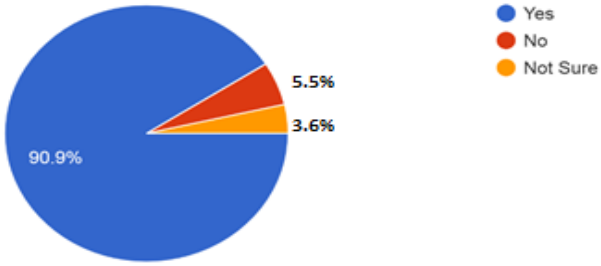
Fairly good amount of people around 64% are in favour of monitoring and auto administration of medicine. We all know with increase in the number of cases, more medical staff is needed to look after the patients. If people are supportive and rely on AI, we can successfully deploy auto administration and monitoring using AI. With some amount of effort, it can be done.

Can AI be used for following up, testing or checkup of treated COVID-19 patients?

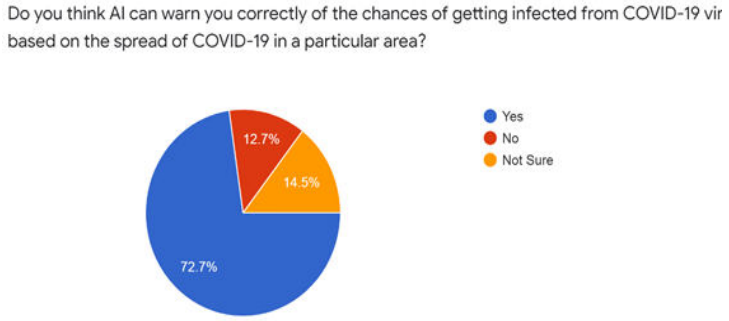


Around 75% of population are expected to participate in the testing and check-up done by an AI. This is a good percentage and we expect that if government automated these, there is huge chance that it works and helps to lessen the manual workload

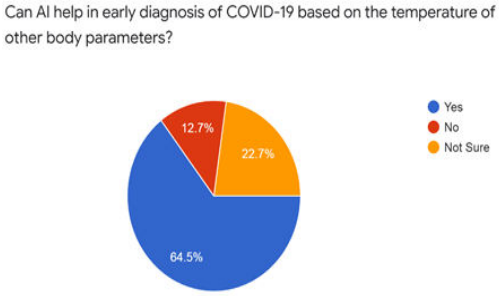
Many countries are not disclosing their COVID-19 patient data. Do you think governments and organisations around the globe should make their data public so that AI scientists can use them to give better predictions related to COVID-19 cases?



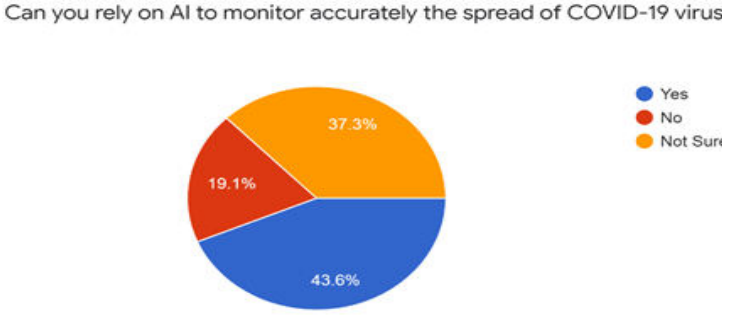
Surprisingly around 91% of the people want that the government should share the private data of the patients in order to make better policies and create an effective AI solution. This is a huge support from people's side. Government should support the AI researchers by providing them with covid-19 data so that effective AI solution can be made



The data shows around 73% think AI can calculate the spread of covid-19. Indian government launched AarogyaSetu app to warn people if they come in contact with a covid-19 positive person. Our data supports the fact that AarogyeSetu has become so popular amongst the people.



A huge amount of research is being done in the field of AI to use body parameters like temperature, cough etc to generate a risk score. From the data we can see around 65% of the people think that this can help. Investors and Companies can use this statistic to predict how successful will AI be in reaching out to people.



There does seems to be a good consensus among people to use AI to monitor the spread of disease. This might be due to the complication arising from lack of health data due to a smaller number of testings, hospitals not revealing the correct figures etc.

Conclusion

This pandemic can be outperformed by utilizing AI Models, the main essential component required is human insight. Notwithstanding that certain issues that are coming up while dealing with this pandemic around the globe are media commotion, alarm and easygoing conduct by individuals, absence of information and impartial and controlled information. Israel is looking for help from its cyber security administrations to watch out and distinguish individuals who are contaminated. Nations like UK, South Korea, China and Taiwan are utilizing resident's area by means of their cell phones to beware of whether individuals are recognizing self-isolate. Nations are creating AI-based applications to deal with COVID-19. UK has built up a 'C-19' COVID manifestation tracker to access high-chance territories. Also, South Korea has built up the 'Crown 100 m' application, which follows resident's area and cautions them on the off chance that they have interacted with a contaminated individual. Singapore has been the best nation in fighting COVID – 19 and decreasing the quantity of cases utilizing the application 'Follow Together'. Robots and automatons are another powerful highlight of AI helping in fighting COVID-19. Chinese police are utilizing automatons to scatter the group at open places and is utilizing shading code put together screen analyzer based with respect to wellbeing condition, which deals with calculations and distinguishes if an individual is sufficiently appropriate to enter shopping centers, parks, metro, and so forth. Singapore is utilizing robots to clean medical clinics. In India, drones are being utilized to watch out for individuals especially in litter states because of absence of resources.In India, drones are being utilized to watch out for individuals especially in litter states because of absence of resources. And furthermore, businesses (manufacturing, pharmaceuticals etc.) can be motivated to employ AI to increase their reach for better service providing and profits. The psychological aspects are also highlighted which points towards increasing trust of people in AI. Thus, various nudge techniques of behavioral economics can also be employed.

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