

APPLICATION OF ARTIFICIAL INTELLIGENCE IN TACKLING COVID 19 IN INDIA – A BRIEF REVIEW

Technology

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ABSTRACT

The Covid- 19 pandemic is the biggest catastrophe of this century. It has led to an increase in demands for healthcare infrastructure, medicines, hospitals, laboratory and healthcare equipment. Also, this highly communicable virus has propelled the people to follow strict covid appropriate behavior. The cognitive abilities of Artificial intelligence and its application in healthcare has proved a boon in this ongoing pandemic. The artificial intelligence has great potential to render services in diagnosing, monitoring, contact tracing, telemedicine, risk assessment, disinfection and several other services which has remarkably help doctors in tackling covid 19 pandemic. This paper briefly reviews the application of Artificial Intelligence in tackling Covid 19 in India

KEYWORDS

Artificial Intelligence, COVID - 19, Contact tracing, Geo-fencing

INTRODUCTION

Artificial Intelligence (AI) refers to the ability of machines to perform cognitive tasks like thinking, perceiving, learning, problem solving and decision making¹

Applications of AI in Health

“For the country like India, with population around 1.3 billion and with acute shortage of doctors, artificial intelligence has the potential to transform healthcare in various ways. It can turn large amounts of patient data into actionable information, improve public health surveillance, accelerate health responses and target research and development”¹

Potential use of AI in Healthcare

- Early Detection
- Diagnosis
- Decision making
- Treatment
- End of Life care
- Research
- Training

AI and COVID-19 in India

This new technology is helpful in tackling the pandemic in the following way –

- Screening of COVID-19 cases
- Containment of corona virus
- Contact tracing and remote monitoring of Covid 19 patients
- Enforcing quarantine and social distancing
- Treatment
- Vaccine and drug development

Artificial Intelligence-based predictive models have emerged as one of the powerful weapons in the fight against COVID-19. Many scientists as well as companies have developed machine-learning models to predict the severity of the disease and identify at-risk populations across the country

'Digital twin' – A virtual representation of an object or system that spans its life cycle, is updated from real time data and uses simulation, machine learning and reasoning to help decision making, has been developed to forecast the spread of COVID-19 in India. Ward-level digital twins were developed and these modelled the spread of the disease as a function of number of proximal contacts, average duration of contacts, people and place characteristics.¹

AI for pandemic preparedness of Covid 19

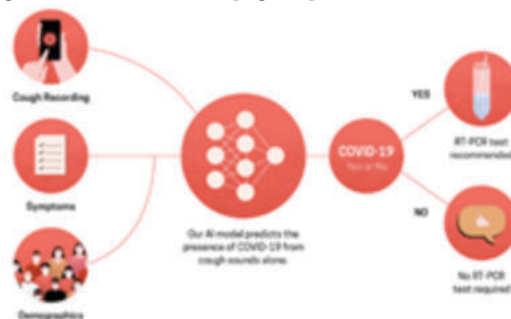
“My Government virtual assistant Chatbot” – It allows citizens to ask relevant queries and clear their doubts regarding Covid disease.¹

AI based voice tool designed to screen COVID-19 -

It is a screening tool which will detect COVID-19 based on the fact that the voice of COVID-19 patient is different from that of healthy person. When a person speaks into the microphone of the app, this tool breaks down the voice in multiple parameters like frequency, noise distortion etc. The values of these parameters are then compared with normal values which helps screen COVID-19. This tool is being pilot tested by University of Tor Vergata in Rome and it has yielded 98% accurate results.²

AI-based tool enabling identification of COVID-19 through cough sound -

An AI based tool has been developed which detects covid-19 based on the fact that the cough of a covid-19 affected patient is different from other coughs. On the basis of reference coughing pattern, this AI powered tool will be able to detect the disease as soon as the person coughs in front of the machine³ [Figure 1].



[Figure 1] AI-based tool enabling identification of COVID-19 through cough sound

*AI-enabled thermal cameras

AI-based thermal camera has been launched to identify anyone with body temperature above 37°C. This camera is able to identify multiple suspects at the same time and that too in the range of 100 meters⁴ [Figure 2]



[Figure 2] AI-enabled thermal cameras

***AI for containment of corona virus**

Some of the AI based technologies that have helped in the containment of the corona virus in many states in India are:

'Milagrow iMap 9'- Milagrow Human Tech launched - a robot designed for floor disinfection purposes which navigates and sanitizes floors without any human involvement¹

Garuda Aerospace, a Chennai based start-up, has developed an automated disinfecting Unmanned Aerial Vehicle (UAV) called "Corona-Killer 100" (a disinfectant spraying drone) Garuda Aerospace has deployed 300 "Corona-Killer 100" drones for disinfection purposes across 26 cities in India.¹[Figure 3]



[Figure 3] Garuda Aerospace

Contact tracing and investigation

Mobile applications for COVID-19 contact tracing and further investigation¹ [Table 1]

[Table 1]

Name of the mobile application	Purpose
Aarogya Setu	- It is a contact tracing app - It uses Bluetooth and location data to track movement of the user. - An alert is generated whenever the user is within six feet of a COVID-19 patient by cross-referencing the Indian government database of COVID-19 patients.
SAHYOG	- It complements the Aarogya Setu app in attainment of three objectives – contact tracing, public awareness and self-assessment - It will collect data at the state level and geo-tag it for further analysis by Survey of India (SOI).

Enforcing quarantine and social distancing

AI based mobile applications and drones have helped in enforcing quarantine and social distancing.

Drones are being used to monitor the movement of COVID19 suspects in quarantine centers. They are responsible for video surveillance and enforcing social distancing. These are helpful in containment zones and in public places like banks, ration shops etc.

Geofencing technology

It is being used to have a strict vigilance on COVID-19 suspects in quarantine. It uses GPS to set up a virtual boundary around the quarantine center.

Geofencing mobile applications [Table 2]

[Table 2]

State	Name of Mobile application	Purpose
Tamil Nadu	Quarantine Monitor	It helps track movement of covid-19 suspects in quarantine
Tamil Nadu	CoBuddy	It is used by Police authorities in Tiruvallur district of Tamil Nadu. for monitoring the movement of COVID-19 suspects under home quarantine.

Maharashtra	Coviguard	Alongwith monitoring the movement of Covid -19 suspects in quarantine, it also has built in facility for personalized chats that helps in quarantined person to communicate with the authorities
Himachal Pradesh	Corona Mukh Himachal	It helps track movement of covid-19 suspects in quarantine
Gujrat	SMS Covid- 19 Tracker App	It helps track movement of covid-19 suspects in quarantine

Artificial Intelligence for treatment and remote monitoring of patients

Kerala Government hospital has deployed the use of robot - 'KARMI-Bot' to serve food and medicines to COVID-19 patients with an objective to reduce risk of infections to doctors and health workers. This robot also enable video call between patients and doctor or relatives. It also disinfects isolation ward. States like Jaipur and Tamil Nadu are also exploring the various uses of such robots.⁵[Figure 4]



[Figure 4] Robot - 'KARMI-Bot'

Artificial Intelligence - enabled COVID-19 sero survey platform

Indian IT firm, Thalamus Irwine has claimed to have developed an Artificial Intelligence (AI) and Internet of Things (IoT)-based sero survey platform by name – "Garuda". This technology would conduct sero-prevalence study which will help identifying the vulnerable groups, geographical pockets where least or no immunity has been developed against Covid-19. This eventually will help in vaccine prioritization and thereby help curb the spread of Covid-19⁶

Take Home Message

- It is of prime importance that AI solutions into the health care industry must be explainable as well rational for its implementation.
- Encouragement of Public-Private Partnership into the domain of AI and Health care industry
- Establish certification system for AI based healthcare solutions
- Vigorous training of workforce in AI

REFERENCES-

- [1.] Bajpai N, Wadhwa M. Artificial Intelligence and Healthcare in India. Cited on February 16th 2022
- [2.] Mumbai students develop AI-based voice tool to detect COVID-19; PTI; New Delhi 16 April, 2020 23:22 IST; <https://www.thehindu.com/sci-tech/technology/mumbai-students-develop-ai-based-voice-tool-to-detect-covid-19/article31360091.ece> assessed on 17th February 2022
- [3.] Artificial Intelligence (AI) powered tool for Covid-19 suspect cases using cough sounds; 17th April 2020; https://www.nipicure.org/upload/resources/img06a8af_Artificial-Intelligence-AI-powered-tool-for-COVID-19-suspect-cases-SOPs-2020.pdf assessed on 17th February 2022
- [4.] Gurgaon-Based Staqu Introduces Camera For COVID-19 Under Analytics Platform JARVIS; Vishal Chawla; 18th March 2020 <https://analyticsindiamag.com/staqu-introduces-camera-for-covid-19-detection-under-analytics-platform-jarvis/> assessed on 17th February 2022
- [5.] Kerala government hospital deploys robot to serve COVID-19 patients; PTI; April 25, 2020; <https://www.thehindu.com/news/national/kerala/kerala-government-hospital-deploys-robot-to-serve-covid-19-patients/article31432663.ece> assessed on 22nd February 2022
- [6.] AI-backed Indian sero-survey tech could prioritize Covid vax process; Ashish Shrivastava; December 23, 2020; <https://www.expresscomputer.in/artificial-intelligence-ai-ai-backed-indian-sero-survey-tech-could-prioritize-covid-vax-process/70786/> assessed on 21 February 2022