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Q Algorithm Used For Detection In Covid-19 Virus

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Abstract:
COVID-19, a new virus, was discovered in Wuhan, China, in December 2019. Due to its infectious features and lack of medically established therapy, the COVID-19 virus spread around the planet in early 2020, causing widespread infections and deaths on all continents except Antarctica. The COVID-19 epidemic has been dubbed the most significant worldwide calamity since World Wars I and II. The initial line of defense in the fight against non-pharmaceutical techniques such as social separation and personal isolation are used to disseminate COVID-19. The global epidemic, which is hurting billions of people economically and socially, has reached a tipping point.
spurred the scientific community to develop computer-assisted solutions COVID-19 diagnosis, prevention, and estimation using digital technologies. Several of these
Efforts are centered on statistical and Artificial Intelligence-based data analysis. COVID19 is a virus. All of these scientific endeavors required that the data collected be made public. To encourage expansion, validation, and improvement, the analysis service should be open source. In the fight against the global pandemic, team.

Keywords COVID-19, coronavirus, pandemic, machine learning, artificial intelligence, open source, data sets

1. Introduction

The Novel Corona Virus (Covid-19), formerly known only as the Wuhan virus, spread to South Korea, Japan, Italy, Iran, and eventually India. It was given the label novel since it is an animal coronavirus mutant that has never been seen previously. The source of the outbreak is yet unknown. The virus is thought to be linked to a Wuhan wet market (containing seafood and live animals) that was not following health and safety requirements. The wet market in Wuhan features Since then, it has been shut down indefinitely. The symptomatology of the Covid-19

is quite similar to those of other viral respiratory infections. Cases range from moderate to severe, with severe cases resulting in major medical issuesor even death. Because the incubation time for the novel coronavirus has yet to be proven, symptoms are expected to occur in 2 to 14 days. The virus's particular ways of transmission are unknown because it is a new virus. 1st COVID-19 is broughtSARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) was declared a pandemic by the World Health Organization on March 11, 2020. Due to its clinical trials on humans of various ages and ethnicities before licensure, the cure for COVID-19 could take several months. Due to possible COVID-19 genetic changes, the virus's treatment may be further delayed. The World Health Organization (WHO) has reported that the novel coronavirus (COVID-19) has just become a pandemic. The severity of the epidemic is growingby the day, and new records are being set practically every day. Around the world, there are 18,514,884, 699,027, and 11,731,138 infected,
death, and recovered cases for this disease [2]. Almost all sectors, including the healthcare system[3], are experiencing severe infrastructure crises as a result of the epidemic, both in developed and developing countries. In medical science, there arevarious diseases that cause a lot of issues in human health, such as heart disease [4], breast cancer [5, 6], liver illness [7], and diabetes [8], but the present pandemic is COVID-19 [9, 10]. Fever, fatigue, breathing difficulties, and a dry cough are the most common symptoms of COVID-19 [11]. Important devices [12, 13] usually available within the healthcare technology [14].

2. Problem statement

Number of software are being implemented to check and identify the infected people of covid-19. But no application has been developed so far that can perform the task of covid-19 detection and identification the person is suffering from covid arenot within a minute.

The major issues seen at the present context are:

- Because of Over speeding of corona virus, the number of infected people increasing day by day.
- Because of low RT-PCR (reverse **transcription-polymerase chainreaction)** test Center.
- Commercially available center provided high cost for RT-PCR test.
- Because of high cost some people do not affordable this RT-PCR test.

3. Objective

The main primary objective is the people follow the rule and take Precaution and If They found some symptoms, Instead of Directly going for test first they check there breathing pattern in this app. objective of our project is to address the issue of this Pandemic.
The objectives are as follows:

- The issues of over spreading without use of human resources, we have designed an application and multipurpose system that addresses.
- To detect the symptoms of covid and give the truth evidence to the victim using Breathing pattern.
- And the Data will be stored in server
- To generate the Report of them we use IOTtechnology

4. Methodology/Algorithm

Q-learning algorithm is a model-free reinforcementlearning algorithm to learn the value of an action ina particular state. It does not require a model of the environment (hence "model-free"), and it can handle problems with stochastic transitions and rewards without requiring adaptations.
For any finite Markov decisionprocess (FMDP), Q-learning finds an optimal policy in the sense of maximizing the expected value of the total reward over any and all successive steps, starting from the current state- learning can identify an optimal action- selection policy for any given FMDP, given infinite exploration time and a partly-random policy" refers to the function that the algorithm computes -the expected rewards for an action taken in a givenstate.

5.Implementation

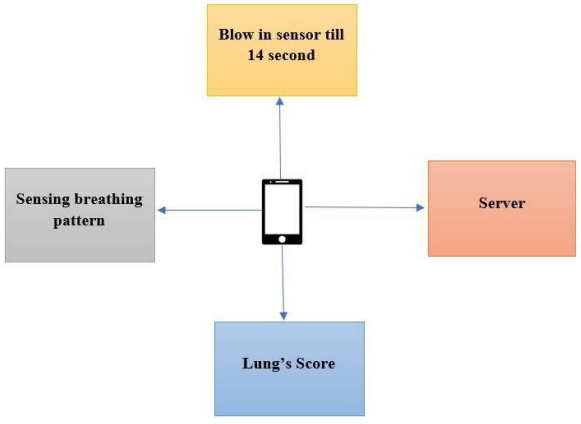

Fig: Implementation of COVID breathing analyzer

The implementation of the Covid breath analyzer is depicted in the diagram above. It displays four components: blow in sensor for 14 seconds, breathing pattern detection, lung score, and server.

First, the Android phone takes input in the form of breathing through an input device, such as a microphone; the user should blow into the microphone for 14 seconds, following which the Q-algorithm detects the breathing pattern and compares it to previously saved data. Then it will go through a series of procedures, including transferring data from the server to the database and calling the table covid track of the dashboard to build a report. It will provide information such as a person's lung score and whether or not they have a COVID positive.

6. Module Analysis

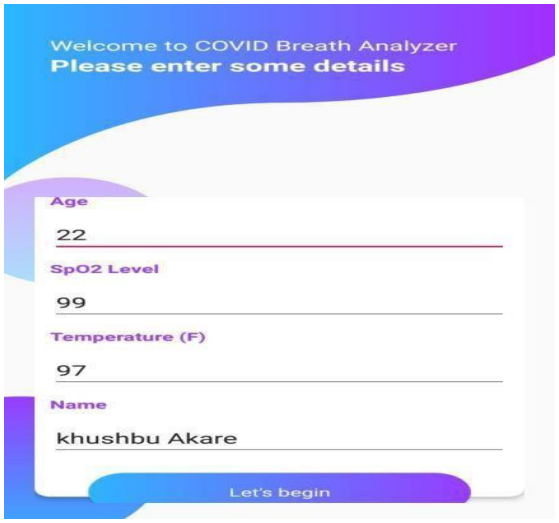

Fig 8.1 Intermediate service

The fig 8.1 shows that, first add the Parameter like Age, SpO2 level, Temperature and name of person and click on let's begin.

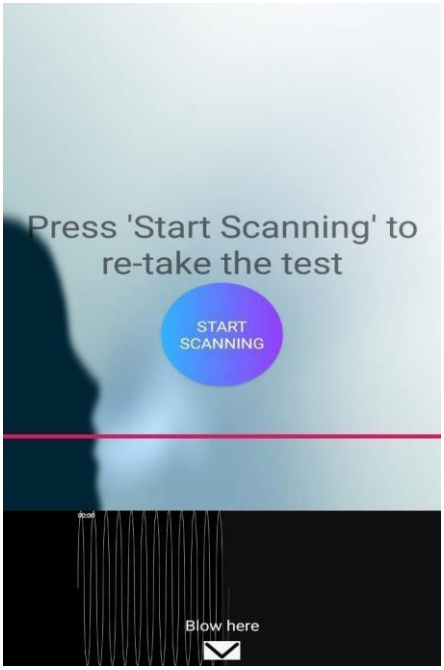

Fig 8.2 Breathing scanner

This Fig 8.2 shows SpO2 level is less than 90 and Temperature is more than 100 please go for breathing test.

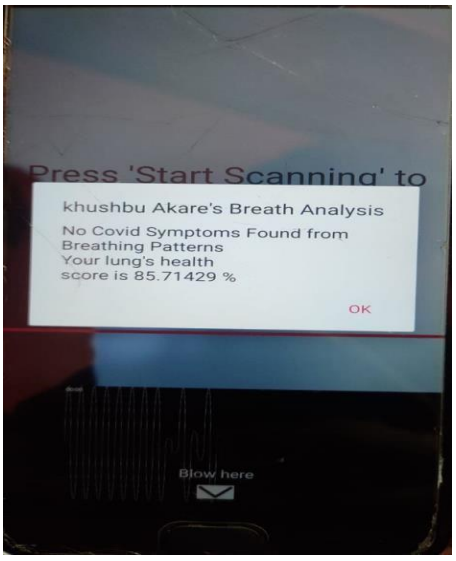

Fig 8.3 Covid Report

This fig 8.3 gives the result on the basis of parameter analysis that the person is not suffering from COVID-19.

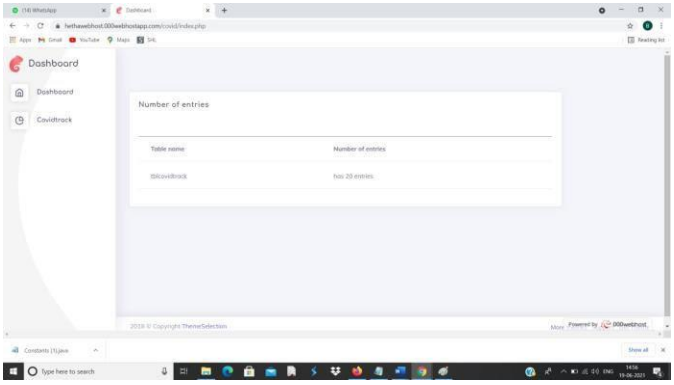

Fig 8.4 Dashboard

This fig 8.4 shows the number Of Entries in Dashboard

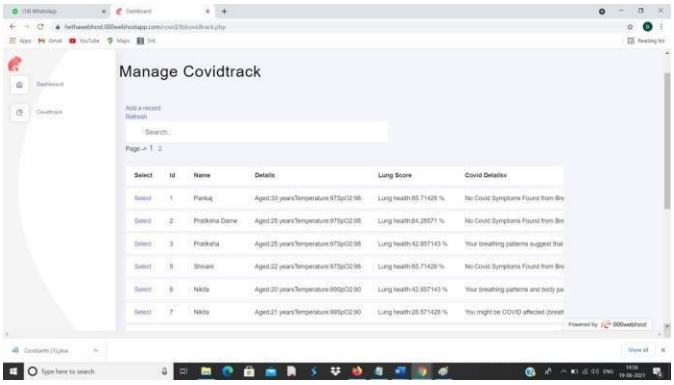

Fig 8.5 Covid-Track

This fig 8.5 shows the report of testing people

7. Related Work

We investigated the use of deep learning models asa technique to identify whether someone is infected with COVID-19 based on an audio sample of eithertheir breathing or coughing, according to the author Bjorn W. Schuller of the study Detecting covid-19 from breathing and coughing noises using deep neural networks. In contrast to the prevalence of high-quality microphones in mobile phones, issues with COVID-19 testing capabilities in disadvantaged countries around the world necessitated the development of this application. aswell as the overall benefits of real-time low-cost pre-scanning for selective testing with more reliable methodologies.[15]

As a result, the models' goal would be to serve as ubiquitous, low-cost pre-testing mechanisms that might help reduce demand for COVID-19 lab tests,which are somewhat expensive to undertake due to the need for materials, equipment, and labor that are not evenly available around the world.
We used a subset of a crowd-sourced database acquired through the University of Cambridge's COVID-19 Speech Android app and online interface to accomplish this. Samples of breathing and coughing recordings were included in the database, together with demographic data, medical history, and COVID-19 testing status. [16]
The achieved results suggest that it is indeedpossible to detect COVID-19 by way of eitherbreath or cough samples with an accuracy relevantto use-cases such as pre-selection for Testing willbe more

trustworthy, and deep learning models will be able to detect this. [17] The current results, however, are constrained by the quantity of data provided, which may preclude the use of even larger models, which are where deep learning models tend to give the best outcomes. The collection of a larger database with fully validated and more varied control data, covering a plethora of other respiratory and related disorders, would open the door to even better, but also more tangible outcomes in the future for this research. [18]

7.1 Breathing pattern

There is no commonly accepted definition of breathing pattern as of now. When it comes to breathing patterns, the timing and volume components are the most commonly stated factors. The tidal volume, breathing rate, inspiration time (Ti), expiration time (Te), respiratory rate, and sigh rate are the elements of breathing pattern that will be researched in this thesis. The fluctuation in tidal volume, ETCO2, and expiration time were also measured, as well as the end tidal carbon dioxide level (ETCO2). These variables were chosen because they show some clear differences between those who are healthy and those who have respiratory difficulties (Tobin et al., 1983b; Brack et al., 2002; Wysocki et al., 2006a; Tobin et al., 1983a). As a result, they can be used to represent a patient's respiratory condition as well as a tool to track changes in breathing caused by experimental therapies (Valta et al., 1992).

7.1.1 Normal breathing pattern

Breathing is a rhythmic process in which the respiratory muscles move the rib cage, which is controlled by the central respiratory pattern generators in the brainstem (Mangin et al., 2008). Normal values for breathing pattern parameters, as measured by a pneumotachograph or RIP, have been published as a comparative tool for healthy and unwell people. A summary is provided in the following table:

	Parameters					
Study	Age	Vt (ml)	Ti (s)	Te (s)	Ti/Tot	Rate (breath/minute)
Tobin *et al.*, (1983)	18–60	383 (85)	1.62 (0.3)	-	0.42 (0.03)	16.7 (2.7)
	60–81	382 (108)	1.68 (0.4)	-	0.41 (0.03)	16.6 (2.8)
Osborne (2000)	19–37	680 (130)	1.57 (0.5)	2.43 (1.02)	0.39 (0.05)	16.6 (3.8)
Parreira *et al.*, (2010)	20–39	352 (133)	-	-	0.40 (0.04)	15.0 (3)
	40–59	302 (117)	-	-	0.40 (0.03)	15.0 (3)
	60–80	338(118)	-	-	0.38 (0.04)	16.0 (3)

Table 3.1.1 Summary of normal values of respiratory parameters for a healthy population.

7.1.2 Breathing pattern variability

Variability is a phrase used to characterise a system's states of dynamic behaviour, and it may be described as the amount of variation within the system (Khoo, 2000). The level of fluctuation of individual factors within the overall breathing pattern is defined as 'breathing pattern variability' in this study. Variability is thought to give the respiratory system the flexibility to respond to changing environmental demands by inducing alterations. Breath-by breath variability is a feature of normal healthy respiratory patterns, according to an increasing body of evidence.

6. Literature Survey

Sr. No.	TITLE	AUTHORS	ABSTRACT	CONCLUSION
1	Trace Together	Government Technology agency(GovTech) In collaboration With the ministry of health(MOH)	Trace Together is a popular smartphone contact tracking app that uses Bluetooth to track the infected people and alert people who have been close to then	The main idea of this paper was to built a software todetect the covid patient
2	NHS smartphone App	British National Health Service	The app will keep track of individuals's travels and notify individuals who come into contact with sick persons. According to the NHS, the app could aid in the relaxation of lockdown by evaluating virus distribution patterns and hotspots.	The software would categorise user information based on demographics, living arrangements, and transportation habits. A maximum number of persons might be determined based on the data analysis and allowed to travel freely.
3	Covid Watch	Stanford University	It detects users when they are close by using Bluetooth signals and notifies them anonymously if they have been in contact with someone who has tested positive.	Any third party, including the government, will be unable to monitor who has been exposed by whom, which is a unique feature of the app.

4	COVID symptom Tracker	St. Thomas Hospitals	To create this software, scientists looked at high-risk areas in the United Kingdom, the rate of virus propagation, and the most vulnerable demographics based onhealth problems.	This software records virus symptoms among users and records virus symptoms forcontinuing study. The app adheres to the General Data Protection Regulation, andthe information is only used for health research and not for commercial gain.

7. System Architecture

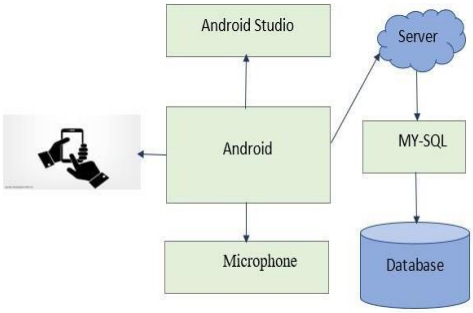

Fig:7.1 System Architecture

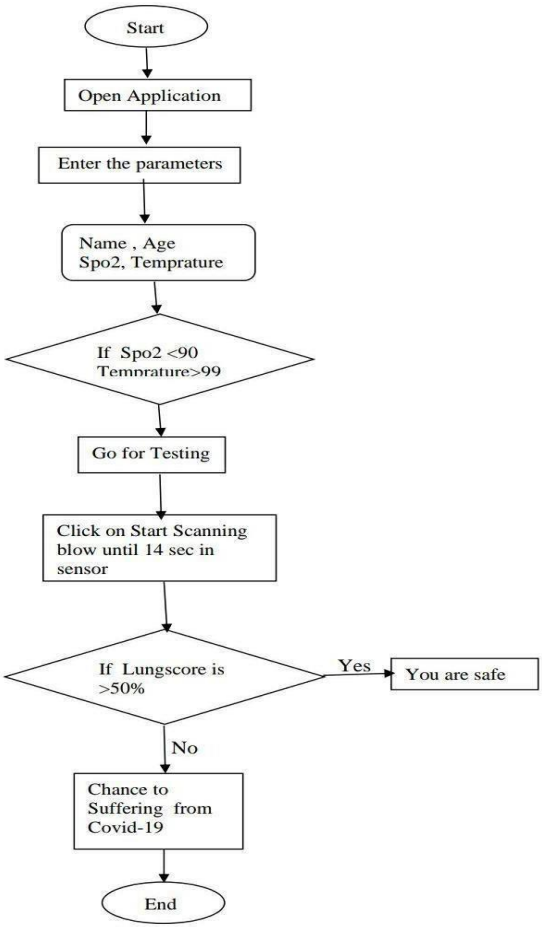

Fig:7.2 System Flow

The diagram below depicts the system's step-by-step operation:

Step 1: The process will begin with the system.

Step 2: Launch the Covid Breath Analyzer app on your Android device.
Step 3: Fill in the appropriate fields in the application, such as name, age, Spo2, and temperature.
Step 4: To check the temperature and oxygen level, we can use a thermometer and an oximeter.
Step 5: The system will detect the incoming parameter in continuous mode.
Step 6: The system will check the SpO2 and temperature values, ensuring that the SpO2 is less than 90 and the temperature is greater than 99.
Step 7: If the aforesaid conditions are met, proceed to testing.
Step 8: Now, in the microphone, press the start scanning button and scan for 14 seconds.
Step 9: After scanning, it displays the breathing pattern, and if we do not blow properly till we are 14 years old, it displays a notice advising us to redo the exam.
Step 10: If we blow properly till we reach 14, they will tell you whether you are affected or not, as well as your lung health score.

8. Conclusion

In this research, the problem of conducting accurate covid detection using machine learing technology in pandemic to support developing applications are addressed. Covid breath analyser Over spreading Detector is used to sense the Breathing pattern to achieve great detection accuracy. Specially, the proposed system is used to detect over spreading virus and reports to concerned people as a proof

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