Novel Technique to Diagnose Coronavirus Using Naïve Bayes Classifier in Healthcare Records

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Abstract— These days, the healthcare enterprises land huge quantum of healthcare data that utmost of the times isn't reused to find out the hidden data and patterns. Data booby-trapping along with machine literacy performs a prominent part in prognosticating the conditions. Currently, COVID – 19 has come a epidemic for the humanity. It's a transmissible complaint and it takes 12 – 24 hours in entering the reports of diagnose. In colorful remote and high altitude areas and due to the exponential growth of COVID – 19 in colorful corridor of the world, it isn't doable to perform the test on mass population. This exploration composition describes a new fashion to diagnose coronavirus using naïve bayes classifier and we hope that this fashion would be useful and fruitful for the humanity and will be a great step to prognosticate the COVID – 19.

Keywords: COVID – 19, Novel Technique, Diagnose Coronavirus, Healthcare Records

I. INTRODUCTION

Coronaviruses (COV) are a family of contagions that beget illness ranging from the common deep freeze to more severe conditions similar as Middle East Respiratory Syndrome (MERS – CoV) (1) and Severe Acute Respiratory Syndrome (SARS – CoV)" (2). It's considered as a new contagion that has not been detected before in mortal beings. It's covered under the order of zoonotic as it can be transmitted between people and creatures. Common signs of infection are briefness of breath, cough, fever and respiratory problems. In case, the cases who are of age 60 and over, infection can beget problem of pneumonia, order failure and indeed death. As per the report published in South China Morning Post (3), this new contagion was linked in 266 persons in Novemer 2019. The details carried by the Post revealed that a 55 time old person from Hubei fiefdom could have been the first case to contract COVID – 19. The contagion which is now blazoned as epidemic by WHO (5) has infected further than persons around the world and killed further than 1645260 mortal beings.

Till now, no vaccine has been given for the COVID-19. In light of this fact, there are only the preventative measures similar as social distancing, hands sanitizers, face masks and PPE accoutrements that one should take to control the spread of coronavirus. The primary ideal of this composition is to design a medium for prognosticating the coronavirus complaint. Thus, the present paper highlights colorful data mining ways to prognosticate the positive cases of COVID – 19.

A. Objective

The aim of this study was to explore the part of the AI system which was designed and developed grounded on the characteristics of COVID-19 CT images in the webbing and evaluation of COVID-19. With numerous successful stories, machine literacy (ML) and deep literacy (DL) have been extensively used in our everyday lives in a number of ways. They've also been necessary in diving the outbreak of Coronavirus (COVID-19), which has been passing around the world. The SARS-CoV-2 contagion- convinced COVID-19 epidemic has spread fleetly across the world, leading to transnational outbreaks.

The COVID-19 fight to check the spread of the complaint involves most countries, companies, and scientific exploration institutions. In this design, we look at the Artificial Intelligence (AI)- grounded ML and DL styles for COVID-19 opinion and treatment.

Likewise, in the battle against COVID-19, we epitomize the AI- grounded ML and DL styles and the available datasets, tools, and performance. This check offers a detailed overview of the being state-of-the- art methodologies for ML and DL experimenters and the wider health community with descriptions of how ML and DL and data can ameliorate the status of COVID-19, and further studies in order to avoid the outbreak of COVID-19. Details of challenges and unborn directions are also handed.

II. PROBLEM DESCRIPTION

The health assiduity is eagerly looking for new technologies and ways to track and control the growth of coronavirus epidemic in this transnational health extremity. One of the topmost uses global technology right now is Artificial Intelligence (AI), which can track the speed and descry the growth rate of the nimbus contagion, and identify the threat and inflexibility of Corona contagion cases. AI can also anticipate the possibility of death by adequately analysing former case data. Artificial intelligence can help us in battling the contagion by testing individualities, medical backing, data and information, and recommendations regarding complaint control.

In order to break complex problems in our lives, AI is a broad marquee that consists of numeroussub-areas. Thesesub-areas include literacy, medication, thinking, representation of information, and searching. Machine Literacy (ML) and Deep Literacy (DL) are a subset of AI areas that correspond of several algorithms that give intelligent models to identify or cluster particular tasks.

III. SCOPE OF THE RESEARCH

Compass OF THE Exploration In this Design, introduce the main compass of AI fastening on ML and DL towards COVID-19 exploration incorporates the sides of complaint opinion and medicine and vaccine developments. Note that, due to the fast elaboration of the COVID-19 epidemic, have

quoted numerous published exploration workshop before a thorough disquisition, where these workshop should actually be surveyed for their perfection and quality in peer review. A taxonomy of our check on ML and DL exploration works towards COVID-19 opinion and treatment.

A. Common Symptoms of Coronavirus

The incubation period of contagion COVID – 19 range from 2 – 14 days and typically around 5 days. Most common symptoms (4) of coronavirus are

_ Fever
_ Tiredness
_ Cough
_ Nasal congestion
_ Runny nose
_ Sore throat
_ Diarrhoea
_ Conjunctivitis
_ Loss of smell and taste
_ Rashes on skin
_ Body ache and pain
_ Bluish lips or face
_ Loss of speech
_ Respiratory Problem

Persons above 60 and other with underlying ailments such as diabetes, hypertension and respiratory diseases are more likely to develop severe problems.

IV. STATISTICS OF COVID – 19

Coronavirus or COVID – 19 are a large family of contagions that are common in creatures. Infrequently, people get infected with these contagions which may also affect other persons. For illustration, SARS – CoV is related with civet pussycats and MERS – CoV is associated with dromedary camels. The sources of coronaviruses haven't yet been verified as scientists are working on this area. It's declared as epidemic by World Health Organization (5) on March 11, 2020 and on March 13, 2020, The President of USA declared coronavirus outbreak a public exigency (6) and there are fears that it can moving towards the situation of disastrous global profitable extremity. In table I, data of verified cases of COVID – 19 along with deaths is given.

On January 20, 2020 total 282 cases of coronavirus were reported to WHO and on December 16, 2020 total number of cases in the world are. Table I easily depicts the total number of active cases and deaths in 10 worst affected countries in the world.

V. METHODOLOGY NAÏVE BAYES CLASSIFIER FOR THE VACCINATION OF COVID-19

Naïve Bayes seems a simple bracket algorithm but in case of prophetic modeling (7), it performs an emotional part. It's covered under the family of probabilistic classifiers which is entirely grounded on Bayer's theorem. Principally, Naïve Bayes is a model of tentative probability. With this model, it is possible to classify an case of given problem which is denoted by a vector X = (x1, …, xn) where n represents features of independent variables. A group of cases were taken in to consideration and programmed with data sets.

The chances were calculated on all the classes and with all the conditions. Results were accumulated and when the test data was handed, we admit the chances for colorful classes on the base of handed symptom details. The details can be used to classify the case in to the class with the probability. On the base of value of the probability, it can be decided that a person is suffering with COVID – 19 or not. Traditionally, contagions were classified and discerned by culture, serological and electron microscopy (8). Applying these phenotypic styles, coronaviruses were nominated as enveloped contagions of 120-160 nm in size with crown shape (9). Coronaviruses are classified in to three orders. Under group 1 and 2, there are mammalian coronaviruses and group 3 covers avian coronaviruses. Different diagnose mechanisms are available to descry the new coronavirus (10) similar as ORF1ab and N, RdRP, E, N, Three targets in N gene, Two targets in RdRP and RT-PCR. Typically, tests results ar available after 12 hours.

As coronavirus is showing exponential growth in colorful corridor of the world, at colorful remote and high altitude areas, the installation of opinion is delicate to give or it take time of 48-72 hours to complete the process of opinion of case.

Thus, in this composition with the help of Naïve Bayes classifier (11), a medium is designed to prognosticate the positive case of coronavirus. All the cases will be diagnosed on the base of attributes (12) taken in the table II. When patient notice symptoms bandied in table II, it can be prognosticated with the medium that the case has the COVID – 19 or not.

Sore Throat and Cough	Runny Nose	Fever	Difficulty in Breathing	COVID - 19?
Yes	No	Yes	Mild	Yes
Yes	Yes	No	No	No
Yes	No	Yes	Strong	Yes
No	Yes	Yes	Mild	Yes
No	No	No	No	No
No	Yes	Yes	Strong	Yes
No	Yes	No	No	No
Yes	Yes	yes	Strong	Yes

Table 1: Attributes for the Discovery of Coronavirus in a Suspect

The working of this medium is bandied in important detail with the help of flowchart in figure I. The flowchart depicts the operations in Naïve Bayer classifier algorithm. By applying this flowchart, we can accessibly prognosticate (13) that the case has been suffered from new coronavirus or not.

Originally, we calculate all possible individual chances applied on the target trait of coronavirus containing all chances of trait of coronavirus. Chances are calculated in the following manner.

P (Coronavirus = Y) = 5/8 = 0.625
P (Sore throat and cough = Y|
Coronavirus = Y) = 3/5 = 0.6

P (Coronavirus = N) = 3/8 = 0.375
P (Sore throat and cough = Y| Coronavirus = N) = 1/3 = 0.333
P (Runny nose = Y| Coronavirus = Y) = 3/5 = 0.6
P (Runny nose = Y| Coronavirus = N) = 1/3 = 0.333

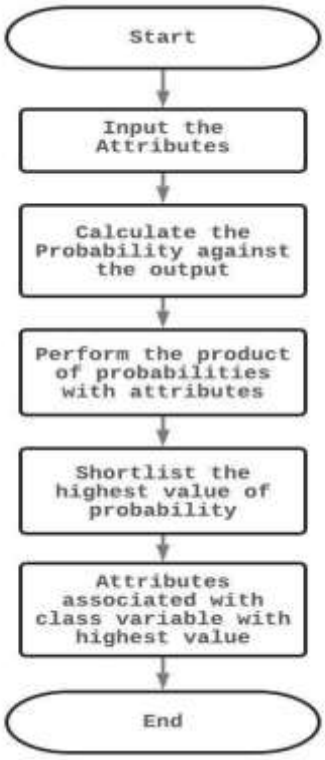
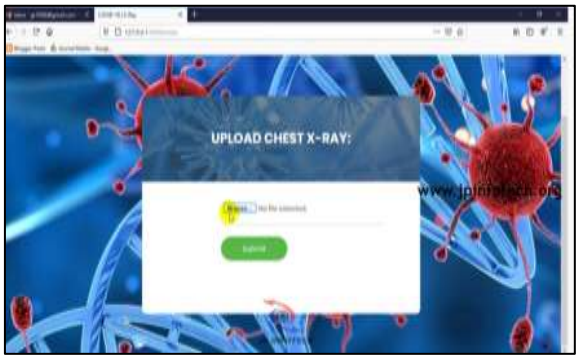


Figure 1: Working of the mechanism

VI. Overall Results and

A. Test Labors

1) TEST FOR COVID 19 USING CHEST X-RaYS UPLOAD XRAYS IMAGES



SELECT IMAGE

Find Covid 19 viruses not found

Analysis Report

VII. Conclusion

The data mining ways can be enforced in association with Naïve Bayes classifier algorithm. Easily the collaboration of these tools performs a prominent part in diagnosing the coronavirus infection or COVID – 19 which is declared as epidemic by WHO. The suggested medium showed emotional results which may lead to farther advances to use data mining, machine literacy, artificial intelligence and information technology for diagnosing the cases for coronavirus. There's a dire need to find out both the cases of coronavirus, which are with the symptoms or asymptotic. It's only the way to break the chain and to control the spread of coronavirus. In future, the analogous medium can be designed with further attributes and using other data mining tools.

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