IS ARTIFICIAL INTELLIGENCE IS A WAY TO DETECT THE COVID-19?

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I. ABSTRACT

Corona Virus is the latest threat over the country. It has different than other virus. So my aim is to give a little idea to detect this virus by machine learning. People are suffering with this very badly. So I have represented a basic algorithm to detect the virus and that can be helpful.

II. KEYWORD

COVID-19, Artificial Intelligence, Machine learning and convolutional neural network

III. INTRODUCTION

The virus "COVID-19" is the current threat for the people. In these days, it is very harmful for both human and animals. The name"COVID-19" was named by WHO(World Health Organization) on feb 11, 2020. Its full form is **Co**rona **Vi**rus **D**isease 20**19.** It started from Wuhan, China late 2019. It was named covid-19 because of "SARS-COV2(Severe Acute respiratory Syndromes Corona Virus-2)" virus. It was first searched in 1968 by a virologist research group.

Why is it named Corona?

According to the journal report of 1968 " these viruses are member of unrecognized group then virologist suggest it should be called corona because of its characteristics presence by which these kind of viruses are recognized in the electron microscope".

Fig. 1:- Picture of corona and its shape

These viruses are single-standard RNA virus. Its size is about 120 nanometres in diameter. They are liable to mutation and recombination and therefore they are highlyvaried. They mainly affect human, non-human mammals and birds. Mostly they exist in in bats.

The virus COVID-19 is thought to have originated in bats and then to human perhaps by blot of meat from wild animals as sold in China's meat markets.

IV. TERMINOLOGY

A. COVID-19

It's a disease caused by the new corona virus that emerged in China in December 2019. It was named COVID-19 by World Health Organization in February 2020. It can be spread from person to person. Its cure is not found yet.

Its symptoms are:-

- Fever
- Tiredness
- Dry cough
- Aches and pains
- Nasal Congestion
- Runny nose
- Sore throats
- Diarrhoea

Its symptoms appear in people within 14 days.

B. ARTIFICIAL INTELLIGENCE

Artificial intelligence or AI is the intelligencedemonstratedby machines. In simple terms we can say,"An intelligence machine that mimic human behaviour". It means we can create some mechanism that can perform the task like human or we can say better than human. I takes input from the outer environment and accomplish the task. Such mechanisn precieves its environment and maximize its chances of successfully achiving its goals.
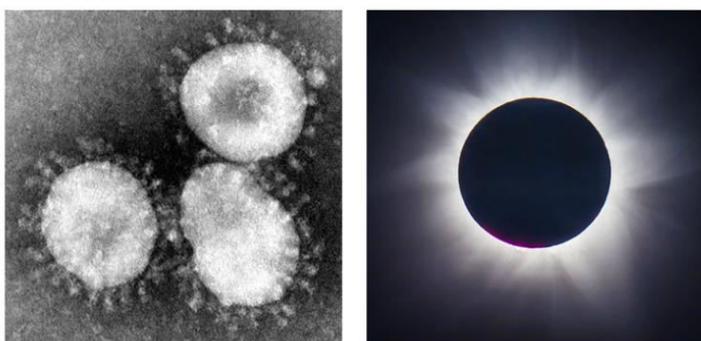
Example:- Spam detection, Auto-mobile mechanisms etc.

C.   MACHINE LEARNING

Machine learning or ML is the subset of AI that make machines to learn itself. It was introduced by **Aurthur Samuel** in 1959. It is the mostly used technologies in these days for image recognition, speech recognition, email filtering, etc. It helps AI to develop such machines that learns from its experiences and perform the task without human interference. It learns from historical data, builds the prediction model and predicts the output for it.

D.   CONVOLUTION NEURAL NETWORK

In simple terms, Convolution neural network work like regular neural network except it has a convolution layer that is a filter. CNNs are made up with the artificial neurons with learnable weights and biases. Neuron takes input,returns a weighted sum total over them, hand it through initiation function and gives output.

V.   HOW DOES IT EFFECT HUMANS ?

The appearance of corona virus is because of spike-glycoproteins which are necessary for the viruses to enter in the host cells. The spike is divided into two parts:-

A.   One Subunit(S1)

It binds to a receptor on the surface of the host's cell.

B.   Other Subunit(S2)

It fuses with the cell membranes. The cell membrane receptor for both SARS-COV1 and SARS-COV2 is a form of angiotensin converting enzymes(ACE-2).

Briefly, the S1 subunit of the spike binds to the ACE-2 enzymes on the cell membranes surface a host trans membrane serine protein(TMPRSS-2) then activate the spike and a leaves ACE-2, TMPRSS-2 also acts on the S2 subunit, facilitating fusion of the virus to the cell membrane.

The virus then move into the cell. Inward the cell, the virus is emancipated from endosome by acidification or the action of an intracellular systems, protease and cathepsin.

Here is the little description to understand it better:-

i.   The corona virus gets to cell membrane.
ii.   An S1 subunit(RED) at the distal end of a glycoprotein spike of the virus bonds to a membrane bound molecule of ACE-2(BLUE).
iii. As more S1 subunit of the glycoprotein spikes unite to membrane attached molecules of ACE-2, the

membrane get going to take shape an envelope around the virus.
iv.   The process continues until the endosome is complete.
v.   The virus get in the cell in two ways:-

a)   A cell-membrane bound serine-protease(BROWN), TMPRSS2, hews the virus's S1 subunits(red) from its S2 subunit(BLACK) and also hews the ACE-2 enzymes. The endosome gets in the cell membrane and can be internalized by the cell.

b)   The same serine protease, TMPRSS2, causes irrevocable conformational alterations in the virus's S2 subunits, initiating them, after which the virus meldsto the cell membrane and can be affectedby the cell.
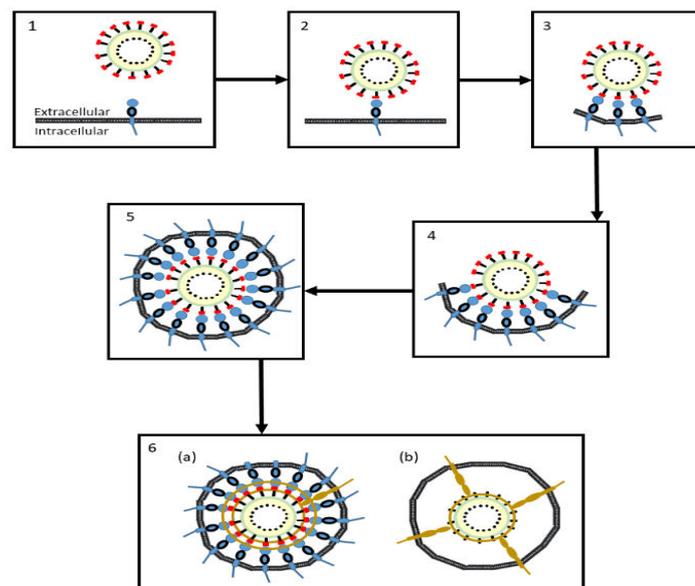

Fig. 2:- A model of entering virus in cell

VI.   ESCAPE MEASURES

In the current time, there is no cure for this virus. Scientist and other virologists are trying to find out its antidore.Whether Indian doctors have found a cure to treat the patient by drugs. This drug is the combination of the anti-HIV, swine flu, and malaria drugs. They give patient a mix of 200mg lopinavir and ritonavir 50mg twice in a day. Doctors also used chloroquine to the patient. In the current day, social-distancing has been a major point to escape with corona virus. If you get sick, you must contact to doctor and make sure to keep distance with another people so that they can't be harmed.

VII.   RESEARCH METHODOLOGY

Artificial intelligence has given us different algorithm to detect the virus. Image recognition is one the selective idea to recognize covid-19 in the blood cell. There have been different algorithms to recognize the image like neural network, deep learning techniques, etc. So I will give a simple algorithm step-by-step to understand it better.

Algorithm:-

i.   First we need to feed the image of corona. For this prepare a dataset of the images and make sure that images size are smaller as like 32*32 pixel so that process can be fast.

ii.   Next, we need to do following steps:-
   a)   Convert the image size smaller by cropping it.
   b)   Flip the image horizontal.
   c)   Adjust hue, contrast and saturation.

iii.   Dissent the dataset into trained_set and test_set.
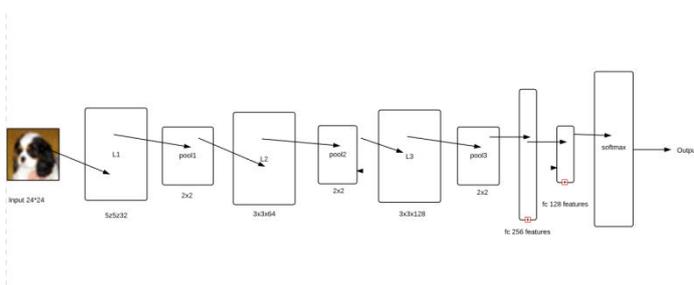
iv.   Now build a Convolution Neural Network.

Fig. 3:- Neural Network Architecture

For this, we need to make 3*3 layer with 2*2 max-pooling.

A. Max-pooling

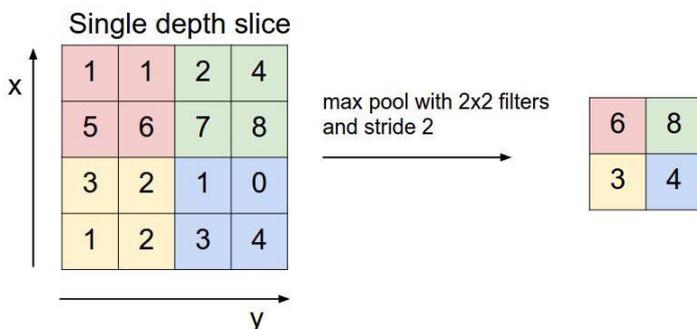It's a technique that reduces the dimension of an image by taking the max value of pixels of grid.

Fig. 4:- Max pool of an image

v.   Now add 2 fully connected layers. It is important to note that two fully connected layers must be in 2-

Dimension state and after output the layers should be in 4-dimenson state. So for that, we need to flatter the layers between them.

vi.   In this module, the parameter identification is a complex task so we must be carefully while passing the arguments.

vii.   In result, we'll get a prediction value that can be false or true.

VIII.   CONCLUSION

Corona virus has been spread over the world. Its cure has not been found. That's why many countries and their people are suffering from this. Scientist and virologist are trying to find out its cure so that they can save the people. So I have given a basic algorithm to detect the virus with the help of image processing using CNN.

IX.   REFERENCES

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