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Prediction and Detection of Covid-19 Using Ml / Ai

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ABSTRACT: An infection spread from china to all around the globe named COVID-19 is currently turned into a devil. The dread of death can be effortlessly found in resident of around180 nations and dread to drive us inside. This is a devil of the 21st century. Coronavirus is an individual from the Corona family and brought about by the SARS-CoV-2 infection. Coronavirus was first distinguished in December 2019 at Wuhan, China. This is another infection responsible for respiratory sickness known as COVID-19. We have restricted articles on the Coronavirus with AI and AI. We don't have any antivirus medication what's more, other informational collection that achieve as a top priority forecast, recognition and stage Distinguishing proof of COVID-19 in Human Bodies. Along these lines, we chose to bring a AI based method with a rundown of datasets that will apply to Covid-19 dataset for distinguishing proof. I firmly accept that ML and Artificial Savvy can help quicken answers for foreseeing the phase of contamination. Our information investigation helps in limiting the effects of the infection related to all the other exploration.

KEYWORDS: COVID-19, AI, SARS, SARS-Co2

I. INTRODUCTION

Coronavirus (COVID-19) is an infectious disease. People who fall sick with COVID-19 experience symptoms and recover after being treated. As of date affirmed COVID-19 cases Footnote1 over the globe are 1,498,833 and mortality around 5.8%. Step by step the death rate is expanding and it's a disturbing variable for the entire world. Transmission is ordered into 4 phases dependent on the method of spread and time. Each country forced various techniques beginning from remaining in-home, utilizing veils, travel limitations, evading get-togethers, every now and again washing hands and sterilizing the spots frequently on account of a typical exertion to fight the flare-up of the disease. Numerous nations forced a lockdown express that forestalls the development of the residents pointlessly. Due to this eviction element and development limitations, the prosperity and economy of various countries are in danger. At the point if the individual is found ill, he is segregated and treatment is given. In India, the flare-up of Covid-19 as upset the working of life all in all. All were pushed to remain back to protect themselves. In the underlying stages, the affirmed cases are those gotten back from supervises followed by transmission through nearby transmission. More alert is given to the old and resistance less individuals. The segment of the tainted individuals in India shows that 39 years is the middle. Relatively, individuals somewhere in the range of 21 and 40 years are being influenced more.

What is COVID-19 caused by?

The virus COVID-19 is primarily transmitted through droplets that occur once a COVID-19 infected person coughs, sneezes or exhales. These droplets are too significant to hold/fly within the air, so they quickly fall to the ground or surface. 1. On the basis of this, we started our research to find a way by which the probability of having COVID-19 should be detected on the basis of the symptoms of a person like

1. **Age**
2. **Gender**
3. **Fever**
4. **Cough**
5. **Additional Symptoms (chest pain & breathing problem etc.)**
6. **Lungs Disease History**
7. **Travel History**
8. **Medical History (diabetes, cancer & blood pressure etc.)**
9. **Condition of Symptoms (in last 48 hours)**

Our application will act like a chatbot for the user, the user interacts with it and will provide all of its details, including his symptoms, problems, traveling history, and habits. Then on the basis of the dataset, that we have

collected from the previous covid-19 positive patients, this Machine Learning based application will predict the probability of having COVID-19.

II. PROPOSED METHODOLOGY

We should try and rate the testing techniques of covid-19 victims the Priority-based automatic Testing System (PbATS) with the assistance of machine learning. Using the PbATS algorithmic rule we will try and categorize the folks that supported the input. We have a tendency to categorize the peoples into three classes as follows:

Category 1 – (Low Risk) - (Self-Quarantined): People who are either not affected or still not showing any symptoms however affected (false-negative in terms of ML). Hence they need to bear the PbATS up to a precise period of time.

Category 2- (Medium Risk) - (Test-Priority): This class contains some false-negative results however started showing covid-19 symptoms and thus need manual testing.

Category 3 – (High Risk) - (Healthcare services-priority): They are the peoples who are seemingly affected with COVID-19 and hence, have to be strictly quarantined and have to provide priority in hospital services.

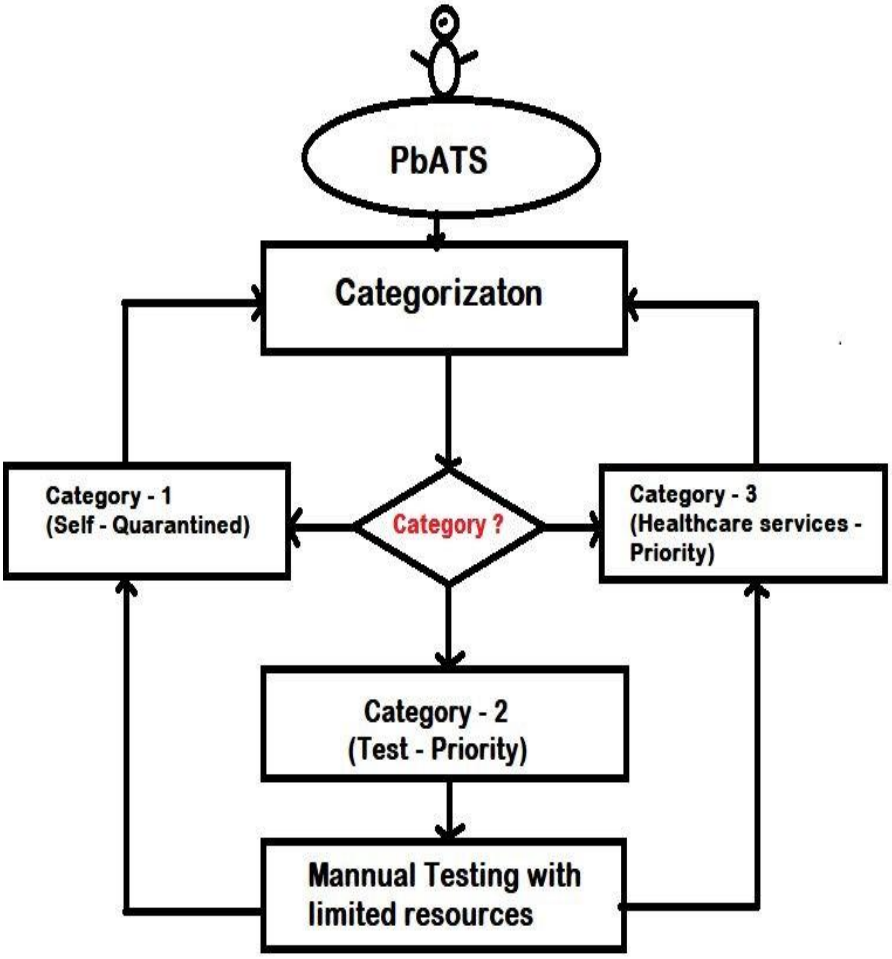


Fig.1 PbAts Data Flow diagram

Machine learning
Artificial Intelligence
Algorithm used: Gradient boosting Algorithm is a ML technique, which is mainly used for regression and classification, that produces a predictable model which is a form of association of infirm prediction models, usually called trees.

Gradient boosting Algorithm mainly involves three elements:

1. **Loss function (problem being solved)**
2. **Weak learner (decision tree is used as a weak learner)**
3. **Additive model (Trees are added one at a time, while existing trees in the model are not changed.)**

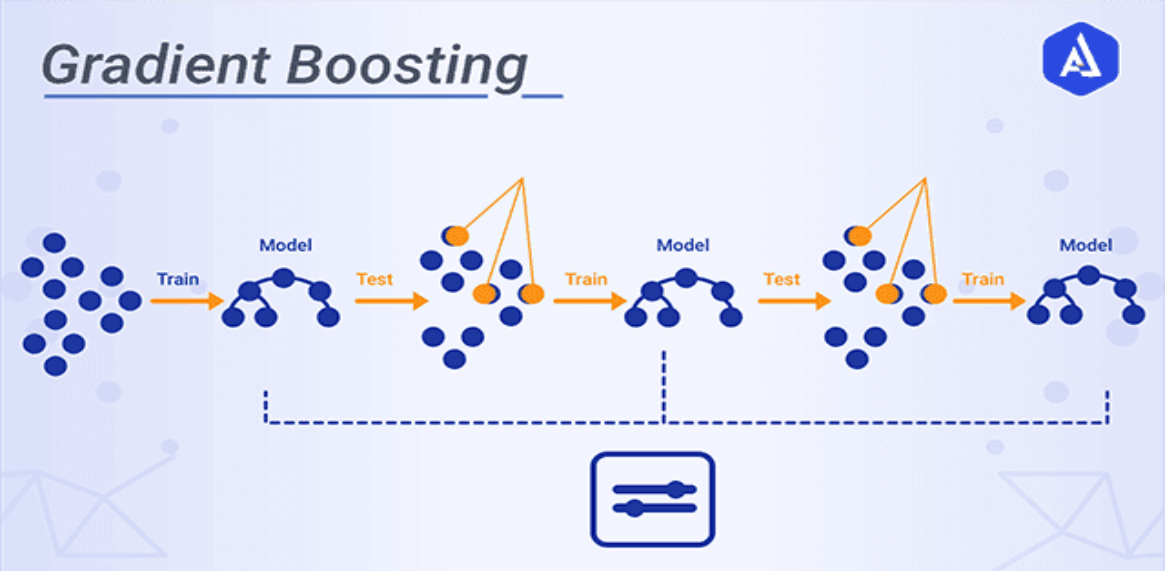


Fig.2 Gradient Boosting

Following are the steps for data preprocessing

1. Collection of data.
2. Data Filtering.
3. Smoothing of data.
4. Reduction of data.
5. Pattern analysis.

Steps for fitting the data into the Algorithm

1 - First fit decision tree on the data talking X as input Y as output.

2 - Calculate the percentage error and then subtract the predicted value from the actual target value.

{error*1*= *y* - *y_pred_1* }

3 - With the help of same input variable fit a new model on error residuals as targeted value.

{eg- errorpred_1 }

4 – Add the new predicted value to the previous predicted value.

{ y2_pred = y_pred1 + errorpred_1 }

5 – Repeat the steps 2 to 4 untill the model get overfit, that can be controlled by consistently validating the data.

$$Loss = MSE = \sum (y_i - y_i^p)^2$$

where, y_i = ith target value, y_i^p = ith prediction, $L(y_i, y_i^p)$ is Loss function

$$y_i^p = y_i^p + \alpha * \delta \sum (y_i - y_i^p)^2 / \delta y_i^p$$

which becomes, $y_i^p = y_i^p - \alpha * 2 * \sum (y_i - y_i^p)$

where, α is learning rate and $\sum (y_i - y_i^p)$ is sum of residuals

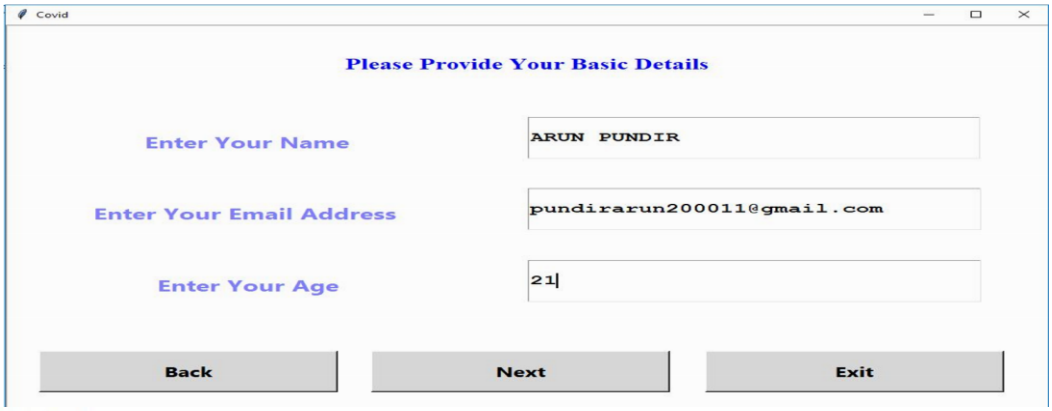
DATASET

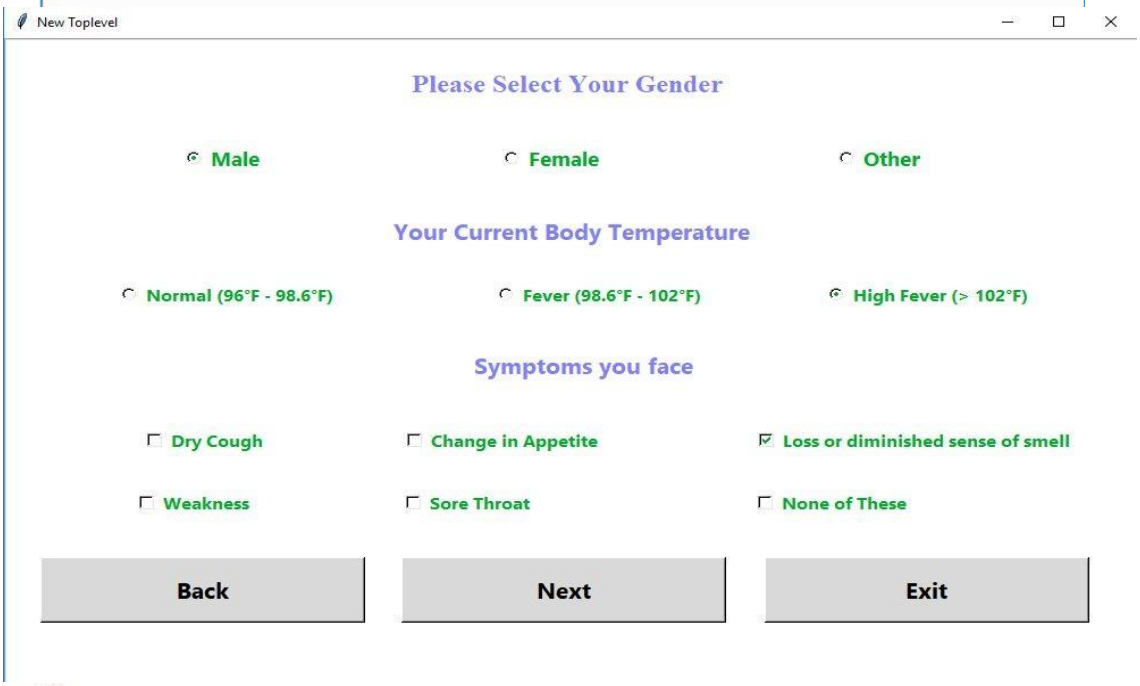
Age	1- Male 2- Female
Body Temprature	1-Normal (96 - 98.6) 2-Fever (98.6 - 102) 3-High Fever (>102)
Symptoms	1-Sore Throat 2-Weakness 3-Loss or diminished smell 4-Dry Cough 5-Change in appetite
Additionals symptoms	1-Feeling Breathless 2-Chest pain 3-sevre cough
Diseases	1-Lung Disease 2-diabetes 3-Reduced Immunity
Symptoms Progress in last 2 days	1-Improved 2-Worsened 3-No change
Travelling Details	1-No travel history 2-Traveled in affected areas

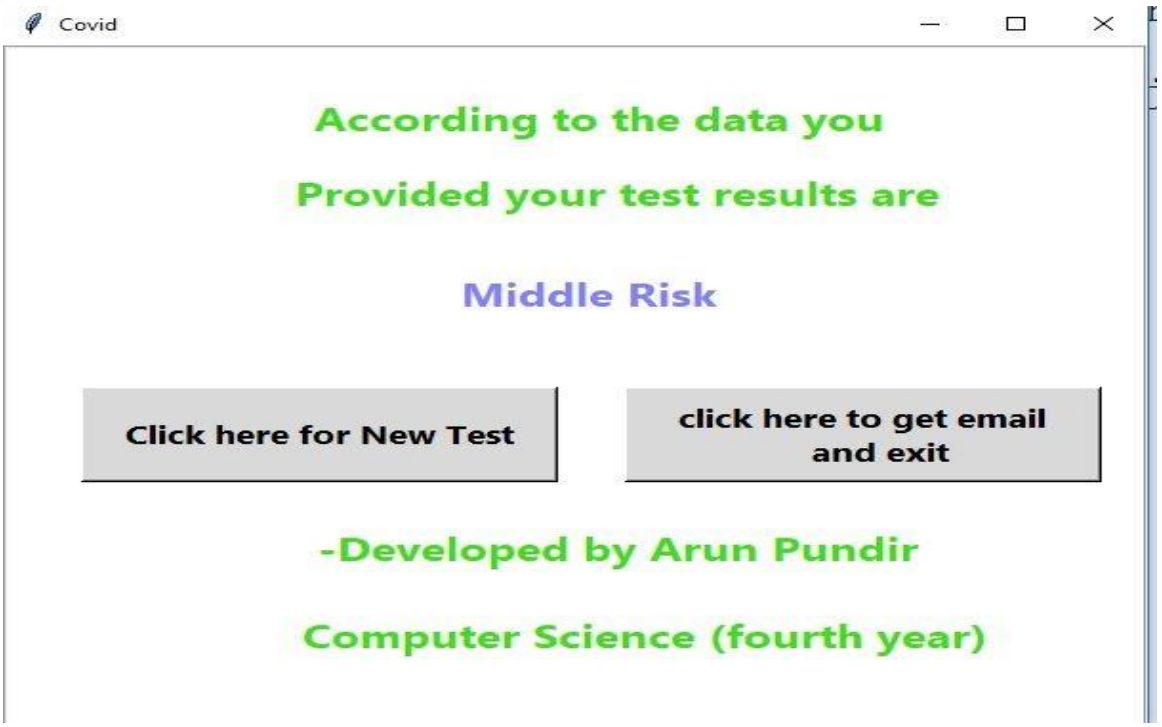
Sample data

Age	Gender	Current Body Temperature	Symptoms	Additional Symptoms
20	Male	Normal (96?F - 98.6?F)	Dry Cough	Moderate to severe cough
20	Male	Fever (98.6?F - 102?F)	Loss or diminished sense of smell	
20	Female	Normal (96?F - 98.6?F)	Change in appetite	Chest pain
20	Female	High Fever (>102?F)	Weakness	Difficulty in breathing
20	Female	Fever (98.6?F - 102?F)	Dry Cough	Severe weakness
21	Male	High Fever (>102?F)	Weakness	Difficulty in breathing
21	Other	Fever (98.6?F - 102?F)	Change in appetite	Persistant pain

Output Screens


Covid
Please Provide Your Basic Details
Enter Your Name
ARUN PUNDIR
Enter Your Email Address
pundirarun200011@gmail.com
Enter Your Age
21
Back
Next
Exit


New Toplevel
Please Select Your Gender
Male
Female
Other
Your Current Body Temperature
Normal (96°F - 98.6°F)
Fever (98.6°F - 102°F)
High Fever (> 102°F)
Symptoms you face
Dry Cough
Change in Appetite
Loss or diminished sense of smell
Weakness
Sore Throat
None of These
Back
Next
Exit


Covid
According to the data you
Provided your test results are
Middle Risk
Click here for New Test
click here to get email and exit
-Developed by Arun Pundir
Computer Science (fourth year)

III. RESULT AND CONCLUSION

The result of the analysis of having COVID-19 proves that if a person having a High probability of having COVID-19, then he/ she will have to take more precautions than the one with Moderate or Low Probability. He/she is more prone to suffer from COVID-19. On the other hand, having a moderate probability of COVID-19 means that the person is prone to the virus but there are more chances for him to stay safe from the virus. But, Low probability doesn't mean that the person won't have any probability of having Corona as a disease, or he will never be affected by the virus. This only means that the person is less prone to the virus than the one with having moderate or high probability. Our next step will be to extend this application to provide prescriptions to the people of all of the three categories including High, Medium, and Low. In the above observation, a 20 years old male is having a High Fever (i.e >102'F). He is now having a diminished sense of smell and feels breathless with no smoking background and have a traveling history in affected areas. His reduced Immunity makes his condition more worsened. In that case, he comes out with High probability of having COVID-19. This project efficiently predicts the probability of having COVID-19 to the different age group people. And, here our observation shows that our application is 90% efficient in predicting COVID-19 to the people. In future work, we shall extend our proposed scheme to provide precautionary measures to the needy along with the probability of having COVID-19.

REFERENCES

[1]. Pavan K. Attaluri "Applying machine learning techniques to classify H1N1 viral strains occurring in 2009 flu pandemic" Published in 2009.
[2]. Schoeman D, Fielding BC. "Coronavirus envelope protein: current knowledge". Virol J 2019;16:69.
[3]. Wim Naudé "Artificial Intelligence against COVID-19: An Early Review" towardsdatascience.com 2020.
[4]. Burhanuddin Bhopalwala "A potential Machine Learning approach that can help stop COVID-19" towardsdatascience.com 2020
[5]. Harish Kumar et.al. "Progressive Machine Learning Approach with WebAstro for Web Usage Mining" International Conference on Computational Intelligence and Data Science (ICCIDS 2019).
[6]. Ran Yang et.al "Chest CT Severity Score: An Imaging Tool for Assessing Severe COVID- 19" Project No. 2020CDJYGRH-YJ03.
[7]. Nicodemus Nzoka Maingi et.al."Comparative Analysis of the C4.5 and ID3 Decision Tree Algorithms for Disease Symptom Classification and Diagnosis", International Research Journal of Advanced Engineering and Science ISSN (Online): 2455-9024, Volume 4, Issue 2, pp.188-194, 2019
[8]. Shaukat K, Masood N, Mehreen S, Azmeen U (2015) Dengue Fever Prediction: A Data Mining Problem. J Data Mining Genomics Proteomics 6: 181. doi:10.4172/2153