A Covid-19 Identification Framework for Vulnerable Using Technology Intervention

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Abstract: - The World Health Organization (WHO) mentioned the Global Outbreak Alert and Response Network (GOARN) has launched a GOARN COVID-19 Knowledge hub. Fever, dry cough, and tiredness are the most common symptoms of COVID-19. Another report from WHO says that laboratory testing guidance for COVID-19 in suspected human cases. Recognizing that the global spread of COVID-19 has increased the number of suspected cases. Thus, a well-formed people support framework is required to safeguard the vulnerable from COVID-19-like disasters in the future. This short paper reports the research findings we conducted by laying out a safeguard and sensible framework for people's well-being during disastrous times. The proposed framework is a fuzzy soft algorithm to improve possible COVID-19 case identification more quickly using a smartphone. The proposed framework has a parameter of fuzzy soft set values like Fever, dry cough, tiredness,etc fed by the user in the mobile application that is identified by using a fuzzy soft algorithm.

Key-Words: - Covid-19, Smartphone, Latitude, Longitude, GPS, Fuzzy Soft.

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1 Introduction

This short paper reports the efforts of the authors to ensure the well-being of public health. The proposed framework provides a comprehensive solution for COVID-19 case identification during disastrous Circumstances. The proposed system ensures that the proper help reaches the people during critical times before it is too late. The world is greatly affected by COVID-19, the first patient of this coronavirus is found in the city of Wuhan, Hubei Province, China. This virus is then spread all over around 215 countries of the World [1]-[2].

As a result, to curb these unprecedented pandemics various measures are taken like Social Distancing, Lock-Down which significantly affecting not only human health but the economics, transportation, education, etc. The government is looking for solutions to deal with this Coronavirus outbreak to provide proper healthcare solutions to the citizens [3].

A huge attack on human health has been noticed globally due to the novel Coronavirus "COVID-19" as named by WHO (World Health Organization). COVID-19 outbreak emerged from a seafood and animal market situated in the city of Wuhan, Hubei Province, China, and investigations are ongoing to determine the origins of the infection [4].

A Smartphone has various types of features such as phone calls, messages, various applications, etc. Smartphones will browse the web run computer code programs sort of a laptop. Smartphones use slightly screens to permit users to move with them [5].

There are thousands of Smartphone apps in conjunction with games, personal-use, and business-use programs that everyone runs on the phone. Latitude and longitude measurements are the key points of our proposed model. This model is used for an earth [6]-[7].

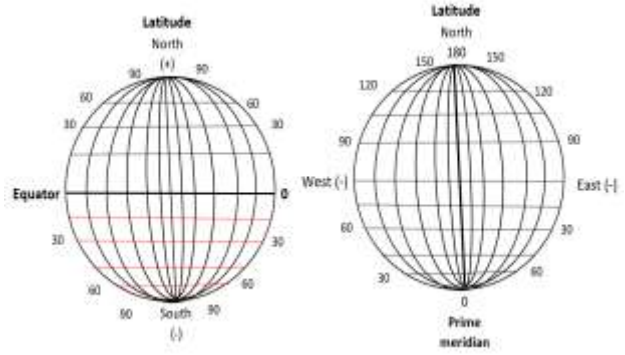

Fig 1: Latitude and Longitude

2 Problem Formulation

GPS is for the radio navigation system for navigating a path or track. It uses radio waves between satellites and a receiver within your phone to produce location and time data for any software package that has to use it.

Definition 1: Let U be the initial universe set and the group of parameters is E. Let P (U) be the set of all fuzzy sets of U and A ⊂ E. A pair (F, A) isa fuzzy soft set over U, wherever F could be a mapping given by F: A→P (U).

Example 1: In reality, taint a lot of data is fuzzy, we can't portray fuzzy data with just two numbers 0 and 1, and we regularly utilize a participation work rather than the fresh numbers 0 and 1 to describe it. At that point, the fuzzy soft set (F,A) can portray the "appeal of the houses" under the Fuzzy conditions.

$F(e_1) = \{ h_1 /0.5, h_2/0.7, h_3 /0.6, h_4/0.8, h_5/0.3\}$

$F(e_2) = \{ h_1 /0.9, h_2/0.4, h_3 /0.8, h_4/0.3, h_5/0.2\}$

$F(e_3) = \{ h_1 /0.5, h_2/0.4, h_3 /0.8, h_4/0.5, h_5/0.8\}$

The likeness proportion of two Fuzzy Soft Sets can be applied to distinguish whether an evil individual is experiencing a specific ailment or not. An evil individual having certain side effects, is experiencing COVID-19, First, the Fuzzy Soft Sets is developed for both sick and sick people.

2.1 Algorithm

CIFS (COVID-19 Identification through Fuzzy Soft)

Input: Parameters of Fuzzy Soft F
Output: Distance and Similarity between observed and expected set

1. Develop a Fuzzy Soft Set (F_1, E) over the universe U dependent on a specialist
2. Develop a Fuzzy Soft Set (F_2, E) over the universe U dependent on manifestations
3. Ascertain the separations of (F_1, E), (F_2, E), (F_3, E)
4. Ascertain likeness proportion of (F_1, E), (F_2, E), (F_3, E)
5. Use similitude to assess the outcomes
6. Calculate Distances and Similarities between ((F_1, E), (F_2, E)) and ((F_1, E), (F_3, E)).

3 Problem Solution

Our work is a very new and effective measure because it is entirely based on earth position value and mobile technology. For demonstration purposes, the six parameters of three Fuzzy soft sets each are created and presented in Table 1.

Table 1. Status Activity Demonstration e_1

S.No	Status	Fuzzy soft set	e_1
1	Yes	(F_1, E)	0.4

2	No	(F_1,E)	0.6
3	Yes	(F_2,E)	0.7
4	No	(F_2,E)	0.2
5	Yes	(F_3,E)	0.6
6	No	(F_3,E)	0.4

Table 2.Status Activity Demonstration e_2

S.No	Status	Fuzzy soft set	e_2
1	Yes	(F_1, E)	0.3
2	No	(F_1,E)	0.5
3	Yes	(F_2,E)	0.5
4	No	(F_2,E)	0.3
5	Yes	(F_3,E)	0.5
6	No	(F_3,E)	0.3

Table 3. Status Activity Demonstration e_3

S.No	Status	Fuzzy soft set	e_3
1	Yes	(F_1, E)	0
2	No	(F_1,E)	0.8
3	Yes	(F_2,E)	0.9
4	No	(F_2,E)	0.3
5	Yes	(F_3,E)	0.7
6	No	(F_3,E)	0.2

The activity includes the aggregated data collected from all three fuzzy soft sets concerning a particular status. A fuzzy soft set for (F_1, E) over U for COVID-19 symptoms as per medical expert opinion and fuzzy soft set for (F_2, E), (F_3, E), over U based on data of an ill person.

Table 4 Status Activity Demonstration e_4

S.No	Status	Fuzzy soft set	e_4
1	Yes	(F_1, E)	0.6
2	No	(F_1,E)	0.7
3	Yes	(F_2,E)	0.2
4	No	(F_2,E)	0.8
5	Yes	(F_3,E)	0.6
6	No	(F_3,E)	0.3

Table 5. Status Activity Demonstration e_5

S.No	Status	Fuzzy soft set	e_5
1	Yes	(F_1, E)	0.5
2	No	(F_1,E)	0.2
3	Yes	(F_2,E)	0.6
4	No	(F_2,E)	0.1
5	Yes	(F_3,E)	0.2
6	No	(F_3,E)	0.8

Table 6. Status Activity Demonstration e_6

S.No	Status	Fuzzy soft set	e_6
1	Yes	(F_1, E)	0.2
2	No	(F_1,E)	0.3
3	Yes	(F_2,E)	0.4
4	No	(F_2,E)	0.5
5	Yes	(F_3,E)	0.5
6	No	(F_3,E)	0.3

The data in the table are self-explanatory and we likewise used this innovation and client input six boundaries, which educated the indications regarding COVID-19 in individuals to the android application introduced regarding the matter's cell phone. Positions of the people are recorded using GPS Coordinates to display their latitude and longitude for further analysis.

The distance d1 between (x_i, y_i) and (x'_i, y'_i) is defined as follows:

$$d_1 = \sum_{i=1}^{n} \left|x_i - x'_i\right|^2 + \left|y_i - y'_i\right|^2$$

The Similarity calculation between data points xi,xj :

$S(i,j) = -||xi - xj|^2$

Figure 2 shows the distance calculations that the likenesses between two sets ((F_1, E) and (F_3, E)) of indications are most extreme, in this way, we presume that the individual is conceivably experiencing COVID-19.

Figure 3 shows the similarity calculations between two sets i.e. ((F_1, E) and (F_3, E)). In this, it is observed the similarity between these sets.

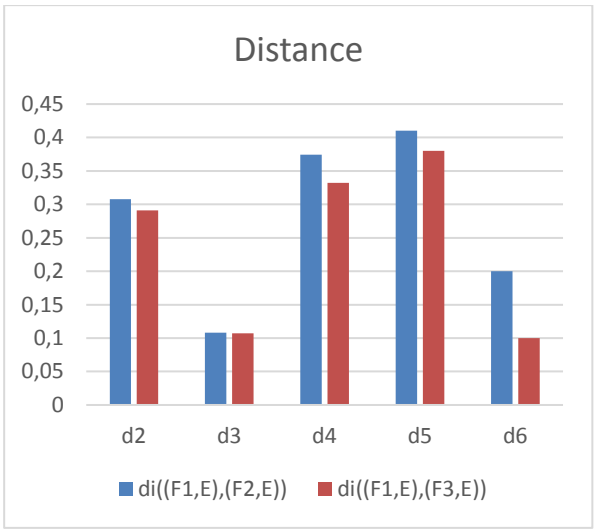

Fig 2: Distance measurement between two sets

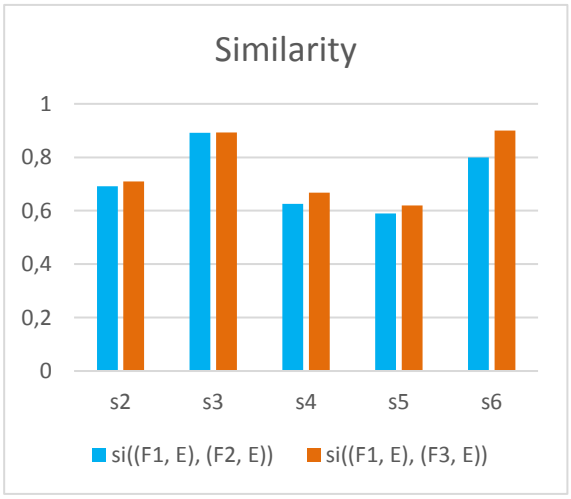

Fig 3: Similarity measurement between two sets

4 Conclusion

During the COVID-19 outbreak, our work is a very new and effective measure because it is entirely based on earth position value and mobile technology. We know that today a mobile phone is an essential part of our daily routine life and more than 70% person use a mobile phone India. Like a word association theory of psychology, using a mobile there may be information transfer between a mobile phone and its COVID-19 volunteer. So, we can say that our GPS Coordinates latitude and longitude provide a solution to safety and security to the people. In some cases where identification is hardly available due to conditions as COVID-19 being positive in a public place and the possibility are very high to spread so identification and separation are required from public places and identified persons that is very harmful to the public health.

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The authors equally contributed in the present research, at all stages from the formulation of the problem to the final findings and solution.

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Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.