



## Analyzes of Mouth Cancer Using Max-Min Composition in Soft Computing

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### ABSTRACT

The intention of making this paper is for the reason that uncertainty in medical reasoning has turned out to be in massive augmentation that it is complicated to be handled. So by means of lending a hand, that is where of the above mentioned health- open-handed system to agree on the concerned problematic factor of mouth cancer, totally using Max-Min composition is found out. Here these lethal types of the cancer, when measured up along with other different and dissimilar cancers that this age group, band that is the generation from this century individuals have and even had been and still being pretentious, in more better expanded way, they have an outcome on all human and beings over the whole wide universe. From the acquired in sequence info, that is from the clinician experts reporting that Smoking, rises of Tobacco products and Alcohol using up in excess or the shortage and avoid doing from too much fuss of drinking are the reason cause for Mouth cancer. Here these causes mentioned according to the clinicians' info are unsure, doubtful and situation to find the effects of mouth cancer are complex, so for this Max-min composition is worn to analyze this issue.

**Key words:** Max-min Composition, fuzzy relation, linguistic term, mouth cancer, tobacco.

### 1. INTRODUCTION

The healthcare organization has enormous volume of data and it is poorly utilized for obtaining the knowledge [1]. The healthcare systems now a day are playing vast role with the recent tools and technologies for disease predictions [2]. The healthcare organizations have more amounts of patient's data and not utilized properly for making the decisions [3]. In the current eras, medicinal system requires the most intellectual system for the diagnosis of the diseases [4]. Most of the passing away of ratio caused in our realm is for the reason that of cancer's growth among people. And, surrounded by those cancers, oral tumor receives the

third position where it pretentious thousands of people for each year [5]. Here from our own insight over the issues and information's on this deadly syndrome ailment, our mother land India has one of the premier levels that are with the common most important, less important resultant and tertiary of citizens are being overstated to these fatal diseases. People that are under the better living, under scarcity poverty and even polished folks judge that Cancer is source starting point of smoking, to their disclosure even smokeless tobacco using habits has turned out to be so far above the ground risk, among the common people, that is found out to be the derivation cause for this complaint of the diseases. It comes in several divisions inside the mouth like oral cavity, tongue under jaws, cheek coating, beneath the teeth, neck side. Ingestion of intense alcohol, tobacco that could be cigarette, smokeless tobacco, masticating the betel nut, sometimes the family history, extremely severe sun coverage, diet these are the hazardous factors of gorge cancer. South and Southeast Asian countries in India are exceedingly overblown by this malignancy put side by side to last nation state [6]. A study of holder organizes that was unavailable from our state; it is also said to be extensively significant for the unrestricted healthiness importance of India.

Foremost, oral tumor is originating at the later stage where the terminations in squat behavior result. Secondly, bucolic neighborhoods are consistent with a lesser amount of proceeds. Low operate and diligence class gives low nourishment, be deficient in of wellbeing be concerned, unpleasant living circumstances are the motivation for it to be in association further on of tumour growth. Malignancies are inherited syndromes that are for the explanation that of cell growth peculiarly as the outcome of broken damaged DNA [7],[ 8]. Inauguration the senior than in sequence about the income reputation, India is surrounded by the countless low-income and central tip proceeds kingdom between countless other territory that the expenditures build the full kin lower poor quality line as a judgment of syndrome very time and all over again show the way to very far greater than the ground a

person's strength payments. The preceding ailment so far had survived makes a diagnosis, so the cure will be triumphant. But ending point of the cancer is exceedingly harsh to restore to health. Supplementary than thousand people, bypass absent every year for the reason that of mounting of the melanoma as there is inadequacy of awareness and medical resources. Owing to non accessibility of health check consultant, people from country surroundings are unsuccessful to make a diagnosis for their ailment. To help out them, expert based on their information arrangement could be constructing to identification any fastidious diseases. Freshly many researchers put up medical based diagnosis system for virus such breast cancer, diabetes, hypertension, etc., [9], [10].

For a year thousands of people everywhere die as of mouth problem. They cannot eat at the same time, as cancer is come about because the sours in the mouth will be sensation like scorching in that condition the one will not be capable to take food appropriately; they be capable of only in taking of water foodstuff this is not an adequate quantity of in favour of the one who has this cancer. Responsiveness surrounded by popular were less before now, good bits and pieces of possession are verbal about using cigarette, brewages, and tobaccos. Smooth despite the fact that everyone routine the equal purpose another time and yet again, there is no utilize [11]. Having the verbal melanoma as a case in indicate we have preferred the few root and personal property. The point stage of the cancer is not accurately experimental by the health centre they more frequently than not use the linguistic expression like very elevated, elevated, intermediate, low down, very low down. We don't know the complete plane of the uncomplaining, using the stipulations is not adequate for the uncomplaining to get appropriate behaviour [12].

This is indecisive here; vacillation that happens is the imperative composite actuality over the therapeutic judgment. Patients cannot put in plain verbal skill truthfully, the tenderness what they be responsive of and what is phenomenon in the body, caretaker or the doctors can't say the correctly what they keep an eye on, lab information on a fastidious someone strength of character outcome in a few scale of fault [13]. To explain the doubtful we have to initiate a practice identified Max-Min work of art in bleary this will give the stage of healthiness topic is convenient for a tolerant. It consists of greatest and smallest process to make out to enlarge and lessen point of verbal sarcoma [14]. Many researchers have not been content with the doubtful term as the steps that are taken also become a illustrate backs is there for each and every challenge. So, we evaluate many and concern and explain the predicament with the Cartesian item for consumption.

## 2. COMMON PROBLEM

Here, the problem faced by the hospital was, suppose if a doctor is unavailable in an hospital the patient cannot treated for the reason what they came. Now a day's many diseases have been increased people were suffering from diseases. To get relief from that kind of illness to get heal from it, there no problems is solved. These troubles are only getting enlarge it is not solved, and also uncertain terms were included to confuse the treatment again.

### 2.1 Previous Problems to Solution

Since the clinicians, surgeons and medical experts as told in the earlier preceding notion, they were able to find the illness for any person, but the value that gave that was lofty, very lofty, and squat and very squat and middle [15]. But they weren't able to tell the accurate high value, but later found that the notion of this would not be uncomplicated for it to judge the problems. And a huge problem arises here as the notations become an obstacle and it would be confusing too. Here as an example if there are three to four children and we were expecting the weight and height for them. And the weight could be with the accurate value, but when we need to tell the height for them we need to make sure that the notations are commonly used to give the person's height that is how tall the kid or the child is.

But using this procedure we can articulate that the value are for each notation like for when the kids are in five and one is taller to another, it can be easy but if we have kids of same height we need to sure or certain if he is a inch taller or shorter to the other so to break this silence we use this to know the exact measure of height. And here this becomes even better and the uncertain not sure notations are made certain using the max-min composition. Now using this max min we have this compassion type to know the valued. Using this medical information's become much easier and effective. They become more sophisticated as well.

### 2.2 Proposed work

For finding the uncertainty many techniques were used but we have chosen a soft computing technique Max-Min Composition to say the accuracy. First we have taken the data between 0 and 1 because it is fuzzy numbers. Then the linguistic term had been taken for the words which are said by the doctors for that we have gone through another step that is triangular fuzzy number it is commonly called as triplet. Here composition will easily identify the person's accurate health condition, for that we have chosen this technique.

### 3. CAUSES AND EFFECTS

**Table 1:** Causes and effects

CAUSES(C)	EFFECTS(E)
C <sub>1</sub> - Tobacco (chewing tobaccos, snuff, cigarettes)	E <sub>1</sub> -Sores on mouth, sores bleeds, teeth gets loose, tongues with sores, paining tongues, full of jaw pains, breathing problem.
C <sub>2</sub> - Pathetic immune System	E <sub>2</sub> - Weak body condition, less nutrition, weight loss, low food intake, damage of body cells.
C <sub>3</sub> - Revelation of lips in the sun	E <sub>3</sub> -Head ache, black lips, sores on lips, itchinness, dry lips, and dizziness.
C <sub>4</sub> - Serious Alcohol habit	E <sub>4</sub> -Loss of immune, loss of digestion, Sore throat, paining while Swallowing.
C <sub>5</sub> - Family issue on cancer	E <sub>5</sub> - Has many possibility of cancer with the family problems.

We have discussed a doctor about the mouth cancer, they had suggested the levels of cancer by seeing the causes and effects what we have taken for the analysis. Doctors had given the linguistic terms for the attributes. We had meet three experts for different opinions.

Expert 1 =	}	<table style="margin: auto;"> <tr><td>H</td><td>M</td><td>M</td><td>L</td><td>VL</td></tr> <tr><td>VL</td><td>VH</td><td>L</td><td>L</td><td>L</td></tr> <tr><td>L</td><td>M</td><td>VH</td><td>VL</td><td>VL</td></tr> <tr><td>H</td><td>M</td><td>L</td><td>VH</td><td>VL</td></tr> <tr><td>VL</td><td>VL</td><td>VL</td><td>VL</td><td>H</td></tr> </table>	H	M	M	L	VL	VL	VH	L	L	L	L	M	VH	VL	VL	H	M	L	VH	VL	VL	VL	VL	VL	H
H	M	M	L	VL																							
VL	VH	L	L	L																							
L	M	VH	VL	VL																							
H	M	L	VH	VL																							
VL	VL	VL	VL	H																							
Expert 2 =	}	<table style="margin: auto;"> <tr><td>VH</td><td>H</td><td>M</td><td>VH</td><td>L</td></tr> <tr><td>VH</td><td>M</td><td>L</td><td>L</td><td>VL</td></tr> <tr><td>M</td><td>ML</td><td>VH</td><td>VL</td><td>M</td></tr> <tr><td>VH</td><td>H</td><td>M</td><td>VH</td><td>L</td></tr> <tr><td>VL</td><td>L</td><td>L</td><td>VL</td><td>M</td></tr> </table>	VH	H	M	VH	L	VH	M	L	L	VL	M	ML	VH	VL	M	VH	H	M	VH	L	VL	L	L	VL	M
VH	H	M	VH	L																							
VH	M	L	L	VL																							
M	ML	VH	VL	M																							
VH	H	M	VH	L																							
VL	L	L	VL	M																							
Expert 3 =	}	<table style="margin: auto;"> <tr><td>VH</td><td>L</td><td>H</td><td>M</td><td>L</td></tr> <tr><td>M</td><td>H</td><td>VL</td><td>VL</td><td>L</td></tr> <tr><td>H</td><td>M</td><td>H</td><td>L</td><td>L</td></tr> <tr><td>M</td><td>H</td><td>L</td><td>H</td><td>VL</td></tr> <tr><td>L</td><td>VL</td><td>L</td><td>VL</td><td>M</td></tr> </table>	VH	L	H	M	L	M	H	VL	VL	L	H	M	H	L	L	M	H	L	H	VL	L	VL	L	VL	M
VH	L	H	M	L																							
M	H	VL	VL	L																							
H	M	H	L	L																							
M	H	L	H	VL																							
L	VL	L	VL	M																							

By completing these relations in matrix form, now need to find the triangular fuzzy number; it will be in three combined number change them in to the single values to identify the higher values.

**Table 2:** Fuzzy number

Linguistic term	Fuzzy Number	X=a+2b+c/4
VH	(0.65, 1, 1)	0.9125
H	(0.5, 0.65, 1)	0.7
M	(0.15, 0.5, 0.65)	0.45
L	(0, 0.15, 0.5)	0.2
VL	(0, 0, 0.15)	0.0375

Now, change the words (terms) in to the found value make those values grouped in matrix. Now the three values altered to solo value for next purpose.

Matrix1: changed from linguistic term to value.

}	<table style="margin: auto;"> <tr><td>0.7</td><td>0.45</td><td>0.45</td><td>0.2</td><td>0.0375</td></tr> <tr><td>0.0375</td><td>0.9125</td><td>0.2</td><td>0.2</td><td>0.2</td></tr> <tr><td>0.2</td><td>0.45</td><td>0.9125</td><td>0.0375</td><td>0.0375</td></tr> <tr><td>0.7</td><td>0.45</td><td>0.2</td><td>0.9125</td><td>0.0375</td></tr> <tr><td>0.0375</td><td>0.0375</td><td>0.0375</td><td>0.0375</td><td>0.7</td></tr> </table>	0.7	0.45	0.45	0.2	0.0375	0.0375	0.9125	0.2	0.2	0.2	0.2	0.45	0.9125	0.0375	0.0375	0.7	0.45	0.2	0.9125	0.0375	0.0375	0.0375	0.0375	0.0375	0.7
0.7	0.45	0.45	0.2	0.0375																						
0.0375	0.9125	0.2	0.2	0.2																						
0.2	0.45	0.9125	0.0375	0.0375																						
0.7	0.45	0.2	0.9125	0.0375																						
0.0375	0.0375	0.0375	0.0375	0.7																						

Matrix2: changed from linguistic term to value.

}	<table style="margin: auto;"> <tr><td>0.9125</td><td>0.7</td><td>0.45</td><td>0.9125</td><td>0.2</td></tr> <tr><td>0.9125</td><td>0.45</td><td>0.2</td><td>0.2</td><td>0.0375</td></tr> <tr><td>0.45</td><td>0.2</td><td>0.9125</td><td>0.0375</td><td>0.45</td></tr> <tr><td>0.9125</td><td>0.7</td><td>0.45</td><td>0.9125</td><td>0.2</td></tr> <tr><td>0.0375</td><td>0.2</td><td>0.2</td><td>0.0375</td><td>0.45</td></tr> </table>	0.9125	0.7	0.45	0.9125	0.2	0.9125	0.45	0.2	0.2	0.0375	0.45	0.2	0.9125	0.0375	0.45	0.9125	0.7	0.45	0.9125	0.2	0.0375	0.2	0.2	0.0375	0.45
0.9125	0.7	0.45	0.9125	0.2																						
0.9125	0.45	0.2	0.2	0.0375																						
0.45	0.2	0.9125	0.0375	0.45																						
0.9125	0.7	0.45	0.9125	0.2																						
0.0375	0.2	0.2	0.0375	0.45																						

Matrix3: changed from linguistic term to value.

}	<table style="margin: auto;"> <tr><td>0.9125</td><td>0.2</td><td>0.7</td><td>0.45</td><td>0.2</td></tr> <tr><td>0.45</td><td>0.7</td><td>0.0375</td><td>0.0375</td><td>0.2</td></tr> <tr><td>0.7</td><td>0.45</td><td>0.7</td><td>0.2</td><td>0.2</td></tr> <tr><td>0.45</td><td>0.7</td><td>0.2</td><td>0.7</td><td>0.0375</td></tr> <tr><td>0.2</td><td>0.0375</td><td>0.2</td><td>0.0375</td><td>0.45</td></tr> </table>	0.9125	0.2	0.7	0.45	0.2	0.45	0.7	0.0375	0.0375	0.2	0.7	0.45	0.7	0.2	0.2	0.45	0.7	0.2	0.7	0.0375	0.2	0.0375	0.2	0.0375	0.45
0.9125	0.2	0.7	0.45	0.2																						
0.45	0.7	0.0375	0.0375	0.2																						
0.7	0.45	0.7	0.2	0.2																						
0.45	0.7	0.2	0.7	0.0375																						
0.2	0.0375	0.2	0.0375	0.45																						

Matrix4: The Dynamic system M

$$M = \begin{pmatrix} 0.8416 & 0.45 & 0.533 & 0.5208 & 0.1458 \\ 0.4666 & 0.6875 & 0.1458 & 0.1458 & 0.1458 \\ 0.433 & 0.3666 & 0.8416 & 0.0883 & 0.6875 \\ 0.6875 & 0.6166 & 0.2833 & 0.8416 & 0.0916 \\ 0.0916 & 0.0916 & 0.1458 & 0.0375 & 0.5333 \end{pmatrix}$$

Patient 1: Let us take the systems of the person who affected by the cancer.

P1 has very high usage of tobacco, Medium immune system, Very Low revelation of sun, High usage of alcohol, Low family history.

P1: {(VH, C1) (M, C2) (VL, C3) (H, C4) (L, C5)}

Now, convert the words of terms in to fuzzy numbers, take that as input vector

P1= A1 = {(0.9125, 0.45, 0.9125, 0.0375, 0.2)}

$$\{\max \{\min\{A1\}\}\} = \{\max\}$$

Compare A1 with the Dynamic System M using Max-Min Composition.

min = {0.8416, 0.4666, 0.4333, 0.0375, 0.0916}

max = {0.8416}

min = {0.45, 0.45, 0.3666, 0.0375, 0.0916}

max = {0.45}

min = {0.533, 0.1458, 0.8416, 0.0375, 0.1458}

max = {0.8416}

min = {0.5208, 0.1458, 0.0883, 0.0375, 0.0375}

max = {0.5208}

min = {0.1458, 0.1458, 0.6875, 0.0916, 0.5333}

max = {0.6875}

**B1= {0.8416, 0.45, 0.8416, 0.5208, 0.6875}**

Matrix5: Compare B1 with the Dynamic System M<sup>T</sup> using Max-Min Composition.

$$M^T = \begin{pmatrix} 0.8416 & 0.4666 & 0.433 & 0.6875 & 0.0916 \\ 0.45 & 0.6875 & 0.3666 & 0.6166 & 0.0916 \\ 0.533 & 0.1458 & 0.8416 & 0.2833 & 0.1458 \\ 0.5208 & 0.1458 & 0.0883 & 0.8416 & 0.0375 \\ 0.1458 & 0.1458 & 0.6875 & 0.0916 & 0.5333 \end{pmatrix}$$

B1= {0.8416, 0.45, 0.8416, 0.5208, 0.6875}

min = {0.8416, 0.45, 0.533, 0.5208, 0.1458}

max = {0.8416}

min = {0.4666, 0.45, 0.1458, 0.1458, 0.1458}

max = {0.4666}

min = {0.433, 0.3666, 0.8416, 0.0883, 0.6875}

max = {0.8416}

min = {0.6875, 0.45, 0.2833, 0.5208, 0.0916}

max = {0.6875}

min = {0.0916, 0.0916, 0.1458, 0.0375, 0.5333}

max = {0.5333}

**A2 = {0.8416, 0.4666, 0.8416, 0.6875, 0.5333}**

Compare A2 with M,

A2 = {0.8416, 0.4666, 0.8416, 0.6875, 0.5333}

min = {0.8416, 0.4666, 0.433, 0.6875, 0.0916}

max = {0.8416}

min = {0.45, 0.4666, 0.3666, 0.6166, 0.0916}

max = {0.6166}

min = {0.533, 0.1458, 0.8416, 0.2833, 0.1458}

max = {0.8416}

min = {0.5208, 0.1458, 0.0883, 0.6875, 0.0375}

max = {0.6875}

min = {0.1458, 0.1458, 0.6875, 0.0916, 0.5333}

max = {0.6875}

**B2 = {0.8416, 0.6166, 0.8416, 0.6875, 0.6875}**

Compare B2 with M<sup>T</sup>

B2 = {0.8416, 0.6166, 0.8416, 0.6875, 0.6875}

min = {0.8416, 0.45, 0.533, 0.5208, 0.1458}

max = {0.8416}

min = {0.4666, 0.6166, 0.1458, 0.1458, 0.1458}

max = {0.6166}

min = {0.433, 0.3666, 0.8416, 0.0883, 0.6875}

max = {0.8416}

min = {0.6875, 0.6166, 0.2833, 0.6875, 0.0916}

max = {0.6875}

min = {0.0916, 0.0916, 0.1458, 0.0375, 0.5333}

max = {0.533}

**A3 = {0.8416, 0.6166, 0.8416, 0.6875, 0.5333}**

Compare A3 with M

A3 = {0.8416, 0.6166, 0.8416, 0.6875, 0.5333}

min = {0.8416, 0.466, 0.433, 0.6875, 0.0916}

max = {0.8416}

min = {0.45, 0.6166, 0.3666, 0.6166, 0.0916}

max = {0.6166}

min = {0.533, 0.1458, 0.8416, 0.2833, 0.1458}

max = {0.8416}

min = {0.5208, 0.1458, 0.0883, 0.6875, 0.0375}

max = {0.6875}

min = {0.1458, 0.1458, 0.6875, 0.0916, 0.5333}

max = {0.6875}

**B3 = {0.8416, 0.6166, 0.8416, 0.6875, 0.6875}**

After knowing the levels of patient we can say the exact stage of the patient here, P1 has

With  $M = A2 = \{0.8416, 0.4666, 0.8416, 0.6875, 0.5333\}$

With  $M^{\wedge}T = A3 = \{0.8416, 0.6166, 0.8416, 0.6875, 0.5333\}$

$M = B2 = \{0.8416, 0.6166, 0.8416, 0.6875, 0.6875\}$

$M^{\wedge}T = B3 = \{0.8416, 0.6166, 0.8416, 0.6875, 0.6875\}$ , the patient had C1 and C3 Causes are higher i.e, the person should taken more tobaccos and revelation of sun on lips so both gives the effects of black lips, sores, redness, sores.

Now, we could identify the absolute value for the one who is affected by the mouth cancer.

#### 4. RISK FACTORS

Commonly cancer consists of many risks:

- Usage of tobaccos together with cigars, pipes, snuff, smokeless tobaccos
- More alcohol using in particular with the tobaccos
- Fair skin people will affected with the cancer by sun exposure

Compared with females males are affected by the oral cancer the rating taken by the reviewers says only about the males, because they addicted with the alcohol, tobacco, and sun exposure. So they can easy get in to the many type of cancer. Cells in human body will automatically increase by these unwanted habits. South Asian peoples were involved in the cancer with other countries.

Cancer may occur in upper or lower lips or in the sides of teeth it will lead to damage of cavity. The one cannot eat food properly need to take only the watery food surely it will affect the immune system because there no consumption food to the level of increase the virus fighting cells. Automatically the person will not get correct nutrition and fight against the cancer cells it will cause increase the sores in the mouth with bleeding. So it will not cure that much fast suppose the patient has sugar surely the sore will not heal quiz, take more time to get rid of the problem.

Many treatments and suggestions are available do follow those things to easily get back from the original health condition. So follow the doctor's suggestion and make the things easy for the health. Most of the people don't know the seriousness of the cancers, if any camps

on full body check-up make use of it without ignoring it.

#### 5. TREATMENT

For oral cancer many treatments are available. These treatments are shows very high effectiveness for the one appears for the uncton.

**Chemotherapy:** it is for the first stage of mouth cancer about 2 centimetres it will lead the treatment called chemotherapy.

**Radiation:** it consists of rays to get through the cancer cells and destroy the cells. It is used to enhance the treatment accurately.

**Surgery:** it is based on the person's cancer level if he/she has gone extreme rate of the cavity problem no other way only it has to get surgery.

#### 6. CONCLUSION

In this Paper, we have shown the certain numbers from the linguistic term by using Max-Min Composition. The chosen causes and effects are correctly matching the matrixes and the comparisons with the system also satisfied. We have proved the uncertainty can also be changed using the algorithm. Whenever the hospitals without the doctors this paper will be help full for treat the persons with the oral cancer.

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