Turiyam Set and Its Mathematical Distinction From Other Sets

Prem Kumar Singh[1,*]

[1]Department of Computer Science and Engineering,
Gandhi Institute of Technology and Management-Visakhapatnam, Andhra Pradesh 530045, India
ORCID**:** orcid.org/0000-0003-1465-6572
Emails: premsingh.csjm@gmail.com; premsingh.csjm@yahoo.com

Abstract

Recently, many researchers paid attention towards exploration of dark data sets. In this process, a problem is addressed while characterization of dark data sets and its representation. One of the suitable examples is cricket data analysis where a match among two team's likes India-Pakistan does not depends on win, draw or loss. There are many matches where Pakistan (or India) losses the match from any weak team in case India (or Pakistan) get out from the Tournament. These types of hidden or dark uncertainty can be represented via Human quantum Turiyam cognition in four dimensional rather than three-dimensional unconscious set. To understand these types of problems current paper tried to explore the Turiyam set with an illustrative and its distinction from other available sets.

Keywords: Ambiguous; Knowledge representation; Turiyam set; Turiyam graph; Uncertainty; Unknown

1. Introduction

Recently, Turiyam set [1-4] and its algebra [5-12] is studied for dealing the unknown data [13-16] in four dimensional space [17-19]. In this case several researchers mailed me about its applications and its exploration in pattern finding [20-22]. Same time some of the researchers confused about its distinction from available set [23]. One of the researchers tried to define the difference among Turiyam set with others [24]. The reason is the neutrosophic set [25] has many issues as explored by Rivieccio [26] with an example which motivated many authors to start work in four dimensional data sets [27-28]. One of the major issues is finding some real life examples for the three dimensional data sets and computing its complement as shown in Figure 1. It represents the Linked Triangle in Indian context by Chola before 11^{th} century. In similar type of image is shown in France at 13^{th} century called as Borromean rings shown in Figure 2. These types of triangle or rings need four dimensions for exploration as shown in Figure 3. It motivated the Singh who introduced the Turiyam set in 2021 for dealing these types of dark data sets in exploration based on human consciousness. However many researchers mailed me that this set is nothing but just three dimensional. Some of the researchers mailed me about applications of Turiyam set and its distinction from other available sets in four dimensional. To solve this issue, author tried to give some potential and neck point difference of Turiyam set with neutrosophic, Plithogenic and Ambiguous set with an example.

Table 1 : Turiyam set and its differences from recently available sets

	Neutrosophic Set [24-25]	Plithogenic set [17, 29]	Ambiguous set [18, 26]	Turiyam set [3-4, 10-19, 27]
Data	Uncertain	Multi-attributes	Ambiguity in event	Dark or Unknown data
Range	$[-3^-, +3^+]$ in case of independent otherwise [0, 1]	$[-3^-, +3^+]$ in case of independent otherwise [0, 1]	[0, 2] where each events are dependent on each other.	$[-4^-, +4^+]$ in case of independent otherwise [0, 1]

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True Part	Yes	Yes	Yes	Yes
False part	Yes	Yes	Yes	Yes
Hesitant part	Yes	Yes	No	Yes
Partially false or True part	No	Yes	Yes	Yes
Geometry	NeutroGeometry	No	No	Unknown Geometry
Dependent event	Yes	Yes	Yes	Yes
Independent events	Yes	Yes	Yes	Yes
Complement	Issue	Issue	No Issue	No issue
Consciousness	No	No	No	Yes
Expert to Expert	Same	Same	Same	Varies
A Real application	Gender like Male, Female, Transgender	Soil or Air Pollution data	Customer feedback towards Pizza in restaurant	Citation data, law, Robotics, voting, Journal rank analysis, Cricket data analysis

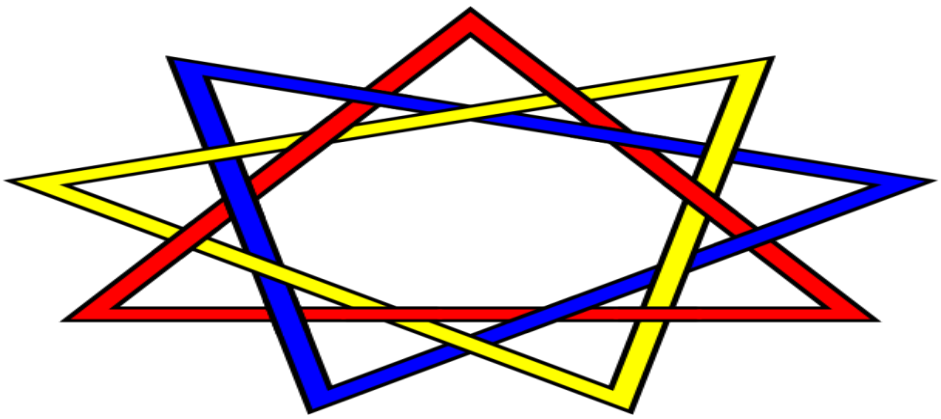

Figure 1: The linked Triangle of true, false or uncertain regions

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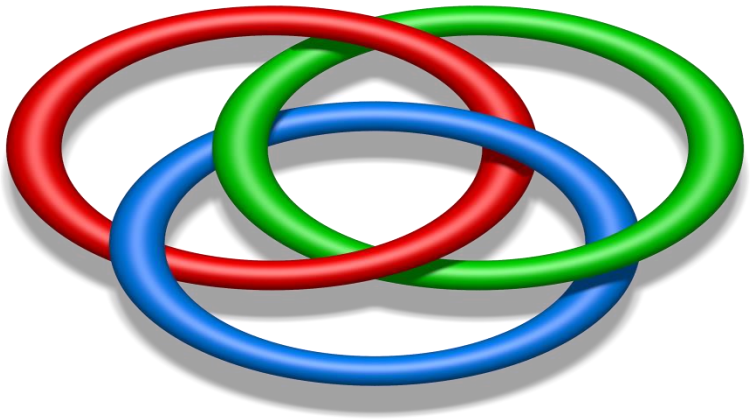

Figure 2: The complement of Borromean Rings

Table 1 explored some potential difference among Neutrosophic set, Plithogenic set, Ambiguous set and Turiyam set based on various mathematical structures. One of the suitable examples for data with Turiyam set is cricket. Let us suppose two Teams A and Team B. They have four way consciousnesses to play with each other beyond win, draw or loss. First both team known to each other, not known to each other, Uncertain to each other or last one is unknown as shown in Table 2. It means any team A or B play the Test cricket or ODI may win the match, draw the match of loss the match. However Turiyam says in case the Team A and B is India and Pakistan then no one can predict the pattern of win, draw or loss. India (Team A) can win (or loss) any match with weak team in case Pakistan get out from the Tournament. It applied vice versa also. These types of loss are considered as win in India (Pakistan) in case it happens. However Neutrosophic, Plithogenic or Ambiguous considers it as loss. This difference can be easily represented as Turiyam set. In similar way any weak team draw the match with strong team then these types of draw is almost considered as Win by the concern expert. These types of human super consciousness and its pattern can be easily represented by Turiyam set as shown in Table 3. In this way Turiyam set is totally distinct than any of the available set discussed in Three-way space (i.e. True, false or Uncertain regions). It gives a way to explore the three dimensional gimbal lock in fourth dimension using human consciousness as shown in Figure 3. Turiyam consciousness changes based on space and time which impacts the exploration of data when compared to Neutrosophic, Plithogenic and Ambiguous set. In this paper author tried to give some of the other examples for applications of Turiyam set for various decision making process.

Table 2: Some possible Turiyam relations exists among Team A and Team B

Conditions	Team A	Team B	Relation
(a)	Known	Known	True relation(*t*)
(b)	Known	Unknown	Uncertain relation(*i*)
(c)	Unknown	Known	Uncertain relation (*i*)
(d)	Known	Refused	False Relation (*f*)
(e)	Refused	Known	False relation (*f*)
(f)	Unknown	Unknown	Liberal Relation(*l*)
(g)	Refused	Refused	Liberal Relation(*l*)

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Table 3: Turiyam set representation of Team *A* Team beyond win, draw or loss

Team *A*	Neutrosophic set	Plithogenic Multi-attribute set	Ambiguous set	Turiyam set	Turiyam Interpretation
Team *B*	(Win-*t*, Draw-*i*, Loss-*f*)	(Win-*t*, Draw-*i*, Loss-*f*)$_m$	(Win-t_1, Partial Win-t_2, Partial Loss-f_1, Loss- f_1)	(Win-*t*, Draw-*i*, Loss-*f*, Liberalization-*l*)	Extracting the Human consciousness involvement in win, draw or loss of the match.
Team *C*	(0, 0, *f*)	(0, 0, *f*)$_m$	(0, t_1, 0, f_2)	(0, 0, *f*, *l*)	Match fixing, May be another team will be out from Tournament, Team *C* played well.
Team *D*	(0, *i*, 0)	(0, *i*, 0) $_m$	(0, t_2, f_1,0)	(0, *i*, 0, *l*)	Rain came, Team *D* is weak team even played well in front of the strong Team like *A*. It is winning for them.
Team *E*	(*t*, 0, 0)	(*t*, 0, 0) $_m$	(t_1, 0, f_1, 0)	(*t*, 0, 0, *l*)	Team *E* is very weak team. Hence nothing to watch the match. Team *A* played well. Team *A* won the match because of Duckworth Lewis law.
Team *F*	(*t*, *i*, *f*)	(*t*, *i*, *f*) $_m$	(t_1, t_2, f_1, f_2)	(0, 0, 0, *l*)	Team is qualified (or disqualified) for the Tournament. Hence win, draw or loss from Team *F* does not affect anything. It is liberal match.
Team *G*	(*t*, *i*, *f*)	(*t*, *i*, *f*) $_m$	(t_1, t_2, f_1, f_2)	(0, 0, 0, *l*)	Team A and Team G is enemy country hence the match will be interesting beyond win, draw or loss. The match can be watched.

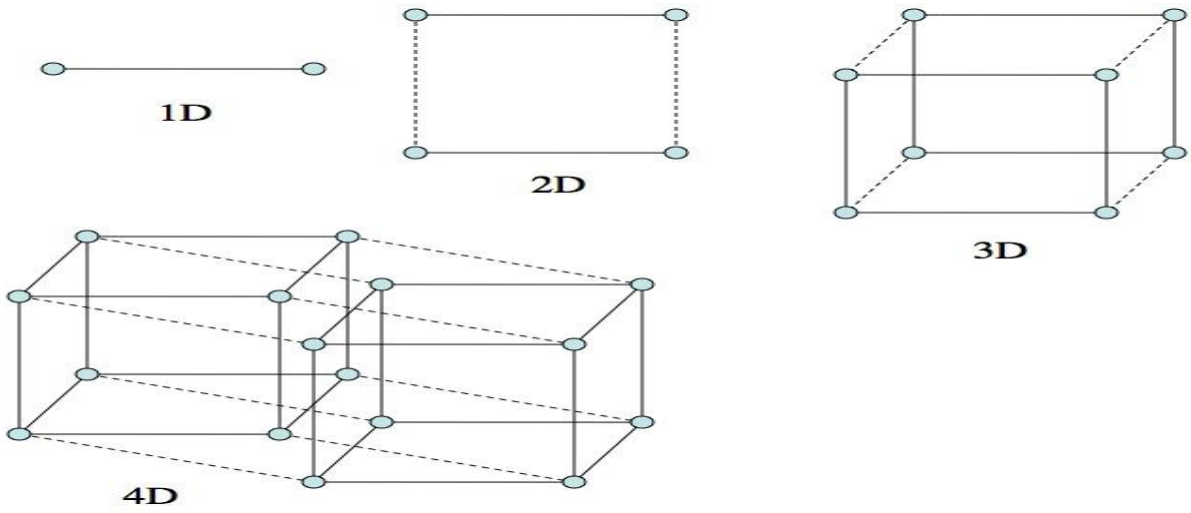

Figure 3: The four dimensional Data Visualization.

Other parts of the paper are organized as follows: Section 2 provides some basic knowledge about Turiyam set. Section 3 provides some applications of Turiyam set and its pattern. Section 4 includes conclusions, followed by acknowledgements and references.

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2. Background

This section provides some basic preliminaries about Turiyam set:
Definition 1 (Turiyam Set) [1-4] : A Turiyam set B on $U \neq \emptyset$ is a set which has the form

$$B = \{<x, \mathrm{t}_B(x), i_B(x), f_B(x), l_B(x)>: x \in U\}$$

where$\mathrm{t}_B(x), i_B(x), f_B(x), l_B(x): U \to [0,1]$denote the truth value, the indeterminacy value, the falsity value and the Turiyam state (or liberal) value for each $x \in X$ correspondingly by which $\mathrm{t}_B(x)$, $i_B(x)$, $f_A(x)$ and $l(x)$ such that -4≤ $\mathrm{t}_B(x) + i_B(x) + f_B(x) + l_B(x) \leq 4, \forall x \in U$.

In this case, $\emptyset_T = (t, i, f, 0)$ and $U_T = (t, i, f, 1)$ are called empty Turiyam set and the universal Turiyam set respectively which can be represented as shown in Figure 4.

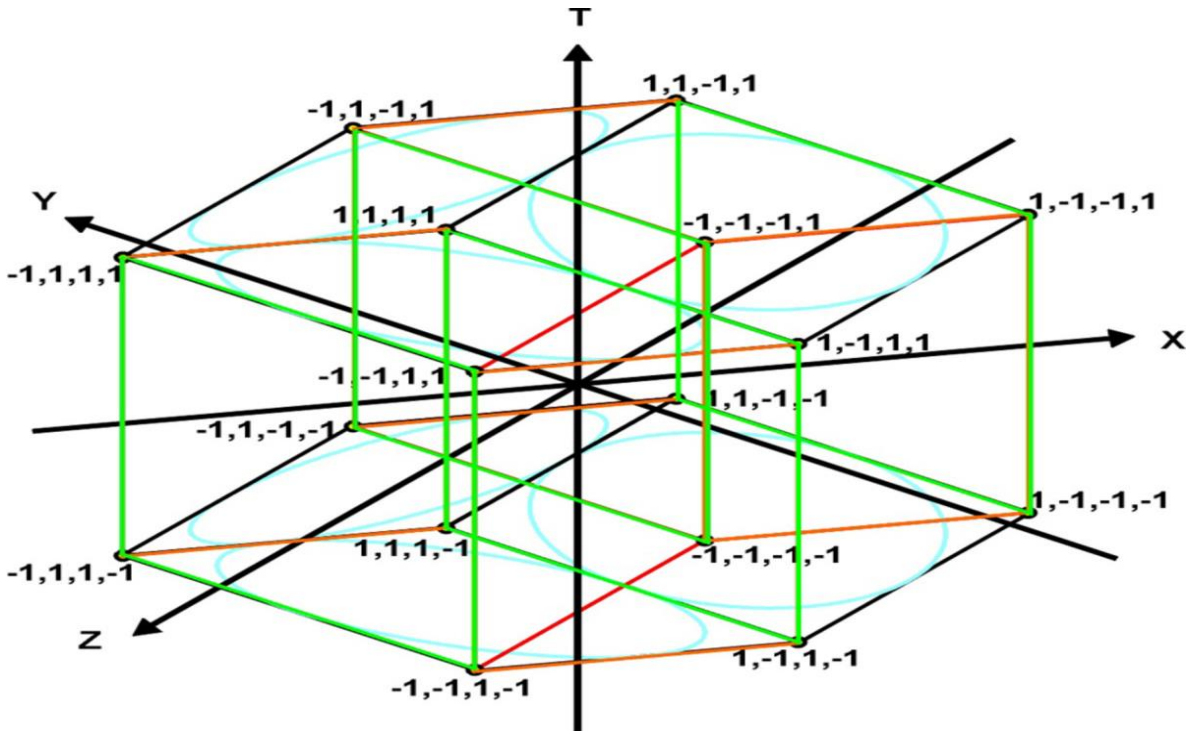

Figure 4: The four dimensional data set visualization.

Definition 2 (Intersection of Turiyam) [1-4] **:**The intersection of Turiyam set T_1 and T_2 can be computed as follows:

(i) $T_1 \wedge T_2 = ((t_1 \wedge t_2), (i_1 \vee i_2), (f_1 \vee f_2), (l_1 \wedge l_2))$.

(ii) $T_1 \wedge T_2 = (t_1.t_2, i_1 + i_2 - i_1.i_2, f_1 + f_2 - f_1.f_2, l_1.l_2)$.

It will helpful in finding the maximum common opinion in two intellectuals and their conversations.

Definition 3 (Union of Turiyam) [1-4]: The union of Turiyam set T_1 and T_2 can be computed as follows:

(i) $T_1 \vee T_2 = ((t_1 \vee t_2), (i_1 \wedge i_2), (f_1 \wedge f_2), (l_1 \vee l_2))$.

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(ii) $T_1 \vee T_2 = (t_1 + t_2 - t_1.t_2, i_1.i_2, f_1.f_2, l_1 + l_2 - l_1.l_2).$

Definition 4 (Complement of Turiyam) [1-4]: The complement of Turiyam set can be computed as follows:

(i) $t'=f, i'=1-i, f=t, l'=1-(t+i+f)$

It will be helpful in finding the refusal degree of two intellectual based on given thought. It means the complements of Turiyam is independent and provide maximum values of non-refusal.

Definition 5 (Turiyam Graph) [10-12]: A Turiyam graph T_G is an ordered pair $T_G = (A, R)$if

$i)$ $A = (a_1, a_2, \dots, a_n)$are the set of vertices such that the functions$t_A, i_A, f_A, l_A: A \to [0,1]$ represent tv, iv, fv and the lv respectively and $0 \leq t_A + i_A + f_A + l_A \leq 4$.

$ii)$$R \subseteq A \times A$ where the relations$t_R, i_R, f_R, l_R: V \times V \to [0,1]$are defined as

$$t_R(a_i b_j) \leq \min\{t_A(a_i), t_A(b_j)\}$$
$$i_R(a_i b_j) \leq \max\{i_A(a_i), i_A(b_j)\}$$
$$f_R(a_i b_j) \leq \max\{f_A(a_i), f_A(b_j)\}$$
$$l_R(a_i b_j) \leq \min_{\forall a_i, b_j \in V} \{t_A(a_i), t_A(b_j)\},$$

denotes the tv, iv, fv and the lv of the edge$(a_i b_j)$respectively, such that $0 \leq t_A(\{a_i b_j\}) + i_A(\{a_i b_j\}) + f_A(\{a_i b_j\}) + l_A(\{a_i b_j\}) \leq 4, \forall \{a_i b_j\} \in R, i, j = 1,2, \dots, n.$

Then, $T_G = (A, R)$ is a Turiyam graph of $G = (V, E)$. Note that R is a symmetric Turiyam relation on A.

Example 1: Figure 3 represents a Turiyam graph $T_G = (A, R)$ of $G = (V, E)$ where $V = \{v_1, v_2, v_3\}$ and $E = \{v_1v_2, v_2v_3, v_3v_1\}$ for the dependent case. The vertex v_1=(0.4, 0.6, 0.1,0.7) represents that vertex v_1 means Team A i.e. India wins 40 percent match, 60 percent matches are uncertain due to rain, equal team fight or Duckworth-Lewis rule, 10 percent match losses and 70 percent matches India tied to win in Turiyam consciousness for winning the trophy. The edge among $\{v_1v_2\}$=(0.1, 0.6, 0.0, 0.5) shows that India can win with Pakistan truly by 10 percent, 60 percent time the match is uncertain, 0 percent they do not want to lose the match whereas every second match India (or Pakistan) try to win or loss the match in case one of them get out from the ICC tournament. These types of data and its pattern can be analyzed using Turiyam consciousness. However the representation of Turiyam context may distinct from expert to expert. One of the reasons that the Turiyam set provides liberalization while representation of expert quantum Turiyam cognition about Team A or Team B. It is totally based on expert super consciousness which may bring conflict.

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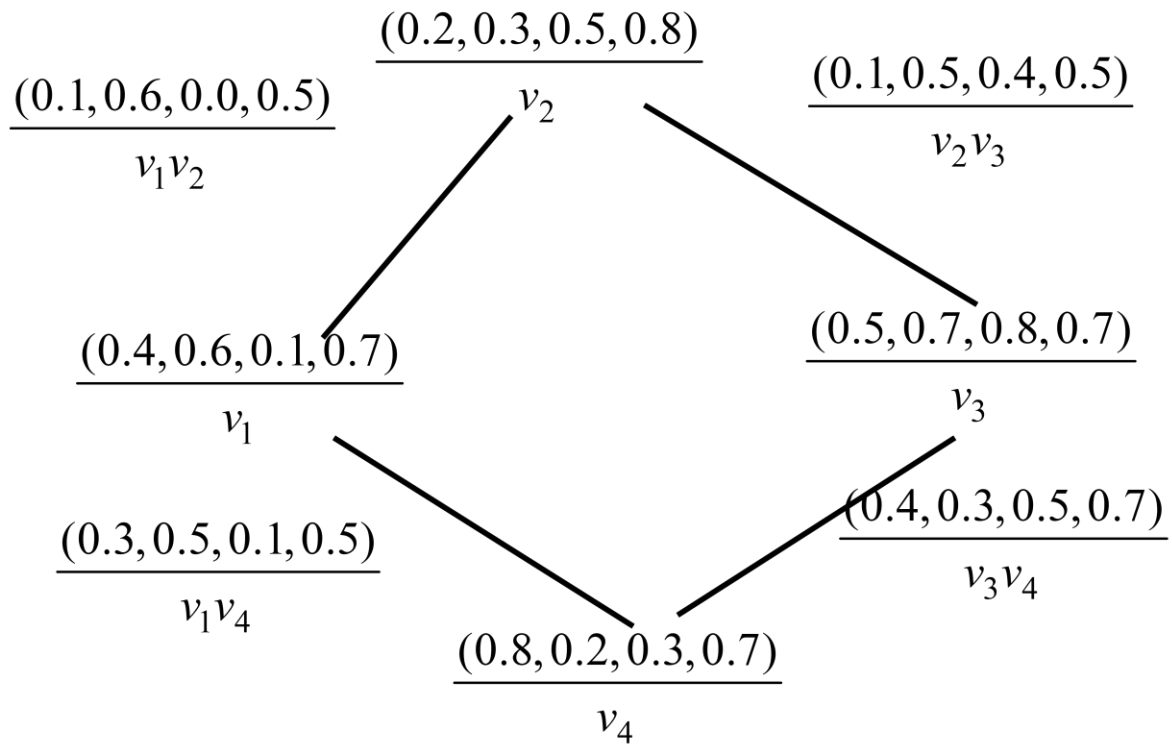

Figure 3: A Turiyam undirected graph

The problem arises how to deal with data with Turiyam set for its precise representation.

3. Illustration

Recently, data with Turiyam attributes is studied extensively [1-4]. Some of the researchers focused on developing its mathematical structure whereas some of them are focused on its applications [5-12]. However the mathematical applications of this set are still at fancy stage [13-19]. One of the reasons that there is less attributes data sets available which contains involvement of Human Turiyam consciousness except four dimension [20-22]. Due to which many authors claimed about involvement of human consciousness in data sets and its randomness measurement [23-27]. The cricket data sets can be considered as one of the suitable examples for dealing the randomness and involvement of Human Turiyam consciousness to win, draw or loss the particular match [28]. In this paper author has focused on dealing the cricket data sets using Turiyam set. To achieve this goal some of the Turiyam awareness for a cricket match is shown in Table 4. It will help much too the young researchers for understanding the data with Turiyam set and its exploration. Figure 5 represents its visualization in two and Four Dimension simultaneously which will help in finding complement. Now some of the real life example for data with Turiyam set is given below for better understanding:

Table 4: Some condition for Turiyam consciousness exploration and representation

	True (t)	*Uncertain(i)*	*False (f)*	*Turiyam or Liberalization (l)*
Match₁	Win	Draw	Loss	Team A (like India) wants to lose the game because Team B (like Pakistan) will be out from ICC and vice versa.
Match₂	Win	Draw	Loss	Team A is strong team when compared to Team B. Hence team A will win the game nothing to waste time
Match₃	Win	Draw	Loss	Team A will try to win the match any how as Team B will be out from ICC
Match₄	Win	Draw	Loss	Team A will try to draw the match wanted rain, Duckworth Lewis to keep out the strong opposition team

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				A from ICC.
$Match_5$	Win	Draw	Loss	Team A will change the player to keep high run rate in case to qualify the ICC trophy
$Match_6$	Win	Draw	Loss	Team A will try to keep low run rate win to disqualify the competitor team B.
$Match_7$	Win	Draw	Loss	Team A got win because of rain or Duckworth Lewis law. Otherwise Team B would have won the game.
$Match_8$	Win	Draw	Loss	Team A got win because the pitch was made according to their bowling.
$Match_9$	Win	Draw	Loss	Team A loss the match but played well. It was 50/50 match. Hence Turiyam will be 0.5.
$Match_{10}$	Win	Draw	Loss	Team A draw the match with strong Team B. Hence in this case Team A will be consider as winning team.

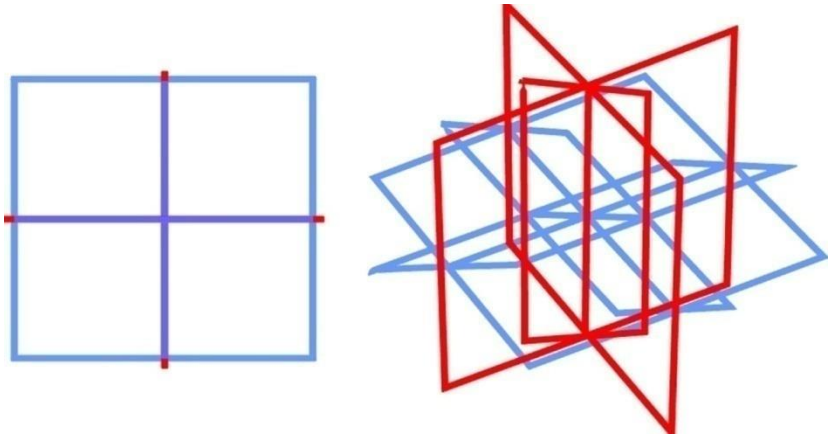

Figure 5: Some condition for Turiyam consciousness exploration and representation

Example 2: (Cricket Data Analysis) [28]: Let us suppose an expert gives opinion about Team *A* towards Team *B* while playing any ICC trophy match using his/her Turiyam consciousness. The expert gives opinion that as per data Team A has won 80 percent Test match with Team B in ICC trophy, 10 percent matches results were uncertain, 10 percent matches loses whereas 10 percent match was liberal means the result of these matches were dependent on disqualification of Team B from ICC. In Similar way expert can write opinion about Team B towards Team *A* where Turiyam will differ whereas win, draw and loss percentage data will be same. These types of data can be easily represented using Turiyam set for pattern analysis of Team *A* and Team *B*.

Table 5: An Expert opinion about Team A (x_1) towards Team B in various Trophies (y_1)

	y_1 (ICC)	y_2 (Champion trophy)	y_3 (Other Trophy)
x_1	(0.8,0.1, 0.1, 0.1)	(0.1,0.2, 0.1, 0.0)	(0.7,0.0, 0.3, 0.0)
x_2	(0.8, 0.1, 0.1, 1.0)	(0.1, 0.8, 0.4, 0.7)	(0.3, 0.6, 0.7, 0.5)
x_3	(0.4, 0.5, 0.3, 0.5)	(0.1, 0.4, 0.8, 0.2)	(0.6, 0.8, 0.1, 0.6)

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It can be observed that Team x_1 plays natural game with team B in any trophies.

Team any match with Team x_2 plays each game such that Team B will be out from ICC trophy or champion trophy even though they win the game, loss the game or draw the game. Team x_3 plays each second game such that Team B will be out from ICC trophy or others trophy even sacrificing its win, draw or loss of matches. In this way Team B management can analyze that Team x_2 is much enemy team than Team x_3. In this way Turiyam set gives a way to analyze the human consciousness and its pattern beyond the win, draw or loss of matches as follows:

(i) True match (t, 0, 0, l): These types of matches where Team A and Team B played the game naturally and one of them has won the match with given condition. It can be represented as (1, 0, 0, 0). In case Team A is strong and Team B is weak. Any cricket expert using their super consciousness can say that Team A will win as it is strong Team when compared to B. It is just waste of time to watch the match. In this case these types of true matches can be written as (1, 0, 0, 1). These types of several cases can be analyzed using Turiyam set.

(ii) Draw match (0, i, 0, l): These types of matches where Team A and Team B played the game naturally and match got drawn. They got equal point. It can be represented as (0, 1, 0, 0). In case Team A is strong and Team B is weak. Even though Team B draws the match means any cricket expert can say that Team B has almost won the match whereas Team A loss the match. This type of case can be represented as two way for Team A (0, 1, 1, 1) whereas for Team B (1, 1, 0, 1). In case both teams are of equal strength and played well then can be written as (0, 1, 0, 0). In similar way many matches can be analyzed using the Turiyam set.

(iii) Loss match (0, 0, f, l): These types of matches where Team A and Team B played the game naturally. One Team has lost the game. It can be represented as (0, 1, 0, 0). In case Team A is strong and Team B is weak. Even though Team A loss with Team B due to condition that one of the strong team C will get out from the Tournament. These types of cases used to be observed in India-Pakistan matches, Australia-New Zealand and other team vice versa. These types of losing the match happened based on Turiyam consciousness of each player. This type of case can be considered as Win-Win case for both team as for Team A (1, 0, 1, 1) whereas for Team B (1, 0, 0, 0). In case both teams are of equal strength and played well then can be written as (0, 0, 1, 0). In similar way many matches can be analyzed using the Turiyam set.

(iv) Liberal match (t, i, f, l): These types of matches where Team A and Team B unknown to each other like Team A is older whereas Team B is new. Sometime they did not know each other. They need to explore the game. Same time some matches which has no impact on qualification and disqualification from the Tournament. These types of matches where win, draw or loss does not impact the qualification and disqualification. There are many matches happened where users knows that this match has no impact on win, draw or loss as already my team qualified (or disqualified for ICC. These types of Turiyam consciousness can be represented as for qualified Team Match A match people come for cheers (t, i, f, l). The disqualified Team B supporter will not show the interest to watch the match also which can be represented as (t, i, f, 0). It is the case when supporter does not bother about win, draw or loss of his/her team. In similar way many matches can be analyzed using the Turiyam set.

(v) Refused match (1-t-i-f-l): There are many matches where Team A refused to play with Team B and vice versa. The refusal of matches happened based on expert Turiyam consciousness only rather than using any uncertainty. These types of matches can be computed via (1-t-i-f-l).

In this way Turiyam set and its representation is distinct from any of the available set while dealing the cricket data sets and its pattern.

Example 3: (Student Image Analysis) : Let us suppose a faculty having examination duty. The crucial problem arises while verification of student which can be characterized as follows:

(i) True Image (t, 0, 0, 0): These types of identity card which contain true image of the student writing the exam.

(ii) Uncertain Image (0, i, 0, l): These types of identity card may contain mix up two or more images. The images contain uncertainty with the student who is writing the exam. These types of uncertainty in images created in consciousness. The student knows that this image is uncertain when compared to me. There are many exams where other student used to seat and write the exam based on uncertain image. It can be represented as (0, i, 0, 1). The i-represents number of students having uncertain image. Any university wants that this uncertainty should be not be maximum. It should be controlled by faculty. In case the faculty able to find those uncertain image then the set

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can be represented as (0, 1, 0, 1) otherwise (0, 1, 0, 0). This is the case where Turiyam set differs from Neutrosophic set where it is represented as (0, 1, 0).

(iii) Wrong image (0, 0, *f, l*): Some time the wrong image, old image, or other student image is posted by University staff or others in hall tickets. These types of situation where the student image can be easily identified as wrong image on Identity card. It can be written via Turiyam set (0, 0, 1, *l*). In case the wrong image can be identified by faculty then it can be written as (0, 0, 1, 1) otherwise (0, 0, 1, 0).

(iv) Liberal or unknown image (*t, i, f, l*): These types of students may forget their ID car, image were absent. In this case the student is conscious that faculty will explore my identity to allow in the exam. In this case the entry of student is totally based on faculty Turiyam consciousness to find the identity of student within given time. Sometime faculty search indexing, his/her mentor or other way to allow in the exam. Many times the faculty allows each unknown students also to write the exam based on his/her consciousness. In this case faculty aware that only my students can attempt the question rather than others. These types of Turiyam consciousness and exploration is based on time based expertise which can be analyzed written (*t, i, f, l*).

Example 4: (Religion Conflict Analysis) : The religion conflict and its analysis become one of the crucial threat for human. It is more crucial in context of democratic country like India where many religions and multi-cultural exists. In this case precise characterization of religion is one of the most difficult tasks. Same time the it arises due to involvement of human consciousness. These types of dark data sets can be characterized by Turiyam set. In this paper the author explained the Indian context example where majority follows Sanatan or Hindu Dharma. It can be characterized as follows:

(i) True Religion (*t*, 0, 0, *l*): It represents those percentage of people who follows the Hindu dharma. It will be consider as Hindu dharma true followers which can be represented as (*t*, 0, 0, *l*): . In this case many possibilities exist: (*a*) The person follows Hindu dharma in unconscious way as their ancestor follows the same. It can be represented as (1, 0, 0, 0), (*b*) The person follows Hindu dharma truly in conscious after reading the books. It can be represented as (1, 0, 0, 1), (*c*) The person follows Hindu dharma 50/50 based on his/her choice as (1, 0, 0, 0.5). In this way Turiyam set.

(v) Uncertain Religion (0, *i*, 0, *l*): It represents that percentage of people who can change their religion based on their conduit metaphor. It means someone can offer money, rice bag, job or anything means they change their religion. Their religion can be represented as uncertain as (0, *i*, 0, *l*). In this case many possibilities exist: (*a*) The person changed the religion in due to its positivity, happiness of the given religion or their conduit metaphor as (0, 1, 0, 1). It means these types of people can change the religion anytime based on their conduit metaphor. (*b*) The person changed the Hindu religion in force, fear or to survive but inner side follows other religion in his/her consciousness. It can be represented as (0.5, 1, 0, -1). These type of people has adopted the new religion in force without leaving the old religion. It is negative Turiyam, (*c*) The person follows half Hindu half Christian or half other religion. It means they are like crypto Christians they keep Hindu name but follow Christianity. These types of uncertain religion of crypto can be represented as (0.5, 1, 0, 0.5). This is the case where Turiyam set characterization differs from Neutrosophic set where it is represented as (0, 1, 0).

(ii) False Hindu (0, 0, *f, l*): These types of people who follow the religions who against Hindu majority of India. Their goal is to rule India. Anyone who opposes Hindu they start following them. It can be written via Turiyam set (0, 0, 1, *l*). In case the people oppose them in consciousness can be written as (0, 0, 1, 1) otherwise (0, 0, 1, 0).

(iii) Liberal (*t, i, f, l*): These are those people who does not follow any religion. They think none of the religion is good or bad. They follow liberalization. One of the suitable examples is child who does not know anything about religion. He/she explores it after some time based on his/her consciousness. Many Professor, scientist, atheist, animals or natural phenomenon follows liberalization. Even a religious person came to the condition that nothing affects them. He/she came into condition beyond profit, loss or uncertainty of life based on his/her super consciousness can be considered as liberalization. These types of people can be represented by Turiyam (*t, i, f, l*). People who refused to follow any religion can be computed via (1-*t*-*i*-*f*-*l*).

Example 5: (Driving Consciousness Analysis) [22]: The driving is another activity which is based on Human consciousness rather than learning. It will become indeed requirement in case self driving car exists. The driving can be characterized as follows:

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(i) True Driving (*t*, 0, 0, *l*): These are the expert driver who has driving license. They drive in consciousness manner (1, 0, 0, 1) otherwise (1, 0, 0, 0).

(ii) Uncertain Driving (0, *i*, 0, *l*): They drive in drinking or much new driver drive the car in uncertain with lack of knowledge or experience. In case the expert driving is driving in drinking then can be represented as (0, 1, 0, 1) otherwise (0, 1, 0, 0).

(iii) False Driving (0, 0, *f*, *l*): These types of people who do not have driving license. Sometime the driver used to drive in wrong side which causes accident. Hence these types of wrong driving happened in consciousness which can be represented as (0, 0, 1, 1) otherwise (0, 0, 1, 0).

(iv) Liberal (*t*, *i*, *f*, *l*): These types of people do not know driving, they are unaware of driving, they are unaware of the road, car etc. In this case they explore the driving based on his/her consciousness.

It can be observed that the characterization of Turiyam set is totally distinct from Neutrosophic, Plithogenic or other sets in many ways. It provides a way to deal with any dark data sets which includes human consciousness. It gives a mathematical way to find the pattern among the data. In near future the author will focus on exploring other mathematical algebra of Turiyam set and its application in dealing human consciousness and its pattern.

4. Conclusions

This paper provides an overview about Turiyam set and its distinction from other sets with an illustrative example.

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