

SOFT HYPER GRAPH for DECISION-MAKING in SOCIAL MEDIA

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ABSTRACT :

A soft hyper graph is a mathematical tools that model complex , multi-person relationship in social media which handling uncertainty unlike standard graph(which only link two users) or regular hyper graph (which connect exactly group)soft hyper graph use parameter based set . this allow platforms to analysis vague overlapping or dynamic interaction to improve user decision making . they connect multiple users (such as an entire group of fields) or a (retweet cascade) in to a single mathematical edge rather than just link pairs . they incorporate “soft set “ principles to manage the vague , subjective or incomplete nature of on line data . the model users specific attributes user interest location or providing settings as parameters to group user flexibly . the system collects fragmented social data like connect shares and topic tags . it evaluate the strategics of sentiments of these parameters using fuzzy logics it frame flexible group of users or items that fit the selected parameters algorithms analysis these groups to make intelligences such as selectively connecting leaders or suggesting relevant connecting to the users.

KEY WORDS : vertices , edges, graph .

INTRODUCTION :

A soft hyper graph is mathematically frame work that combines “soft set theory “ while deal (with uncertainty and parameters) with hyper graph theory (which model complex multi-person relationship rather than just single two-way connection) it is used in social media identify influencers analysis group behaviors and improve the decision-making by tracking how idea speed among the group of people . traditional social networks models usually connect these two people at a time . (person A and person B) in reality social media interact happen in group instead of single line between two profits these can connect multiple multiple user in a single group (eg shared interest , hash tag comping on a group chats) these allows the model to handle vagueness and uncertainty (like subjective opinions or changing user performance) by applying specific parameters to the data .the map how opinion changes as people interact in large connectivity showing how conciseness from over time . they help identify the key users who are most effective at specifying interact across multiple connected groups they find hidden , overlapping communities based on shared tags interest or multi- user interaction branded can analysis these complex web to targets specific groups. Based on their connection parameters rather than individual browsing history . these model polyadic (many-to-many) interaction accurately . integrate human ambiguity (like likes , dislike or uncertain relationship

) in to hard data reduce the computational works load computed to traditional dense group models.

Soft hyper graph handle

Fuzzy or incomplete :

Soft hyper graph and this hybrid variant handle fuzzy or incomplete data by replacing strict binary number (0 or 1)with continuous parameters – driven mapping and degree of truth instead of regularly absolute knowledge multi- entity relationship they mathematically formalizing missing , vague or parameterized information.

How handle incomplete data :

In standard hyper groups , a the hyper edge either explicitly contain a set of models or it does not motodtsov soft set theory Handle incomplete information through parameterization.

The machines :

A soft hyper graph defiance a mapping from a set of real-word parameters(eg condition , two intervals environment factors) to the subset of vertices and hyper edges.

Handling incompleteness :

If data is missing or incomplete under one parameters (eg missing sensor data at time A) the system does not crash or invalid the graph . it isolate the description under parameters A. whole maintaining structural integrity across the other valid parameters (eg time B and Time C)

Handle fuzzy variant ambiguity :

When the node attributes or group relationship certain noise pure soft hyper graph are combined with fuzzy mathematical methods .

Fuzzy soft hyper graph :

Instead of node clearly belonging to a hyper edge under a specific parameters it belongs with c membership degree.

Intuitionistic fuzzy soft hyper graph :

To handle severe data gaps or has fully this model track both membership (truth) and non-membership (false) the remaining gap 1-membership + non-membership) explicitly measure the hesitancy / in data mines defense (the exact measure of how incomplete the data is).

Differentiate topologies :

Instead of relaying on hard-code , error-prone data to construct hyper edges , the network uses similarity metrics to dynamically generate soft , continuous hyper edge .

Information aggregation :

During the message passing the network weight a node contribution by its fuzzy membership score noisy or unverified data points are automatically maintain via how weighted preventing incomplete data from skewing global prediction.

Soft hyper graph VS fuzzy hyper graph :

Soft and fuzzy hyper graph are both advanced mathematical tool used to model complex network when relationship in value ambiguities the main difference is how they handle this uncertainty the fuzzy hyper graph use degree of membership to measure how strongly elements belongs to a group , while soft hyper group uses parameter based constrain to determine all possible comping of elements.

Fuzzy hyper graph :

BASIS :

Built on fuzzy set theory , where an elements connection to the hyper edge is assigned a value between 0 and 1.

FOCUS :

Answer the questions “ to what degree is in the part of the group ?”

STRUCTURE :

Nodes and hyper edges how connected membership values , allowing for partial or graded relationship (eg) 0.8 memberships)

SOFT HYPER GRAPH :

BASIS :

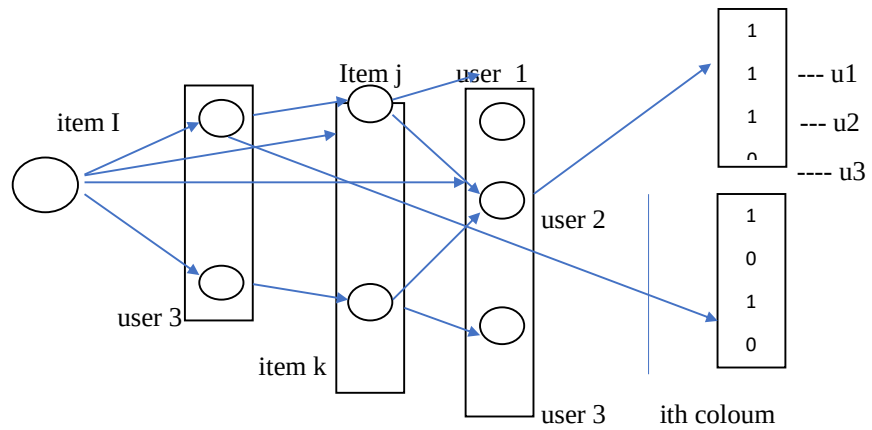
Built on soft set theory , where relationship are determined by a script set of parameters or rules.

FOCUS :
answer the questions “ which item satisfy the condition required to forms the specific groups.

STRUCTURE :

Groups (hyperedges) are defined based on whether a node possess certain characteristics relationships are exact and binary (an elements either fit the parameters or does not) but the parameters themselves define a flexible universe of possible edges .

HYPER EDGE I th coloum



HYPER edge is a GRAPH theory :

A hyper graph is a generation of a standard graph and key concept in graph theory . while traditional graph edges connect exactly two vertices , a hyper edges can connect any multiple of vertices simultaneously .

HYPER edges :

In normal graph or edge is a pair of vertices in hyper edge graph on edge edges (called hyper edges) can group these fewer of any member of vertices together in a single connection .

MODEL grouping :

This make hyper graph a perfect for showing multi – way relationship .For examples a hyper edge can easily represent group of standard working on a single project rather then just connecting two standard.

TYPES :

Uniform hyper graph :

A hyper graph when every single hyper edges connect the exact some nature of vertices . a standard graph is a uniform hyper edge where every edge connect exactly two vertices.

Directed hyper graph :

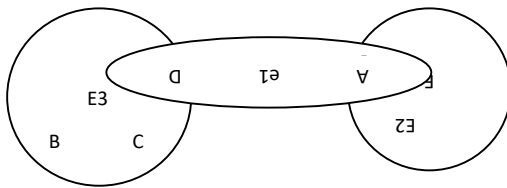
A graph where the connection have a specific direction the edge point from a set of “tails” vertices to set of “head” vertices which is widely used in computer science to model complex dependency.

Hyper graph theory is highly useful for modeling complex large- scale system in bio-logy , social works and artificial intelligence.

REPRESENT mathematically :

It is type of mathematical graph that allows an 'edge'(called hyper edge) to connect any member of vertices which a standard graph limit connection to exact pair of nodes a hyper graph is perfectly suited to model-complex , multi-way relationship.

MATHEMATICAL definition :



Hyper graph is formally represented as a pair $h=(V,E)$ where- V (a set of element called vertices or nodes) - E : a formally of non – empty subset of V called hyper edge . -unlike standard graph , a single hyper graph $e \in E$ can contain any number of vertices.

How support in SOCIAL MEDIA :

Hyper graph improves the social media patten by moving beyond simple “one-to-one “instead of just linking two people hyper graph connect multiple users , items or connect in to the single groups or events (called a hyper edge) this makes then executed for mapping complex real-world social dynamics.

GROUP recommendation :

Traditional graph suggested to connect users enjoy some graph of items , hyper graph models entire group and topic simultaneously allowing for better suggestion for “thing-to-buy” – “event-to-attend” or “ friends-to-add” -based on shared interest.

TERGETED advertising :

Hyper edge group users who exchanged with specified connects (like a hash tag or a specific brand page) helping brand targeted their ads much more accurately

FAKE news CONTROL :

Hyper graph tracks how false information spread through connected groups rather than just individual-to=individual “ connects this allows system to spot the score misinformation more quickly.

IDENTIFY experts :

By moving out which users are deeply connected to highly engaged communication , system can easily spot thought leaders or influencers with in specific niche.

PREDICTING content POPULARITY :

By grouping multi media content (like image, text, and video) around user dismission and of hyper graph help system predict which post will go viral.

Hyper graph often more accurate picture of social networks by recognizing that social instruction usually take place in multi user groups.

IN real-world :

Using hyper graph for real-world social media app is a great way to under stand complex user behavior . unlike traditional group that connect only two points hyper graph connect multiple points at once this makes their perfect for modeling complex group chats, shared hash tag and overlapping communities.

FIELD :

A soft graph is a mathematical tool used to model complex, uncertain relationship where items can belong to multi[le overlapping groups at the same time these in social media . it applied of data science , artificial intelligence and operation research to help compute analysis vast networks of data and make automation choice.

Soft set :

This adds “uncertainty “ or “fuzzy “ to the model . it allows the system to weight how strongly a user or pieces of data files in to a specifics groups rather than just saying a strict “yes” or “no”.

Hyper graph :

A hyper graph is a generation of the you in which any subset of the vertex set can be and edge . the idea if lift set was given by D . Molotov . this is a new mathematical tool to idea with uncertainty many practical problems can be solved early with to help of soft set theory.

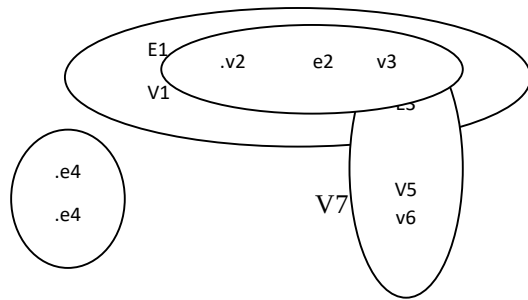
Soft hyper graph :

A soft hyper is a generation of a hyper graph where each edge (or hyper edge) connect a connect a soft set of vertices rather than just two , this concept allow for the representation of relationship and structure that are more complex then traditional graph . the idea of soft hyper graph was introduced to apply soft set theory which deal with uncertainty and vagueness making them useful is carious application including decision- making and modeling complex relationship.

HYPER graph theory :

It is a branch of graph theory that execute the concept of graph by allowing edge to connect the number of vertices .this generation enables the refraction of complex relationship and structure relationship that are not adequately capture by standard graph . hyper graph are used in various field including database theory bio- informatics and complex networks design to model relationship between multiple entities or bio-logical entities .they also utilize in making

leading task such as hyper graph spatial clustering and hyper graph semi-supervised leading to provide data model and classified regulation.



CONCLUSION

in order to degree the exact error/ problems in others systematics method fuzzy set theory and graph theory . the presented soft hyper graph is recommendation as a mathematical gadgets to tackle the uncertainty as well as complex linkage of networks by using this graph theory modeling of social networks relationship is easier to analyzing the application of graph theory to social media performs also help in understanding social dynamics , identify the trends and developing more efficient making and adverting strategies .this is inspired by hyper graph - based approach . we proper a novel data model for social media networks . it allows to represents in single way all the different kinds of relationship that are typically of those environments (among multi-media content , among users, and multi-medias contents among user themselves) and to enable several kinds of analysis and applications from the other hand we have tested several influencers maximization algorithms leverage the introduced networks structure in order to show the adjusting to consider also (“user-to-multimedia”) relationship (in addition to “use use-to-user “ once) in the influencer analysis problem primarily experience using the data of driven /social media networks shows how approach obtain very promising results.

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