VALIDATING HUMAN BEHAVIOR PROFILE BY FUZZY CONTROL LOGIC

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Abstract: Validating the new advanced conduct of people in any association is challenge because of challenges in estimating the highlights developing in it. It needs either solid proof by demonstrating of human conduct as human asset of an association or evaluating the highlights by an important study and it needs strong demonstration by modeling of control rationale and Petri-net gives as an open door for outlining a dependable framework for this reason. Fuzzy control logic gives a facility for designing a reliable system for this purpose. We do here the imprecisions in measuring character qualities attributes are respective with the membership function or characteristics function of fuzzy control logic and also rules are being generated or mapped form the fuzzy features to the crisp output are modeled by colored Petri-net. In this paper we step-in-aid of the execution the problem of implementing such a Petri-net based advice system for human resource. As proof of concept we peruse fuzzy control system base is then mapped to a fuzzy Petri net and then within the verification (reachability graph) and validation (reasoning the Petri net) process and conducted collection of data for this research. The obtained model is validated with the human resource management.

Keywords— human behavior,fuzzy control system,high level fuzzy petri nets, verification, validation, forward chain inference fuzzy control logic.

I. INTRODUCTION

All in all these days human conduct models are standards to make decision numerous simulations. The intricacy examination of human conduct models requires particular adaptable quick thinking and displaying techniques. The field of master framework appears to be extremely fitting for outlining and actualizing a learning base relating to human behavioral examinations. As the class of fuzzy petri-net [2, 3, 4] are extremely deduction system, for describing the uncertain information on in this analysis of human conduct looked up the student professor interaction as a system. We consider plan and advancement of manage base framework as affiliations envision from the students to require their commitments as an eventual outcome of rivalries, even of the verification, validation and quality– based obligations have raised [5]. The teacher understudy communication is picked as the contextual investigation since it is something unmistakable for every one of us who extremely live in a scholarly condition being in coordinate contact with such a framework in our regular daily existence and something you should manage a day after the other truly was worth giving an attempt.

There are several rationales behind which to base a computational paradigm for expert systems on Petri net theory.
- Petri nets accomplish the organizing of information inside administer bases, which can express the connections among principles and enable specialists to develop and alter lead bases.
- The Petri net's realistic nature gives the representation of the dynamic conduct of administer based thinking.
- Petri nets make it easy to outline a proficient thinking calculation.
- The Petri net's systematic ability gives a premise to building up an information confirmation procedure.
  To display fuzzy control logic, thinking using Fuzzy Petri nets, a few imperative issues should be tended to.
- Is incomplete coordinating considered?
- Does the Petri net's terminating decide that tokens will be expelled from the info spots of a progress after the change let go stay unaltered? It ought to be noticed that the terminating guideline in Petri nets is a reason for controlling the development of markings in the
- Execution process. To alter the terminating principle is to change the development of markings.
- Is the proposed calculation reliable with the rule based thinking?
- Is the proposed calculation reliable with the execution of Petri nets?

II. FUZZY PETRI NETS

A. Short Introduction:

What is fuzzy Petri net: Petri net developed by Carl Adam Petri in his Ph.D. thesis in 1962, A FPN is a directed graph containing two types of nodes: places and transitions, where circles represent places and bars represent transitions. Each place represents an antecedent or consequent and may or may not contain a token associated with a truth degree between zero and one which speaks for the amount of trust in the validity of the antecedent or consequent. Each transition representing a rule is associated with a certainty factor value between zero and one. The certainty factor represents the strength of the belief in the rule. The relationships from places to transitions and vice versa are represented by directed arcs.

$FPN = (P, T, D, I, O, \mu, \alpha, \beta)$, where

- $P = \{p1, p2, \ldots, pn\}$ is a finite set of places,
- $T = \{t1, t2, \ldots, tm\}$ is a finite set of transitions,
- $D = \{dl, d2, \ldots, dn\}$ is a finite set of propositions,
- $P \cap T \cap D = \emptyset, |P| = |D|$
- $I: P \times T \rightarrow \{0, 1\}$ is the input function, a mapping from places to transitions?
- $O: T \times P \rightarrow \{0, 1\}$ is the output function, a mapping from transitions to places?
- $\mu : T \rightarrow [0, 1]$ is an association function, a mapping from transitions to [0,1] i.e. the certainty factor?
- $\alpha: P \rightarrow [0, 1]$ is an association function, a mapping from places to [0,1] i.e. the truth degree?
- $\beta: P \rightarrow D$ - is an association function, a mapping from places to propositions?
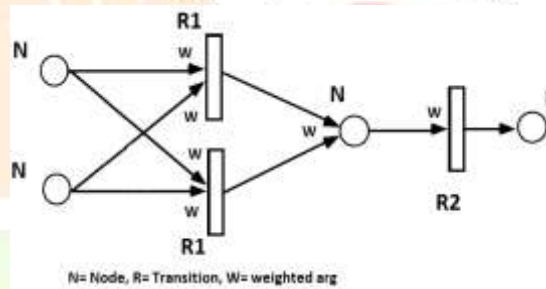

N= Node, R= Transition, W= weighted arg

Fig.decision model

Petri nets extend unit a graphical and numerical showing instrument important to a couple of structures. {they area unit they\'re} an ensuring, delineating and making sense of information science structures that are portrayed as being orchestrating, odd, appropriated, parallel, nondeterministic, or subjective [6 - 9]. However the tokens of spot center point's area unit independently notwithstanding whole number; the ending of move center points has no restriction; the heap perform for data and yield is precluded to positive number. It's light to illuminate the system holding thoughtless lead. Consequently, some specialist have given a couple of harebrained Petri web shows and influenced it to settle sensible impediment. The prevailing reckless Petri nets an area unit a lot of non-deterministic or limited to exhibiting an unmistakable really issues. The past isn't invaluable for examination and in like manner the careless Petri nets that meet typical disservice is troublesome to loosen up elective one. Along these lines, an indication of latest reckless Petri nets is given. Major designs and phrasings of Petri nets that we tend to use all through this paper will be seen by References.

The monitoring fuzzy Petri net – is defined as being the FPN = < P, T,D, I,O, f, F, ?S, !R, a, b, l > , with:

P = { p1 , p2 ,…..pn} - the finite set of places modeling possible faults, identified at the discrete event system level. Two types of faults characterize this fault set: basic faults and derived faults. The considered faults can be as well transient that persistent;

T = { t1 , t2 ,…..tn } - the finite set of transitions, representing the fault evolution, corresponding to the set of logical fuzzy rules R. Every transition is associated to a fuzzy rule;

D = {d1, d2, …dn} - the finite set of logical propositions that defines the rule basis R; I : T® P - the input function of places;

O: P ® T - the output function of places;

f : T® F - the function that associates to the every rule modeled by a transition, a function F describing the credibility degree $\mu = F(t)$ of the rule. The instant t corresponds to the detection of a fault symptom in the surveyed discrete event system;

S ={ s1 , s2 ,…, .sl} - the set of fuzzy symptoms (signals) received by the monitoring system from the surveyed discrete event system;

!R ={ r1 , r2 ,…, .rl} - the set of fuzzy recovery information (signals) emitted by the monitoring system. These signals will be used by the recovery tool;

a: P ® [0,1] - the function giving a fuzzy value aj of credibility for each place pi corresponding to the logic proposition di OED. This parameter represents the possibility of apparition of the corresponding fault;

b: P ® D - the bi-jective function that associates a logic proposition di to each place pi OEP;

l : P ® [0,1] - the function that associates an acceptance/permissiveness warning threshold li of the fault corresponding to each pi OEP of the critical path of the fault tree. These thresholds represent the starting point of all recovery policy. M0 - the basic faults places initial marking. Every token of the marking M0 is associated to the fuzzy number 1 that means the certainty of the basic fault occurrence.

Rules for buying fuzzy inference system

		human behavior model (HBM)		
		Low	Medium	High
Little prone	Low	Low	Medium	High
	Medium	Very low	Low	Medium
	High	Very low	Very low	Low
Moderately prone	Low	Medium	High	Very high
	Medium	Low	Medium	High
	High	Very low	Low	Medium
Very prone	Low	High	Very high	Very high
	Medium	Medium	High	Very high
	High	Low	Medium	High

(Row labels: Risk tendency on left, Volatility inner; rows grouped as Little prone, Moderately prone, Very prone)

Fig. rules for selling fuzzy inference system

B. Mapping to FPN

All through this mapping system, all guideline is addressed as a move with its relating sureness variable and every forerunner is shown by information put and in this way the consequents are incontestable by out spots with examination truth degrees. Amid this showing a move here a proposal is scepter to surrender if all its enter spots have a reality degree looking like or over a predefined confine regard. As attracted Fig.1, inside the wake of ending the rule, the yield spots can have a fact degree taking after the data put truth degree expanded by the move confirmation variable.

fuzzy Petri nets (Fpns) [18, 14, 12, 13] are used for realizing outline what is all the more reasoning inside the area of uncertain information and learning bases. Machine bringing in with down like AND-OR neurons [17, 16] and with down like Petri nets are anticipated by Pedrycz. In, though showing a particular mental component structure, Pedrycz investigated the degree of the model in down like illustration recognition.

The anticipated model of down linked Petri web typifies down like OR AND neurons addressed by spots and moves of the framework. Frequently, a gathering of moves copied by an accumulation of spots constitutes a layer. A l-layered down like Petri web on these lines holds l₁1 layers of moves imitated by spots, and an extra epitomize layer involving spots essentially. The spots inside the last layer are known as shutting spots. Such a framework has 2 figural benefits. To begin with, it will address off base learning like ordinary Fpns. Second, the framework may well be prepared with an accumulation of input– yield cases (as in an exceedingly nourishment forward neural net). Such a framework, once used for article recognition from down like qualities, offers the benefits of each erroneous reasoning and machine taking in on a standard.

C. The proposed strategy

The thinking forms in this structure are developed deliberately by considering the affecting properties fittingly. Any taskmaster inclination is to confine the worker's flashing conduct and take choices. Yet, here we attempt to incorporate research of the properties to be incorporated. For this reason forward chain adspection by surmising is finished by fuzzy petri-net speaking to the administer base covering every one of the properties.

D. Model for the HRBM

HRBM exists with the parameter with the end goal of adjusting the worker practices. The essential execution markers more often than not will be no immediate. Thus the analyst extricates them by directing a significant study precisely. Here we plan the survey thoroughly covering the related properties associated to the execution of individual conduct of a representative. We consider 15 such properties and planned with two level of extraction as appeared in the accompanying segment

III. CONCLUSION

Improving the fidelity and automation of simulations, human behavior modeling is the concern of nowadays research. On this way, in this research a new case study dealing with professor student interaction is defined. The corresponding rule base was constructed by gathering information through specially designed questionnaires. The rule base was mapped to a FPN and through an FPN-based recently presented method was verified to distinguish and refine the structural errors. Afterwards, the semantic errors were distinguished by reasoning the FPN through the dynamic validation.

IV. ACKNOWLEDGEMENT

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