

Implementation of Knowledge Structure for Fuzzy Petri Nets

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Abstract Nowadays Fuzzy Petri Nets is getting significant in the domain of soft computing due to the frequent applications obtained for the society. However the research community finds the difficulty in tackling soft computing. The main aim objective, goal, result of this paper is to achieve a simple layout for the knowledge structure for an effective class room (learning platform) in order to meet the learning outcome of Fuzzy Petri nets. The construction is carefully made after surveys & reviews throughout the branches of AMET university and obtained the knowledge structural model .This model is finally evaluated for its performance and result are presented.

Keywords: Fuzzy logic, Petri nets, Fuzzy Petri nets, Soft Computing, ontology, knowledge Structure (KS)

1. Introduction:

Students need knowledge and skills that will help them live a full life in the society. Knowledge of mathematics is a requirement for every person. Mathematics spread through all aspects of life. Many of the development and decisions made in industry and commerce, the provision of social and community services as well as government policy and planning etc; rely to some extent on the use of mathematics. It is important for our students to acquire the foundations of knowledge and skill, to develop the capabilities for learning how to learn, to think logically, creativity and critically, to develop and knowledge, to analyze and solve problems.

Teaching method refers to the general principles, pedagogy and management strategies used for classroom instruction. Teaching theories can be organized into four categories based on two major parameters: a teacher-centered approach versus a student-centered approach, and high-tech material use versus low-tech material use.

Fuzzy Petri Nets (FPN): Petri Nets (PN) are a graphical and mathematical modeling tool applicable to many systems. There are promising tools for describing and studying information processing systems that are characterized as being concurrent, asynchronous, distributed, parallel, nondeterministic and/or stochastic [Murata. T, 1989]. Fuzzy Petri nets containing two types of nodes: places and transitions, where circles represent places and rectangle 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 [Fei Liu *et al*]

In section II, we discuss about the related works around Fuzzy Petri Nets in order to link the relevance of our work section III describes the terms and methods in order to enhance the readability of the research work Section IV presents Methodology for Application of Image classification using deep learning, Section V presents the main experiments applied for main approach and the results are presented, In the section VI with concluding remarks.

2. Related works

In this study [Fei Liu *et al*] the fuzzy logic methodology will be integrated to represent individualized knowledge structure. Fuzzy logic model of perception (FLMP) is to calculate the fuzzy subordinate relationship among concepts and fuzzy structural modelling (FSM), which is a complex system method, will construct the hierarchical diagrams to represent individualized knowledge structure. Measurement of similarity based on fuzzy values will describe the similarity between individualized knowledge structure and expert's knowledge structure.

In this paper [Burcin Bosta and Adnan Yazici, 2007] Petri net (FPN) model to represent knowledge and the behavior of an intelligent object-oriented database environment, which integrates fuzzy, active and deductive rules with database objects. The behavior of a system can be unpredictable due to the rules triggering or un triggering each other (non-termination). Intermediate and final database states may also differ according to the order of rule executions (non-confluence). In order to foresee and solve problematic behavior patterns, we

employ a static rule analysis on the FPN structure that provides easy checking of the termination property without requiring any extra construct. In addition, with our proposed fuzzy inference algorithm, we guarantee confluent rule executions.

3. Terms and Methods

In this section the terms and methods for Fuzzy Petri Nets are described in simple form as follows. The terms are introduced from the conceptual level and methods are selected to emphasize the proof of existence of terminology for Fuzzy Petri Nets.

AMET University serves as an ocean of knowledge for over 4000 students pursuing Programmes ranging from diploma to Doctoral programs through 9 schools and 23 intensive research and training centres for marine and marine related activities. We conducted the survey very successfully and collected the data as we planned.

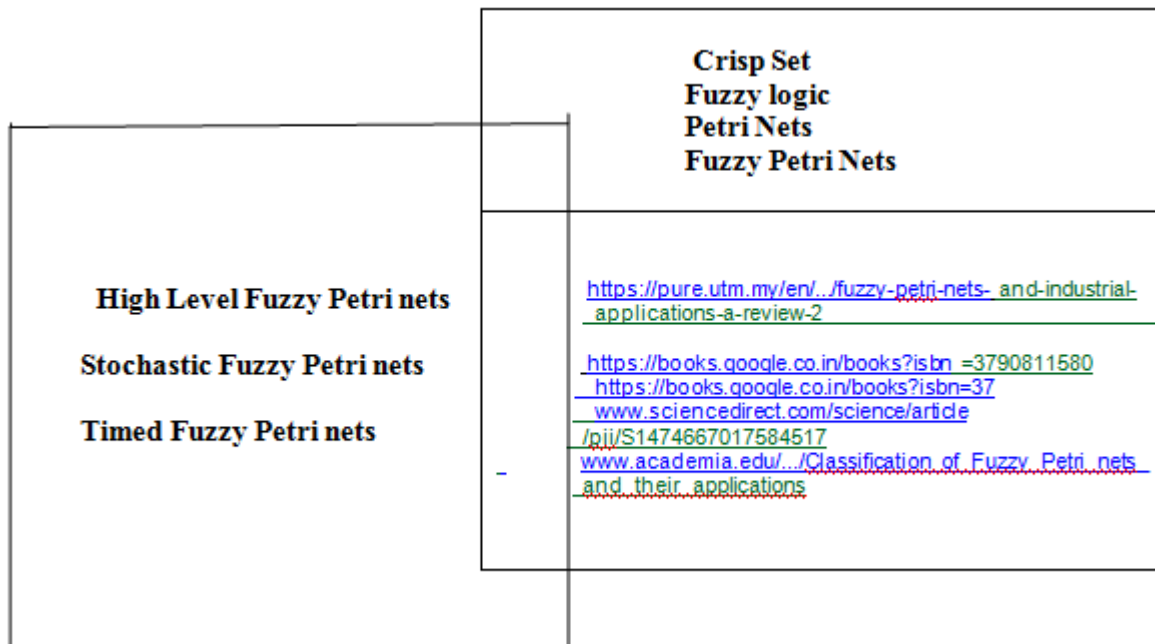


Fig 1. Architecture Diagram

Ontology Diagram

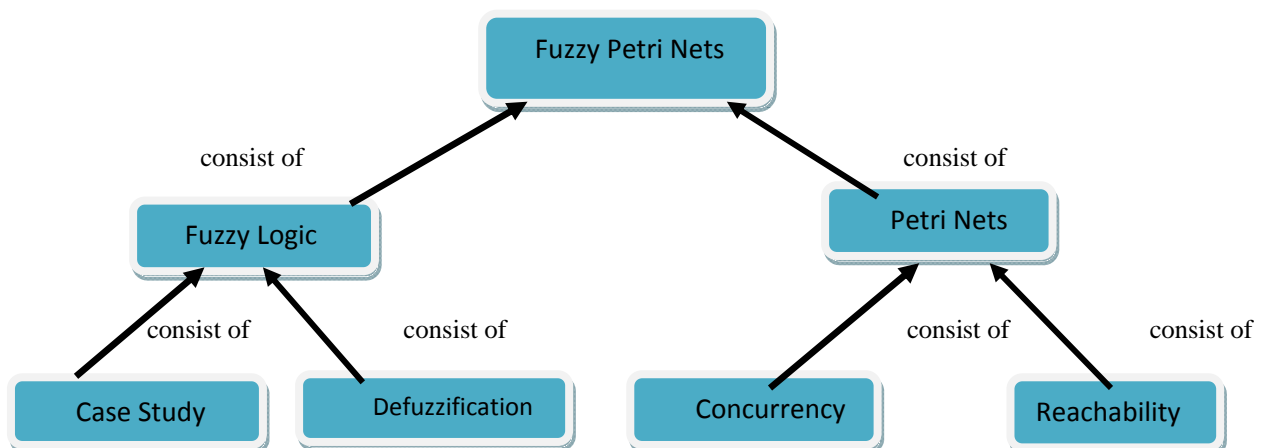


Fig: 2 Ontology for Fuzzy Petri Nets

4. Methodology for Application of Fuzzy Petri Nets:

The recent development in instruction Technology for Education has shown various methods for effective learning. Preparation of knowledge structure of Fuzzy Petri Nets for using inside a class room must be evaluated for its design and contents. The framework shown in the fig.1 architecture diagram contains three components. The focus concept is treated with three levels namely with three levels familiarity scale, (which can be dealt as reading assignment or self study through the internet search engines), threshold concepts (which are mandatory

learning task inside the class room or library or in the form of project based or mini projects) and list of pointers in the web space namely the uniform resource location.

5. Experimental Setup:

The experiments based on our selection of topic in the domain of interest were carried out. This had been implemented with appropriate approvals from authorities in the university. Since the knowledge structure is part of activities of the teacher's pedagogy style, getting permissions happened to be cleared quickly as well automatically. Few classes were selected for internal assessment and these tools were applied to check the feasibility and the correctness of the approaches. The following table shows the difference in the performance.

Table 1.Comparison of KS –(N) with Non KS approaches

S.No	Class	Branch	with KS	Without KS
1	II A	Petroleum Engg	99%	85%
2	II B	Petroleum Engg	93%	82%
3	IIIA	Mining Engg	91%	74%
4	III B	Mining Engg	85%	72%
5	III C	Mining Engg	71%	64%
6	IVA	Harbour Engg	57%	52%
7	IVB	Harbour Engg	56%	52%
8	IVC	Harbour Engg	85%	78%

The above table clearly makes us to understand the following observations. The foremost observation is the KS approach demonstrates the other approaches. The last row values are inferior due to the learning style of the students in the class as well as difficulty level inherently hidden in the some of the parts of Fuzzy Petri Nets.

Class	with KS	Without KS
II A	99%	85%
II B	93%	82%
IIIA	91%	74%
III B	85%	72%
III C	71%	64%
IVA	57%	52%
IVB	56%	52%
IVC	85%	78%

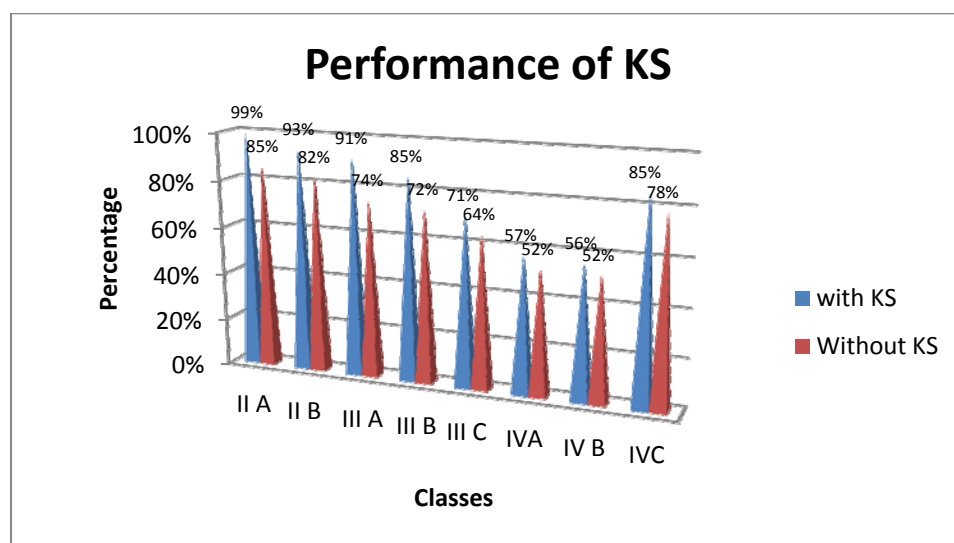


Fig: 3 Efficiency of knowledge structure

In fig.3 the efficiency of depicted by the difference in the approaches and it demonstrate the performance appreciably. The maximum efficiency is found for approach in the range of 93% to 99%

6. Conclusion:

The spectrum of methods followed traditionally yields much variation and not of any lifted advantages. However our novel approach based knowledge structure mapping into the syllabus contents yield better results as demonstrated by our experiments.

Acknowledgement:

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