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Knowledge Gaining In Unclear Systems Using Grid Computing

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Abstract— The use of bio-inspired knowledge gaining for Fuzzy Systems founded on Swarm Intelligence-Particle Swarm Optimization (SI-PSO). Swarm-based models consider knowledge entities as particles that move in the space to reach the higher quality. Fuzzy Systems following SI-PSO for knowledge acquisition are categorized in this work as Swarm Fuzzy Systems (SFSs). Specifically, two learning methodologies, KASIA (using rule bases as particles in PSO) and KARP (using rules as particles in PSO) are introduced. SFSs performance is studied in a problem of practical importance nowadays with data sets, the learning of fuzzy meta-schedulers in computational grids. Fuzzy meta-schedulers are Fuzzy Systems doing intelligent allocation of jobs to improve the performance of the grid, such as the reduction of the execution time of workload. The scheduling decisions are taken based on the knowledge of the Fuzzy System and in this way, the relevance of their learning process are critical. In this work, compared results of the performance of the different SFSs and a comparison between SFSs and Genetic Fuzzy Systems are presented. Simulations results show that SFSs can achieve a faster convergence and higher quality with a reduced number of control parameters what makes them a good alternative to Genetic Fuzzy Systems.

Index Terms— Swarm Intelligence-Particle Swarm Optimization (SI-PSO), Swarm Fuzzy Systems, Fuzzy meta-schedulers, Genetic Fuzzy Systems.

I. INTRODUCTION

Nowadays, one of the most important areas for the application of Fuzzy Set Theory is Fuzzy Rule-Based Systems (FRBSs). These kinds of systems constitute an extension of classical Rule Based Systems, because they deal with fuzzy rules instead of classical logic rules. An important application of FRBSs is Linguistic Modeling, which in this field may be considered as an approach used to model a system making use of a descriptive language based on Fuzzy Logic with fuzzy predicates, where the interpretability of the obtained model is the main requirement. Thus, the linguistic model consists of a set of linguistic descriptions regarding the behavior of the system being modeled. In this approach, fuzzy linguistic IF-THEN rules are formulated and a process of fuzzification, inference, and de -fuzzification leads to the final decision of the system. Although sometimes the fuzzy rules can be directly derived from expert knowledge, different efforts have been made to obtain an improvement on system performance by incorporating learning mechanisms guided by numerical information to define the fuzzy rules.

This issue, known as fuzzy rule learning (FRL), is considered a hard problem and a large number of methods have been proposed to automatically generate fuzzy rules from numerical data making use of different techniques such as ad hoc data-driven methods, neural networks, genetic algorithms, fuzzy clustering, etc. For a review on some of them, refer to . In this contribution we propose a novel way of facing the FRL problem making use of Ant Colony Optimization (ACO) algorithms. To do so, the FRL problem will be formulated as an optimization problem and the features related to these kinds of algorithms—such as heuristic information, pheromone initialization, fitness function, solution construction, and pheromone update—will be introduced.

II. RELATED WORK

Fuzzy rules are linguistic IF-THEN- constructions that have the general form "IF A THEN B" where A and B are (collections of) propositions containing linguistic variables. A is called the premise and B is the consequence of the rule. In effect, the use of linguistic variables and fuzzy IF-THEN-rules exploits the tolerance for imprecision and uncertainty. In this respect, fuzzy logic mimics the crucial ability of the human mind to summarize data and focus on decisionrelevant information. In a more explicit form, if there are I rules each with K premises in a system, the I th rule has the following form.

IF a1 is A i,j ϴ a2 is A i,2 ϴ…….ϴ ak is A i,k then Bi

In the above equation a represents the crisp inputs to the rule and A and B are linguistic variables. The operator 1 can be AND or ORor XOR.

KASIA is analyzed as a learning strategy in fuzzy-rule-based met scheduler design for grid computing, and performance is compared with other scheduling strategies based on genetic learning and existing scheduling approaches.

A new approach is proposed for the evolution of rules as individuals for FCS through the application of SI in the learning of the classifier discovery system.

III. FUZZY RULES BASED SYSTEM

Analyzing the requirements of the task to be performed, the next step is to analyze the problem and understand its context. The first activity in the phase is studying the existing system and other is to understand the requirements and domain of the new system. Both the activities are equally important, but the first activity serves as a basis of giving the functional

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specifications and then successful design of the proposed system. Understanding the properties and requirements of a new system is more difficult and requires creative thinking and understanding of existing running system is also difficult, improper understanding of present system can lead diversion from solution.

A. Compose Request

The Composer allows you to craft custom requests to send to a admin. You can either create a new request manually, or you can drag and drop a session.

Table1. Manager Response

Column Name	Data Type	Allow Null
LOGIN ID	Varchar(20)	Checked
REQUEST NAME	Varchar(50)	Checked
CITY	Varchar(25)	Checked
REQUEST DETAILS	Varchar(20)	Checked
REQUEST SENT TO	Varchar(20)	Checked

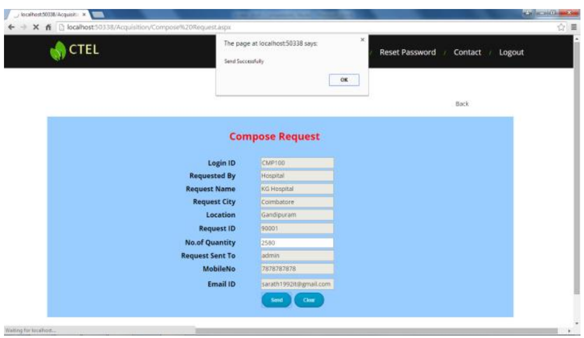

Fig.1. Manager Response

B. Response Details

It is act of responding. Reaction to an event, occurrence, or situation, aimed at its containment or control. Any behavior, that results from a stimulus.

C. Allocate Request & Manager Response

The allocate process of adding and assigning request and sub-request, and, unlike much other online project management, allows you to assign tasks to several people instead of just one. It can be provides a comprehensive information sharing, alerting, and notification solution.

Table2. Manager Response

Column Name	Data Type	Allow NULL
MANAGER ID	Varchar(20)	Checked
REQUESTED ID	Varchar(25)	Checked
REQUESTED BY	Varchar(25)	Checked
REQUEST NAME	Varchar(25)	Checked
STATUS	Varchar(MAX)	Checked

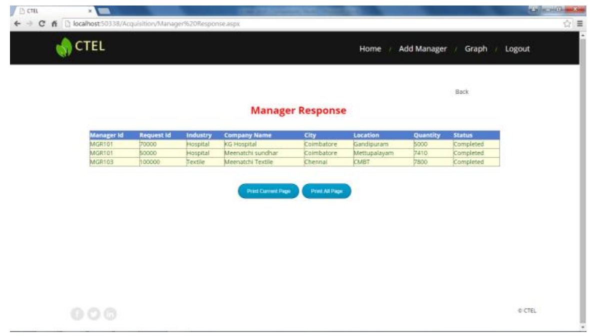

Fig.2. Manager Response

D. Send User Response

The send a finished request from customer send from the customer to admin.

Table3. Manager Response

Column Name	Data Type	Allow NULL
MANAGER ID	Varchar(25)	Checked
REQUEST ID	Varchar(25)	Checked
REQUEST NAME	Varchar(25)	Checked
REQUEST DETAILS	Varchar(25)	Checked
STATUS	Varchar(25)	Checked

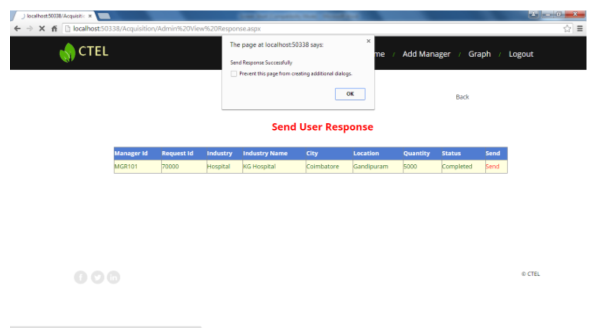

Fig.3. Manager Response

E. Suggestion

Suggestion was designed to capture and share ideas by reducing the physical, political and technical barriers to communication. It collects ideas in a central repository that can be analyzed by anyone with the appropriate access credentials.

Table4. Suggestion

Column Name	Data Type	Allow NULL
EMPLOYEE ID	Varchar(50)	Checked
DESIGNATION	Varchar(MAX)	Checked
SUGGESTION	Varchar(MAX)	Checked

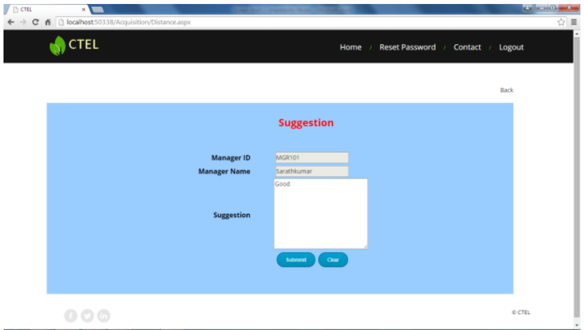

Fig.4. Suggestion

IV. ADVANTAGES

- Flexible, intuitive knowledge base design
- Control and Supervision speak the same language
- Convenient user interface. Easier end-user in perpetration when the final user is not a control engineer
- Easy computation. Widely available toolboxes and dedicated integrated circuits
- Linear in parameter systems makes possible least squares, dead-zone learning algorithm and other results from adaptive control
- Validation, Consistency, redundancy and completeness can be checked in rule bases
- That could speed up automated learning and improve user interpretability
- Ambiguousness fuzzy logic is a “natural” way of expressing uncertain information
- KASIA, KARP algorithm and logic reasoning, allowing for integrated control schemas
- FLC can incorporate a conventional design and fine-tune it to certain plant nonlinearities due to universal approximation capabilities

V.IMPLEMENTATION

The new system was started to operate along with existing system. The result of the new system was compared with the old system. Suppose the result is wrong, the error must be debugged. After the acceptance of the user, the existing system will be placed by the new system. This software package has been made user friendly and menu driven. So any user can handle this package very easily and it does not require any intensive training for the user.

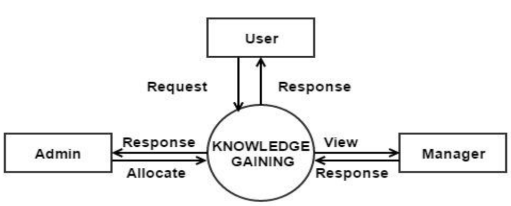

Fig.1. Level 1 Process.

Graphical Tool:

Graphical tool used to describe and analyze movement of data through a system. These are the central tool and the basis from which the other components are developed.

The transformation of data from input to output, through processed, may be described logically and independently of physical components associated with the system.

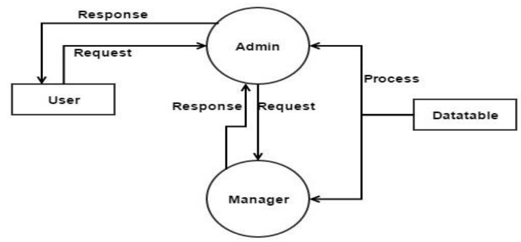

Fig.2. Level 2 Process.

Data Dictionary:

Database users and application developers can benefit from an authoritative data dictionary document that catalogs the organization, content and conversions of one or more databases. This typically includes the names and descriptions of various tables and fields in each database, plus additional details,like the type and length of each data element.

VI. CONCLUSION

Thrusters are not linear controllers because their output is fixed. Therefore the moment generated by thrusters depends on its starting period. Thrusters can only generate moment in one direction. Thus, another thruster is needed to generate moment in the opposite direction. The difference is that the range of membership function changes was modified in this work to analyze the limit cycle. Minimizing the time required for the system to reach the steady state is an important point in fuzzy controller design.

The two machine learning techniques based on SI for RB and rule discovery in fuzzy systems have been introduced, resulting in SFSs. These techniques take advantage of the properties of the PSO to obtain higher quality for RBs in a shorter time and with a simply setup.Specifically, it has been analyzed that these strategies are able to improve both accuracy and convergence features, with the computational cost, of genetic-based machine learning approaches in a problem of practical importance nowadays, the design of fuzzy meta-schedulars for Grid Computing. It has been shown that the swarm models for RB discovery and rule discovery, KASIA and KARP, respectively, provide higher quality RBs and rules in terms of accuracy and improved convergence behavior in comparison to classical strategies involving the same computational effort step by step in the whole learning process, Pittsburgh and Michigan approaches and with a simpler setting.

VII. FUTURE WORK

Anomaly based intrusion detection systems are provided in order to protect computer networks against novel attacks and improve network security. These systems perform intrusion detection by comparing current network traffic with a behavioral model of normal network activity. As the pattern of network traffic changes over time, static models are not appropriate to monitor malicious activities. As the static models could be tuned with respect to changes in traffic pattern, adaptive models are used in this manner. In this paper, we have presented an PSO based Fuzzy for anomaly detection in intrusion detection system. A whole new membership function successfully adjusted from standard fuzzy membership function.

It could be done with representation of fuzzy membership function value as particles. The particle represent will be changes to reach the optimal value foreach iteration using optimization method. The fuzzy membership function will be shrinks, move or expand through the changes of each value. Based on result experiment, the PSO+ Fuzzy has adjusted fuzzy membership function and improved the performance result in term accurately to destination and faster in speed of convergence. PSO+Fuzzy rule-based modeling is used to create the detection model. In addition, prediction results are delivered to system user for verification. Fuzzy controller module uses verified results in order to tune the detection model. To improve the accuracy for detect the anomaly in the intrusion detection system we extend our work with Genetic algorithm.

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