TECH-TALK

BIANNUAL MAGAZINE

COMPUTER SCIENCE AND ENGINEERING

2016-17

ISSUE- II

Computer Science & Engineering Department

VISION

"The Computer Science & Engineering aims at providing continuously stimulating educational environment to its students for attaining their professional goals and meet the global challenges."

MISSION

- To develop a strong theoretical and practical background across the computer science discipline with an emphasis on problem solving.
- To inculcate professional behavior with strong ethical values, leadership qualities, innovative thinking and analytical abilities into the student.
- Expose the students to cutting edge technologies which enhance their employability and knowledge.
- Facilitate the faculty to keep track of latest developments in their research areas. Encourage the faculty to foster the healthy interaction with the industry.

UG – B.TECH
PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.
PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.
PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.
PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAMME OUTCOMES (Pos)

Engineering Graduates will be able to:-

Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

Problem analysis: Identify, formulate, review research literature, and analyze complexen gineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Design/development of solutions: Design solutions for complex engineering problems anddesign system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Modern tool usage: Create, select, and apply appropriate techniques, resources, and modernen gineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

The engineer and society: Apply reasoning informed by the contextual knowledge to assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Environment and sustainability: Understand the impact of the professional engineering solutionsin societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms ofthe engineering practice.

Individual and team work: Function effectively as an individual, and as a member or leader indiverse teams, and in multidisciplinary settings.

Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Project management and finance: Demonstrate knowledge and understanding of theengineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES(PSOs):-

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyse, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

PG - (M.TECH)

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1. To inculcate the investigating and adaptability skills into the students to carryout research on recent trends in Computer Science and Engineering Technology .
2. To empower the student with the qualities of effective communication, technical document writing, team work, lifelong learning attitude,and leadership needed for a successful career.
3. Enlighten the students on analysing engineering issues in a broader perspective with ethical responsibility towards sustainable development to satisfy the societal needs.
4. Equip the students with all-round knowledge to adapt the evolving technical challenges and changing career opportunities in par with global competency.

Program Outcomes PG Graduates will be able to :-

PO1: Independently carry out research /investigation and development work to solve practical problems

PO2: Write and present a substantial technical report/document

PO3:Demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program

PO4: Design and develop software projects given their specifications and within performance and cost constraints.

PO5: An ability to Work on multi-disciplinary projectsand exhibit team skills to upgrade knowledge for adoption of current technological changes.

PO6: Understand the impact of the professional engineering solutionsin societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Ms. G. V. Rajya Lakshmi

Asst. Professor

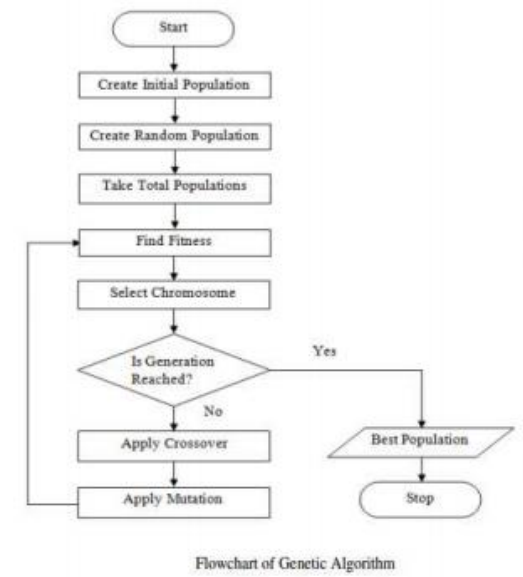
"Intrusion Detection by using fuzzy genetic algorithm"

Abstract

Network security is of primary concerned now days for large organizations. The intrusion detection systems (IDS) are becoming indispensable for adequate protection against attacks that are constantly changing in magnitude and complexity. With data probity, confidentiality and availability, they must be reliable, easy to dominate and with low maintenance cost. Various modifications are being applied to IDS regularly to distinguish new attacks and handle them. This paper proposes a fuzzy genetic algorithm (FGA) for intrusion detection. The FGA system is a fuzzy classifier, whose knowledge depraved is modelled as a fuzzy rule such as "if-then" and improved by a hereditary algorithm. The method is tested on the benchmark KDD'99 intrusion dataset and compared with other extant techniques available in the literature. The results are encouraging and demonstrate the benefits of the proposed accession.

Genetic Algorithm Overview

A Genetic Algorithm (GA) is a programming technique that uses biological enlargement as a problem solving strategy. It is based on Darwinian's principle of evolution and survival of fittest to optimize a population of candidate solutions almost a predefined fitness. Once the rules are developing, the intrusion detection system becomes simple, experienced and adequate one. GA uses an evolution and natural selection that uses a chromosome-like data structure and evolve the chromosomes using selection, recombination and alteration operators. These bearings could be referred to as genes. An evaluation function is used to calculate the correctness of each chromosome according to the desired solution; this function is known as "Fitness Function". During the process of appraisal "Crossover" is used to simulate natural reproduction and "Mutation" is used to alteration of species . For survival and combination the selection of chromosomes is partial fronting the fittest chromosomes. When I use GA for solving various problems three factors will have vital impact on the effectiveness of the algorithm and also of the utilization. They are: i) the fitness function; ii) the representation of individuals; and iii) the GA parameters. The determination of these circumstances often depends on implementation of the system. In the following sections, I focus our discussions on acquire the set of rules using Genetic Algorithm.



Flowchart of Genetic Algorithm

Fuzzy Logic

It has been shown by Baruah that a fuzzy number [a, b, c] is defined with associating to a membership function μ(x) lying between 0 and 1, $a \leq x \leq c$. Further, he has extended this definition in the following way. Let μ1(x) and μ2(x) be two functions, $0 \leq \mu 2(x) \leq \mu 1(x) \leq 1$. He has concluded μ1(x) the fuzzy membership function, and μ2(x) an associating function, such that (μ1(x) – μ2(x)) is the fuzzy membership value for any x. Finally he has characterized such a furry number by {x, μ1(x), μ2(x); $x \in \Omega$}. The complement of μx is always estimate from the ground level in Zadehian's theory [10], whereas it actually counted from the level if it is not as zero that is the surface value is not always zero. If other than zero, the problem arises and then we have to count the membership value from the surface for the complement of μx. Thus I could achieve the following statement – Complement of μx = 1 for the entire level Membership value for the complement of μx = 1- μx My system forwarded a definition of complement of an protracted furry set where the furry reference function is not always zero.

Conclusion

In this paper, a method of applying ancestral algorithms with fuzzy logic is presented for network intrusion detection system to efficiently detect various types of network intrusions. To implement and measure the performance of the system I carried out a number of experiments using the accepted KDD Cup 99 benchmark dataset and obtained reasonable detection rate. To measure the fitness of a chromosome I used the furry confusion matrix where the fuzzy membership value and fuzzy membership function for the complement of a fuzzy set are two different approaches because the surface value is not always counted from the ground level. The proposed detection system can upload and update new rules to the systems as the new encroachment become known. Therefore, it is cost effective and flexible. The method suffers from two aspects. Firstly, it generates false alarms which are very serious problem for IDS. Secondly, for high dimensional data, it is hard to generate rules that cover up all the attributes.

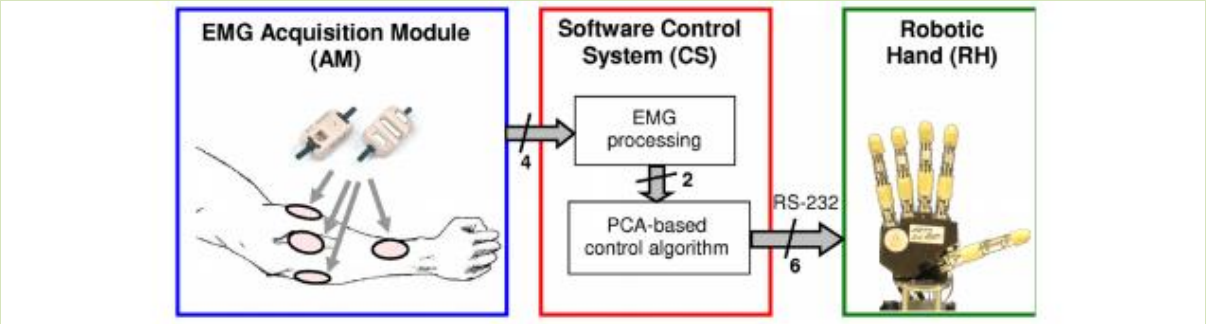
Ms.B.Shyamala

Asst Professor

"Real Time Electronic Control of Multi Fingered Hand Based on Sensors"

Abstract

In spite of the advances made in the design of dexterous anthropomorphic hand prostheses, these sophisticated devices still lack adequate control interfaces which could allow amputees to operate them in an intuitive and close-to-natural way. In this study, an anthropomorphic five-fingered robotic hand, actuated by six motors, was used as a prosthetic hand emulator to assess the feasibility of a control approach based on Principal Components Analysis (PCA), specifically conceived to address this problem. Since it was demonstrated elsewhere that the first two principal components (PCs) can describe the whole hand configuration space sufficiently well, the controller here employed reverted the PCA algorithm and allowed to drive a multi-DoF hand by combining a two differential channels EMG input with these two PCs. Hence, the novelty of this approach stood in the PCA application for solving the challenging problem of best mapping the EMG inputs into the degrees of freedom (DoFs) of the prosthesis.



commands, implementing the algorithm based on PCA previously presented by the authors. At a glance this algorithm reverted the PCA concept and allowed to drive the dexterous 6-motor hand in a pre-defined hand-posture workspace with just two independent control inputs (in this case the 2-DoF wrist movements); the pre-defined hand-posture workspace is illustrated in Figure. The picture shows a discrete grid representing the two inputs and a sample of the postures assumed by the hand (corresponding to such inputs), i.e., the two-to-six mapping. The map denotes that some areas (i.e. some input combinations) are more functional for certain grasp types rather than others. The pre-defined workspace of the hand was actually the result of the analysis of postural data directly collected from the six position sensors in the hand, while performing a multitude of grasps.

In this study the two control inputs were obtained from effective myoelectric signals picked-up in real-time on the forearm of able-bodied subjects wearing the prosthetic hand emulator, so that they could control (moving their wrists as shown in Figure) the posture of the hand in the workspace (in Figure), and hence grasp objects. As shown in our previous work, the first input Ch1 (wrist flexion/extension) mostly influenced fingers flexion/extension (horizontal

axis in Figure) whereas the second input Ch2 (wrist adduction/abduction) influenced thumb rotation (vertical axis in Figure). For the sake of clarity, the mathematical description of the my electric joystick, of the hand-posture workspace.

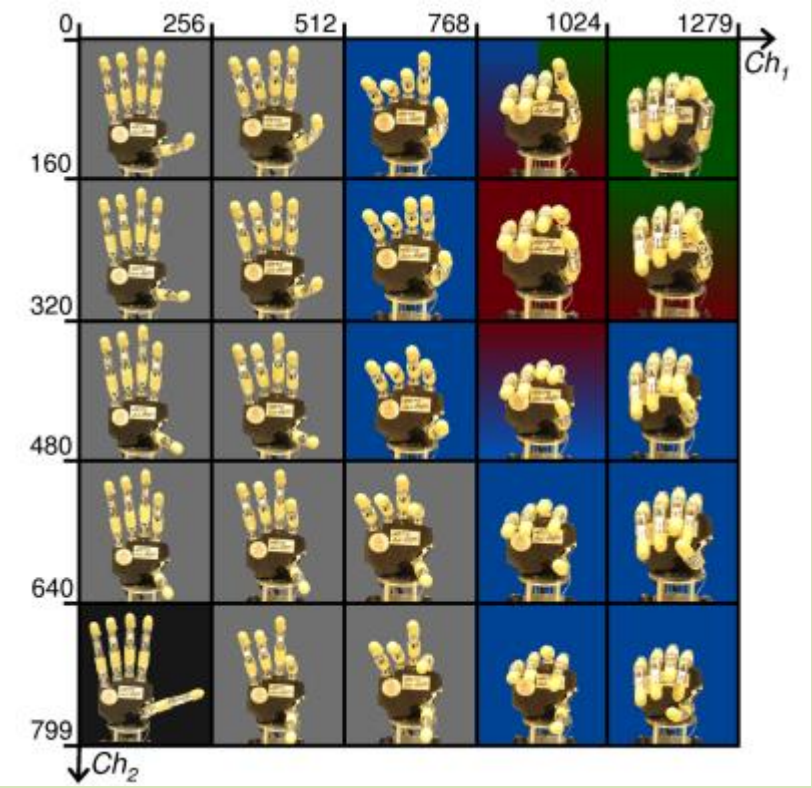


Fig: CyberHand postures distribution.

Conclusion

In this work, we demonstrate for the first time that a PCA-based controller can be successfully combined with a two DoFs (4 electrodes) EMG acquisition system and easily used by able-bodied participants to control in real-time the prehension of a five-fingered six-motorized artificial hand. The experimental results of the trials described in this paper demonstrate that this bio inspired my electric interface and control system has the great potential to become a usable means for amputees by achieving both ease of use and dexterous functionality, and by allowing them at last to manage their hand prosthesis in a more intuitive and natural way.

Dr. N. Ravi Shankar

Professor & HOD

"Diversify Based On the Context of the Word Queries for Xml Data"

Abstract

While keyword query empowers ordinary users to search vast amount of data, the ambiguity of keyword query makes it difficult to effectively answer keyword queries, especially for short and vague keyword queries. To address this challenging problem, in this paper we propose an approach that automatically diversifies XML keyword search based on its different contexts in the XML data. Given a short and vague keyword query and XML data to be searched, we first derive keyword search candidates of the query by a simple feature selection model.

Consider an XML data T and its relevance based term-pair dictionary W. The composition method of W depends on the application context and will not affect our subsequent discussion. As an example, it can simply be the full or a subset of the terms comprising the text in T or a well-specified set of term-pairs relevant to some applications. In this work, the distinct term-pairs are selected based on their mutual information. Mutual information has been used as a criterion for feature selection and feature transformation in machine learning. It can be used to characterize both the relevance and redundancy of variables, such as the minimum redundancy feature selection.

Algorithm

```
1: Mm_n ¼ getFeatureTerms(q, G);
2: while (qnew ¼ GenerateNewQuery (Mm_n)) 6¼ null do
3: f ¼ null and prob s k ¼ 1;
4: lixjy ¼ getNodeList(sixjy , T) for sixjy 2 qnew ^ 1 _ ix _ m ^ 1 _ jy _ n;
5: prob s k ¼ Q fixjy2sixjy2qnew ð jlixjy j getNodeSizeðfixjy ;T ÞÞ;
6: f ¼ ComputeSLCA({lixjyg);
7: prob q new ¼ prob s k * jfj;
8: if F is empty then
9: scoreðqnewÞ ¼ prob q new;
10: else
11: for all Result candidates rx 2 f do
12: for all Result candidates ry 2 F do
13: if rx ¼¼ ry or rx is an ancestor of ry then
14: f:removeðrxÞ;
15: else if rx is a descendant of ry then
16: F:removeðryÞ;
17: scoreðqnewÞ ¼ prob q new * jfj* jfj
18: if jQj < k then
19: put qnew : scoreðqnewÞ into Q;
20: put qnew : f into F;
```

Conclusion

In this paper, we first presented an approach to search diversified results of keyword query from XML data based on the contexts of the query keywords in the data. The diversification of the contexts was measured by exploring their relevance to the original query and the novelty of their results. Furthermore, we designed three efficient algorithms based on the observed properties of XML keyword search results.

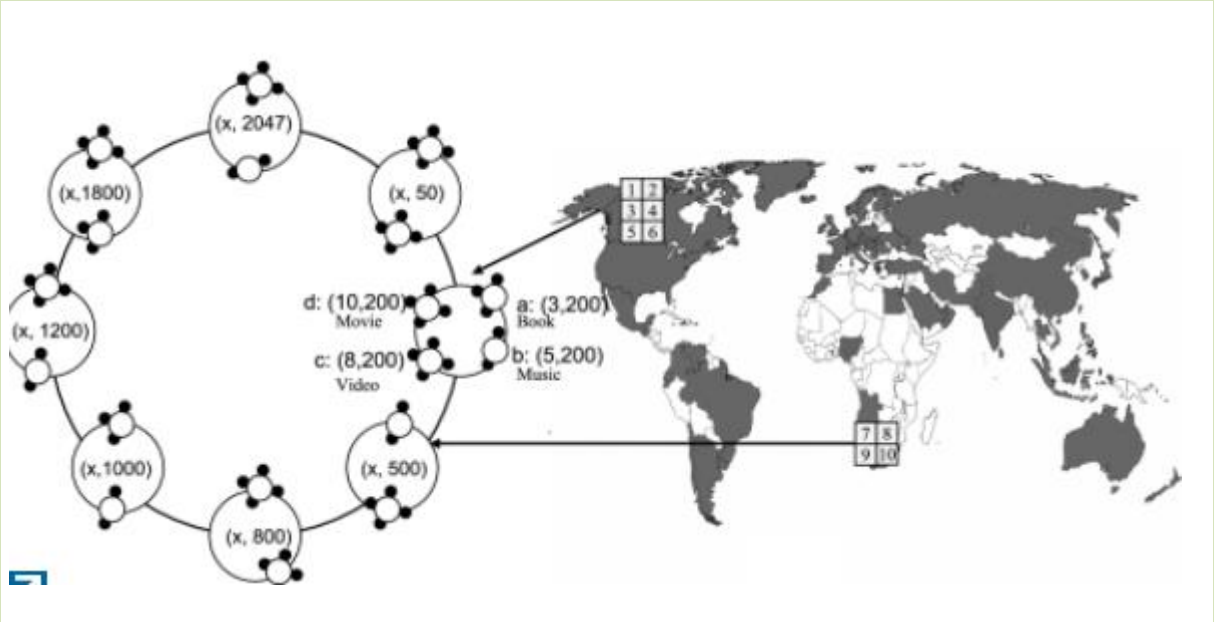
Dr. N. Ravi Shankar

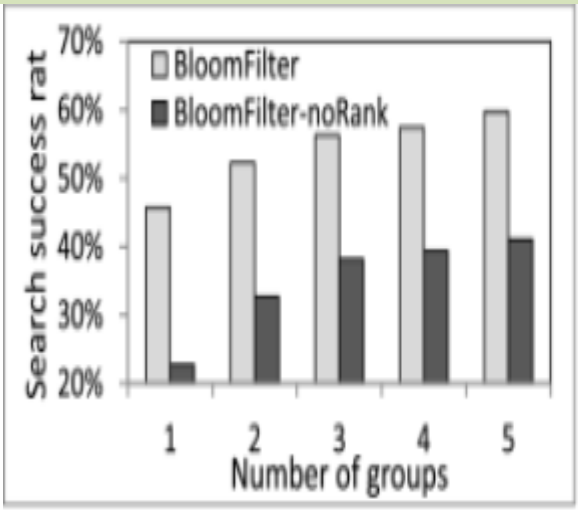
Professor & HOD

" P2P Sharing Cluster Proximity Interest-Aware File System"

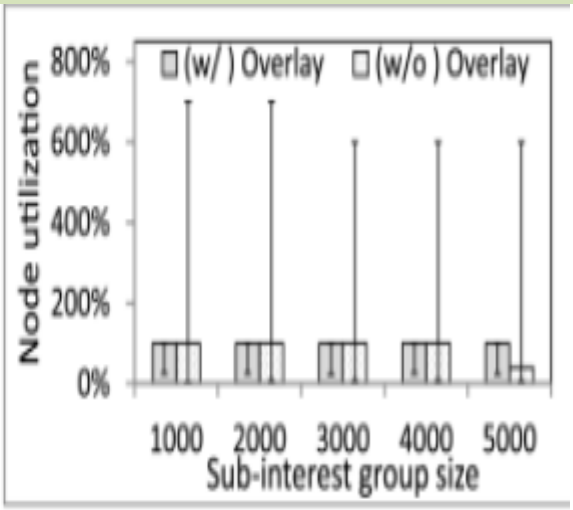
Abstract:

Efficient file query is important to the overall performance of peer-to-peer (P2P) file sharing systems. Clustering peers by their common interests can significantly enhance the efficiency of file query. Clustering peers by their physical proximity can also improve file query performance. However, few current works are able to cluster peers based on both peer interest and physical proximity. Although structured P2Ps provide higher file query efficiency than unstructured P2Ps, it is difficult to realize it due to their strictly defined topologies. In this work, we introduce a Proximity-Aware and Interest-clustered P2P file sharing System (PAIS) based on a structured P2P, which forms physically-close nodes into a cluster and further groups physically-close and common-interest nodes into a sub-cluster based on a hierarchical topology.





(a) Searching success rate with sub-interest clustering



(b) Node utilization with node capacity classification

To measure the performance of effectiveness of overlay construction inside a group based on node capacity. we measured the node utilization by ut=W/C , where W is the total number of requests handled in a second and C is the node capacity. We used (w/)Overlay to denote our node capacity-aware overlay, and (w/o)Overlay to denote the same method to build the overlay except that Class1 and Class2 randomly selected nodes. Fig. shows the fifth percentile, median and the 95th percentile of all nodes' 99th utilization during the experiment.

Conclusion

In recent years, to enhance file location efficiency in P2P systems, interest-clustered super-peer networks and proximity-clustered super-peer networks have been proposed. Although both strategies improve the performance of P2P systems, few works cluster peers based on both peer interest and physical proximity simultaneously.

Dr. N. Ravi Shankar

Professor & HOD

"Flexible and Secure Key Exchange Mechanism for Network File Systems"

Abstract:

This paper deals the problem of key establishment for secure many-to-many communications. The problem is inspired by the proliferation of large-scale distributed file systems supporting parallel access to multiple storage devices. Our work focuses on the current Internet standard for such file systems, i.e., parallel Network File System (pNFS), which makes use of Kerberos to establish parallel session keys between clients and storage devices.

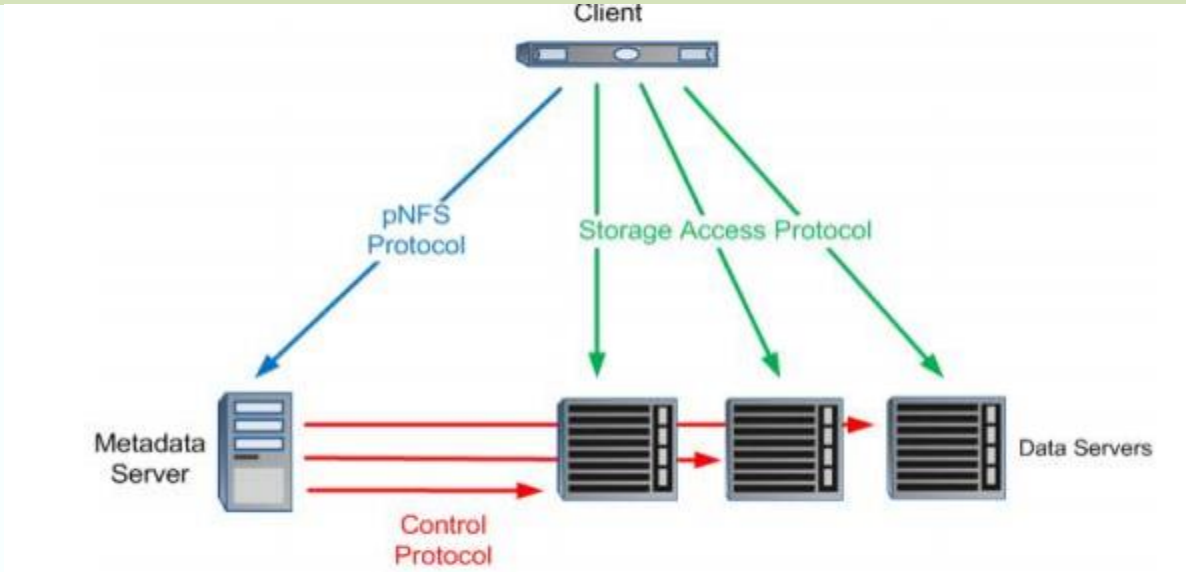


Fig: The conceptual model of Pnfs

The pNFS client works seamlessly when the application tries to access flexible volumes hosting file systems from nodes that are added to the cluster namespace without any disruption. No additional mounts are required from the client for the application to access these volumes as long as the application identifies that these volumes are valid for its use. Typically in a scenario where hierarchical storage management (HSM) is deployed, aging files are automatically moved to volumes created in less expensive SATA disks.

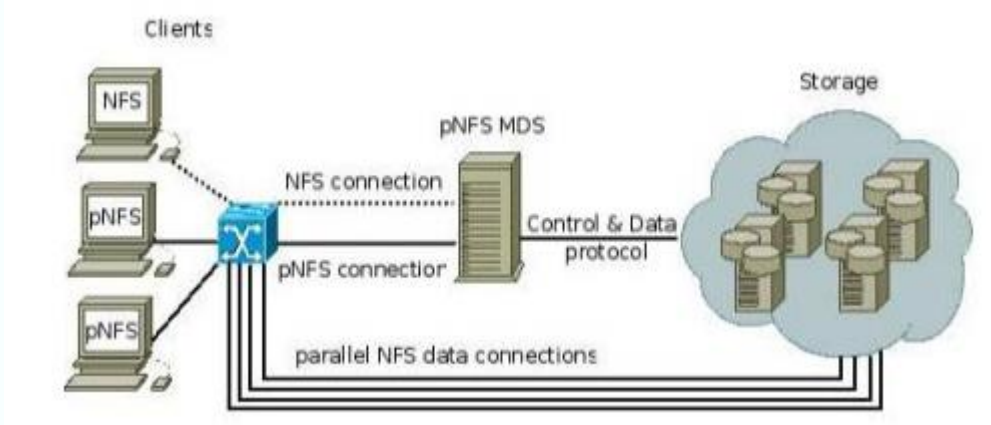


Fig: Proposed System Architecture

Conclusion

We proposed three authenticated key exchange protocols for parallel network file system (pNFS). Our protocols offer the advantages over the existing Kerberos-based pNFS protocol. First, the metadata server executing our protocols has much lower workload than that of the Kerberos-based approach. Second, two our protocols provide forward secrecy: one is partially forward secure (with respect to the multiple sessions within a time period), while the other is fully forward secure (with respect to a session). Third, we have designed a protocol which not only provides forward secrecy, but is also escrow-free. R

Dr. N. Ravi Shankar

Professor & HOD

"Enhanced QoS Based Collaborative Filtering for Web Service Recommender System"

Abstract:

A web service is a software system designed to support interoperable worldwide computer-to-computer interaction. Web services have been widely deployed for developing service-oriented applications in both industry and academia in recent years. The number of publicly available Web services is immovably increasing on the Internet. However, this generation makes it hard for a user to select a proper Web service among a large amount of service candidates. An unsuitable service selection may cause many problems (e.g., unsuitable performance) to the resulting applications. This paper, propose a novel CF-based Web service recommendation system for helping users select services with optimal Quality-of Service (QoS) performance. QoS (Quality-of-Service) is an important concept in cloud computing. It is very complicated to take decision on choosing the cloud services depending on QoS requirements.

Fig: QoS Requirements for Web Services

With the generation of web services as a business solution to enterprise application integration, the QoS for web services is becoming progressively important to service providers. Quality of Service (QoS) of a web service is an important factor that differentiates similar services offered by different service provider. The QoS requirements for web services here mainly refer to the quality bearing of a web service. These may include reliability, performance, scalability, robustness, capacity, exception handling, integrity, accessibility,

accuracy, availability, interoperability, and network-related QoS requirements. The enforcement of a web service represents how fast a service request can be completed. Web services should be provided with highest reliability. Reliability here explains the ability of a web service to perform its required functions under stated conditions for a specified time interval.

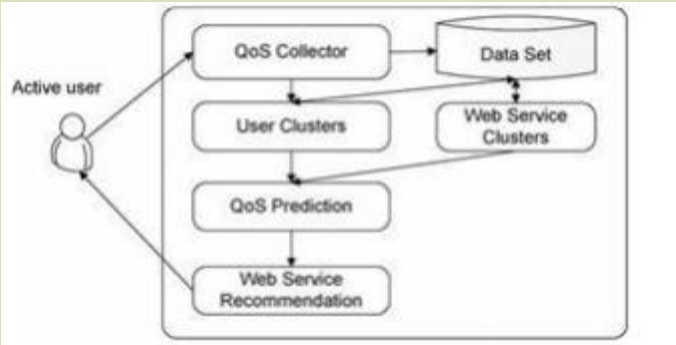


Fig: System Overview of LoRec

Conclusion

This paper presents an innovative QoS-aware Web service recommendation approach .The basic idea is to predict Web services QoS values and recommend the best one for active users based on historical Web service QoS records. In order to better recommend Web services to users from amount of services with identical functions, this paper proposed a Web service recommendation approach based on collaborative filtering. Cloud computing aim is to provide scalable and adaptive to the diversity of end-users. Optimal service selection is important to obtain high quality cloud applications

Dr. N. Ravi Shankar

Professor & HOD

"The Strong Confidence: The Process of Computational Dynamic Trust Model for Secure Communication in Multi-Agent Systems"

Abstract:

Finding reliable partners to interact with in open environments is a challenging task for software agents, and trust and reputation mechanisms are used to handle this issue. From this viewpoint, we can observe the growing body of research on this subject, which indicates that these mechanisms can be considered key elements to design multi agent systems (MASs). Based on that, this article presents an extensive but not exhaustive review about the most significant trust and reputation models published over the past two decades, and hundreds of models were analyzed using two perspectives.

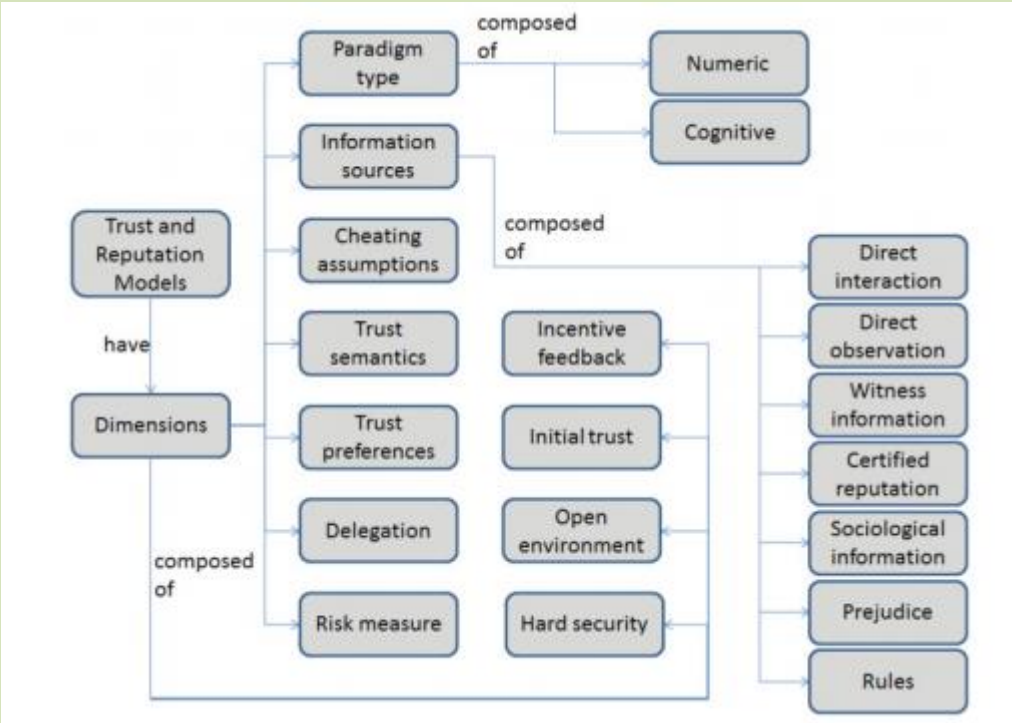


Fig: Dimensions of trust and reputation models

Based on the dimensions shown in Table II, the aim of this section is to define each one of them and show how trust and reputation models are related to them. This section presents our first contribution, including explanations about how MASs make use of these dimensions and

a general discussion about all the dimensions used in the literature. explanation is the growth of the interest in applications that consider the cognitive aspects closest to human behaviour, instead of only simple scenarios. An example is the argumentation process, which requires more reasoning and complex agents, different from purely numeric ones . Despite this, most models are interested only in providing resources for simple cooperation or partner selection, and they do not take into account these aspects. We think this scenario will change in a few years and researches will focus their work on the cognitive and affective aspects of trust.

Paradigm type		Information sources					
C	N	DI	WI	SI	CR	P	RL
18/106 (16%)	91/106 (85%)	73/106 (68%)	79/106 (74%)	10/106 (9%)	3/106 (2%)	5/106 (4%)	8/106 (7%)
Cheating assumptions			Trust semantics	Trust preferences	Delegation	Risk measure	Incentive feedback
L0	L1	L2					
72/106 (67%)	2/106 (1%)	30/106 (28%)	19/106 (17%)	8/106 (7%)	9/106 (8%)	7/106 (6%)	4/106 (3%)
Initial trust			Open environment			Hard security	
15/106 (14%)			37/106 (34%)			8/106 (7%)	

Table: Trust Dimensions

Conclusions

The need for interaction is an essential feature in MAS applications. In opened and uncertain environments, agents may present difficulties in obtaining information about unknown members, resulting in a great barrier to interaction. As shown in this article, trust and reputation models still receive attention as the primary alternative to reducing interaction risks in open environments.

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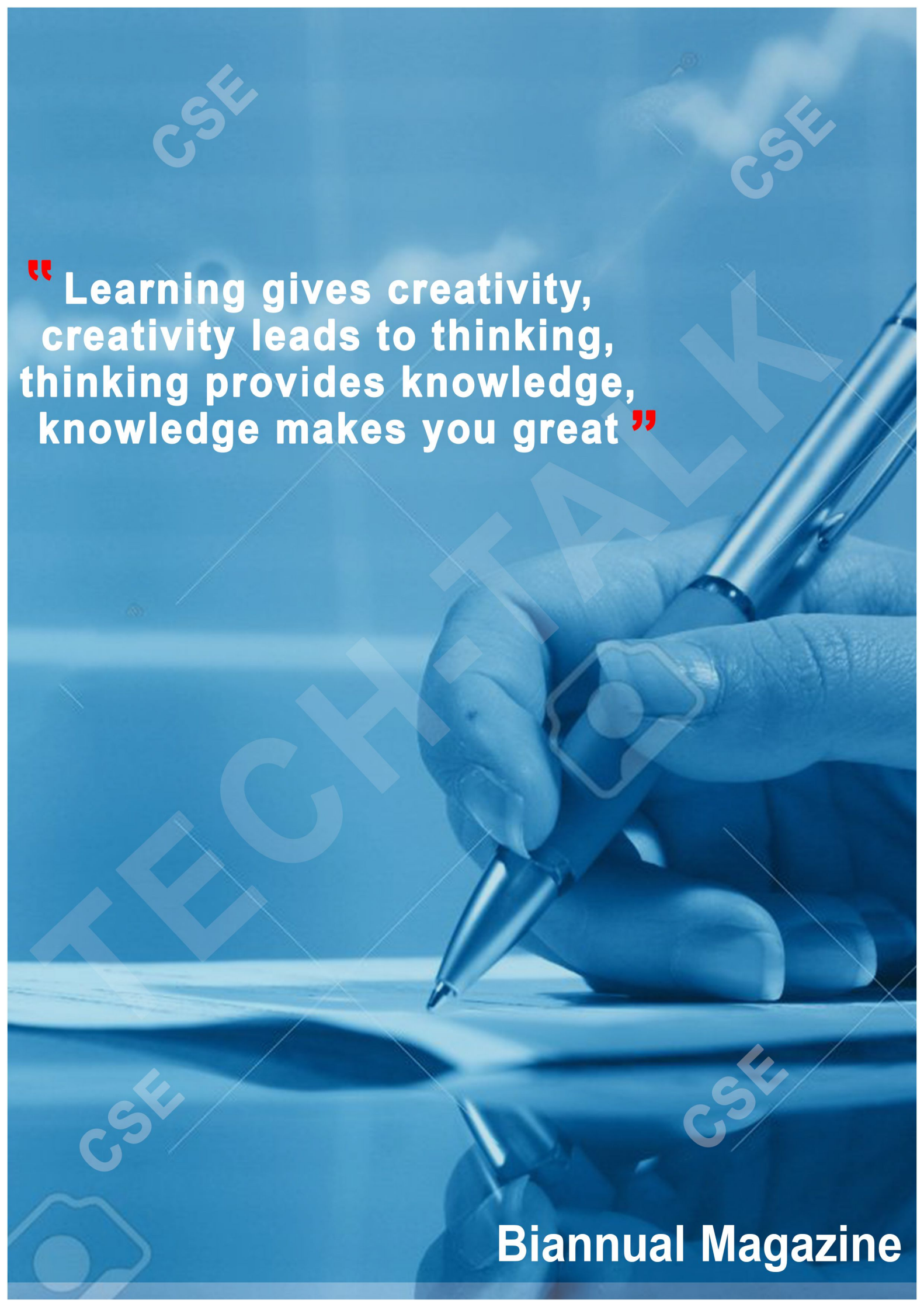
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creativity leads to thinking,
thinking provides knowledge,
knowledge makes you great"
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