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Evaluating the Efficiency of Video Transmission Using a New Circular Search Algorithm Based on the Motion Estimation for a Single User

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Keywords: Convolutional coding, Video transmission, Block-Matching, Motion Estimation.

Abstract

The successful transmission of video over wireless networks faces many challenges and problems that contribute to the weakening of efficient transmission systems because of the limited resources and the environment surrounding the wireless signal. Therefore, In order to deal with these challenges we need not only to compress the video in efficient ways but also to use a good transmission system that overcome the errors of the channel and correct potential errors during the transmission process. In this paper, the transmission system depends on the transmission of the video to a single user, a proposed system to simulate the transmission in the mobile networks and to measure the efficiency of the transmission system is added to the percentage of noise (i.e. additive white Gaussian Noise (AWGN) channels). In many such practical systems, jointly source and channel coding the efficiency and performance of the transmission system can be greatly improved to obtain a transmission system without channel errors. The source coding decreases the redundancy in the signal sent to provide bandwidth and the channel/convolutional coding (CC) adds useful redundancy to combat channel errors. The circular search algorithm for motion estimation (ME) is used as a source coding method. The results show that the suggested system can produce a balance among the compression performance and maintain video quality. The methods used in the transmission process showed a great advantage in the performance of the channel encoding compared to that of another transmission system without channel coding.

1. INTRODUCTION

The development of the video communication process and the computing system becomes very easy through applying data compression and bandwidth efficiently. The design of wireless transmission systems such as broadcast video transmission and messages via the internet turns to be easily implemented. The major challenge in the field of video communication is the weakness of Internet services which may cause a major delay in data loss or loss of transmission. So,

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Innovative Queue Management Mechanism for Congestion Control in Wireless Cloud Computing Environment

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Abstract--- As the demand on the cloud services increases, networks in the wireless cloud environment would not be able to handle the big amount of data traffic without some procedures that control the arriving traffic from outside the cloud and manage the connections inside the cloud. Thus, for efficient traffic monitoring and control, it is essential to have some measures that would improve the cloud performance. Since congestion phenomenon can negatively affect the utilization of the cloud resources and reduce the performance experienced by the end-uses, it is highly necessary to diminish congestion phenomena in order to optimize the cloud service utilization and provide end-users with appropriate level of performance that meets their requirements. The paper aiming at improving the performance in wireless cloud computing environment in frame of delay, packet loss, throughput, and utilization.

Keywords--- Cloud model, Hoff's model, Wireless cloud, Congestion Cloud.

I. Introduction

Cloud computing all the technical, electronic and information achievements in various fields, the world is turning to advanced technology cloud computing, which relies upon the exchange of preparing and storage room of the PC to the purported Cloud, a server is gotten to through the Internet, IT programs from items to administrations. So everything that is used and what happens from the processes and programs to access files and data stored on computers over remote networks. For such big amount of data, the difficulty of management on the one hand storage and processing being large data through a small set of computers (Kadhim, Mahdi, et al. 2018). Computer networks support almost every aspect of modern business. In the area of competent management is critical to the success of the company and experts who can perform this role has expanded after too. Network management is a rapid development specialty that needs leadership, problem solving, organizational, as well as technical ability in data management and analysis service provided in computing and protection (Buyya et al. 2008). Cloud computing may refer to a collection of infrastructure equipment and frameworks programming in server farms that gives pay-examine parallel administrations to many applications in different areas such as physics, biology, chemistry, finance, and information retrieval, to name few (Hoffa et al. 2008). Define cloud computing is a group of virtual servers that networked over Internet and dynamically managed, monitored and maintained by the cloud provider. Services in cloud computing are characterized into three main categories (Kadhim, Yusof & Selamat 2018). Programming as a Service (SaaS), Platform as a Service (PaaS), and Cloud Software Infrastructure that is made out of three layers to be specific; computational assets or Infrastructure as a Service (IaaS), Data-Storage as a Service (DaaS), and Communication as a Service (CaaS). Figure 1 presents the cloud computing classification model (Chhabra & Dixit 2015). SaaS is browser-based applications (such as Google Docs and Google SpreadSheets) with predetermined functionality and scope. It reduces the requirements of hardware (and other related matters such as the maintenance of the hardware) on the end user's side, as it allows developers to frequently upgrade and fixe their applications at the data center offered by the provider. With PaaS, application-programming interfaces (APIs) are provided to developers to build, test, and deploy applications on the cloud. For IaaS, datacenters supply flexible infrastructure resources for several services such as computing, storing, and communication.

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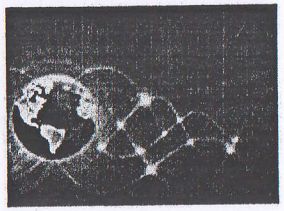

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WEB-MODEL OF DISTRIBUTED REAL-TIME INFORMATION SYSTEM

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ABSTRACT

The article describes approaches to solving the problem of effective use of computing resources in the design of complex web-oriented distributed systems, as well as the development of a web-based distributed real-time information system *for holding competitions in scientific and educational works. The system is implemented on the basis of the Yii framework in PHP. The interaction between the application server and the client application is organized using the MVC (Model View Controller) pattern, where the view is the user interface with tools for working in the system, and the controller provides interaction between the model and the view. The client application is designed on the basis of the design pattern "Module" due to the mechanism of (closures) in the JavaScript language. This approach to organizing the structure of the web system creates the conditions for centralized processing, storage and delivery of spatial data via the Internet for remote users. The system implements the separation of users by roles into "Administrator", "Verifier" and "Participant". The article describes user activity diagrams with the roles "Administrator" and "Verifier", built according to the methodology of UML (Unified Modeling Language).*

The developed system allows in real time to submit applications for participation in the contest of scientific and educational works to the "Participant of the competition", to check, approve, reject and send for completion the applications, as well as to form documents summarizing the results of the competition "Checker", thereby carrying out and controlling the entire cycle of activities for organizing the competition of scientific and educational work in the web-system.

Key words: distributed computing system, software package, web application, server, client, pattern, architecture.

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THE METHOD OF AUTOMATED FORMATION OF THE SEMANTIC DATABASE MODEL OF THE DIALOG SYSTEM

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ABSTRACT

The paper deals with the problem of intellectual database content analysis for creating a semantic database model. Voice assistants are created to simplify interactions with mobile devices such as smartphones and tablets. A text is a system of analogue of this approach. As a result, user can interact with software using natural language. User interface is a set of software solutions that helps to search, review, obtain and process information from a database that is external storage. The natural language interface is the sort of user interface that accepts and processes the natural language queries. This interface can also be used in natural language. A semantic database .This model includes interconnections and internal structure of a database. Manual creating of a semantic database model .The system of semantic database mode. The proposed method uses a set of approaches to an automated semantic model. An object domain thesaurus helps to define semantics and solve the problem of polysemy in text processing Patterns helps to extract interconnections in a database. The analysis of the field of the field. Locale indication allows decreasing the time for a database content analysis. The system of semantic database model .The proposed method uses a set of approaches to an automated semantic model. An object domain thesaurus helps to define semantics and solve the problem of polysemy in text processing. Patterns helps to extract interconnections in a database .The analysis of the field of the field. Locale indication allows decreasing the time for a database content analysis. The system of semantic database model. The proposed method uses a set of approaches to an automated semantic model. An object domain thesaurus helps to define semantics and solve the problem of polysemy in text processing. Patterns help to extract interconnections in a database.

Key words: Natural Language Processing, Semantic Model, User Interface, Database, Dialog System.

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Empirical Investigation of TCP Incast Congestion in Wireless Cloud Computing Networks

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Abstract: The promising services offered by cloud computing environments have led to huge amount of data that need to be processed and stored. Wireless cloud networks rely on Transmission Control Protocol/Internet Protocol (TCP/IP) for reliable transfer of data traffic between the cloud end-users and servers and vise-versa. Even though TCP has been successful for several applications, it, however, does not perform well in wireless cloud environments. The many-to-one communication pattern used in such environments with such huge amount of data resulted in TCP incast problem. Transmission Control Protocol incast problem happens in cluster based storage workloads where a lot of end-users communicate simultaneously to a server in the cloud through a bottleneck router, creating buffers overflows which lead to high packet loss. This paper presents an empirical study on TCP incast in current wireless cloud networks and how it is caused. It evaluates TCP-Vegas and TCP-Sack to examine their behaviors and suitability for short-lived connections in terms of queue occupancy level, packet drops, throughput, link utilization and bandwidth unfairness between the TCP connections. It was found that both protocols suffer from high packet loss and link underutilization with comparable throughput.

Keywords: Internet Congestion Control and Avoidance, Queue Management, TCP Incast, Wireless Cloud Networks, Cloud Computing

Introduction

Cloud computing has become very popular in recent years. The propagation of networked devices and offered services over Internet has given the rise to huge amount of data that need to be processed and stored. According to studies by an independent consulting firm, the need for cloud computing will reach about 22 million users by 2020, with annual growth projected to grow % 26 percent annually (Yassin *et al*., 2017). It is impossible to be processed or stored by one computer or even a small group of computers (Puthal *et al*., 2015). Thus, cloud computing has emerged and become widely popular as a global technology for cost effective resource availability and management to achieve significant performance improvements in analyzing such large-scale data. Well-known organizations such as Amazon, Google, Microsoft, HP and IBM have been deploying on-demand "Clouds" for all required software (services) around the world (Staudinger *et al*., 2014; Botta *et al*., 2016) and host applications that produce numerous data such as scientific computing, social networks, e-commerce, web search, retail and distributed files systems, to name a few (Hammadi and Mhamdi, 2014).

In cloud computing, Quality of Service (QoS) for network communication should be guaranteed. Communication is an essential component of the cloud infrastructure. Thus, it is necessary for cloud systems to provide reliable communication along with processing ability and sufficient bandwidth. In the direction of this goal, Communication as a Service (CaaS) layer is responsible of meeting such requirements, through for example dynamic provisioning of bandwidth and network monitoring. Transmission Control Protocol (TCP) is underlying transport protocol that is commonly used in cloud networks due to its reliability of data delivery (Kulkarni *et al*., 2013; Garai *et al*., 2015).

Even though TCP has succeeded in satisfying the requirements of most of Internet-based communications, however, its performance has been degraded in the cloud environment where high burst tolerance, low latency and

The Effectiveness of Random Early Detection in Data Center Transmission Control Protocol-Based Cloud Computing Networks

Qusay Kanaan Kadhim[1,2], Robiah Yusof[1], Hamid Sadeq Mahdi[3], Siti Rahayu Selamat[1]

Abstract – *Wireless cloud computing environment becomes an important element of Internet. The underlying transport layer protocol in such environment should efficiently deal with high bursty traffic tolerance, presents low delays, and offers high throughput. DCTCP is the common cloud transport protocol that is capable of tackling TCP incast and queue build-up problems. However, its performance is considerably degraded when there are tens of servers responding to one aggregator simultaneously. In this paper, the performance of DCTCP with the utilization of RED queue management mechanism is evaluated. The evaluation results showed that there is a tradeoff in the use of RED. On one hand, RED is not good for short-lived and medium-lived connections as it presents higher completion time delay compared to the normal DCTCP mechanism. On the other hand, it presentsacceptable delay for longlived connections but at the cost of throughput.*

Keywords: *Wireless Cloud Computing Environment, Data Center Networks, DCTCP, RED*

I. Introduction

The rapid growth of the Internet and the emergence of client–server computing and have led to the idea of cloud computing environment which becomes an important part of future Internet [1]-[19]. Data centers are considered the heart of the cloud environment and the backbone of the Internet hosting various ranges of applications.

Data centers are usually referred as mission critical systems whereреliability is the main factor that should be achieved at any cost. Cloud data centers provide timely accessible services to social networks and web users, such as Google, Facebook, and Yahoo; in addition to providing online resources for the userssuch as Amazon Elastic Compute Cloud (EC2) and Microsoft Azure and many more [1].

There are many factors that contribute to the data distribution and scaling challenges in cloud data centers, which are [2]:

- Explosive growth of data with no locality.
- Legal requirement to backup data in geographically separated locations.
- Emergence of mobile and cloud computing.
- Massive "interactive" web application.
- Energy constraint.

There are three types of traffic coexist in cloud data center networks:

Short-lived traffic such as Google search and Facebook updates, in which, transmission rate of the connections is less than 100kB. Such connections require short response times.

- Medium-lived traffic such as small-and medium-sized file downloads using YouTube, and also Facebook photos. The transmission rate of such connections varies from100kB to 5MB; and they usually require low latency.
- Long-lived traffic such as large software updates (antivirus updates) and video on demand (large movie downloads). The traffic of these connections usually exceeds 5MB; and they require high throughput.

Since the cloud environment is supposed to achieve high throughput and low latency, round-trip time (RTT) in some cases is less than 250 microseconds without considering the queuing delay [3]. Classified available data centers are based on their cost and performance characteristics. Incoming user requests are distributed among available data centers [4]. The performance of the cloud data center networks depends on three essential requirements: high bursty traffic tolerance, low delay, and high throughput, which are imposed by the aforementioned traffic types that coexist in cloud networks, where each traffic type requires certain application quality of service that differs from the other.

The main issue related to the performance of cloud networking is the use of transmission Control Protocol/Internet Protocol (TCP/IP) stack that was specifically designed for Internet. TCP/IP suffers from several performance issues when it is traditionally and genuinely used in cloud data center networks without modification according to the diverse requirements of several coexist traffic types of the cloud environment. It has been observed that TCP fails to fulfill the aforementioned three essential requirements because of

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THE USE OF SPATIAL RELATIONSHIPS AND OBJECT IDENTIFICATION IN IMAGE UNDERSTANDING

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ABSTRACT

Image understanding includes mathematical and geometrical abilities. It requires analyzing, classifying, labeling to identify requirements, involving difference comparing or appreciated gaps in an image or object analysis, and these investigation cases use different methods. Image understanding supports many knowledge fields as Image Processing, Artificial Intelligence, Computer Graphics, Psychology, Object Recognition and many other fields. From another side, the information of spatial relationships holds enormous and vast inputs for the study of image understanding. This paper concentrated on the techniques of image understanding by the use of spatial relationships and object identification, whereas staying nearer to the related issues.

Key words: Understanding, Object Identification, Spatial Relationships, Context, Categorization, Computations Modeling

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1. INTRODUCTION

The definition of image understanding is the method of an image interpreting into different objects or areas. This method helps to find out alteration happens in a specific image. The next steps are learning objects meaning containing their specific spatial relationships with the other objects or the entire image. The previous definition express the necessity of a suitable process, or technique for image studying and understanding. So, firstly the image needs to be divided into parts, and different objects to interpret the image (George, 2016).

A Review Study on Cloud Computing Issues

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Abstract. Cloud computing is the most promising current implementation of utility computing in the business world, because it provides some key features over classic utility computing, such as elasticity to allow clients dynamically scale-up and scale-down the resources in execution time. Nevertheless, cloud computing is still in its premature stage and experiences lack of standardization. The security issues are the main challenges to cloud computing adoption. Thus, critical industries such as government organizations (ministries) are reluctant to trust cloud computing due to the fear of losing their sensitive data, as it resides on the cloud with no knowledge of data location and lack of transparency of Cloud Service Providers (CSPs) mechanisms used to secure their data and applications which have created a barrier against adopting this agile computing paradigm. This study aims to review and classify the issues that surround the implementation of cloud computing which a hot area that needs to be addressed by future research.

Keywords: Cloud, Computing, Security, Issues

1. Introduction

Cloud computing becomes a promising networking for infrastructure pattern which can deploy large-scale application in a cost-effective method. It is defined as "applications delivered as services over the Internet and the hardware and systems software in the data centers that provide those services [1]. Recently, cloud computing has been widely adopted by the industry and organizations due to its usability and simple cloud of services oriented models. The number of cloud users can access the cloud of services to keep on the increasing daily and safe systems in the cloud computing environments. Cloud computing technology plays an important role in academic and industry organizations. The business processes are composed and implemented in the distributed loosely coupled environments and the composite of services which includes more services and thus the cloud of services will be connected by varies patterns and approaches. Cloud computing is providing organizations to use shared data storage and cloud resources. It is better than to develop with the own platforms. Further, cloud computing provides companies to have a data flexible, secure system, and cost-effective cloud infrastructure [2]. Additionally, the cloud computing can provide on demand dynamically scalable virtualized cloud resources via the web of internet. indeed, the cloud computing has not only changed the way of providing cloud services but influenced the way of application

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قراءات الرؤية وآليات المنهج الجمالي على وفق استراتيجيات التفكير في الخطاب التشكيلي

أ.م.د. وسام أحمد شهاب / مركز دراسات الكوفة / جامعة الكوفة

م. فردوس حيدر محمود / كلية التربية الأساسية / جامعة ديالى

ملخص البحث

تؤكد الاتجاهات الحديثة في الميدان المعرفي النقدي على ضرورة إكساب المتلقي مهارات تمكنه من التغلب على الصعوبات بانتاج صور ذهنية يستطيع من خلالها الاشتباك مع المنجز الفني، التي من شانها أن تقلل من تعقد البنية المعرفية للعمل نفسه وخاصة نحن نعيش عصر الانفجار المعرفي، الأمر الذي يتطلب من المتلقي أن يركز على استراتيجيات خاصة من شانها أن تجعله عنصراً فاعلاً، خاصة في كيفية معالجة المعلومات التي يستقبلها، ومن بين تلك استراتيجيات التفكير فوق المعرفي وانطلاقا من أهمية المشهد المعرفي تعرض البحث الحالي الى دراسة استراتيجيات التفكير تلك، إذ أن تطبيق مثل هذه الأساليب العملية في التفكير النقدي يطرح مشكلة مفادها (كيف يتم فهم البنى الفكرية للخطابات البصرية ؟).

لمعالجة هذه المشكلة، قام الباحثان بدراستهم الموسومة (البنى الفكرية للخطابات البصرية (بيت موندريان) أنموذجا). ولأجل التصدي لمشكلة البحث المبينة، تكونت مفاصل البحث من اربعة فصول ، اشتمل الأول منها على الاطار المنهجي للبحث وتحديد هدفه الذي تمثل في تعرف (تحليل البنى الفكرية لخطاب (بيت موندريان) على وفق استراتيجيات التفكير)، اما حدوده فقد اقتصرت على لوحة (تكوين بالاحمر و الازرق و الاصفر) للفنان (بيت موندريان) انموذجا للدراسة الحالية، إضافة الى تحديد استراتيجية التفكير فوق المعرفي في تحليل عينة البحث.

اما الفصل الثاني (الاطار النظري) فقد تضمن مبحثين الاول منها (مفهوم التفكير فوق المعرفي) والثاني اختص بدراسة (استراتيجيات التفكير فوق المعرفي نفسياً وتربوياً)، وقد جهد الباحثان على شمول متعلقات ومحاور البحث النظرية بالمراجع والمصادر العربية، كما شمل الفصل ما اسفر عنه الاطار النظري من مؤشرات. اما الفصل الثالث فشمل اجراءات البحث التي شملت مجتمع البحث وعينته المتمثلة بالوحة الفنان (موندريان) (تكوين بالاحمر و الازرق و الاصفر) لتمثل انموذج البحث وشمل ايضاً اداة البحث التي تمثلت باستراتيجيات التفكير فوق المعرفي في تحليل عينة البحث، وشمل كذلك منهج البحث (المنهج الوصفي)، وتحليل العينة . بينما شمل الفصل الرابع ما توصل اليه الباحثان من نتائج واستنتاجات واهم التوصيات والمقترحات وقائمة الهوامش وثبت بالمصادر والمراجع العربية.

الفصل الاول :

اولاً: مشكلة البحث

ان الكم الهائل من المشكلات التي بدأت تفرض هيمنتها نتيجة التسارع المعرفي ، جعلت من التفكير والتمتع بمهاراته ضرورة حتمية للتمكن من تلك المشكلات التي باتت أحدى ملامح الألفية الثالثة، لذا فإنه من الواجب إعادة النظر في أساليب التحليل، وطريقة تفكير المتلقي، وان المهم حقا هو أن يتعلم كيف يفكر في الطرق الفعالة التي ينبغي عليه التفكير من خلالها بقصد تنمية وأطلاق طاقات الأبداع لديه، والخروج به من ثقافة تلقي المعلومات إلى ثقافة بناء المعلومات وتحويلها إلى معرفة تتمثل في أكتشاف العلاقات في العمل الفني بما يمكنه من الانتقال من مرحلة المعرفة إلى مرحلة فوق المعرفة (melacognition) والمتمثلة في التأمل في المعرفة، وفهمها وتفسيرها وأستكشاف أبعادها من خلال استراتيجيات من البحث والتقصي.

يرى الباحثان ان عملية تغيير وتطوير قدرات المتلقي تعد معادلة ذات طرفين أساسيين أحدهما التفكير، والاخر آليات التحليل ويساعدها وعي المتلقي بتفكيره ومشاركته في التقدم العلمي والفني، ويمثل الهدف الاسمى

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اثر استراتيجية نجمتين ورغبة في التعبير الفني

لدى تلميذات الصف الخامس ابتدائي

م.نورس حيدر محمود

... الحالي إلى معرفة :"أثر استراتيجية نجمتين ورغبة في التعبير الفني لدى تلميذات الصف الخامس الابتدائي" ولتحقيق هدف ... الباحثة الفرضية الصفرية الرئيسة :" لا توجد فروق ذات دلالة معنوية عند مستوى (٠,٠٥) في متوسط درجات ... التعبير الفني بالرسم لتلميذات المجموعة التجريبية (أفراد العينة) في الاختبار القبلي والبعدي"، وأقتصر البحث على تلامذة ... المرحلة الابتدائية التابعة لمحافظة ديالى للعام الدراسي 2017- 2018، وتمّ اختيار منهج البحث التجريبي ومنه ... مجموعة واحدة وبتطبيقين قبلي وبعدي ، ومن متطلبات هكذا اجراء استمارة تحليل تعبير التلامذة الفني ، وقد تبنت ... التي استعملت في المجتمع ذاته ، وتم التأكد من صدقها وثباتها ، وبعد استخدام الاحصاء الملائم مثل : الاختبار التائي ... تفوق التحليل البعدي على التحليل القبلي لرسومات التلامذة ، وهذا يؤكد فعالية الاستراتيجية ، كما توصلت ... الاستنتاجات والتوصيات والمقترحات .

... رسوم الاطفال واثره في تنمية التعبير الفني لدى تلامذة المرحله البتدائيه، رساله غير منشوره، جامعة ديالى، كلية التربيه الاساسيه، العراق.

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Technology of the Coordinator's Construction for Distributed Transactions in the Web Service Conditions

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Abstract:

The article is devoted to the transactions management in the heterogeneous distributed information environments is considered and the construction tool of the transaction coordinator on the basis of the scripting LUA language in the conditions of Web service is offered.

The LUA scripting language, in context of creation of LTM transaction coordinator using the modified query language LQL, has sufficient tools available in modern scenarios programming languages, When determining the library of LTM transaction coordinator built in conditions of LUA machine, using modernized scripting LQL.

Keywords: LQL language, LUA language, Database Management (DBMS), CORBA, IS, web-service.

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Confirm Content Validity and Sender Authenticity for Text Messages by Using QR Code

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Keywords: Electronic messages, message's symbols, Digital signature, ASCII code, QR Code #,C language

Abstract

In light of the information revolution taking place in the modern world, therefore it becomes necessary and important to save this electronic messages. So we offered this technique to ensure the safety of the content of the messages and authenticity of the sender through networks communication by converting the message's symbols to numbers , each one of this symbols (letters, numbers, symbols) will converted into three digits, the first digit represents the ASCII code of the symbol , the second digit represents the frequency of this symbol in the message (the number of times this symbol is appear in the message), and the third digit represents the total number of the locations of the symbol (calculates the symbol location from the first symbol in the message to this symbol itself and blanks also calculated too) .The digital signature of the sender will converted to numbers like the symbols of message we explained it before, and this numbers of the digital signature will gathering together to produce three numbers only, this number will gathering with each numbers of the message's symbols, the final numbers will converted to QR Code , the QR Code will placed with the message and sent to the recipient. The recipient returns the steps of the sender (produce QR Code from the received message) and compared it the received QR Codes, if it is match or not. The recipient will ensure that the content is secure, and confirms the authenticity of the sender.

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Estimating the state of website security as poorly re based on fuzzy logic methods

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Abstract

The research is devoted to the analysis of page loading tim indicator for any web-site. As a rule, the sites are hosted on characteristics. The users interact with the environment is largely (external threats such as penetration, denial of service, the intr language of structured SQL queries, etc.). It should be n uncertainties generated by hardware and software are also impor is influenced by the influence of the external environment ar servicing the functions of web-sites, which leads to occurrer

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Adaptive feed control of operating tool in Robot machine

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abstract :

Adaptive ornate milling technology involves variation of milling operational parameters (particularly, cutter feed speed) based on wood surface texture at the processing spot. It is appropriate to use wood fiber orientation optical recognition method for adaptive ornate milling.

Adaptive milling method is very efficient for ornate milling, when cutter moves along a complex trajectory in space, and feed direction and fibers alignment substantially alters along the trajectory. Moreover, at sharp trajectory sections, adaptive choice of operational parameters permits to materially reduce the chance of wood damaging. Adaptive milling method is most effective for poor value wood that has low stress-strain properties and complex surface structure, so is very prone to damage.

System for programmed PID controller adjustment involves computer with software for certain operating system, input/output hardware and connector cables. Communication with facilities is typically performed by use of OPC server. While adjusting, an object is included in the control loop. The system adjusts and PID controller is registering obtained parameters. Obtained in such way controller parameters will be near optimal due to intuitive user interface, high computer capability and limitless system identification algorithms.

The format in the search shows schematic structure of automated control system of tool feed in adaptive milling, which uses CNC-controlled 3D vertical milling machine, control computer and camera for wood fiber orientation optical recognition, its signal being transferred to milling parameters optimization application.

It should be noted that at such milling with control of supply rate along the complex trajectory of supply of the milling tool, it would be possible to significantly reduce the percentage of shatters. This would allow to significantly reduce economic expenditures for additional operations concerning the surface recovery.

Keyword : Robot machine, OPC server , Proportional Integral Derivative (PID) controller

حيدر عبد الباقي

УДК: 674.026

МАТЕМАТИЧЕСКОЕ МОДЕЛИРОВАНИЕ ПРОЦЕССА ФРЕЗЕРОВАНИЯ ДРЕВЕСИНЫ

MATHEMATICAL MODELING OF THE WOOD MILLING PROCESS

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Аннотация: В статье рассматриваются определение математической модели оптимальной скорости подачи фрезы при адаптивном фрезеровании.

Summary: The article deals with the definition of the mathematical model of the optimal feed rate of the mill with adaptive milling.

Ключевые слова: математическая модель, адаптивное фрезерование, скорость подачи фрезы.

Keywords: mathematical model, adaptive milling, feed rate of the cutter.

Технология адаптивного декоративного фрезерования заключается в изменении технологических параметров процесса фрезерования (в частности, скорости подачи фрезы) в зависимости от структуры поверхности древесины в месте обработки. Для адаптивного декоративного фрезерования целесообразно использовать методику оптического распознавания ориентации волокон.

Предлагаемая технология адаптивного фрезерования наиболее эффективна для декоративного фрезерования, когда фреза движется по сложной траектории в пространстве, при этом взаимная ориентация направления подачи и волокон существенно изменяется вдоль траектории. Кроме того, на участках траектории с малым радиусом кривизны, адаптивный выбор технологических параметров позволяет существенно снизить вероятность скола древесины. Особенно эффективна технология адаптивного фрезерования для древесины малоценных пород, обладающих низкими механическими свойствами и сложной структурой поверхности, поэтому в высокой степени подверженной разрушению.

Технология адаптивного фрезерования в первую очередь может быть использована малыми предприятиями, с мелкосерийным и позаказным производством декоративных элементов мебели. В условиях работы данных предприятий нет возможности подбирать режимы фрезерования опытным

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ИНФОРМАЦИОННЫЕ ПРОИЗВОДСТВЕННО-ТЕХНОЛОГИЧЕСКИЕ ПОТОКИ МЕБЕЛЬНОГО ПРЕДПРИЯТИЯ КАК ОБЪЕКТА УПРАВЛЕНИЯ

INFORMATION PRODUCTION-TECHNOLOGICAL FLOWS OF THE FURNITURE ENTERPRISE AS THE OBJECT OF MANAGEMENT

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Аннотация: В статье рассматриваются информационные потоки мебельного предприятия с точки зрения управления.

Summary: In the article information flows of the furniture enterprise from the point of view of management.

Ключевые слова: управление, автоматизация, мебельное предприятие.

Keywords: management, automation, furniture enterprise.

Специфика мебельной отрасли и исторические особенности ее развития в России определяют специфические условия и требования, которые необходимо учитывать при выпуске новое мебели. Большинство мебельных предприятий относятся к малому бизнесу, для которого разделение процесса создания новых изделий на конструирование, технологическую подготовку производства, планово-экономические расчеты и др. четко не прослеживается. Выполнение многих проектных, технологических операций совмещается и по времени, и по исполнителям. Это требует определенной универсальности, совмещения в них элементов автоматизации производства [1].

На рынке программных продуктов для автоматизации конструкторского и технологического обеспечения выделилось отдельное направление, ориентированное на мебельные предприятия [2, 3].

В процессе комплексной автоматизации мебельного производства необходимо преодолеть несколько достаточно распространенных заблуждений, а также решить ряд задач, общих для любого предприятия. Только в этом случае можно рассчитывать на успешное завершение проекта автоматизации выпуска новое мебели.

Одно из заблуждений является средством кажущейся простоты производства мебельных изделий и заключается в непомерно завышенных

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ИССЛЕДОВАНИЕ ЭФФЕКТИВНОСТИ АДАПТИВНОГО ФРЕЗЕРОВАНИЯ ДРЕВЕСИНЫ

STUDY OF EFFICIENCY OF ADAPTIVE MILLING OF WOOD

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Аннотация: В статье рассматриваются целесообразность и экономическая эффективность адаптивного фрезерования древесины.

Summary: The expediency and economic efficiency of adaptive wood milling is considered in the article.

Ключевые слова: адаптивное фрезерование, скорость подачи фрезы, эффективность, ориентация волокон.

Keywords: adaptive milling, feed rate of milling cutters, efficiency, fiber orientation.

Для исследования эффективности процесса адаптивного фрезерования провели серию экспериментов с переменной скоростью подачи фрезы.

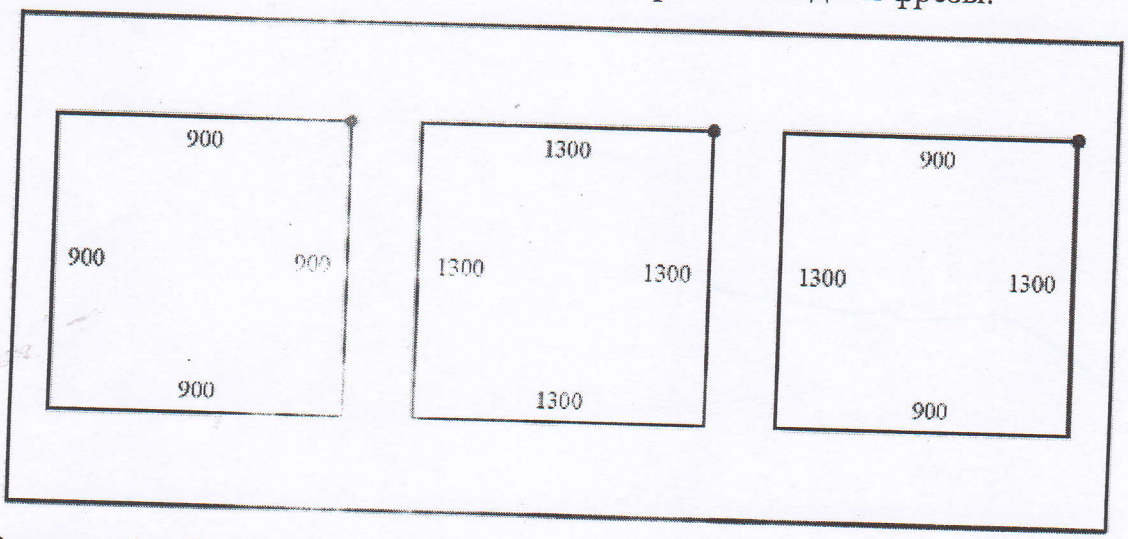

Рисунок 1 – Задание на фрезерование для станка с ЧПУ в эксперименте по изменению скорости подачи в зависимости от ориентации волокон (указана скорость подачи в мм/мин при фрезеровании поверхности древесины сосны)

Задача на фрезерование состояла в проходе конической фрезой квадратного контура (рисунки 2 – 4). Для каждой породы древесины фрезерование по квадратной траектории производили тремя различными

[illegible]

دبلو

Analyzing Methods and Opportunities in Software-Defined (SDN) Networks for Data Traffic Optimizations

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Abstract—Computer networks are dynamic and require constant updating and monitoring of operations to meet the growing volume of data trafficked. This generates a number of cost issues as well as performance management and tuning to deliver granular quality of service (QoS), balancing data load, and controlling the occurrence of bottlenecks. As an alternative, a new programmable network paradigm has been used under the name of Software Defined Networks (SDN). The SDN consists of decoupling the data plane and controlling the network, where a programmable controller is responsible for managing rules for routing the data to various devices. Thus, the hardware that remains in the network data stream simply addresses the routing of the packets quickly according to these rules. In this context, this article conducts a study on different methods and approaches that are being used in the literature to solve problems in the optimization of data traffic in the network through the use of SDN. In particular, this study differs from other reviews of SDN because it focuses on issues such as QoS, load balancing, and congestion control. Finally, in addition to the review of the SDN's state-of-the-art in the areas mentioned, a survey of future challenges and research opportunities in the area is also presented. load balancing and congestion control. Finally, in addition to the review of the SDN's state-of-the-art in the areas mentioned, a survey of future challenges and research opportunities in the area is also presented. load balancing and congestion control. Finally, in addition to the review of the SDN's state-of-the-art in the areas mentioned, a survey of future challenges and research opportunities in the area is also presented.

***Keywords**-Networks Defined by Software; Performance; Congestion; Challenges; Load Balancing.*

*****

I. INTRODUCTION

The ability of computer networks coupled with infrastructure problems and the increasing volume of data traffic are limiting today for performing scalable services that need high availability as well as adequate performance. This amount of data comes from a variety of sources, such as the large number of users who send and receive information, intelligent sensors and applications that perform large data transmissions [1]. Conventional networks use special algorithms implemented in dedicated components to control and monitor the data flow in the network, managing the routing of packets and reassessing, at regular intervals, the state of the connection between the network devices.

In the conventional network, when a packet is received by a network device, whether it is a router or switch, a rule set is built into its own firmware in order to find the destination device to optimize the packet forwarding path [2]. These network devices use a variety of time-consuming and complex protocols in terms of management and time, where network administrators are responsible for setting up policies to respond to a wide variety of network events and applications involved. In particular, administrators need to manually transform high-level policies into low-level configuration commands while adapting to changes in network conditions. Often, these tasks need to be done through proprietary tools that are limited in functionality.

Network management and fine-tuning of performance is quite challenging in the traditional scenario, becoming also prone to errors due to poor human interpretation of network events [3]. In this context, software program- mobility paradigm (SDN) ideas come back with the popularization of the OpenFlow protocol, eliminating the rigidity present in traditional networks. With this, a decoupling of the data and control layers occurs, where all the network management becomes programmable in a controller, while the network hardware (switches or routers, for example) is simply the task of routing packets according to the rules that are established in the software [4].

An SDN allows network behavior to be more flexible, as well as adaptable and manageable according to the needs of each business context. As discussed, OpenFlow is a standardized protocol for communication between switches and the SDN controller. It was proposed as a way for the scientific community to test new ideas and experiments. Initially OpenFlow was deployed in the network of an academic campus [5], but nowadays it is used in several US and European universities [6]. In addition, the industry has also adopted this protocol in its SDN implementations as a strategy to increase network functionality and reduce the costs and complexity of network hardware.

Several literature reviews were performed with a focus on SDN. For the most part, the focus of research is on (I) concepts, challenges and future opportunities for SDN [1, 2, 7]; (II) programmable networks [3]; (III) innovations in the Openflow protocol [4]; (IV) taxonomy for classification of literature reviews in SDN [8]; (V) solutions and problems caused when updating flows and rules in the SDN network [9, 10]. This article presents a literature review of methods and approaches that are being used by researchers to solve

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An Efficient Two- Stage Block Coding Method for Compression Binary Images

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Abstract *- Efficient image compression without quality loss is one of important problems of the information theory. This problem has a wide practical application. It is known that any digital image can be represented by a sequence of messages. The only requirement for these methods is the possibility of restoring an exact copy of the original image from a sequence of messages [1]. One of the ways of choosing messages is that the adjacent picture elements are grouped into blocks. Then, these blocks are encoded according to the probabilities of their occurrence. Thus, short codewords are used for the most probable configurations of blocks, and long code words are used for less probable configurations. The result is an average ratio of data compression. The block coding method makes it possible to obtain efficient compression binaryimages without losing quality. This paper considers the solution of this problem. We consider any binary image as many adjacent rectangular blocks of a certain size. Using the optimal Huffman coding we can achieve the highest data compression. However, in blocks larger than 3×3 a set of messages is very large, and the Huffman code becomes inefficient. In addition, statistical analysis of binary images shows that a block consisting of white elements has high probability. Based on this observation and applying the known optimal code, this paper proposes an efficient two-stage block coding method for compression binary images. We found the optimal block size at the first stage of coding. We have also compared the experimental results of the compression ratio with the proposed algorithm and the block algorithm JPEG. The results have confirmed the efficiency of the proposed method.*

Keywords: *binary image , block coding , compression ratio.*

1. INTRODUCTION

Effective compression of images without loss of quality is one of the important problems of information theory, which has wide practical application. A number of studies have been devoted to its solution (for example [1-2-3]). Any digital image can be represented through a series of messages. There are numerous techniques to select such messages. The only requirement for them is to enable the restoration of an exact copy of the original image from the message sequence. Onlyaway for selecting messages is to grouping adjacent image components into blocks each block with size n × m, where n isthe number of elements in the horizontal direction and m is the number of element in the vertical direction [1]. Then the received blocks are coded depend on their probabilities of their appearance, and for the most probable blocks configuration, short code words are used, and for less likely ones, long code words, resulting in an average compression of data. This type of coding is called block coding and is considered in [4]. Block coding using adaptive methods was considered in [5, 6].

Any binary image will be considered as a set of n × m rectangular blocks adjacent to each other. Each image element can be either white (0) or black (1), so the total numbers of blocks configurations, that is, the possible element locations numbers in the blocks, is 2nm. These blocks form a collection of messages that characterize the image. Applying the optimal Huffman code [7] to the block set, you can achieve the greatest data compression. However, for blocks larger than 3 × 3, the aggregate of messages is very large, and the use of the Huffman code becomes unreasonable.

In this paper, I propose an effective two-stage block coding method for binary images. The optimum block sizes were found in the first stage of the coding, and the experimental compression results of the constructed algorithm were compared with the results of compression of the block JPEG algorithm [8], confirming the effectiveness of the proposed method.

2. BLOCK CODING METHOD

Statistical analysis of block configurations for binary images shows that a block consisting of white elements has a rather high probability. Proceeding from this observation and the suboptimal code proposed in [7], we construct an effective method of block coding. Coding will be carried out in two stages.

Let's consider the first stage. The codeword for a block consisting of one zeros will be 0. The codewords for other block configurations are formed from nm binary bits corresponding to this

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Developing High School Information System Using Artificial Intelligence Methods

Firas Mohammed Aswad[1], Ali M. Ahmed[2]

Abstract: *The article deals with the software tools for organizing and planning educational process using models, methods and algorithms of artificial intelligence.*

Keywords: artificial intelligence, genetic algorithm, evolutionary process

1. Introduction

Scheduling of classes is one of the most important tasks of educational process management. Therefore, automation of scheduling of classes in systems of mass education is still a topical problem of organisation of educational process. Good schedule of classes helps improve:

a) Quality of training;
b) Economic efficiency of training;
c) Convenience of training of students and work of teachers.

Automation of scheduling procedure enables to:

a) Consider a number of timetable conditions and requirements;
b) Strictly formalise a procedure for making a timetable, which is the best in a determined sense;
c) Implement a criterion or optimisation approach to scheduling;
d) Reduce scheduling time considerably.

Timetable is defined with subset S of Cartesian product of five discrete sets: training groups (set G), teachers (set P), subjects (set D), time (academic hours) of classes (set T), and classrooms (set A):

$$R=\{GxPxDxTxA\}$$

Then, the scheduling problem on the quality level can be formulated as follows: for each training group it is necessary to make a schedule of classes within a semester with specification of classrooms and times of classes for each subject under study.

To describe a classroom located in i[th] building under number j with the type t, a three-component sequence is introduced:

$$A=\{a_j\},\ a_j=\left(a_j^v, a_j^s, a_j^{type}\right) \quad (1)$$

The description of time intervals of classes like this involves the use of consequence numbering of academic hours in a semester. The time intervals are described with a set T, each element of which is a three-component sequence of the form:

$$t_k=\left(t_k^w, t_k^d, t_k^p\right) \quad (2)$$

where t_k^w is a week number, $t_k^w=\overline{1,N_{wps}}$; where t_k^d is a week number, $t_k^d=\overline{1,N_{dpw}}$; where t_k^p is a week number, $t_k^p=\overline{1,N_{cpd}}$. Here, N_{wps} is a number of academic weeks in a semester, N_{dpw} is a number of academic days in a week, N_{cpd} is a number of academic hours in an academic day.

Teacher object $P=\{p_i\}$,

$$p_i=\{d_1,d_2,...,d_m\} \quad (3)$$

where

p_i is a teacher code, d_j is one of the subjects taught by the teacher, and m is a total number of subjects he/she can teach.

Limitations imposed on the timetable are described as follows:

1) Mathematical expression describing the absence of classroom clashes.
2) Absence of clashes for teachers describes that for each ordered pair of elements including academic hour and teacher, either there is the only block of classes conducted by this teacher within the given hour, or there is no such a block at all.
3) Absence of clashes for training groups.
4) Conformance of a classroom type to a class conducted.
5) Limitation imposed on the number of academic hours conducted within an academic day means that for each pair of elements including group and day, the number of classes may not exceed the maximum allowed value N_{nap_max}.
6) The requirement of absence of gaps for training groups.

Under the above requirements, a target function is defined on the basis of minimisation of penalty indicators. Each violation of a limitation or a desirable requirement increases the value of the target function according to a requirement's importance coefficient.

Following the timetable mathematical model, when solving a scheduling problem, a specimen consisting of three chromosomes is considered. Each chromosome, in turn, consists of genes designated with whole numbers $1,2,...,i,...,N$, whereby a gene number of each chromosome corresponds to a number of class block, e.g., z^{th} gene in the first, second, and third chromosome characterises the block of class z from the set Z.

The information content of the first chromosome is classrooms used in the educational process, the second chromosome – time of classes (academic hours), the third chromo-

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Confirm Content Validity and Sender Authenticity for Text Messages by Using QR Code

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Keywords: Electronic messages, message's symbols, Digital signature, ASCII code, QR Code #,C language

Abstract

In light of the information revolution taking place in the modern world, therefore it becomes necessary and important to save this electronic messages. So we offered this technique to ensure the safety of the content of the messages and authenticity of the sender through networks communication by converting the message's symbols to numbers , each one of this symbols (letters, numbers, symbols) will converted into three digits, the first digit represents the ASCII code of the symbol , the second digit represents the frequency of this symbol in the message (the number of times this symbol is appear in the message), and the third digit represents the total number of the locations of the symbol (calculates the symbol location from the first symbol in the message to this symbol itself and blanks also calculated too) .The digital signature of the sender will converted to numbers like the symbols of message we explained it before, and this numbers of the digital signature will gathering together to produce three numbers only, this number will gathering with each numbers of the message's symbols, the final numbers will converted to QR Code , the QR Code will placed with the message and sent to the recipient. The recipient returns the steps of the sender (produce QR Code from the received message) and compared it the received QR Codes, if it is match or not. The recipient will ensure that the content is secure, and confirms the authenticity of the sender.

processes

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Article

Impact of Metaheuristic Iteration on Artificial Neural Network Structure in Medical Data

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Abstract: Medical data classification is an important factor in improving diagnosis and treatment and can assist physicians in making decisions about serious diseases by collecting symptoms and medical analyses. In this work, hybrid classification optimization methods such as Genetic Algorithm (GA), Particle Swam Optimization (PSO), and Fireworks Algorithm (FWA), are proposed for enhancing the classification accuracy of the Artificial Neural Network (ANN). The enhancement process is tested through two experiments. First, the proposed algorithms are applied on five benchmark medical data sets from the repository of the University of California in Irvine (UCI). The model with the best results is then used in the second experiment, which focuses on tuning the parameters of the selected algorithm by choosing a different number of iterations in ANNs with different numbers of hidden layers. Enhanced ANN with the three optimization algorithms are tested on biological gene sequence big dataset obtained from The Cancer Genome Atlas (TCGA) repository. GA and FWA are statistically significant but PSO was statistically not, and GA overcame PSO and FWA in performance. The methodology is successful and registers improvements in every step, as significant results are obtained.

Keywords: classification; metaheuristic algorithms; ANN; PSO; FWA; GA; data mining

1. Introduction

Medical data classification is an important factor in enhancing diagnosis and treatment. Moreover, this field continues to grow for computer researchers because of the major role played by medical data in human life. Classifying medical data can assist physicians in making decisions about serious diseases by collecting symptoms and medical analyses. Symptoms of patients are used as attributes for a disease data set, which also considers the number of instances.

The large amount of available medical data might be useful in healthcare. Data mining can be used in analyses of medical centers for providing sufficient sources, timely detection, and prevention of diseases, and avoiding high expenses caused by undesired and costly medical tests [1]. Numerous data mining approaches are implemented by scientists for diagnosing and treating various diseases, such as diabetes [2], liver disorder [3], Parkinson's [4], and cancer [5]. The artificial neural network (ANN) is used widely in disease mining classification and prediction; when performed with conventional backpropagation training, ANN improves accuracy and efficiency Mandal and Banerjee [6].

Heider et al. proposed a neural network cluster, which consists of four subfamily networks, to assign a small GTPase to one of the subfamilies and a filter network to identify small GTPases [7]. Desell et al. presented an ant colony optimization algorithm to evolve the structure of deep recurrent