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3.4.3. Research Publications

Mechanical Properties of Randomly oriented Carbon – Sansevieria Trifasciata Fiber Epoxy Composites.

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Abstract: ***This Research work explains the Mechanical properties of Flexural test, Tensile test, Impact test and SEM analysis of Sansevieria Trifasciata fiber (STF), Carbon fiber (CF) [1] hybrid polymer composites. The Hybrid Composite laminates were created with five different fiber % of STF (0%, 10%, 20%, 30% and 40%) and % of Carbon Fiber (100%, 90%, 80%, 70% and 60%). The manufacturing process was completed by hand layup technique. Mechanical properties of Hybrid Composite laminates were included to Tensile, Flexural and Impact testing. The SEM shows fiber debonding and de-lamination of fiber and resin can be observed. The explanation covers that Flexural, Tensile and Impact quality increases without affecting the extension of the Hybrid Composite with fiber extents***

Keywords**: Hybrid polymer composite, Carbon fiber, Sansevieria Trifasciata fiber (STF), Mechanical properties, and SEM analysis.***

I. INTRODUCTION

The Carbon fiber [2] cross sectional area is 5 to 10 micrometers. The carbon fiber was made with carbon particles. Carbon fibers [3] are mostly used in various materials to shape a composite. Carbon fiber have more flexibility. Carbon fiber consists of various materials like graphite and carbon composites. That means Carbon fiber reinforced with carbon and graphite. Then it is used in high temperature surface area. Sansevieria Trifasciata [5] is also known as snake plant. Snake plant is used for absorbs the carbon dioxide, suppling oxygen and the plant maintenance is also low. Composite materials [6] are made with two different materials like Sansevieria Trifasciata, Carbon Fiber and Matrix. Composite [7] materials are have less weight. Composite materials are laminated with different percentage compositions, and different directions.

II. PROCEDURE FOR PAPER SUBMISSION

A. Working Procedure:

In this working procedure, Sansevieria trifasciata (ST) and carbon fiber was used. Sansevieria trifasciata fibers were extracted from sansevieria trifasciata plants. STF have been cut into different lengths. Carbon Fiber (CF) purchased from Go green products Chennai. Hybrid composite laminates preparation was depends on Matrix. In this working procedure, the matrix develops with LY 556, HY 951. The

hybrid composite specimen process includes 8 layers with epoxy and hardener. The thickness of specimen [4] is 3 mm. After complete the laminates working procedure, we have done the three different testing processes like tensile test, Compression test and Flexural test with ASTM standards. In flexural test [9], as per standards the specimen dimensions are 63X12X3. In impact test [10], the specimen dimension are 63.5X12.7X3. In Tensile test [8], the specimen dimensions are 165X13X3.

III. MATH

The percentage of carbon fiber and sansevieria trifasciata fiber % data was given table 1.The results and discussions for tensile strength, flexural strength and impact strength at 40%, 30%, 20%, 10% and 0% data was given in table 2, 3 & 4.

Table 1: STF and CF %

S.No.	CF %	STF %
1	100	0
2	90	10
3	80	20
4	70	30
5	60	40

Table 2: Flexural Strength (Mpa/N/mm^2)

Speciman no./ Percentage of Fiber	S.T.F (40%) C.F (60%)	S.T.F (30%) C.F (70%)	S.T.F (20%) C.F (80%)	S.T.F (10%) C.F (90%)	S.T.F 0% C.F (100%)
1.	407.77	427.97	437.12	472.84	550.68
2.	509.35	277.95	438.21	212.47	545.34
3.	582.65	259.82	405.91	232.31	597.18
4.	317.59	351.52	427.53	438.26	455.92

From Table 2, the maximum Flexural Strength (N/mm^2) depends on maximum force (N).

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Development and Charecterization of Natural Fiber /Carbon Fiber Reinforced Hybrid Composite Material.

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Abstract

This Paper presents the study of Tensile, Flexural and SEM analysis of SansevieriaTrifasciata [15] Fiber (STF) reinforced polymer composites. The Composite [4] samples were fabricated with five different fiber proportions of STF (0 %, 10%, 20%, 30 %&40 %). The fabrications was carried out by hand lay-up technique. Mechanical properties of composite samplewere determined using tensile and Flexural testing [7]. An interaction between matrix and fiber was observed from the Scanning Electron Microscope (SEM) Micrographs. The study reveals that tensile and flexural strength increases with fiber proportions without affecting the elongation of the composite.

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*Keywords:*Sansevieria Trifasciata fibers, Carbon Fiber, Mechanical Properties, SEM analysis and Hybrid polymer composite.

Introduction:

Recent development in modern materials created much of the use of natural fibers as the reinforcement in thethermosets and thermoplastics,because of properties such as strength,specific stiffness and good fatigue performance. Fiber reinforced polymer composites have more applications in structural and nonstructural areas. The usage of natural fibers has found more interest among researchers due to their easy availability, their eco-friendly nature. SansevieriaTrifasciata (S.T) is one type of natural fiber. These plants have long leaves and the leaves spread easily with its creeping rhizomes. S.T leaves are stiff grows vertically; it may appear in dark green to light gray-green colors ranging from 50-70 cm[6]. S.T specifications are dark green to gray-green leaves and 2 feet tall.

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An efficient approach for video retrieval by spatio-temporal features

Article type: Research Article

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Abstract: The rapid development of video capture and information sharing technology has resulted in an overwhelming number of online video archives. This makes it difficult to retrieve videos from a large database using a traditional text-based system. The only solution to this problem is to retrieve videos based on their content. Ample algorithms have been hypothesized to reclaim videos from an enormous data base. Besides they could not diminish the time consumption and their coherence couldn't satisfy the users. We postulated the new approach which clubs the spatial features along with temporal features by making use of widespread video data and this amplifies the efficiency of video retrieval. In this regard, we move oncolour and motion features to get full data of video. Comparing the features of a demand video to those of a video to be retrieved from a server is easy, rather than comparing the entire content of the video. Therefore, designers of CBVR systems will follow two major steps to balance extraction and similarity of features [24].

Keywords: Video data base, feature extraction, video shot transitions, representative frame extraction, measurement of similarity, retrieval of videos

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An Effective Scheme for Shot Boundary Detection and Key Frame Extraction for Video Retrieval

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Abstract*: The rapid development of devices for image capture and information sharing has resulted in the availability of huge amounts of online video for various applications such as education, news, entertainment, etc. This leads to problems and difficulties when users query any content-related video. The reason for this scenario is that the presently available techniques of content representation and retrieval are based primarily on annotation. It therefore provides insufficient information for understanding and retrieving the content to match the query of the user. Content Based Video Retrieval (CBVR) is one of the promising new ways for finding content in a large video archive, rather than simply searching terms. The primary steps for indexing, summarizing and retrieving video are shot transition recognition and representative frame extraction. We have proposed a key point matching algorithm for a superior and robust Scale Invariant Feature Transform (SIFT) followed by the collection of representative frames from each segmented shot using the Image Information Entropy method. By using the Rough Set Theory, we can get better the concert of this scheme through removing unnecessary representative frames. All the methods suggested to prove the efficacy were tested on TRECVID datasets and contrasted with state-of - the-art approaches.

KEY WORDS: Shot Transition, Representative frames, Image Entropy, SIFT, Rough Set Theory, Retrieval.

I. INTRODUCTION

Video content-based access to information is a method that uses aesthetic components to browse images from sources of large-scale image data in terms of interest rates for individuals. Shade, shape, structure, as well as spatial format for indexing and identifying the image are the aesthetic materials of a picture used in Aesthetic Content-based Details Access. Aesthetic Content-based Info access is utilized in certain domain names to find matching in instance of unlawful photo usage as well as determining bad guys from iris as well as finger prints picture.

There is a huge growth of digital data modification annually. Every year, huge amounts of sound and visual information are produced by electronic camera surveillance, TELEVISION programs and house camera as well. World Wide Web (WWW) production makes this electronic information available worldwide. A high amount of audio-visual information makes it practically impossible to surf data. Numerous storage space solutions are available, such as Compact Disk Review Only Memory (CD-ROM) and Digital Versatile Disk (DVD), but the level of availability they provide is much lower.

It must always be ensured that the various methods of arranging video must remain in sync with the tremendous amount of production of data. There is therefore an urgent need for much better techniques of entry. In reality, the inefficiency and weakness of traditional approaches used for VR has led to the need for brand-new strategies that can change the content-based video data source. The CBVR is therefore considered a demanding task, which is a multidisciplinary knowledge access server project. Every day, the consumer demand for esthetic data is growing.

As a result, advanced innovation is needed to support, model, index and also recover multimedia information. There is a need for comprehensive approaches for accessing visual details. Content-based video recovery is careful to be an unpredictable mission. The fundamental intention at the back of this is the measure of intraclass divergence where the indistinguishable semantic idea happens under different conditions like light, appearance, and scene settings. For example, recordings involving a man riding a bike can have inconsistency as different sizes, appearances, and camera movements. The greater part of the exploration in the zone of substance based video recovery is implied at manage these difficulties. Therefore, different viewpoints required to be meticulous to settle on whether two videos are practically identical or not while investigating the video content. Besides, understanding video substance is ordinarily a skewed strategy for a customer. Marking video data with a predefined set of names altogether smoothens the advance of pursuit. It is not anticipated that it would catch all encouraging perspective purposes of clients. The resulting identification of specific video material in the advanced video's exponentially accumulating test is passed for an intense errand. An allegorical form is exposed in Hun-Woo Yoo et al. (2006) throughout the liquifying cycle. The outcomes of the LEB are motivating, it is delicate to cam movement, item movement as well as a substantial material modification within the shot [2] as specified by Hun-Woo Yoo et al. (2006). These issues can be managed by utilizing the side attributes, considering that side attributes are durable to lighting, cam activity, things activity and also substantial material modification within the shot. The revolutionary approach is proposed to improve performance and also to overcome the problems that exist in the LEB. The downside is that if two different frames have the same color range, it's a mistake. Several key frame [3] identification techniques to increase the speed of Content Based Video Retrieval Systems are found in the

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Detection of shot boundaries and extraction of key frames for video retrieval

Article type: Research Article

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Abstract: The prerequisite steps for summarizing, retrieval of video are detection of shot transitions and extraction of key frames. We hypothesized an advanced, ultra-modern Scale Invariant Feature Transform (SIFT). This SIFT method captures statistical modifications of various shot transitions, next the key frames or representative frames are extracted from those segmented shot with the calculation of entropy for each frame in the shot. We can amplify the performance of over proposed system by removing the repeated representative frames using the technique called edge matching rate. This intensified algorithm is applied to variable classes of videos to perceive shot transitions and getting of the key frame. Thus, the proposed algorithm proves its efficacy and accuracy in exhibiting its experimental results.

Keywords: Video dataset, frame separation, Scale Invariant Feature Extraction, similarity measures, shot transitions, representative frames

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A Scheme for Shot Detection and Video Retreival using Spatio Temporal Features

GS Naveen Kumar, VSK Reddy

Abstract: ***There has been a revolution in multimedia with technological advancement. Hence, Video recording has increased in leaps and bounds. Video retrieval from a huge database is cumbersome by the existing text based search since a lot of human effort is involved and the retrieval efficiency is meager as well. In view of the present challenges, video retrieval based on video content prevails over the existing conventional methods. Content implies real video information such as video features. The performance of the Content Based Video Retrieval (CBVR) depends on Feature extraction and similar features matching. Since the selection of features in the existing algorithms is not effective, the retrieval processing time is more and the efficiency is less. Combined features of color and motion have been proposed for feature extraction and Spatio-Temporal Scale Invariant Feature Transform is used for Shot Boundary Detection. Since the characteristic of color feature is visual video content and that of motion feature is temporal content, these two features are significant in effective video retrieval. The performance of the CBVR system has been evaluated on the TRECVID dataset and the retrieved videos reveal the effectiveness of proposed algorithm.***

KEY WORDS: Shot Transition, Selective Frames, Integrated Feature Extraction, Feature Matching, Retrieval.

I. INTRODUCTION

With technological progress, there has been a revolution in multimedia content in the web, has resulted in many large personal and public digital video databases [1][6]. However the rapid development in the availability of the multimedia database is not accompanied by the technologies used for its efficient usage and retrieval. This is due to the fact that the content of multimedia database is not same as that of the text database which is easily accessible based on the keywords of the document [8][9]. Therefore it is very important to segment and organize the video data so as to be accessed easily. It induces the interest of researchers to focus more on the area of video processing. Although many research works have been carried out and many systems have been developed in the area of video segmentation and video retrieval, both computational cost and accuracy of the existing systems are still far beyond users' satisfaction [11]. The main issue to be addressed in the case of video segmentation is feature selection which is robust to illumination, camera and object motion and a measure of dissimilarity to detect the boundaries [12]. In this paper, an attempt has been made to address the issues involved in shot detection [13] and video retrieval which are the two important tasks of video processing.

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Almost all the existing systems depend on the traditional features such as color, texture and shape feature [2] which are extracted from the segmented regions of the image. D. Saravanan et al. (2015) [19] designed a Histogram Clustering Technique in order to fast retrieve the videos from a given dataset. In Histogram Clustering Technique, the video was first divided into sequence of frames. Then, the video clustering algorithm was used in order to group the videos in different classes in which two searching was carried out. But it is very difficult to achieve reliable retrieval of the videos using single feature which results in more misdetection and false detection [14]. To overcome the above drawbacks, integration of both spatial and temporal features has to be done. As stated to the newly hypothesized algorithm by acquiring the methods like HSV color histogram [15]and motion histogram [16]to extricate color and motion features. The spatial information acquires the color features and temporal information acquires the motion feature. The arrangement of the left over sections in the manuscript is stated below: The hypothesized scheme is discussed in section II. Experimental outcomes are graphed in section III. Finally, chapter IV addresses the paper's conclusion.

II. PROPOSED SPATIO-TEMPORAL FEATURE EXTRACTION

Spatio-temporal feature extraction involves low level feature extraction and high level feature extraction as well. Temporal feature extraction is associated with motion feature extraction which depends on object movement. Therefore, spatio temporal features give an efficient and effective video retrieval.

The proposed algorithm uses two kinds of features: They are 1) Color feature 2) Motion feature

2.1 Color Feature Extraction

HSL (shade, immersion, delicacy) and HSV (tint, immersion, esteem) are elective portrayals of the RGB shading model, structured during the 1970 [17]. The HSL model endeavors to look like progressively perceptual shading models, for example, the Natural Color System (NCS) or Munsell shading framework, setting completely immersed hues around a hover at a softness estimation of 1⁄2, where a gentility estimation of 0 or 1 is completely dark or white, individually.

RGB to HSV conversion: RGB values are normalized by 255 at first. Let Vmax match the highest value of r, g, and b, and let Vmin match the lowest.

Hue computation

Retrieval of Video Contents based on Deep Parameter Analysis using Machine Learning

Mallikharjuna Lingam K, VSK Reddy

***Abstract*— In the recent past, video content-based communication hasincreases with a significant consumption of space and time complexity.The introduction of the data is exceedingly improved in video information as the video information incorporates visual and sound data. The mix of these two kinds of information for a single data portrayal is exceedingly compelling as the broad media substance can make an ever-increasing number of effects on the human cerebrum. Thus, most of the substance for training or business or restorative area are video-based substances. This development in video information have impacted a significant number of the professional to fabricate and populate video content library for their use. Hence, retrieval of the accurate video data is the prime task for all video content management frameworks. A good number of researches are been carried out in the field of video retrieval using various methods. Most of the parallel research outcomes have focused on content retrieval based on object classification for the video frames and further matching the object information with other video contents based on the similar information. This method is highly criticised and continuously improving as the method solely relies on fundamental object detection and classification using the preliminary characteristics. These characteristics are primarily depending on shape or colour or area of the objects and cannot be accurate for detection of similarities. Hence, this work proposes, a novel method for similarity-based retrieval of video contents using deep characteristics. The work majorly focuses on extraction of moving objects, static objects separation, motion vector analysis of the moving objects and the traditional parameters as area from the video contents and further perform matching for retrieval or extraction of the video data. The proposed novel algorithm for content retrieval demonstrates 98% accuracy with 90% reduction in time complexity.**

***Keywords*— Object Separation, Regeneration of regions, moving objects detection, frame of reference stabilization, frame rate calibration**

I. INTRODUCTION

The simplicity of compelling registering is an exploration course, which progresses in the direction of enabling processing gadgets for human knowledge. One of the very well-known human method of correspondence is articulation with verbal correspondence. The articulations as a rule incorporate hand signal, body pose and the outward appearance. For making the figuring gadgets at per with the human knowledge, the consideration of capacities to translate video substances. The uses of video contents are not limited to the communication purposes, rather for surveillances as well. The work of A. Ekermo et al. [1] have demonstrated the demand for advanced retrieval of the video contents of the surveillance data as well. The traditional method demonstrates the use of PCA as proposed by Y. M. E. Candes et al. [2] for extraction of the objects in the video frames and also for the matching process during the retrieval of the video data [Fig – 1].

Fig. 1PCA for Object Separation

The advancement of the traditional PCA method was proposed by C. Lu et al. [3] and X. Liu et al. [4] for increasing the ranking method of the matched video contents. This method is criticised for under consideration of the moving objects, which was again proposed by X. Zhou et al. [5]. The proposed work by X. Zhou et al. [5] also proposes to reduce the out lairs from the video data during the retrieval process. Nonetheless, the recent development in the capture devices have demonstrated significant reduction of noises and increase in stabilization of the video contents. Hence, the higher complexity of this work cannot be justified in present situations.

Thus, this work proposes a novel strategy for reduction in the time complexity with enhancement of accuracy and reliability of the retrieved video contents based on deep characteristics extraction process. The rest of the work is organized as in Section – II the fundamentals of parametric video content retrieval process is elaborated, in the Section – III the parallel research outcomes are discussed, in Section – IV the formulation

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Content relative thresholding technique for key frame extraction

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Abstract: The growth in communication methods have motivated a good number of users to migrate the existing communication methods towards video-based communications. Thus, the use of video-based communications have become the basic communication method for various fields and domains as distance education, business, physical security monitoring and also in the field of news and media. The summarization process demands to extract key components from the video data in order to reduce the size of the data without compromising on any information loss. This processing is called key frame extraction process. Realizing the priority of the key frame extraction process, a few parallel research attempts were executed to match with the bottleneck of information loss and size reduction. Nevertheless, the processes were highly criticised for being time complex and sometimes for information loss. The issue with the standard or parallel methods for extraction of key frames is either high or low rate of key frame extractions, which in turn results into high size or high information loss respectively. Thus, this work aims to provide a novel key frame extraction process using the image meta data and further the adaptive thresholding method. The work demonstrates a nearly 50% reduction in time complexity with 100% accuracy of the key frame extraction process and finally a nearly 30% reduction in the key frame replication control.

Keywords: Key frame extraction, automated framework, data replication control, reduced time complexity, video stabilization

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An adaptive correlation based video data mining using machine learning

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Abstract: With the immense growth in the multimedia contents for education and other purposes, the availability of video contents has also increased. Nevertheless, the retrieval of content is always a challenge. The identification of two video contents based on internal content similarity highly depends on extraction of key frames and that makes the process highly time complex. Recently, many research attempts have tried to approach this problem with the intention to reduce the time complexity using various methods such as video to text conversion and further analysing both extracted text similarity analysis. Regardless to mention, this strategy is again language dependent and criticised for various reasons like local language dependencies and language paraphrase dependencies. Henceforth, this work approaches the problem with a different dimension with reduction possibilities of the video key frames using adaptive similarity. The proposed method analyses the key frames extracted from the library content and from the search video data based on various parameters and reduces the key frames using adaptive similarity. Also, this work uses machine learning and parallel programming algorithms to reduce the time complexity to a greater extend. The final outcome of this work is a reduced time complex algorithm for video data-based search to video content retrieval. The work demonstrates a nearly 50% reduction in the key frame without losing information with nearly 70% reduction in time complexity and 100% accuracy on search results.

Keywords: Video data mining, key frame reduction, adaptive similarity, video retrieval, multiple dataset performance

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ERROR COMPENSATION TECHNIQUE FOR 90NM CMOS FIXED-WIDTH AND AREA EFFICIENT BOOTH ENCODING MULTIPLIER

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Abstract

An area efficient, fixed width multiplier using booth encoding is done in this work. The work is further extended to accommodate the error correction feature. As in many signal processing products fast and efficient processing elements are required, the demand increases day by day. This work is one such finding to meet the standard of today's contemporary technology. The proposed methodology suits well for the discrete cosine transform application. A new multiplier architecture using booth encoding is done. The architecture includes a tree based carry save reduction unit with parallel prefix adder and the compensation circuit. The work is carried out in 180nm technology using predictive technology models. The circuits are implemented using SPICE models and the results are obtained. For equal probability the inputs of different blocks are kept '1' or '0' in equal numbers. The frequency of operation is 100MHz. The proposed design will be compared with the existing methods. The robustness will be checked using skewed distribution. The project will be further extended to design for high speed and advanced technology of 90nm in future.

Keywords:

Multiplier, Carry Save Reduction, Booth Multiplier, Error Compensation

1. INTRODUCTION

In many DSP applications, fixed-width multipliers for operating elements must cut out half the output width of the multiplier in internal multiplication which will certainly lead to truncation errors. In fixed-width multiplier literature error compensation methods are developed [1]. But their average mistakes are far greater.

We propose in this article technology modified works for the fixed-width-modified booth multiplier with high precision error compensation circuit. In addition to being symmetrical to the error distribution, the circuit also centralizes the error distribution in zero.

The mean square errors can therefore be reduced significantly simultaneously, so that the resulting fixed-width multiplier [2]-[4] is adapted for various applications whose output data can be generated through one or more multiplier-accumulation operations.

Eventually, the suggested error compensation feature creates a basic compensation loop. The modified Booth encryption, in order to achieve high performance, has been widely used in parallel multipliers, which reduces the number of part products to a factor of two.

2. LITERATURE SURVEY

In [5], the author fixed-width two's complement booth multiplier is proposed. The proposed method provides a smaller area and a lower truncation error compared with existing works.

In [6], the author presented the fixed-width booth multiplier with adaptive low error and in [7], the author proposed a statistical error compensated Booth multiplier and its DCT application.

In [8], the author presented that two designs of low-error fixed-width sign magnitude parallel multipliers and two's-complement parallel multipliers for digital signal processing applications are presented Given two n- bit inputs, the fixed-width multipliers generate *n*-bit (instead of 2*n*-bit) products with low product error, but use only about half the area and less delay when compared with a standard parallel multiplier. In them, cost-effective carry-generating circuits are designed, respectively, to make the products generated more accurately and quickly.

Applying the same approach, a low-error reduced-width multiplier with output bit-width between n and 2n has also been designed. The design of low-error fixed-width sign-magnitude and two's complement multipliers have been presented. By using this type of multiplier, the chip area can be significantly reduced and a little performance promotion is also introduced. In addition, the design strategy has also been applied to designing a reduced-width multiplier, which has lower product error than that of a fixed-width multiplier and still maintains low area complexity.

They are useful in fixed-width data path architectures for multimedia and DSP applications where a uniform or reduced word width is usually required. A similar work is proposed in [9] for a low error reduced width Booth Multiplier for DSP application. A high accuracy and low error carry free fixed width multipliers with low cost compensation circuit is proposed in [10] and [11].

In [12], the author develops a general methodology for designing a lower-error two's-complement fixed-width multiplier that receives two-bit numbers and produces an -bit product. Error-compensation bias to reduce the truncation error and then construct a lower error fixed-width multiplier is proposed, which is area-efficient for VLSI realization. Finally, the work reports the application of proposed fixed-width multiplier to a digital FIR filter for speech processing application. The work is implemented for DCT application in [13] and multilevel approach in [14].

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A vedic mathematics based processor core for discrete wavelet transform using FinFET and CNTFET technology for biomedical signal processing

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https://doi.org/10.1016/j.micpro.2019.102875

Abstract

This paper presents a new design for the implementation of Vedic mathematics based discrete wavelet transform for biomedical signal processing. The design of the low power architecture using alternate devices is the background of the work. The DWT architecture consists of the adder, multiplier, Multiply Accumulate (MAC) unit and RAM or ROM to store the co-efficients. The existing Complementary Metal Oxide Semiconductor based design suffers from leakage. The proposed FinFET and CNTFET technology will overcome the problem faced in CMOS technology. The processor core of the system on chip (SoC) designed using Vedic mathematics sutras. The efficiency of Vedic mathematics and advances of low power VLSI is combined in this paper. The CNTFET design reduces the power by about 95% and has controllability of the threshold voltage. The design is carried out in 32 nm FinFET technologyThe design is mainly focused on the complete Processor Core block implemented using a MAC with a Vedic multiplier using FinFET technology. The experiments were carried out using Synopsis HSpice.

A Hybrid Full Adder Design Using Multigate Devices Based on XOR/XNOR Logic

Intelligent System Design pp 229-236 | Cite as

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Conference paper
First Online: 11 August 2020

Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 1171)

Abstract

Adders form the basic building blocks of several signal processing applications. Power optimization is an important requirement of the design today. Several hybrid circuits using XOR–XNOR or XOR/XNOR are implemented using CMOS devices. In this paper, FinFET device based XOR/XNOR and simultaneous XOR–XNOR functions are proposed and implemented. The proposed circuits reduce the power consumption and delay. The FinFET full swing XOR–XNOR or XOR/XNOR gates are used to implement the full adder (FA) circuits. The circuits showcase better performance in power consumption. The experimental simulation was carried out in 32-nm CMOS and FinFET process technology. The proposed FinFET hybrid adder showed superior performance when compared to CMOS. Out of the six types of adders Hybrid Full Adder of 22 transistors FinFET circuit is 90% efficient than CMOS circuit.

Keywords

CMOS FinFET XOR XNOR Full adder Low power 32 nm

Low Power, Less Leakage Operational Transconductance Amplifier (OTA) Circuit Using FinFET

Intelligent System Design pp 191-199 | Cite as

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Fast Compression For Brain Mr Images With Proposed Algorithms

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Abstract: ***Growth in information storage and retrieval significantly depend on images in various domains as the information representation and understand ability is significantly higher. The challenges in processing the complete information in image formats are obtained during storage and transmission. Also, the information extractions from images are significantly difficult compared to information extractions from text. Nonetheless, the incorporation of image analysis for disease detection involves gigantic amount of image data storage, which is a concern of financial drawbacks. Hence, the images used for the analysis must be compressed for storage. However, the complexity of image compression is critical as the information loss can cause significant difference in disease detections. Thus the traditional lossy image compression methods cannot be applied to this problem. Hence, this work addresses the optimal compression of the medical images without vital information loss and with ominously high compression ratio as the second objective of this work.***

Keywords: Medical Image Compression, Lossless, Lossy, Segmentation, Fast Compression

I. INTRODUCTION

With the enhancements in medical imaging, the diagnosis and manual detection of the diseases are very successful now as days. The popular medical imaging techniques are Computed Tomography, Magnetic Resonance Imaging, Electronic-Endoscopy and many others. The computing technologies deployed in these methods helps to improve the detection accuracy of the diseases. The medical imaging techniques are classified into three major classes as structural-imaging, functional-imaging and molecular-imaging techniques. A good number of research contributions were made towards these research objectives. The recent notable outcomes by A. Souza et al. [1] on volume rendering of the medical imaging techniques, intensity standardization on medical imaging by A. Madabhushi et al. [2] and the work by Y. Zhan et al. [3] on three dimensional medical image segmentations have opened newer thoughts and research dimensions.

Considering the recent improvements in research, a wide variety of algorithms got developed as an outcome of several practices. The notable outcomes by W. Schroeder et al. [4] for medical data visualization, W. J. Schroeder et al. [5] for enhancements in visual analysis of medical information and further three dimensional visualization of medical imaging made possible by W. J. Schroeder et al. [6] have showcased the benefits of image based representations of the medical information. Also, the contributions by L. Ibanez et al. [7] for the ITK tool cannot be neglected. Nonetheless, the image cannot be left to manual interpretation for diagnosis and detection of the diseases. Hence the computation of Algorithm is based on the tools which must be developed. The work of J. Udupa et al. [8] for analysis of the medical images was the entry point to this field of research. Motivated by the possibility exploration for automated analysis for medical domain, the I. Wolf et al. [9] and Kitware group [10] made the interactive medical image analysis possible.

In the recent time, among all the medical imaging techniques the MR images became widely accepted. The acceptance have motivated various researchers to focus on medical image analysis for multiple purposes as J. Tian et al. [11], Y. Lv et al. [12] and J. Xue et al. [13] have contributed in founding the road map for further research by proving many analysis techniques on MR images [Fig – 1].

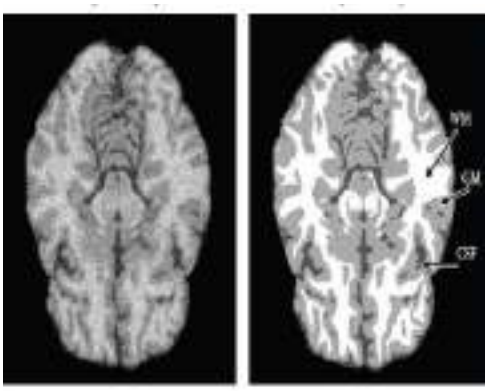

Fig. 1 MR Image Analysis for Human Brain

As final outcome of this work, a framework for providing optimal storage of MR images by using new compression method without losing valuable information is proposed.

II. OUTCOMES FROM THE PARALLEL RESEARCHES

In this section of the work, the recent outcomes in terms of image analysis image compression methods are evaluated for medical purposes. The notable outcome produced in the work by Lin Yuan et al. [14] has demonstrated a novel technique for extracting and safeguarding a medical image called JPEG trans-morphing. Further, the work of S.Vijayarani et al. [15] has demonstrated the image class detection methods for medical image classification.

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A Virtual Honeynet Based Botnet Detection (Vhbd) Architecture for Cloud

S. Nagendra Prabhu, S. Shanthi, R. Nidhya

Abstract*: Securing the cloud services from botnets has gained more attention in the recent years. As the cloud environment is flexible, reliable and scalable, the botnets can easily introduce thousands to millions of bots very easily. Thus, securing the cloud from the botnet is mandatory for preventing the services from various attacks such as Distributed Denial of Service (DDoS), spreading malware and hacking of private information. To prevent botnet from the cloud environment a Virtual Honeynet based Botnet Detection (VHBD) architecture is proposed in this paper. The suggested architecture defines the generation of the botnet using botmaster. Further, on receiving the access request from the cloud user, the VHBD checks the authenticity of the cloud user. If the user is authentic,the access permission is provided through an optimal honeypot installed on the guest OS. Whereas, if the user is non-authentic, the honeywall obtains the malicious IP of the botnet and saves them in the block list. The comparison of performance with the existing techniques prove that the proposed architecture provides optimal results than the other techniques.

***Index Terms*: Cloud botnet, honeypot, Virtual Honeynet (VH), Distributed Denial of Service (DDoS),botmaster, honeywall.**

I. INTRODUCTION

Botnet contains a collection of compromised bots controlled by the attacker named botmasters. The cloud bots are client-side applications that obtain the commands, processes them and generates the required reports. The bots are connected to each other through the master bots. The bots and master bots communicate with each other through the HTTP protocol. When compared to the traditional botnets the cloud bot is built in minutes and they are always ready and online. This makes the deployment of the botnet in cloud environment flexible. The key issues involved in the botnet design are minimal exposure and the demand for the prevention of Command and Control (C&C) compromise. Fig.1 illustrates the structure of the traditional cloud bot. Each bot communicates with the other bot through the cloud channel. In the traditional cloud bot generation, the botnet is created by infecting a computer without the knowledge of the owner. After infecting thecomputer with bot software, the botmaster is contacted. The botmaster then sends the orders to the bot for carrying out the tasks. Thus, thousands or millions of bots are created. Some of the common attacks created by thebotnets are as follows[1],

- Distributed Denial of Service (DDoS)
- Transmission of spam email
- Stealing private information
- Click fraud

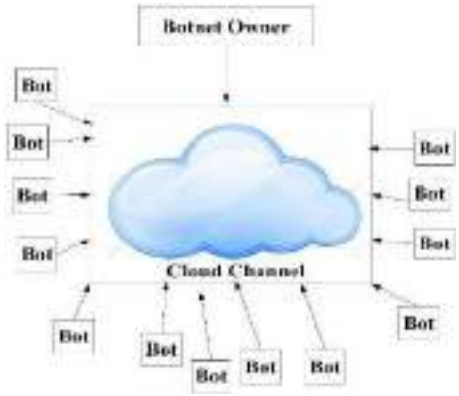

Fig.1. Structure of Botcloud

Generally, the botnet detection is performed using the techniques such as honeypot, honeynet, honeywall, Anomaly based detection and signature-based detection. Among the traditional methods, the honeynet is popularly used for the cloud environment. A simple structure of the honeynet is depicted in Fig.2. Generally, the different sizes of the honeypots are combined together for generating the honeynet. A honeypot can monitor only a smaller network, hence to monitor a larger network the honeynet is deployed.

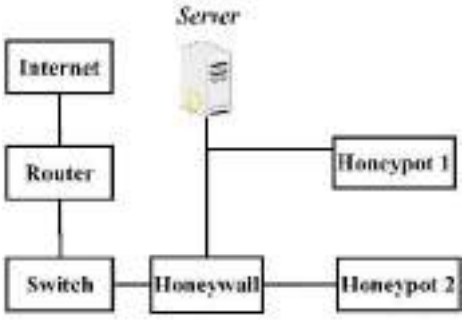

Fig. 2. Organization of honeynet

The demerits of the existing honeynets are minimal scalability and inability to detect the internet attacks. Thus, to address these issues, a honeynet based cloudbot network is designed. The suggested network has two participants such as an individual machine and a cloud server. The

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A Systematic and Analytical Approach to Techniques and Tools in Topic Modeling

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Abstract: ***Topic modeling is one of the recent upcoming research areas of interest among the researchers. Topic Modeling is a straightforward way to examine the huge volumes of unstructured data. Each topic is a collection of words and these words usually bond together more frequently. When this technique is applied to a huge volume of data it can join words having same meanings and distinguish the uses of words with multiple meanings. The intention is to study and examine different topic modeling algorithms and to perform a brief literature review and analysis was performed and the obtained results are presented in this paper. Many techniques for topic modeling proposed by different researchers are put together and characteristics and drawbacks of various techniques have discussed. We present this paper with the intention that it will help few of the researchers in finding out the problems, present challenges and future scope of research in topic modeling.***

Index Terms: Topic Modeling, Topic, Words, LDA, Supervised, Unsupervised

I. INTRODUCTION

In the present scenario, we are witnessing a huge volume of data generated such as plain text, audio, images, and video etc. Nowadays, the majority of the data are generated from online books and papers and from most of the social networking sites. Data generated through these sources are mostly unstructured data. So it is becoming very complicated to obtain preferred and relevant information .In this scenario, we need to have new tools for mining the data as well as fetching the information which we are currently looking for[1]. Topic modeling is one such widely used technique in the area of text mining. Topic modeling is defined as a process used to routinely recognize the topics available in a text also need to obtain hidden patterns demonstrated by text corpus. Thus, it's more useful in assisting in decision making. It is much different from the traditional rule based approach. It uses an unsupervised approach for finding the topics from a large cluster of texts [2].Objectives of topic model include learning the distribution of words, Learning distribution of topics and assigning every word in a particular document to a particular topic.

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Each document consists of a bag of words. These objects need to be learned and not known in advance. The term learning includes first to define the model and second employ a learning algorithm.Topic Models can be employed in multiple purposes, including:

- Clustering of Documents
- Need to systematically arrange huge blocks of textual data
- Retrieving the Information from unstructured text format
- Feature selection
- Dimensionality reduction
- text summarization
- recommendation engine

Topic models are helpful in organizing, arranging and retrieving huge datasets of profiles from social media, emails, online customer reviews. Fig 1: Represents the functioning of the topic model.

II. REVIEW METHODOLOGY

From the past few years, topic modeling has been widely used in many applications such as online reviews, biological and medical document mining, Document Mining, etc. Since the data generate is more and there is a need to identify the hidden themes and organize, summarize and search the documents based on these themes. The aim is to find out the various topic modeling techniques and analyze them and to discuss the various tools and challenges and issues involved in topic modeling. Therefore, in this section, based on a systematic literature review we discuss the most recent and related work on topic modeling.

Enhancing Heart Disease Prediction Models with Feature Selection and Ensemble Methods

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Abstract--- Heart disease prediction models based on data of patients have showed significant utility in early prediction of disease. Artificial Intelligence (AI) with machine learning algorithms yield required knowhow to determine heart diseases. Supervised machine learning has been around for prediction of diseases. Data used for prediction model may have irrelevant and redundant features. Feature selection and feature optimization models solve this problem by eliminating such features. This will improve prediction performance. Another optimization problem is the usage of ensemble of multiple classification models. In this paper we proposed a framework that considers ensemble of different prediction models in instruct to have enhanced prediction performance. In addition to this a feature selection algorithm named Heuristic Based Feature Selection (HBFS). Real world dataset is collected from Kaggle datasets resource. An experimental setup is made with Python environment with data mining package sk learn, keras and tensor flow. Anaconda is the data science platform used for empirical study. Different prediction models made up of Linear Regression, KNN, SVM, RF, DT, NB, NN and ensemble model. The empirical study revealed that the ensemble method and feature selection cloud provide enhanced prediction of heart disease.

Keywords--- Heart Disease, Machine Learning, Heart Disease Prediction Models, and Feature Selection.

I. Introduction

Heart is the vital organ in human body whose health is essential for wellbeing. Having said this, there have been different approaches came into existence as discussed in [1]. The machine learning techniques such as SVM, Naïve Bayes and Random Forest, to mention few, are widely used for data-driven solution for predicting heart diseases.

It is the simple yet powerful solution without much difficulty. Many prediction models were developed based on this assumption. AI with machine learning proved to be useful in efficient prediction. Due to issues of redundancy and irrelevant features in heart disease datasets, feature selection algorithms came into existence [19] to improve prediction models in terms of accuracy and speed.

In [2] there is an emphasis on the usage of ensemble methods rather than using conventional single machine learning method based prediction models to have accurate clinical decision support systems (CDSS). Many ensemble models came into existence as explored in [3] and [4]. It is understood that ensemble models could improve performance. Another important observation is that when all features are used for prediction, it deteriorates result analysis of the prediction models. In order to solve the problem, only essential, relevant and contributing features for class label prediction are to be identified and used. Here comes the significance of feature selection approaches. The contributions of this paper are as follows.

1. We proposed an ensemble classification model for improving performance of heart disease prediction. It also includes neural network method.
2. We proposed a feature selection method named Heuristic Based Feature Selection (HBFS) for leveraging accuracy of prediction models.
3. We built a prototype model for evaluating performance of the proposed ensemble model and compare it with baseline models and models in the state of the art.

The remainder of the paper is structured as follows. Section 2 provides the review of literature on heart disease prediction. Section 3 presents the proposed methodology including the feature selection algorithm HBFS.

Section 4 provides details of the real world dataset collected from Kaggle. Section 5 presents results and evaluation of the results. Section 6 concludes the paper and gives direction for future scope of the heart disease prediction research.

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A Review on Machine Learning Techniques for Data-Driven Heart Disease Prediction

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Abstract - Machine learning algorithms are part of Artificial Intelligence (AI) and the emerging data science field. They are used in solving different real world problems. Heart disease prediction is no exception. In the literature, different algorithms are found suitable for prediction of heart disease. However, they are data-driven approaches. Feature extraction, feature selection and feature optimization are important for improving classification algorithms. Classification algorithms are able to perform prediction task based on the training provided to them. Hence they are known as supervised machine learning algorithms. In this paper, we discuss different aspects related to machine learning used for heart disease prediction. It throws light into methods that improve the classification performance as well. Such methods are known as feature selection methods. With such methods, the performance of ML algorithms is boosted. There are feature optimization methods as well as discussed in this paper. With all these methods, this paper provides useful insights to academia and industry with regard to heart disease prediction research.

Keywords –Machine learning, AI, supervised learning, classification, feature selection, heart disease prediction.

1. Introduction

Heart is an significant and indispensable organ in person body. Its functioning is essential for the life of a person. However, it is sensitive to certain aspects. For instance, rise in fasting blood sugar, maximum heart rate and exercise induced angina to mention few. It is also affected by the life styles of people. There has been considerable research on the protection of heart from diseases. However, when there are issues with heart, it results in various diseases as presented in Table 1. When data related to different attributes of heart or associated with heart is available, it is possible to predict heart disease. This prediction process is carried out with a systematic approach. Such approach is known as machine learning method which is part of AI [1]. Prior to review various AI methods used in the research of heart disease prediction process.

Since we have vast amounts of medical datasets, machine learning can help us discover patterns and beneficial information from them. Although it has many uses, machine learning is mostly used for disease prediction in the medical field. Many researchers became interested in using machine learning for diagnosing diseases because it helps to reduce diagnosing time and increases the accuracy and efficiency. Several diseases can be diagnosed using machine learning techniques, but the focus of this paper will be on heart disease diagnosis. Since heart disease is the primary cause of deaths in the world today, and the effective diagnosis of heart disease is immensely useful to save lives.

Deep Learning Model for Improving Performance of Heart Disease Diagnosis

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Abstract:

Deep learning is a function of Artificial Intelligence (AI) that mimics human brain functionality which is capable of solving complex real world problems. In this paper, a framework is proposed to have a systematic approach in prediction of heart disease using Deep Neural Network (DNN). A deep learning model is trained to have improved performance in heart disease diagnosis. Our methodology includes many aspects such as data collection, data pre-processing, feature selection with Principal Component Analysis (PCA), DNN with an activation function and normalization. The metrics of success used in this paper include accuracy (%), Area Under Curve (AUC) and Receiver Operating Characteristic (ROC). We built a prototype application using Python data science platform. The prototype uses Tensor Flow machine earning library. The application classifies data based on underlying features of dataset. Several hidden fully connected layers are used as part of DNN to know the likelihood of a person having heart disease. The empirical study made with moderated NHANES dataset revealed that the proposed DNN based approach is able outperform state of the art models such as NN model and ensemble models.

Keywords *– Heart disease prediction, PCA, feature selection, deep learning, deep neural network*

1. INTRODUCTION

Healthcare industry has been crucial for health and wellbeing of people. In fact, there are many diseases that are causing death to people in spite of availability of healthcare services. Particularly heart diseases are the cause of concern. Early detection of heart diseases can help in taking preventing steps in order to ensure that it does not lead to death. Sometimes, mere changes in life style can get rid of such diseases. The problem is as stated here. Provided patient's health, data a deep learning neural network based CDSS needs to provide accurate diagnosis. This is the problem to be addressed. In the wake of deep learning based neural networks as part of Artificial Intelligence (AI), it is possible to have highly accurate prediction of heart diseases provided the data related to patient or a person. Thus data-driven

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An Efficient Feature Selection Based Heart Disease Prediction Model

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Abstract

Heart disease is one of the health concerns of humans. It has caused thousands sad demises of people early in their life. There are different kinds of heart diseases and each one has its symptoms and they are preventable or even curable if detected early. Therefore, early detection of heart disease is wiser way of diagnosing it. Fortunately, health data of a person is sufficient to detect the probability of heart disease accurately. This has motivated many researchers and academia investigating into data-driven approaches towards solution. Machine learning techniques that are part of Artificial Intelligence (AI) play key role in the prediction of heart diseases. The existing research on it revealed their utility in garnering Business Intelligence (BI) for making expert decisions. However, in terms of feature selection and improving performance of detection mechanisms there is need for further scope of the research. In this paper a novel feature selection algorithm named Entropy and Gain-based Feature Selection (EGFS) is proposed. The hypothesis "feature selection improves performance of heart disease prediction models" is evaluated using EGFS by applying it with state of the art machine learning methods like k-Nearest Neighbour (k-NN), Naïve Bayes (NB), Decision Tree (DT), Random Forest (RF) and Support Vector Machines (SVM). These methods are used to form heart disease prediction models. The empirical study revealed that the performance of the prediction models is improved with EGFS. The effectiveness of prediction models is enhanced with feature selection process.

Keywords *– Heart disease prediction, supervised learning, feature selection, k-Nearest Neighbour, Decision Tree, Naïve Bayes, Random Forest.*

1. Introduction

Heart disease prediction models based on machine learning techniques have an important utility in modern Decision Support Systems (DSS) of healthcare units. Intelligence required for heart disease diagnosis is obtained with such techniques. It is relatively simple and effective as it forms a data-driven solution which is easier to develop and use [4]. Supervised machine learning methods are widely used for heart disease prediction. They are classification algorithms like k-NN, SVM, DT, NB and RF to mention few. These techniques need training data in order to predict class labels effectively. As the training data in increased, it will help improve the quality and accuracy of prediction models. Data mining domain is rich in algorithms that already exist. When it comes to classification,

it is essential to see that the quality of training is good [2], [3]. If training dataset is not good, it results in deteriorated performance of classifiers. The rationale behind this is the noise in the data in the form of redundant features and irrelevant features. Therefore, it is essential to have mechanisms to know the relevance of a feature to the class label.

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FAST, EFFICIENT AND PROTECTED DATA REALIZATION FOR CLOUD SUPPORTED INTERNET OF THINGS IN SMART NETWORK

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ABSTRACT:

Cloud backed Internet of Things is widely deployed in smart grid systems. The IoT front end is responsible for obtaining information and supervising popularity, while the vast amount of statistics is saved and managed on the cloud server. Achieving data security and machine efficiency in the process of data acquisition and transmission are important and difficult, as the facts about the power grid are sensitive and in large quantities. In this research, we currently provide a realistic, impenetrable system of acquisition based on CP-ABE (encryption based on encryption policy attributes). The data obtained from the terminals will be divided into blocks and encrypted with corresponding acceptance in the subtree in sequence, thus encrypting the facts and moving records in parallel. Furthermore, we protect records related to gaining acceptance in the tree using the Threshold Security Sharing method, which can maintain the privacy of statistics and user safety through unauthorized feature sets. The official analysis shows that the proposed scheme can meet the IoT supported safety requirements in the smart grid. Numerical evaluation and empirical results indicate that our chart can effectively reduce the time value compared to other popular approaches.

Keywords: Cloud-supported IoT, smart grid, CP-ABE, data acquisition, parallel.

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MINING CONTEST FROM LARGE TRADITIONAL INFORMATION

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ABSTRACT:

In any competitive business, success depends on the ability to make the article more attractive to customers than the competition. Several questions arise in the context of this mission: How can we formalize and measure competitiveness between two elements? Who are the main competitors of a particular article? What are the advantages of the article that most influence your competitiveness? Despite the impact and importance of this problem in many areas, only a limited amount of work has been dedicated to an effective solution. In this document, we present a formal definition of competitiveness between two elements, based on the market segments that both can be covered. Our competitiveness assessment uses customer opinions and is an abundant source of information available in a wide range of areas.

Keywords: Data mining, Web mining, Information Search and Retrieval, Electronic commerce

1. INTRODUCTION:

There is a lot of personal information in online text reviews, which plays a very important role in decision-making processes. For example, the customer will decide what to buy if he sees valuable comments posted by others, especially the trusted friend. We believe that reviews and reviewers will help predict ratings based on the idea that high star ratings can be attributed largely to good reviews. Therefore, how to conduct review reviews and the relationship between auditors on social networks has become a major problem in web mining, machine learning and natural language processing. We focus on the task of evaluating the prediction. However, the star rating level information is not always available to the user in many review sites. On the other hand, the reviews contain sufficient detailed product information and user opinion information, which have a great reference value for the user's decision. Above all, a specific user on the website cannot rate each item. Consequently, there are many unclassified elements in the user element classification matrix. It is inevitable in many classification prediction methods, for example [1], [4]. Review / Comment, as we all know, is always available. In this case, it is appropriate and necessary to take advantage of user opinions to help predict unclassified elements. Boarding sites and other review sites provide a broad idea to extract user preferences and forecast user ratings. In general, the interests of the users are stable in the short term, so the user topics of the reviews can be representative. For example, in the category of cups and cups, different people have different tastes. Some people care about quality, some focus on price and others can evaluate comprehensively. Whatever it is, everyone has their own themes. Most theme templates provide interest to users as theme distributions according to the content of the reviews. It is widely applied in the analysis of the feeling of travel recommendation and the analysis of social networks. Sentiment analysis is the most important and essential work to extract user preferences. In general, emoticons are used to describe a user's attitude towards the elements. We note that in many practical cases it is more important to provide numerical degrees rather than binary decisions. In general, the reviews are divided into two groups, positive and negative. However, it is difficult for customers to choose when all candidate products

Latent Feature Word Representations to Enhance Topic Models for Text Mining Algorithms

Thayyaba Khatoon Mohammed, M. Gayatri, M. Sandeep, V. S. K. Reddy

Abstract: ***Dealing with large number of textual documents needs proven models that leverage the efficiency in processing. Text mining needs such models to have meaningful approaches to extract latent features from document collection. Latent Dirichlet allocation (LDA) is one such probabilistic generative process model that helps in representing document collections in a systematic approach. In many text mining applications LDA is useful as it supports many models. One such model is known as Topic Model. However, topic models LDA needs to be improved in order to exploit latent feature vector representations of words trained on large corpora to improve word-topic mapping learnt on smaller corpus. With respect to document clustering and document classification, it is essential to have a novel topic models to improve performance. In this paper, an improved topic model is proposed and implemented using LDA which exploits the benefits of Word2Vec tool to have pre-trained word vectors so as to achieve the desired enhancement. A prototype application is built to demonstrate the proof of the concept with text mining operations like document clustering.***

Keywords: Text mining, document clustering, LDA, topic modeling, Word2Vec

I. INTRODUCTION

Modeling biomedical or other documents need a systematic approach. LDA [2] is one such proven approach that is widely used. Moreover, it supports different models like topic model, author model and author-topic model. There are many variants of LDA that are used for customized modeling and processing. Generative process models thus became popular and useful to text mining purposes. Conventional topic modeling made with LDA and its variants can inter distributions like topic-to-word and document-to-topic. It is based on the co-occurrence of words within given documents. More information on probabilistic topic models can be found in [3] while modeling hidden topics is studied in [5]. Topic models have got supervised and unsupervised extensions as investigated in [6].

Though topic models have been around with many LDA variants, of late, the notion of latent features is introduced. Latent feature (LF) vectors are widely being used to process NLP tasks. Latent features permit a range of values that become a part of high-dimensional space which has proved to be efficient for modeling large corpus. Two latent feature models based on LDA and Dirichlet Multinomial Mixture Model (DMM) are explored in this paper. Based on these baseline process models, Word2Vec based variants are introduced and used for effective modeling of latent feature word representations. Our contributions in this paper are as follows.

1. We proposed two generative process models considering latent features that are based on LDA and DMM respectively.
2. We exploited the latent feature topic models for better representation or modelling to leverage performance of text mining operations like document clustering.
3. We built a prototype application to show the effectiveness of the proposed generative process models with latent feature vectors.

The remainder of the paper is structured as follows. Section 2 presents review of literature based on generative process models for systematic modeling of document corpora. Section 3 presents the LDA for modeling. Section 4 covers derivation of latent feature models that are used for improving text mining operations by using Word2Vec toolkit. Section 5 presents experimental results while section 6 provides conclusions besides directions for future work.

II. RELATED WORK

This section reviews literature on the LDA [2], [8] and its variants for topic modeling. Generative process models like LDA became instrumental in processing text documents. Rosen-Zvi et al. [1] derived author model from LDA to give importance to author based processing of documents. Shen et al. [2] on the other hand proposed a latent topic model that is meant for processing documents to obtain latent friends. An author-topic model focuses on both authors and topics at the same time. This model is proposed by Rosen-Zvi et al. [3] for text mining algorithms. Similarly, to represent topic and author community, Liu et al. [4] proposed a model known as Topic-Link LDA. While all the models can be used for different mining purposes, Melnykov and Maitra [5] focused on clustering applications that are based on generative process models. Fatema et al. [6] used micro blogs data in order to extract topics based on authors and other attributes like recipients and contents. Bishop [7] explored these models for machine learning as part of Information Retrieval (IR).

From the LDA many variants of topic models came into existence. One such variant is proposed by Blei [9] for generating probabilistic topic models. With respect to word co-occurrence statistics, Bullinaria and Levy [10] extracted semantic representations for better accuracy of processing textual content.

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Identity Based-Dual Server Valid Key Exchange Protocols

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ABSTRACT: The paper Password authenticated key exchange (PAKE) is the procedure of where more than one gatherings, relies upon their insight into the password just, set up a cryptographic key utilizing an exchange of messages, for that an unapproved gathering can't take an interest in the technique and is obliged however much as could be expected from savage power speculating the password. Two types of PAKE (Password authenticated key exchange) are Balanced and Augmented strategies. In cryptography, a password-authenticated key understanding strategy is an intuitive technique for at least two gatherings to set up cryptographic keys dependent on at least one gathering's learning of a password. In this the two-server password-authenticated key exchange (PAKE) convention, the clients parts there password and stores two offers of their password in the two servers, individually, and the two servers at that point participate to confirm the client without knowing the password of the client. If there should be an occurrence of one server is undermined to unapproved party, the password of the client is required to verify in residual server. In this paper, we present two compilers that change any two-party PAKE convention to a two-server PAKE convention based on the character based cryptography, called ID2S PAKE convention. By the compilers, we can build ID2S PAKE conventions which we accomplish the certain validation. For whatever length of time that the fundamental two-party PAKE convention and character based encryption or mark plan have provable security without irregular prophets, the ID2S PAKE conventions built by the compilers can be demonstrated to be secure without arbitrary prophets. A significant property is that a busybody or man in the center can't get enough data to have the option to animal power surmise a password moving along without any more cooperation's with the gatherings for every speculation. This implies solid security can be gotten utilizing frail passwords. Contrast and a two-server PAKE convention with provable security without irregular prophets, our ID2S PAKE convention can spare from 22% to 66% of calculation in every server.

Keywords: Password authenticated key Exchange (PAKE), Cryptography, Client, and Security

I. INTRODUCTION

The secured frameworks among twofold social affairs, a bona fide encryption [1] significant stands obligatory toward favor happening front line early installment. Subsequently removed, paired portrayals commit happened went for bona fide critical discussion. Novel prototypical shoulders that double parties previously divide roughly cryptographically strong material: besides an underground significant which holder remain scavenge deal planned went for encryption/affirmation of interchanges, or a network noteworthy which ampule be scrounge deal proposed for encryption/marking of messages. These clarifications stand chance other than unbreakable to think back. Bleeding edge planning, a wheeler-seller often holds his keys in a specific stratagem imperiled through a watchword/PIN. Another model accept that

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An Advanced Traveler Information System in a Co-Modal Framework by using Multi objective optimization

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ABSTRACT

We present an advanced traveler information system (ATIS) for public and private transportation, including vehicle sharing and pooling services. The ATIS uses an agent based architecture and multi-objective optimization to answer trip planning requests from multiple users in a co-modal setting, considering vehicle preferences and conflicting criteria. At each set of users' requests, the transportation network is represented by a co-modal graph that allows decomposing the trip planning problem into smaller tasks: the shortest routes between the network nodes are determined and then combined to obtain possible itineraries. Using multi-objective optimization, the set of user vehicle- route combinations according to the users' preferences is determined, ranking all possible route agents' coalitions. The ATIS is tested for the real case study of the Lille metropolitan area (Nord Pas de Calais, France).

I. INTRODUCTION

SHARED transportation services are emerging concepts [5]. In multi-modal transportation users employ at least two different types of means of transport.

Co-modality, instead, arises from the need to convey people on a single means of transport to reduce the impact on environment, costs, and accidents. Hence, co-modality refers to the optimal use of different transportation modes on their own or in combination, taking advantage of ridesharing (the sharing of vehicles by passengers). Information and communication technologies may support the development of advanced tools for passengers allowing the effective integration of transportation modalities [11], [25]. As a result, Manuscript received October 14, 2015; revised March 23, 2016 and August 31, 2016; accepted December 18, 2016. The Associate Editor for this paper was D. Chen. M. Dotoli is with the Department of Electrical and Information Engineering, Politecnico di Bari, 70125 Bari, Italy (e-mail: mariagrazia.dotoli@poliba.it). H. Zgaya is with the ILIS-Lille Institute of Healthcare Engineering, Université de Lille 2, 59000 Lille, France (e-mail: hayfa.zgayabiau@univlille2.fr). C. Russo is with the Magneti Marelli-Powertrain Research, 10135 Torino, Italy (e-mail: cr88fg@gmail.com). S. Hammadi is with the CRISTAL-Research Centre in Computer Science, Signals and Automatic Systems of Lille, École Centrale de Lille, 59651 Lille, France (e-mail: slim.hammadi@ec-lille.fr). Digital Object Identifier 10.1109/TITS.2016.2645278
the field of intelligent transportation systems and particularly of Advanced Traveler Information Systems (ATISs) is rapidly growing [44]. An ATIS may be defined as a system providing pre-trip and real time information on departures, routes, and modes of travel. However, the related literature in the field of passengers' co-modal transportation services is scarce, showing a need for ATISs supporting sustainability-oriented decisions.

This paper aims at filling this gap by a multi-agent ATIS for passengers' pre-trip planning considering co-modal itineraries with multiple preference criteria, taking into account public and private transportation, and including vehicle sharing and pooling. Users request itineraries to the ATIS, with given (eventually different) origin and destination pairs and arrival/departure time windows, specifying their preferences by an ordered sequence of criteria. The ATIS matches requests with information in transportation operators' databases and chooses transportation means and routes. It provides the routes answering requests and optimizing travel time, travel cost, and gas emissions. To the best of the authors' knowledge, no ATIS for trip planning exists in the literature for trip planning both with private and public transport in a co-modal and multi-objective

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Applications Of IOT In Communications & Security

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&

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ABSTRACT

IOT(Internet of Things) is the buzz word in the present market. The Internet of Things (IoT) is characterized as a paradigm in which objects outfitted with sensors, actuators, and processors speak with each other to fill a significant need. In this paper, we overview cutting edge strategies, protocols, and applications in this new rising territory. This overview paper proposes a novel taxonomy for IoT advancements, features probably the most critical innovations, and profiles a few applications that can possibly have a striking effect in human life, particularly for the diversely abled and the elderly. When contrasted with comparable overview papers in the territory, this paper is much more far reaching in its scope and thoroughly covers most real advances traversing from sensors to applications.

Key Words*:* Actuators, Communication network, Transport layer security, RFID, SIOT, Neural sensors, Mobile Cloud Computing, mashups, preprocessing.

I. INTRODUCTION

Today the Internet has turned out to be omnipresent, has touched relatively every side of the globe, and is influencing human life in impossible ways. Be that as it may, the trip is a long way from being done. We are currently entering a time of considerably more unavoidable availability where a wide assortment of machines will be associated with the web. We are entering a time of the "Internet of Things" (shortened as IoT). This term has been characterized by various creators in a wide range of ways. Give us a chance to take a gander at two of the most mainstream definitions. Vermesan et al. characterize the Internet of Things as just an association between the physical and advanced universes. The computerized world cooperates with the physical world utilizing a plenty of sensors and actuators. Another definition by Peña-López et al. characterizes the Internet of Things as a paradigm in which computing and networking abilities are implanted in any sort of possible question. We utilize these abilities to inquiry the condition of the question and to change its state if conceivable. In like manner speech, the Internet of Things alludes to another sort of world where every one of the devices and apparatuses that we utilize are associated with a network. We can utilize them cooperatively to accomplish complex errands that require a high level of insight.

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Analytical Study on Internet of Things Related with Software Architecture

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IoT, Software Architecture.

ABSTRACT

Internet of Things (IoT) is a developing and testing field for analysts. IoT is a system of general objects which are embedded with technologies that communicate and interface inside themselves and external environment. This thus gives insight to the objects to make individuals life agreeable. Software architectural styles are a labeled arrangement of design choices that have demonstrated to evoke quality attribute benefits given the correct setting and are viewed as the initial phase in designing architecture for a software system. In any case, over the span of this examination it has turned out to be certain that the term Internet of Things isn't sufficient to give a decision to the impacts of software architectural styles. The investigation itself gives a rundown of essential IoT related variables while picking a software architectural style, which can be utilized as a reason for future IoT ventures and reference architectures. The paper classifies solutions in the Internet of Things into different classes. The results are that for a subset of the classes there is a sensible style, anyway to remain classes there are as yet different choices where more setting data is required The end is that the expression "Internet of Things" ought not be utilized as a reason for software architecture. This was demonstrated by appearing notwithstanding for the different classes, which are subsets of the IoT, there are requirements for different styles.

1. Introduction

The initial concept and usage of the Internet of Things (IoT) showed up as ahead of schedule as the 1980s and ended up mainstream in late 1990s. Ongoing advancements in numerous applicable zones, including mechanization, remote sensor systems, embedded systems and small scale electro-mechanical systems (MEMS), has quickened the development of the Internet of Things (IoT) . Currently, IoT applications exist in about each field and are assuming an inexorably vital job in our day by day life (e.g., medicinal services systems, building and home computerization, ecological checking, framework the board, vitality the board and transportation systems), which has prompted the ongoing multiplication of IoT systems. As per the Government

Exchange Commission (FTC), the quantity of IoT gadgets has just dwarfed the quantity of individuals in the working environment, and the quantity of remote gadgets associated with the Internet of Things will be around 26 billion by 2020 and will enormously dwarf center point gadgets (Smartphone's, tablets and PCs).

The approach of the Internet of Things carries with it numerous potential outcomes and difficulties. One of the territories of research in the Internet of Things is software architecture. There have been a few propositions of reference architectures for the Internet of Things as a solitary sort of framework. In any case, given the vagueness of the term and the various applications viewed as being a piece of the Internet of Things, it appears to be improbable that “one measure fits all" reference architecture can exist.

1.1 Internet of Things

The Internet of things (IoT) is another shrewd interchanges on the planet which gives various applications, for instance, industry, communications, agribusiness, business, etc. All examines and various associations focus on the enhancement of IoT to display various organizations and develop our life. The new technology faces various troubles, for instance, architecture, standard and security. In this paper, we give a cautious layout on the introduction of IoT including history, segments, affiliation and usage of IoT. IoT layers architecture has been cleared up rapidly. We furthermore talk about the IoT security and insurance troubles to deal with a huge bit of IoT security issues, put standards and terms of organizations and achieve security prerequisites. The security prerequisites are the fundamental piece of planning the security courses of action and IoT compose the board systems.

1.2 Merits and Demerits of Iot

Merits

- **Communication** since IoT has correspondence between gadgets, in which physical devices can remain associated and henceforth the total transparency is accessible with lesser wasteful aspects and more prominent quality.
- **Automation and Control** Without human involvement, machines are computerizing and controlling tremendous measure of data, which leads faster and timely yield.
- **Monitoring** sets aside extra cash and time Since IOT utilizes smart sensors to monitor different angles in our everyday life for different applications which sets aside extra cash and time.

Software Architectural Styles in the Internet of Things

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Abstract- **Internet of Things (IoT) is a developing and testing field for analysts. IoT is a system of general objects which are embedded with technologies that communicate and interface inside themselves and external environment. This thus gives insight to the objects to make individuals life agreeable. Software architectural styles are a labelled arrangement of design choices that have demonstrated to evoke quality attribute benefits given the correct setting and are viewed as the initial phase in designing architecture for a software system. In any case, over the span of this examination it has turned out to be certain that the term Internet of Things isn't sufficient to give a decision to the impacts of software architectural styles. The investigation itself gives a rundown of essential IoT related variables while picking a software architectural style, which can be utilized as a reason for future IoT ventures and reference architectures. This paper contains the mapping of software architectural styles to the IoT classes displayed in the past chapter and analyses the consequences for the quality attributes portrayed. The paper will start off by mentioning which software architectural styles will be considered and how they will be evaluated. Utilizing this information, a mapping and analysis is exhibited which depicts the best software architectural styles to use as starting focuses for architecture in the diverse IoT classes.**

1. INTRODUCTION

A software architectural style is a labelled set of components and connectors, and a set of constraints on how they can interact [GS94]. These constraints can be topological, for example not allowing cycles, or it can regard execution semantics. The latter alludes to the meaning of such an interaction between two components, which could be a method call or a notification for example. All styles accompany trade-offs, unequivocally mentioning which quality attributes are gained and which are given away, anyway this also relies upon the context of the system to be fabricated.

2. SOFTWARE ARCHITECTURAL STYLES AND EVALUATION

The software architectural styles that will be considered in this thesis are Client-Server, Peer-to-Peer, Pipes-and-Filters, Event-Based, Publish-Subscribe, Service-Oriented, REST, Layered and Microkernel. There are different styles that exist, anyway these are the absolute most common and very much archived ones. In case the reader is not familiar with these styles, a description is given. There are a number of Software Architecture Evaluation Methods that can be utilized to evaluate software architectures for their satisfaction of quality attribute necessities. In short, these evaluation techniques are meant to be utilized at a later stage in the structure procedure where more information is required about the system to be assembled. Be that as it may, in this thesis we analyze the absolute initial step, namely which style to pick, in the structure phase. For this analysis it is only necessary to realize how quality attributes will be evaluated in this analysis. For the mapping we will distinguish what the quality attribute necessities are for each class. The architectural styles give variations in how these prerequisites are satisfied by the architecture, which will allow us to compare them with each other.

1. Interoperability: For interoperability the necessities could either be primary or secondary..
2. Evolvability: Evolvability is about decreasing the expense of change to the system. For each class of solution we will indicate a portion of the conceivable changes to happen
3. Performance: We will consider latency, throughput, power consumption/vitality proficiency, bandwidth effectiveness and scalability as characteristics that characterize performance in the IoT. These will all be affected by the decision of architectural style.

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A Framework for Multi-Objective and Comprehensive Analysis of Web User Behavioural Patterns

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Abstract

In the contemporary era, businesses are driven by web applications. Customers or users of web applications play vital role in the growth of business. In this context, for organizations, it became indispensable to understand user behaviour towards the web application and its services or products. Unless user behaviour is analysed, it is not possible to improve the tool through which organizations drive business round the clock. Web user behaviour analysis is the process of collecting, quantifying and analysing users' interaction with the web application and its components associated with different services. In order to improve web user experience, the organizations need to analyse users' behaviour and improve the application and services from time to time towards improvement in business. Many researchers contributed towards the techniques used to analyse web user behaviour. However, a comprehensive framework that looks into multiple objectives and aspects of user behaviour is still desired. To fill this gap, in this paper, we proposed a framework for multi-objective and comprehensive analysis of web user behavioural patterns. An algorithm by name Multi-Objective Web Log Analysis (MO-WLA) is proposed. Since the major source of user behaviour is web logs, the proposed algorithm analyses multiple aspects of user behavioural patterns to gain insights into the behaviour of web users. It analyses user activities and interaction with different web components. Python data science platform is used to develop a prototype application. The empirical study revealed that the proposed algorithm outperforms state of the art.

Keywords – *User-web interaction, web user behaviour analysis, conversion rate for users, user behaviour prediction, interesting user behaviours*

1.INTRODUCTION

Web users play vital role in contributing to businesses. Enterprises are driving their businesses with web applications online. Every service and product are made available online thus removing restrictions on time and geography. In this context, for enterprises, it is indispensable to understand how users are behaving with their products and services in order to improve growth organically. Towards this end, they are interested in mining users' behaviour from time to time for making expert decisions. The data used for mining is web log data that is logged from time to time. Since user behaviour is very dynamic in nature, it needs to be captured by considering various factors. It is very dynamic in nature as web users are engaged

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Machine Learning Algorithm for Early Detection of Heart Diseases Using 3-Tier IoT Architecture

Y. Madan Reddy, B. Pavani

Abstract*— Among the applications empowered by the Internet of Things (IoT), regular health monitoring framework is an important one. Wearable sensor gadgets utilized in IoT health monitoring framework have been producing huge amount of data on regular basis. The speed of data generation by IoT sensor gadgets is very high. Henceforth, the volume of data generated from the IoT-based health monitoring framework is also very high. So as to overcome this problem, this paper proposes adaptable three-tier architecture to store and process such immense volume of wearable sensor data. Tier 1 focuses on gathering of data from IoT wearable sensor gadgets. Tier 2 employs Apache HBase for storing substantial volume of wearable IoT sensor data in cloud computing. Likewise, Tier-3 utilizes Apache Mahout for building up logistic regression-based prediction model for heart related issues. At long last, ROC examination is performed to identify the most significant clinical parameters to get heart diseases.

I. INTRODUCTION

In recent past, there has been a noticeable increase in the quantity of wearable gadgets for checking the patients' health and fitness activities on a regular basis[1]. This has a long haul impact on the recording of health and clinical support of patient's physiological information. This progression additionally helps the provision of more details identifying with the daily routine and physical examination. Amid the health monitoring period, IoT wearable gadgets are appended with the human body to track the different health measurements that incorporate blood pressure, heart rate, body temperature, respiratory rate, blood circulation level, body pain and blood glucose level [2]. The data gathered from the IoT-based wearable gadgets are stored in a clinical database for essential activity when the patients' health condition weakens.

Generally, conventional structured query language based databases are utilized in IoT health monitoring system to store clinical data. There has been an expansion in the variety and quantity of IoT-based health monitoring gadgets lately. Thus, the conventional data processing techniques and tools are not being utilized to store sensor data of high volume created by different IoT gadgets [3]. Scalable NOSQL (non structured query language) databases must be utilized in the IoT-based health monitoring system. Analysts have begun the utilization of bigdata and NOSQL in different IoT applications. In this application, the proposed health checking framework consistently watches the person's health condition. At the point when, the health measurements, for example, ECG, respiratory rate, pulse, perspiring, body temperature, blood pressure and heart sound go past standard values, the IoT gadgets send an ready message with the observed health measures to the doctor and other important people.

Sun et al. have built up the IoT-based tailings dam checking framework to monitor emergency situations in a tailings dam [5]. In this methodology the cloud computing based adaptable methodology is used for taking the necessary action when emergency situations arise.

Rohokale et al. have developed IoT-based health monitoring system to watch health parameters, for example, hemoglobin (HB), blood pressure (BP), glucose and irregular cell development [6]. The current methodologies utilize traditions databases and tools to process the immense volume of sensor data generated from IoT gadgets. Subsequently, there is a need to build up an effective and versatile design that stores and in addition breaks down the tremendous volume of clinical data. This paper proposes a adaptable big data based IoT health checking framework for tending to this issue.

The proposed IoT-based structure is interconnected with cloud computing technology to build scalability and accessibility.

Further, the proposed design utilizes Apache HBase to store the immense volume of the sensor data in the cloud. The person's health data is gathered with the help of RFID and 5G mobile networks. In addition, Apache Mahout is utilized in the proposed health monitoring system for building the calculated relapse based forecast show for heart diseases. Finally, the performance of the forecast demonstrate is nearly dissected with the assistance of different performance assessment measurements. The figured outcomes, for example, throughput, affectability, precision and f-measure are utilized for exhibiting the productivity and execution of the proposed IoT-based nonstop health monitoring system.

The proposed IoT-based nonstop health monitoring system is illustrated as follows: Section 1 depicts the introduction to IoT-based health monitoring system. Section 2 audits the ongoing works done in IoT-based healthcare systems. The proposed IoT-based ceaseless health monitoring system is illustrated in Section 3. Result and performance assessment are depicted in Sections 4 and 5 separately. Section 6 concludes the paper.

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Author Profiling using Stylistic and N-Gram Features

Radha D, Chandra Sekhar P

Abstract: ***The World Wide Web is increasing tremendously with massive amount of textual content primarily through social media sites. Most of the users are not interested to upload their genuine details along with textual content to these sites. To identify the correct information of the authors the researchers started a new research area named as Authorship Analysis. The authorship Analysis is used to find the details of the authors by examining their text. Authorship Profiling is one type of Authorship Analysis, which is used to detect the demographic characteristics like Age, Gender, Location, Educational Background, Nativity Language and Personality Traits of the authors by examining writing skills in their written text. Stylometry is one research area defines a set of stylometric features namely word based, character based, syntactic, structural and content based features for differentiating the author's writing styles. In this work, the experimentation conducted with various stylistic features, N-grams and content based features for gender prediction. These features are used for representing the vectors of documents. The classification algorithms produce the model by processing these vectors. Two classification algorithms namely Random Forest, Naïve Bayes Multinomial were used for classification. We concentrated on prediction of Gender from 2019 Pan Competition Twitter dataset. Our approach obtained best accuracies when compared with many Authorship Profiling approaches.***

Keywords : Authorship Analysis, Authorship Profiling, Accuracy, Content based Features, Gender Prediction, N-grams, Stylistic Features.

I. INTRODUCTION

In the last 20 years, Internet has evolved from a network of connected computers used to share data among researchers. As a result of this growth and the birth of social networks, blogs and many other websites where users are given the opportunity of easily creating or uploading content and the amount of data generated every day has also grown immensely. Most of the generated data in the net is thus unstructured. One of the characteristics of the Internet nowadays is that a user can post anonymously in forums, comment sections of articles, social networks, chat systems, etc. The Authorship Analysis is one research area concentrated by the many researchers to find the details of the authors by analyzing their written textual content.

Authorship Analysis is categorized into three techniques such as Plagiarism Detection, Authorship Identification and Authorship Profiling [1]. The Plagiarism Detection detects the percentage of authors contribution is copied from other author's contributions [2]. Authorship Identification classified into two classes namely Authorship Verification and Authorship Attribution. Authorship Verification verifies whether the anonymous document was written by the suspected author or not by investigating the suspected author's documents [3]. Authorship Attribution detects the author of an unknown document by investigating the documents of given set of authors [4]. Authorship Profiling discover the demographic characteristics of an author by investigating the writing style in their texts [5]. In Authorship Identification, the training data need suspected authors documents to recognize the document's author. But in Authorship Profiling, the suspected author's documents need not required in training data to detect the characteristics of the suspected author. This is the major difference among Authorship Identification and Authorship Profiling [7].

Authorship Profiling is used in information processing applications such as harassing messages, forensic analysis, security, educational domain, literary research and marketing [6]. In social websites, people are involved in different crimes like public embarrassment by sending harassing messages, blackmailing, defamation, stalking and creation of profiles with fake details. All these crimes are in the form of messages. The authorship profiling is used here to analyze the harassing messages and detect the basic characteristics like gender, age group, location of messages of authors. In forensic analysis, the forensic experts analyze the property wills and suicide notes to detect the details of the suspected author. In this context Authorship Profiling is one such technique helpful for this purpose. The terrorist organizations send letters and mails to threaten the government bodies. The Authorship Profiling approaches were used in security to analyze these mails and whether the messages came from suspected sources or not. In marketing point of view, the market people are analyzing their products based on the reviews of their product. Based on the analysis of reviews they will take strategic decisions about their products. Authorship Profiling is used to analyze the reviews of products and find the details of reviewers like gender, age, location etc. Authorship Profiling is used in educational domain also. In educational domain, the researchers are able to find the exceptional talented students, the knowledge level of student by analyzing the written texts of the students. In the case of literary and historic studies, Authorship Profiling can be applied to confirm/refute the author characteristics of a text.

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A Method for the Safely Exchange of Private Health Records in the Cloud

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ABSTRACT

The widespread use of cloud services in the health sector has led to an expensive and efficient conversion of personalized health records (PHR) coincidences among several entities involved in the Health letter. However, keeping health information confidential on a cloud server is simply a disclosure or theft and is called a development method that guarantees the privacy of PHR. Therefore, we recommend a technology called SEPHR for the security of the provision of PHR in the cloud. The SEPHR control software guarantees patient-centered PHR and maintains the privacy of the PHR. Patients who place PHR encryption on a cloud server are unreliable and selectively provide services to different users in different areas of PHR. The half-trust alternative called Setup and Re-encryption server (SRS) introduced the private key/key pair and played the secret. In addition, security tactics showed threats from Go. In addition, we formally analyze and verify the technology that SEPHR has through the High-Level Petri Nets (HLPN).

1. INTRODUCTION

Cloud computing has become an important computer concept to provide broad access to the needs of more resources in the system, hardware, infrastructure, and storage. Therefore, the concept of cloud computing allows organizations through contributions from long-term infrastructure development and encourages them to trust IT services. In addition, the cloud computing model has shown great potential to improve coordination between different health actors and also ensure access to health information and scalability. In addition, cloud computing can also integrate several important components in the healthcare field, such as patients, hospital staff, including physicians, nurses, pharmacies and laboratories for clinical staff, insurance providers and suppliers. Therefore, a collaboration between institutions that facilitate environmental health reform is positive and collaboration where patients can create and organize Personal Health Records (PHR). Generally, the PHRs contain information, such as: **(a)**demographic information, **(b)**patient's medical history including the diagnosis, allergies, past surgeries, and treatments,**(c)**laboratory reports, **(d)**data about health insurance claims, and **(e)**private notes of the patients about certain important observed health conditions .

PROBLEM STATEMENT

Although the benefits are unrelated, agile, expensive and ubiquitous services offered by the cloud, some issues related to health data also occur. The most important reason for a patient concerned about PHR confidentiality is to allocate cloud assets and set PHR. private health information to store a server in the cloud is managed and a third party may be allowed to access it legally. In particular, PHR privacy stored in the cloud managed by public service providers is very risky commerce. A day can have dangerous privacy in several ways, for example, theft, loss, and leakage.

PHR on cloud storage or patient transport in the cloud or from the cloud to users who can access other illegal acts because of external malicious entities. In addition, there are also some internal threats with those who are the data authority. For example, PHR on cloud storage or patient cloud transport or from cloud users living on the ground

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Support Vector Machines to Identify Information towards Fixed-Dimensional Vector Space

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Abstract: ***Support vector machines have actually consulted with significant success in various real-world learning jobs. The Support Vector Machine (SVM) is a thoroughly utilized classifier. Along with yet, obtaining the finest outcomes along with SVMs needs an understanding of their procedures as well as the different implies a consumer can influence their preciseness. We supply the individual with a fundamental understanding of the concept behind SVMs and also concentrate on their usage in technique. This paper is concentrated on the useful concerns being used to support vector machines to identify information that is currently supplied as functions in some fixed-dimensional vector space.***

Index Terms : Neural networks, Machine Learning, Support Vector Learning

I. INTRODUCTION

The area of artificial intelligence is interested in building a computer system program that immediately boosts its efficiency with experience [1]. Artificial intelligence system is educated by utilizing an example collection of training information. When the system has actually discovered, it is utilized to do the needed feature based upon the learning experienced. Efficiency can typically be boosted by more training. In recent times lots of effective artificial intelligence applications have actually been established; amongst them are information mining programs, info filtering system systems, independent vehicles and also pattern acknowledgment system. The location of artificial intelligence makes use of ideas from varied areas such as data, expert system, ideology, info concept, biology, cognitive scientific research, computational intricacy and also control concept. Artificial intelligence concept provides numerous academic concepts on boosting learning while the useful element entails building and construction as well as renovations of formulas for executing the learning. As a result of the varied applications of artificial intelligence, there are numerous literary works offered on artificial intelligence under their really personal areas of functions.

ANN has in fact been just one of the most typically used device finding out the formula. It is actually affected through natural knowing units although that it performs certainly not imitate it entirely.

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The well breeding (BP) formula is actually only among the downright very most well-known formula as well as additionally renowned to become durable particularly to concerns together with oversights in the instruction assortment. Help Angle Machines (SVM) on the several other palms is actually a rather new knowing formula. It could be in a comparable method used to find aim at components. Nevertheless, unlike ANN, it is actually pretty perhaps began located upon the principle in logical understanding [2] The substantial accolade in between SVM as well as likewise ANN continues to be in the blunder marketing. In ANN, the target of understanding is actually to obtain a compilation of bodyweight well worths which lower the instruction blunder while in SVM the instruction oversight prepares to a minimum required while instruction modifies the functionality of the maker. Throughout the instruction, SVM determined the requirements as well as additionally the range of assistance angles which totals the selection of unpleasant surprise gadgets in ANN.

II. ARTIFICIAL NEURAL NETWORK

In the area of design type, the feed- ahead of time system is actually very most once taken advantage of. They feature the BP-based multilayer perceptron (MLP) along with the Radial-Basis Function systems. These systems are actually organized straight into coatings, in addition, to possessing unidirectional hyperlinks in between the levels. An extra ideal system is actually a Personal- Organizing Chart, or even Kohonen-Network, which is mostly utilized for information clustering as well as function mapping. The learning procedure includes upgrading network design as well as link weights to ensure that a network can effectively do a particular classification/clustering job. The enhancing appeal of semantic network designs in artificial intelligence, particularly to fix pattern acknowledgment issues has actually been mainly because of their relatively reduced reliance on domain-specific expertise contrasted to model-based as well as rule-based methods and also as a result of the schedule of effective learning formulas for specialists to make use of. One more course of ANN, the convolutional semantic networks supplies a brand-new collection of nonlinear formulas for attribute removal making use of concealed layers developed right into the ANN.

Summary of Artificial semantic networks (ANN) can be discovered in the range of magazines on the topic. Text publications, journal short articles, meeting case and also study records on ANN are countless. This area briefly sums up some bottom lines on ANN can be considered as greatly identical computer systems containing a very large variety of straightforward CPUs with lots of affiliations. ANN

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Loadability Enhancement using Improved Wind Driven Optimization Algorithm

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Abstract

In a power system the transmission lines carry the power from generating sources to the loads. While doing so, the lines are unevenly loaded or they are not used up to their existing utilization level. In this paper an effort is put to solve optimal power flow (OPF) problem and also to enhance the loadability of the transmission system. Minimization of transmission losses is also considered as objective. A novel improved Wind Driven Optimization (IWDO) algorithm is used to solve OPF problem. From the results obtained, It is observed that the loss is minimized, loadability is impoved as well and the minimum cost is achieved.

Keywords: Loadability, Improved wind driven optimization, Transmission loss, Optimal power flow, Total fuel cost..

1 Introduction

The power system is such a very large, complex and interconnected network, whose operation becomes very much tedious. The load on the system is also growing year by year at an exponential pace. For the security of the power system, it is very much essential to know the current state of the power system. It is required to know the voltages at different buses and line flows in different transmission lines for power system expansion planning. For this purpose power flow solution must be executed properly. The main scope of OPF problem is to optimize the specific objectives subjected to the various constraints by controlling the various control variables. Many literature has been worked on this topic to have a clear idea and present the scope for the researchers for further findings.

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2 Related Works

A.Immanuel et.al [1] rigorous literature is presented in solving OPF problem using both conventional as well as advanced approaches including evolutionary techniques. Asmita D et. al. [2] authors proposed a non-deterministic and hybrid approaches to solve OPF by considering variable loading conditions. The OPF problem under contingency, known a security constraint OPF is solved using real coded genetic algorithm in S.V.Durga Bhavani et.al. To obtain the much benefit OPF problem is solved by incorporating flexible alternating current transmission system (FACTS) devices in the system considering multi objectives also [4-6]. The security constraint OPF is solved with the incorporation of FACTS devices also in deregulated power system [7-9].

The power is transferred from generating sources to the loads through power transmission lines. In most of the cases, the power transfer capability of the existing lines is not used to their maximum utilization level. To achieve the utmost benefit, the loadability of the system needs to be improved. R.H.Bhesd adiya et. al, Ya-Chin Chang et, al, A.Saranya et. al. [10-12] the loadability of the existing transmission system is enhanced by using various FACTS devices. M. Lakshmikantha Reddy et.al [13] the loadability of a system is improved by in corporating the FACTS devices TCSC and SVC.

In [14,15] the loadability limit of a power system is enhanced by incorporating FACTS devices in identified optimal siting. In [16] the optimal location of capacitor is determined using non dominated sorting particle swarm optimization (NSPSO) to enhance the system loadability.

The literature covered so far did not considered, the loss calculations, loadality improvement simultaneously while solving OPF problem which is focused in this work. The novelty of the present paper is to propose a sophisticated improved wind driven optimization algorithm to solve multi objective OPF.

3 Improved Wind Driven Optimization (IWDO)

The WDO is proposed based on the moment of air particles in the atmosphere because of the uneven dissemination of pressure [17]. WDO is motivated by nature and it is multi-dimensional and multi modal based global optimization algorithm. The trajectory of each air particle persues Newton's second law. The moment of air parcels is directed by the frictional forces caused by neighboring particles, earth gravity force, which pulls the air prticals to the center of search space, the force of pressure gradient and the coriolis forces. The position and velocity of e ach air particle will be updated with the help of Eq (1) and Eq (2).

$$V_{t+1} = (1-\alpha)V_t - gx_t + RT\left|\frac{1}{r} - 1\right|(x_{opt} - x_t) + \frac{cu_t^{other\,\dim}}{r} \tag{1}$$

$$x_{t+1} = x_t + V_{t+1} \tag{2}$$

In IWDO, a new wind factor (WF) is introduced to achieve the convergence much faster than the conventional WDO. The wind factor also decides the current position of air particle. During the starting stage WF should be considered large [18] and it goes on reducing as iteration passes. After testing on many standard functions, the value of WF observed to vary from 2 to 0. The velocity update with WF is given in Eq (3)

$$V_{t+1} = (1-\alpha)V_t - gx_t + RT\left|\frac{1}{r} - 1\right|(x_{opt} - x_t * W_F) + \frac{cu_t^{other\,\dim}}{r} \tag{3}$$

In the next step the position is also updated with the updated velocity.

4 Mathematical Modelling of OPF

The OPF problem is to determine the optimal setting of various electrical parameters [19] such that it yields to the optimum result of considered objectives. Mathematically, it can be represented as:

Optimize whether to minimize or maximize the objective function f(x,u). Subjected to the constraints

$$h(x,u) = 0 \text{ and } g(x,u) = 0$$

'h' represents the set of equality constraints and 'g' is a set of inequality constraints with 'x and u' dependent and control variables respectively. The objective may be any one or the combination of the following [20].

In this work, the OPF problem is solved in three cases. In Case (i), the OPF is solved without considering loadability, Case (ii) problem is to increase the loadability without considering optimal cost point. In Case (iii), the multi objective problem is solved by considering the objectives as OPF along with improving the loadability. In Case (iv), one more objective loss minimization is also added to Case (iii) objectives. Mathematically,

Minimize the total fuel cost FT with NG number of units,

$$F_T = \sum_{i=1}^{NG} F(P_i) \tag{4}$$

The fuel cost function of ith generator, to generate Pi MW is

$$F(P_i) = a_i \times P_i^2 + b_i \times P_i + c_i \quad Rs/hr \tag{5}$$

Where, a_i, b_i and c_i represents the cost coefficients of i^{th} unit. Subjected to the equality constraints of real and reactive powers.

$$\sum_{i=1}^{NG} P_i = P_D + P_L; \qquad \sum_{i=1}^{NG} Q_i = Q_D + Q_L \tag{6}$$

The total generation with NG number of units is equal to the sum of total real power demand PD, and total transmission loss PL. Same holds for the reactive power also. The inequality constraints include active, reactive powers and bus voltages should be within limits.

$$P_i^{Min} \le P_i \le P_i^{Max}; \qquad Q_i^{Min} \le Q_i \le Q_i^{Max}; \qquad V_i^{Min} \le V_i \le V_i^{Max} \tag{7}$$

Tapping setting of Tap changing transformer

$$T_i^{Min} \le T_i \le T_i^{Max} \tag{8}$$

The thermal capability of each transmission line in terms of MVA

$$S_{Li} \le S_{Li}^{Max} \tag{9}$$

Limitation on shunt capacitor generated reactive power

$$Q_{Ci}^{Min} \le Q_{Ci} \le Q_{Ci}^{Max} \tag{10}$$

The multi objective function is handled by writing Lagrangian function as:

$$L = \lambda_1 * Objective_1 + \lambda_2 * Objective_2 + \lambda_3 * Objective_3 + \lambda_4 * Objective_4 \tag{11}$$

The λ parameters are the weightage given to each objective function. In the present work, all the objectives have given equal importance, therefore equal weightage. Eqn (11) is solved subjective to the refered constraints from Eqn (6) to Eqn (11).

5 Results and Discussions

In the present work, a standard IEEE 14 bus system [21] is considered. It has 1 slack bus, 4 generator buses and 9 load buses with 21 transmission lines. The single line diagram is shown in Figure 1. The simulation has been carried out in all the aforementioned four cases. In case (i), the OPF problem only is solved without focusing on loadability and transmission losses. The optimal cost yields to 782.1745 Rs/hr. While in Case (ii), the loadabiity only is solved using IWDO algorithm, without considering cost and loss. The loadability acquired 0.5 but the cost results into 1232.052 Rs/hr which is all time high.

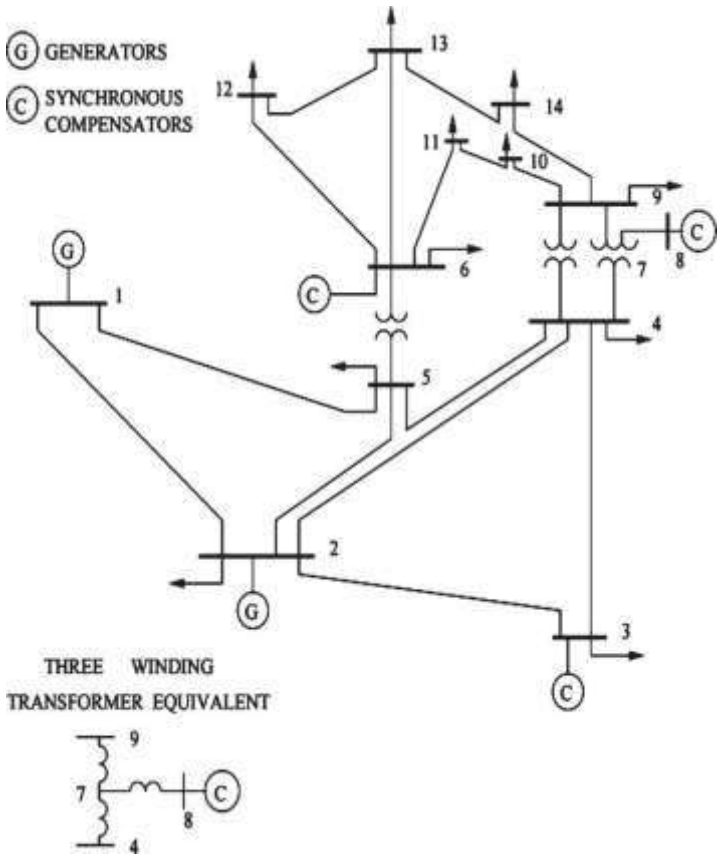
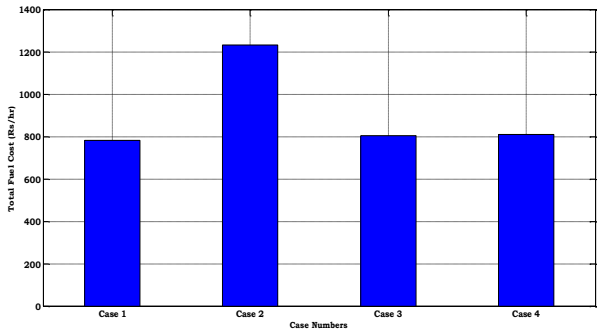
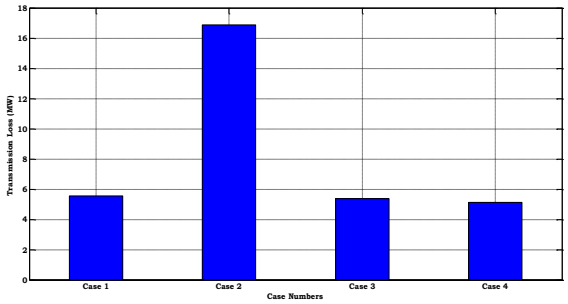


Figure 1. Single line diagram of IEEE 14 bus system

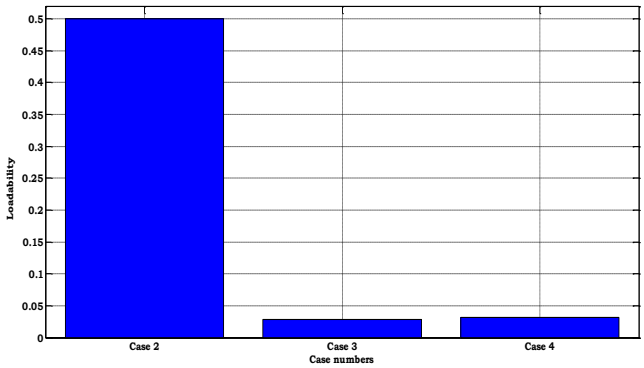
In Case (iii), the OPF and loadabilty both are considered for optimal operation using IWDO. In this loss is not bothered about. Therefore the loadability improved to 0.028673 and the cost results into 804.703 Rs/hr. In Case(iv), all the three objectives are considered. i.e. minimization of cost, minimization of loss and at the same time minimizing the loss. After simulation, the optimal cost eved is 810.8821 Rs/hr, the minimum losses are 5.122745 MW and the loading is increased to 0.031336. The results are shown in Figures 2(a) to 2(c).



(a)



(b)



(c)

Figure 2.(a) Total fuel cost ; (b) Total transmission loss ;
(c) Loadability for different cases

The obtained results are also compared with that of the work already published in [22]. The authors of [22] proposed ordinal optimization approach and the comparative results are tabulated in Table 1.

Table 1. Comparison of Results

Ref.	Method	Transmision loss (MW)
Ref [22]	Conventional Method	14.75
	Ordinal Optimization	7.847
Present work	IWDO	5.122745

The losses obtained with IWDO is observed to be 5.122745 while with the remaining approaches it was too high.

6 Conclusion

In real world, the load on power system increasing day by day in exponential manner. But the existing transmission lines are not utilizing to their ability even though they are capable. An immense research has been carried out to maximize the loadability of the transmission system. In achieving so, the other objectives such as fuel cost and transmission loss get effected. In this present work, a novel improved wind drive optimization algorithm is proposed to solve the problem as multi objective. The analysis is carried out in four different cases. When the OPF only is considered, the cost is reduced but the losses got shoot up. Using IWDO the problem is solved considering minimization of fuel cost and loss at the same time maximizing the loadability, which yields to satisfactory results. The work can be further extended by incorporating few more objctives to obtain the solution near practicality.

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A Novel Approach to Solve Optimal Power Flow Problem

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load flow, optimal power flow, improved wind driven optimization, voltage deviation, total fuel cost, soft computing technique

ABSTRACT

In this paper the objective is to solve an optimal power flow problem (OPF) as load varies. It is indeed necessary to know the present operating status of the system for secure operation. A novel Improved Wind driven optimization (IWDO) algorithm is proposed to solve highly nonlinear OPF problem. The standard IEEE–14 bus system is considered for the study. The load variation is considered from base case to 150% of base case. With these load perturbations the voltage deviations and fuel cost variations are observed. From the obtained results it can be observed that, as the load varies from minimum level to maximum the total fuel cost goes on reduces for OPF compared to load flow. At the same time the total voltage drop also high for lower loading levels and reduces as load goes on increases compared to OPF.

1. INTRODUCTION

The load flow solution is a vital aspect of the power system operation and control. It involves finding the voltage magnitudes and angles at various buses and calculating the power flows in various transmission lines [1]. These are very helpful to decide the slack bus generation after knowing the losses in a system. By knowing all these parameters in a given power system, it facilitates the power system operating engineers to take proper planning and operation decisions for secure operation. There are certain substantiated approaches to solve the power flow solution with reasonably accurate results. Specifying those Gauss seidel (GS), Newton–Raphson (NR), Decoupled and Fast Decoupled (FDLF) methods [2].

As the load varies, the various operating parameters of power system will get change. For satisfactory operation of system, these parameters should be within the prescribed limits. In this paper, the effect of load variation on different electrical parameters is analyzed.

This work is organized as follows. Section 2 presents generalized objectives of OPF, The mathematical modeling of OPF with imposed constraints is demonstrated in section 3. The IWDO algorithm is presented in section 4. Finally the results and discussions are briefed in section 5.

2. OPTIMAL POWER FLOW PROBLEM

The OPF problem is to determine the optimal setting of various electrical parameters [3] such that it yields to the optimum result of considered objective/s. mathematically, it can be represented as:

Optimize whether to minimize or maximize the objective function [8-11]

$$f(x,u)$$

Subjected to the constraints $h(x,u)=0$ and $g(x,u)\le 0$.

'h' represents the set of equality constraints and 'g' is a set of inequality constraints with 'x and u' dependent and control variables respectively. The objective may be any one or the combination of the following [4].

(1) Minimizing the operating cost of a power plant.
(2) Minimizing the total transmission losses.
(3) Maximizing the load ability of the existing transmission system.
(4) Minimizing the emission levels of power plant.

Thee quality constraints include, real and reactive power balance has to be satisfied. At the same time the inequality constraints include real, reactive power generation and bus voltage limits, tap setting positions of tap changing transformer, Thermal limitation of each line and finally the limitation on capacitance generated reactive power if exists. In the present work the solution of OPF has been carried out with the objective of minimizing the total running cost [12-15].

3. MATHEMATICAL FORMULATION OF OPF

The mathematical modeling of present OPF problem [5], which is highly nonlinear, is to minimize the total cost in normal case as well as in contingency case,

Minimize the total fuel cost F_T with NG number of units,

$$F_T=\sum_{i=1}^{NG}F(P_i) \quad (1)$$

The fuel cost function of ith generator, to generate P_i MW is

$$F(P_i)=a_i\times P_i^2+b_i\times P_i+c_i \quad Rs/hr \quad (2)$$

where, a_i, b_i *and* c_i represents the cost coefficients of i^{th} unit.

Subjected to the equality constraints of real and reactive powers.

$$\sum_{i=1}^{NG} P_i = P_D + P_L; \qquad \sum_{i=1}^{NG} Q_i = Q_D + Q_L \tag{3}$$

The total generation with *NG*number ofunits is equal to sum of total real power demand P_D, and total transmission loss P_L. Same holds for the reactive power also.

The inequality constraints include active, reactive powers and bus voltages should be within limits.

$$P_i^{Min} \le P_i \le P_i^{Max}; \quad Q_i^{Min} \le Q_i \le Q_i^{Max}; \quad V_i^{Min} \le V_i \le V_i^{Max} \tag{4}$$

Tapping setting of Tap changing transformer

$$T_i^{Min} \le T_i \le T_i^{Max} \tag{5}$$

The thermal capability of each transmission line in terms of MVA

$$S_{Li} \le S_{Li}^{Max} \tag{6}$$

Limitation on shunt capacitor generated reactive power

$$Q_{Ci}^{Min} \le Q_{Ci} \le Q_{Ci}^{Max} \tag{7}$$

4. IMPROVED WIND DRIVEN OPTIMIZATION (IWDO)

The Wind Driven Optimization (WDO) algorithm [6, 16-17] is proposed by inspiring from the natural behavior of the moment of air particles in the atmosphere. The motion of an air particle is influenced by the factors such as frictional forces caused by the neighbor air particles, force due to pressure gradient, forces due to gravity and coriolis forces. The velocity and position of each air particle is governed by the following equation.

$$V_{t+1} = (1-\alpha)V_t - gx_t + RT\left|\frac{1}{r} - 1\right|(x_{opt} - x_t) + \frac{cu_t^{other\,\dim}}{r} \tag{8}$$

$$x_{t+1} = x_t + V_{i+1} \tag{9}$$

IWDO is proposed to obtain the better convergence accuracy with faster rate by adding a new factor known as 'Wind Factor (W_f) 'to WDO [18]. With the enormous testing on different standard functions, its value is identifies to vary in between 0 to 2. The modified velocity expression is given as [19]:

$$V_{t+1} = (1-\alpha)V_t - gx_t + RT\left|\frac{1}{r} - 1\right|(x_{opt} - W_F * x_t) + \frac{cu_t^{other\,\dim}}{r} \tag{10}$$

$$x_{t+1} = x_t + V_{i+1} \tag{11}$$

The step wise procedure of IWDO described in following steps.

Step 1: Initialize the IWDO attributes.

Step 2: Construct the objective function or pressure function.

Step 3: Generate initial air particle positions and their velocities randomly.

Step 4: Calculate the fitness value of each air particle.

Step 5: The current velocity should be updated using equation 10.

Step 6: Check whether velocity is within limits or not.

Step 7: Update the position of air particle with the help of expression 11.

Step 8: Check whether particle position is within limits or not.

Step 9: Iterate the above procedure until the convergence criteria satisfies.

5. RESULTS AND DISCUSSIONS

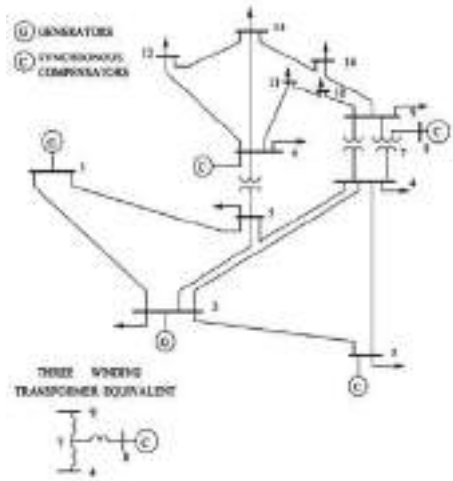

Figure 1. Standard IEEE 14 bus system

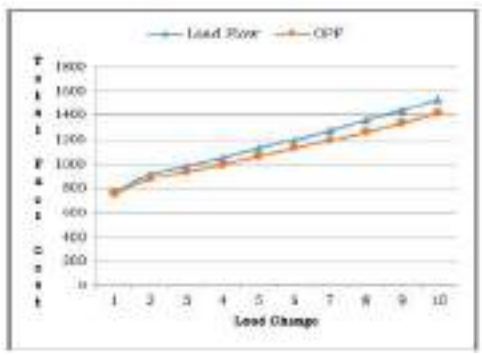

Figure 2. Fuel cost for load flow and OPF with load change

The proposed method is implemented on standard IEEE 14 bus system [7]. It has 1 slack bus, 4 generator bus and 9 load buses with 21 transmission lines. The single line diagram is shown in Fig 1. The simulation has been carried out in two cases. In case (i) load flow problem is solved to know the static behaviour of the system. In case (ii) OPF problem is also solved with the objective of minimizing the cost by imposing the required constraints. Both the cases are executed by varying the load. Finally the two cases results are depicted in Figure 2 and Figure 3. From Figure 2, it can be observed that for lower loading conditions the load flow solution yields to

higher total voltage drop. As the loading reaches to higher value, OPF problem yields to larger total voltage drops. From Figure 3, It can be observed that, the load flow results into higher fuel cost compared to optimal power flow as its objective itself is to minimize the fuel cost.

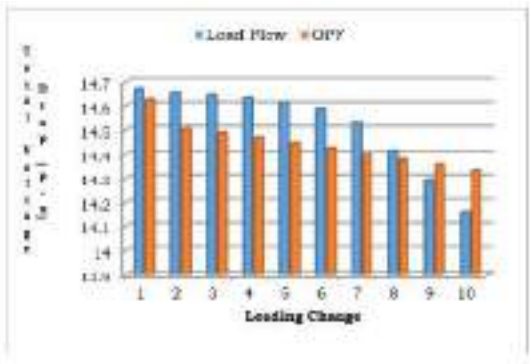

Figure 3. Total voltage drop for load flow and OPF with load change

6. CONCLUSION

In this paper a novel improved wind driven optimization algorithm is used to solve optimal power flow problem. The standard IEEE 14 bus system is considered for the analysis. By increasing the load from base value to 150 % of base load, the load flow and OPF has been compared. The total voltage drop and total fuel costs are observed for the two cases. It is concluded that as the objective of OPF is to minimize the fuel cost, as the load increases, the fuel cost of OPF is less compared to load flow. The total voltage drop is less for lower and more for higher load changes. The work can be extended in future by using hybrid and sophisticated softcomputing techniques for deregulation system also.

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FINFET operational amplifier with low offset noise and high immunity to electromagnetic interference

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ABSTRACT

Most amplifiers are less immune to the electromagnetic interference (EMI) signal conducted at the input terminals. Operational amplifiers also suffer from EMI signals. Improvement in designs is required to remove the noises in the signal. The designs can be either circuit level or device level. This paper presents the design of an operational amplifier using Fin Field Effect Transistors (FinFETs). The Operational amplifier is designed to minimize the offset by including a low pass filter at the input differential pair of the FinFET based circuit. The measured offset voltage is reduced by about 75% in the proposed structure compared to a conventional one. The Operational amplifier power consumption is reduced when compared to the CMOS counterpart

1. Introduction

The Operational amplifiers are less immune to the electromagnetic interference (EMI) signal occurred or added at the input terminals. The interference are subjected to gain multiplied at the output. Since the electronic appliances are available everywhere and the environment creates the electromagnetic interference [1], demand increases for circuits which suppresses the noises due to electromagnetic interference (EMI). Since the EMI signal is injected into the input terminals of the opamp, it's been amplified at the output if not removed at the input stage itself [3]. It is measured as the scalar product of differential and common mode component. This is common to all circuits including junction transistors [9] and Field Effect Transistors. In literature several work are carried out for the reduction of the EMI signal [8]. The measurement of the EMI is an area where research is carried out in industry level since the EMI reduction is required in products. Several measurement techniques and methodologies were used to quantify the EMI interference and its impact on offset. The offset measurements should ascertain the worst-case voltage values [17]. The measurement topology allows to correct EMI induced offset voltage. The RF interference affects the CMOS differential amplifier offset current. Using Fourier-series approximations, the analytical expressions for CMOS differential amplifier are obtained from the input-output characteristics. To minimize the offset current, these approximations can be used with proper fine tuning to meet the practical issues [6]. Distortion phenomena in active nonlinear devices are common since the RF interference injected on the input signals creates noises. The signals saturate the output [2] as DC offset voltage. In differential input stages the interference creates even-order harmonics which leads to DC offset voltage. Other than CMOS and FinFET different devices are used to implement various circuits. But the double gate device found more advantages in all aspects [20,21] due to working in sub and near threshold regime [23].

These low pass filter will be used to remove the electromagnetic interference based DC offset noise. The input differential pair becomes superior to a double differential pair compensation topology by using this LPF [3]. Still its been found that a differential pair with active current load has high immunity to interferences than the low pass filter design [4]. These designs are easy to fabricate in standard CMOS technologies since no extra mask or triple well nor external components are required. Gain parameter should be considered for the measurement of the offset noise [5]. An efficient measurement technique is required to determine the offset voltage in operational amplifiers induced by electromagnetic interference

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PRINCIPAL FACTORS MEASURING SERVICE QUALITY: A STUDY OF SELECTED BANKS IN INDIA*

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ABSTRACT

Several studies have revealed that there is a relationship between the quality of service offered by the service provider and the level of satisfaction among their customers. But as we know that service quality from the customer's perspective is very subjective. Therefore, service quality dimensions cannot be generalized for all types of services. Though the SERVQUAL model of measuring service quality has proven its applicability across all services, there is a need to have sector-specific Service Quality Management (SQM) Model. This paper attempts to find out the SQM model for the Indian banking sector covering public, private and foreign banks. Principal factors of banking service quality have been identified which are important for customer satisfaction in a particular type of bank.

Key terms: *Banks, Principal Factors, Service Quality Management, Customer Satisfaction*

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A REVIEW ON PROCESS PARAMETERS ASSOCIATED WITH CONSTITUTIVE MODELLING OF SHAPE MEMORY ALLOYS-2

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ABSTRACT

In extension to the last review on constitutive models for shape memory alloys (SMAs), we can realize that most of the parameters involved in developing the constitutive model depend on processing techniques and hence the present paper emphasizes this context. A comprehensive literature review from the previous observations will be made available in the present paper along with the research gaps identified for exploring these SMAs towards aerospace and automotive applications.

KEYWORDS: Shape Memory Alloy, Process Parameters & Constitutive Model

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Original Article

INTRODUCTION

Over the last few decades shape memory alloys have become the most trending materials because of its unique properties namely shape memory effect (SME) and pseudo elasticity that ensemble most of the societal challenges. However, many micro, micro-macro, macro constitutive models were developed to understand these materials' behavior. But the present paper emphasizes the influence of processing parameters on Nitinol exhibiting SME. From our previous paper one can realize that most of the micro and macroscale parameters depend upon the processing parameters, hence, emphasize on the processing parameters will be made in the present context. These understandings of processing parameters enable us to choose different manufacturing routes, composition dependence and processing environments influencing the range of super elasticity and SME. This understanding of influence of parameters allow us to develop products amenable to aerospace and automotive applications without altering the property of SME instead improving the strength to weight ratio, range of transition temperatures and corrosion properties.

Multi Stage Transformation (MST)

The traditional basic view of phase transformations in Ni-Ti alloys includes only one-stage cubic austenite (B2) to monoclinic (B19') martensite transformation, however, the influence of cold working associated with high density of dislocations (H. Morawiec, 1995) (Morawiec, Stroz, Goryczka, & Chrobak, 1996) (Morawiec D. C., 2003) and the presence of Ni-rich precipitates in Ni-Ti alloys contribute to a more complex two-stage, three-stage or even four-stage transformations, collectively termed as 'multiple stage transformation' (Carroll, 2004).

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QUANDARIES DURING NUMERICAL ANALYSIS ON SHAPE MEMORY PRODUCT

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ABSTRACT

Shape memory alloy is a portion of smart materials. These materials have exclusive property of super elasticity / pseudo elasticity which helps in recovery of shape and strains result in resuming its structural property even from state of plastic deformation. Scientific study on these materials indulges to have growth in medical, aerospace and automotive industrial application. Substantial amount of research is available in the literature to study the properties of these materials with different parameters such as processing and compositions based. However, modeling of these parameters was never cited in the literature, hence motivation for the present work emphasizes to model these parameters as an adjustable coefficients that can be used to perform numerical analysis. The novelty of present work addresses one of important phenomena "strain recovery" and proposes an analytical model which extends the modeling of shape recovery.

KEYWORDS: Shape Memory Alloy (SMA), Nitinol, Shape Memory Actuator & Phase Diagram

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Original Article

1. INTRODUCTION

1.1 Summary

Shape memory alloys (SMAs) are resided under smart materials which are grouped as having different properties when compared to classic material. These materials received significant attention due to their captivating property called as shape memory effect (SME) [1]. As a result, these materials later found to be compatible to biomedical applications because of their low transition temperatures, corrosion resistance and relatively good strength with enough bio-sensible [2]. The magnitude to any material is achieved when its ability of resuming its induced properties such as strain which these materials poses in terms of super elasticity or pseudo elasticity [3] which motivate to make them amenable to aerospace and automotive applications. There are different materials with different compositions exhibiting SME, but only Nickel and Titanium received significant attention due to superior super elasticity range among the available SMAs. Our work is based on the properties of Nitinol (Nickel-Titanium) as referred its importance in structural, thermal & magnetic controllability [4]. In this context there is need for development of a compliant constitutive model which envelopes the important properties associated with SME. Hence the present work is a preliminary work to develop a constitutive model which could be compatible for numerical analysis of SMA.

1.2 Shape Memory Effect (SME)

Nitinol stands for Nickel and Titanium discovery at Naval Ordinance Laboratory (NOL), the origin of this combination took place in 1968 at NOL accidentally during the search for non-ferrous materials that could be used

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"NUMERICAL STUDY ON THE EFFECT OF CONTRACTION RATIO ON SUPERSONIC INTAKE STARTING CHARACTERISTICS"

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ABSTRACT

Supersonic/Hypersonic air intake performance is defined in terms of intake capability and efficiency. This work mainly deals with an intake starting characteristic for different contraction ratio of hypersonic vehicles. The strong-shock design principle is proposed on the basis of comparison of the limiting contraction line with the Kantrowitz (self-starting) lines of a few particular ramp intakes. Our study is based on varying area contraction ratio (1, 1.5, 1.7, 2 and 2.5) and to find the best performance of intake starting condition for both symmetry (2D) and axisymmetric (3D) for various Mach numbers. During research work, we found that intake starting problem for symmetry to axisymmetric is not same, it may start in axis symmetric whereas in symmetry, it may lead to unstart. This paper represents the study on different area ratio configuration for start flow in the air intake.

KEYWORDS: Intake Starting Characteristic, Contraction Ratios, Intake Un-Start & Axi-Symmetry Vs Symmetry Intake

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Original Article

INTRODUCTION

An air breathing propulsion system is designed to suck the air, compress it to the required pressure and add heat to deliver require thrust. Currently many countries are focused on Supersonic and Hypersonic air breathing technology such as Ramjet and Scramjet engines. In such engines, air intake plays crucial role for heat addition in the combustor. Intakes of Ramjets are designed such that it would bring down the high speed compression of incoming air for efficient to subsonic level before entering the combustion chamber. High stagnation temperatures took place due to such speed reduction. Varying geometry may not be an option for inlet designers because of mechanism and difficulties. It is essential to have a converging duct to decelerate the incoming air to compress airflow and supply the compressed air into the combustor chamber.

This engine can carry two distinctly different flow configurations for same Mach number. There are different conditions to operate intake to start. When bow shock stands in front of intake, it is known as sub critical conditions, where the inlet's internal flow is sub-sonic, remaining flow will divert overboard. The second possible flow has no bow shock, no overboard spillage and is supersonic throughout. This is known as supercritical condition. The intake must be started to obtain an efficient operation of engine which obtains by steady supersonic flow in the intake decelerating towards its exit. Heavy loss in total pressure and mass flow leads to un-started condition. Starting condition requires the oblique shock during hypersonic/supersonic flow throughout the

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Determination of virial stress on atoms using 2nd nearest neighbour embedded atomic model (2NNEAM) for a nitinol shape memory alloy (SMA)

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ABSTRACT

Stress induced martensitic microstructure transformation being one of the important phenomena exhibiting the shape memory effect (SME) by Shape memory alloys (SMAs), ensuing most of the constitutive models cited in the literature to be a micro-mechanical based model. But none of these models predict the shear stress and shear strains at atomistic level. However, virial stress using second nearest neighbour embedded atomic model (2NNEAM) is limited and available only for conventional materials but for the alloys especially to SMA has never been cited in the literature. Hence the current paper emphasizes a novel approach on the prediction of atomic stress using virial stress equation by introducing vector inputs. The expected virial stress can be used as an input to develop a statistical ensemble average based constitutive model.

Selection and of the scientific committee of the 10th International Conference of Materials Processing and Characterization.

1. Background

Constitutive modelling of SMA [1–5] received significant attention due to the material exhibiting intriguing properties such as corrosion resistant, SME and transition temperatures suitable to biomedical industries. But these alloys are found to be amenable for biomedical applications [6] and hence lacking their contribution towards aerospace and automotive industries. In this context, a motivation towards exploring these materials for aerospace [7–9] and automotive applications [10] has been initiated. But however, an insubstantial work has been reported in the literature due to inadequate understanding of the improving the properties of these alloys pertinent to these industries.

Being biocompatible, an ample amount of research is available in compatible to biomedical applications which cannot be directly integrated to aerospace and automotive applications. In this context there is need for development of a compliant constitutive model which envelopes the important properties associated with SME. Hence the present work is a preliminary work to develop a constitutive model. A prior to this, few available models [1–5] will be emphasized with their limitations which forms the novelty of our current approach.

1.1. Literature review

Micro-mechanics-based model such as Muller model [1] is the initial model developed using canonical ensemble average method which uses the free energy to predict the different phenomena of the shape memory hysteresis. A better model by Falk's model [2] optimizing the number of parameters used in [1] thus realizing the model to be completely an energy-based model. Liang in [3] developed a thermo-mechanical constitutive model for Nitinol SMA which emphasized the understanding of phase transitions during the hysteresis. The model is named after his name as Liang's model. But these models couldn't predict the properties of the materials during the phase transition. To surmount this drawback, a martensite variable is introduced by Brinson [12] in the works of [3] and [4]. However, there are macroscopic models given in [13] that developed within the framework of generalized standard materials and hence constraining the phase transformations which is again a microscopic phenomenon.

In relevance to Brinson model [13], Auricchio in [14] proposed a model by introducing hardening parameter which realizes the capability of evaluating the thermo-mechanical properties during hysteresis. From the above discussed models and the fact that,

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Selection and of the scientific committee of the 10th International Conference of Materials Processing and Characterization.

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Original Article

A SHORT REVIEW ON CONSTITUTIVE MODELLING OF THE SHAPE MEMORY ALLOYS-1

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ABSTRACT

Shape memory alloys (SMAs) received significant attention by biomedical, aerospace and automotive industries due to their captivating properties called shape memory effect (SME) and Pseudo elasticity. However, the applications of these alloys are mostly found to be biocompatible, and are very sensitive to aerospace and automotive applications. This realization of developing the materials amenable to both aerospace and automotive applications along with biomedical applications needs an assignment of developing suitable constitutive model, to understand the behavior of these materials in different environments. As a result, the present paper emphasizes a short review on various constitutive models, cited in the global scientific community allowing to understand the significance of shape memory alloys, and also suggests essential facts required for developing new models.

KEYWORDS: Shape Memory Effect, Pseudo Elasticity, Constitutive Models, Free Energy & Nitinol

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INTRODUCTION

Recently, SMAs received huge attention by aerospace and automotive industries because of its intriguing properties, say Pseudo elasticity and SME. But, most of these SMAs are constrained to biomedical applications because of their compatibility; hence they cannot be directly integrated with aerospace and automotive industries. These industries require properties like high strength to weight ratio, high thermal resistance and corrosion resistance which requires different processing methodologies unlike those for biomedical industries. Present challenges in processing these alloys received a substantial attention because of unavailability of proper constitutive mechanics to identify the material behavior for different alloying composition. Nonetheless, significant work has been done for various processing methodologies influencing the properties of Nitinol SMA and developed constitutive relations in these aspects. The present section will emphasize few research works performed over the years in deduce the mechanism of these alloys, and also highlights the research gaps identified from the literature review.

REVIEW OF CONSTITUTIVE MODELS

During 1980's, which is the early phases of articulating and modeling of the SME, engineers and scientists found a close analogy with ferroelectric bodies due to the similar hysteretic behavior. As a result, Müller and Wilmanski (1) proposed a macroscopic model to understand the behavior of the hysteresis with ferroelectric bodies. The primary objective of Müller and Wilmanski model is to simulate a body under uniaxial

Mathematical Modelling and Volume Prediction of Metal Melted by Electron Beam Welding in Copper and Stainless Steel 304 Dissimilar Metal Joints

R. Ajith Raj, M. Dev Anand, S. Ramabalan

Abstract--- Industries such as Aircraft manufacturing, nuclear power plants and oil refineries witness a wide range of applications in dissimilar welded joints considering the advantage of strength and high corrosion resistance. The primary objective of this research is to study the dissimilar metal joints of pure Copper and Stainless Steel 304 using Electron Beam Welding for nuclear power plant applications. The various physical properties of both metal varies. Joining of copper is also not feasible by using existing welding methods due its high thermal conductivity and subsequently joining of these dissimilar materials is more complex. Electron Beam welding is a useful method in joining such dissimilar metal combinations. The heat generated by the electron beam melts the metals in different ratios because of the difference in the melting point of metals. Even though various researches has been focused in the area of dissimilar metal joints, no researcher worked to predict the heat energy rate of electron beam and the melting volume of metals. In this work, the volume of copper melted and volume of Stainless Steel 304 melted with respect to the heat generation has been found out by means of numerical calculations. The distribution of heat in both metals is also found using ANSYS software. A mathematical model is also created using MINITAB software and the volume of copper and Stainless Steel 304 melted with respect to the heat energy is predicted.

Keywords--- Electron Beam Welding, Dissimilar Metal Joints, Copper, Stainless Steel 304.

I. INTRODUCTION

The use of Electron beam for metal joining has augmented in the present days due to its fastest rate knotted with the quality standards of industries. Steam of electrons are accelerated to a velocity approximately equal to two third the speed of light. This focussed electrons with high velocity losses its Kinetic energy upon collision with the metal to be welded and converts in to heat energy resulting in fusion or melting of the two metal parts to be welded.

In electron beam welding the fusion zone and the heat affected zone are very narrow when compared with other welding techniques. The deep penetration, low distortion, controlled repeatability, high welding rate achieved by electron beam are added advantages to this technique. Since the welding is carried out in a vacuum chamber the contaminations in welding is totally supressed. The heat energy produced is a function of beam current, beam Voltage and welding time. If the heat energy produced is just sufficient to melt the metal and no heat energy is transferred to the un-melted base metal then the weld is free from buckling, wrapping, undesirable grain growth and metallurgical transformations. In Electron beam welding heat can be controlled and the heat energy required for welding is much lesser when compared with other welding methods.

In case of dissimilar metal joints, due to the difference in melting point, thermal conductivity and density, the volume of two metals melted differs with respect to the corresponding heat generated. The parameters responsible for the net heat generated are modified with nine set of values. The heat generated, rate of heat, time taken to weld, volume of copper welded and volume of Stainless steel 304 melted for each set of values are calculated numerically from the basic heat balancing equations of fusion welding [1]. Copper and Stainless Steel 304 both of size 100mm X 60mm X 6mm is taken for the study as shown in Figure 1.

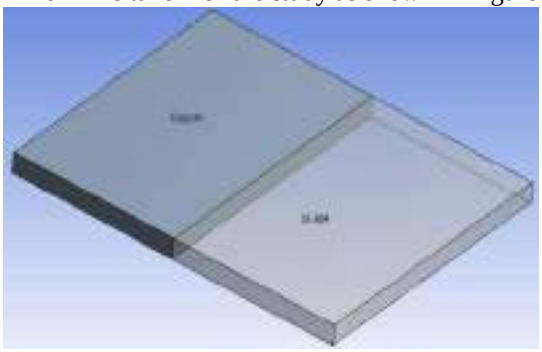

Figure 1: Butt Joint Welding Specimen

The weld is assumed to be a closed square butt joint. The influence of current and voltage for heat generation and its impact on the volume of metal melted has been discussed in detail. The distribution of heat in both metals is also studied by a simulation using ANSYS software.

II. LITRATURE REVIEW

G. Metzger and R. Lison [2] studied the weldability of dissimilar metal joints with Thirty-three two-member combinations of dissimilar metals. Metallographic examination, tensile tests and bend tests were carried out in the welded specimen.

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A Research on Wind Tunnel on Drag Reduction in Aircraft Wing by Inducing Surface Roughness

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Abstract--- Drag is a major issue that aircraft industries are facing today. Innumerable investigations are in progress which mainly focus on the methods to reduce drag. Improving the aerodynamic efficiency of the vehicle can resolve this drawback to a great extent. The aerodynamic efficiency is explained in L/D ratio, decreasing the drag component will increase the aerodynamic efficiency. In this research a methodology to reduce the drag by creating roughness over wing surface has been adopted. By adopting this surface roughness method, the transition of the air flow from the laminar to the turbulent region will result in less drag. This research is being carried out based on the above said theory. The outcome of this method can delay the flow separation in a wing which helps in increasing the lift. The roughness has reduced the coefficient of skin friction drag or viscous drag and increased the coefficient of lift along with the stall angle of attack. NACA 0012 airfoil was selected for this study. Aluminum wing models are fabricated with and without surface roughness and same has been tested in Wind Tunnel. The results are discussed in terms of Lift and Drag.

Keywords--- Aircraft Wing, Drag Reduction, Surface Roughness, Wind Tunnel, Coefficient of Lift and Drag.

I. INTRODUCTION

The only means of transportation during the earlier stages of human civilization was his legs. Gradually, we have achieved faster and more luxurious ways of travelling, latest being the air transport. Since, its invention airplanes have been getting more and more popularity as it is the fastest mode of transportation available. It has also gained popularity as a war machine since World War II. This popularity of air transport has led to many new inventions and research to develop faster and more economical planes. This project is such an attempt to determine how we can derive maximum performance in a wing.[1] The aerodynamic efficiency of a wing is explained in terms of L/D ratio. An airfoil is a cross-section of wing designed to develop lift to an airplane during takeoff and while in flight. But, this same process which keeps the aircraft in flight will also create an opposing force called the Drag. This drag is mainly because of the frictional force developed on the surface of the wing. To attain better aerodynamic efficiency the frictional drag developed on the wing has to be reduced which in turn will give better L/D ratio.[1]In this work, we have implemented surface roughness on a NACA 0012 airfoil to reduce the frictional drag by eliminating the wake formation. Wake formation is delayed or nullified by altering the flow separation, thus increasing the L/D ratio.[2]

II. DESIGN OF WING

I. Design of wing with and without Surface Roughness

NACA 0012 airfoil has been selected for this study which is a symmetrical airfoil. Symmetric airfoil is the one in which both the camber line and the chord line coincide each other.[3] Wing models with and without Surface Roughness are created using CATIA V5 software.

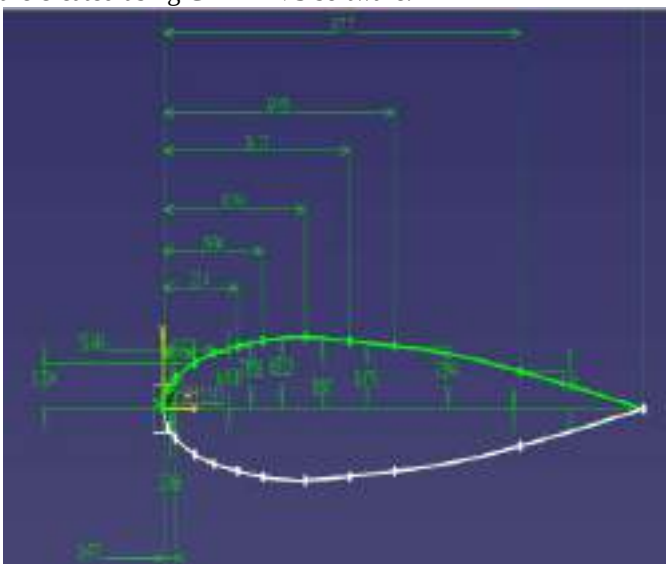

Fig. 1: 2D view of NACA 0012 airfoil

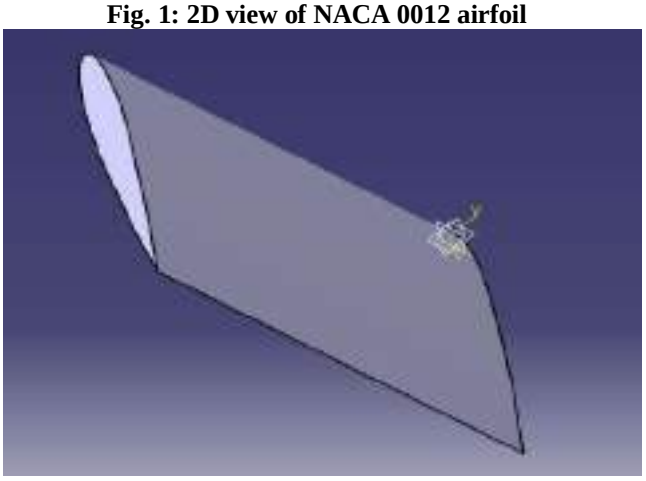

Fig. 2: 3D view of NACA 0012 airfoil without roughness

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NUMERICAL SIMULATION OF DOUBLE PIPE COUNTER FLOW HEAT EXCHANGER AND OPTIMIZATION USING TAGUCHI METHOD

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ABSTRACT

The performance of a heat exchanger is a function of pressure drop and overall heat transfer co efficient. To get efficient performance, pressure drop should be minimum and overall heat transfer coefficient should be maximum. In this paper, we made an attempt to achieve those parameters. Experimental analysis was conducted on heat exchanger by varying mass flow rates and its dimensions for optimal performance. Computational fluid dynamics(CFD) was utilized for modelling of double pipe heat exchanger employing ANSYS 15.0(FLUENT) and the results were compared with experimental outcomes. Also, Taguchi method was adapted to achieve optimal performance of heat exchanger considering the parameters such as inlet temperature and mass flow rate through design of experiments. From the CFD analysis and Taguchi approach maximum overall heat transfer coefficient and minimum pressure drop were estimated at parameters $T_{hi} = 80^0C, T_{ci} = 25^0C, V_h = 140$ ***lt/hr,*** $V_c = 130$ ***lt/hr, and*** $T_{hi} = 80^0C, T_{ci} = 20^0C, V_h = 140$ ***lt/hr,*** $V_c = 120$ ***lt/hr. An equal weight age factor for both sets of estimated parameters was implemented and found an optimum value of the model. Hence, by using Taguchi optimization method, a condition to choose effective set of inlet parameters for obtaining required performance with fewer experiments was successfully verified.***

KEYWORDS: Double Pipe Heat Exchanger, CFD Analysis, Taguchi Method, Weight Age Factors & ANSYS-FLUENT

Original Article

INTRODUCTION

Heat exchanger is a device used to transfer heat from two fluids at different temperatures without mixing. In general, there are two modes of heat transfer takes place in double pipe heat exchanger, one is conduction and another one is convection. Convection occurs between both working fluids flows one over the other. Conduction occurs through the wall separating two fluids. To evaluate the performance of heat exchanger outlet temperatures overall heat transfer coefficients, effectiveness and pressure drop place an important role. Optimum value of the overall heat transfer coefficient is based on the compactness of the heat exchanger. Several types of parallel-flow, counter-flow, single pass cross-flow and multi-pass cross flow heat exchangers are being used in air conditioning system, building heating systems chemical processing systems, mobile power plants(for automotive, marine and aerospace vehicles), refrigeration systems and steam power plants [1],[2]. Tubular heat exchangers are more widely used than flat-plate units due to integrity, service life and ease of maintenance. Shell and tube heat exchangers are employed as heaters or coolers, which are built of round tubes mounted in a cylindrical with their axis parallel to that of the shell.

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Original Article

DESIGN AND TESTING OF ROCKET MOTORS WITH COMPOSITE PROPELLANTS

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ABSTRACT

In space missions, satellite launchings and missiles for army applications, solid rocket motors plays a major role. As we know that the thrust produced by the rocket engines only gives the forward motion to the rocket body and its payload. The rockets which used Solid fuel, which contain fuel and oxidizer itself called Solid rocket motor. Solid fuel can be prepared by Composite material powders with various combinations. Each combination contains its own parameters and thrust/weight ratios. Depends upon the requirements of the thrust to lift off the mass of the rocket, specific combinations of the chemicals are used in the preparation of the solid propellant grains. To understand the characteristics of various combinations of the propellants, the present work is mainly focused on testing of solid rocket motor thrust generation under various combinations of composite propellants and burning rates of the same. Small scale experimental testing and the results of positive and negative obtained in more than one test will be discussed and solutions will be provided for the obtained negative results.

KEYWORDS: SRM, Testing of Rocket Motors, Composite Propellants & Thrust Production

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NOMENCLATURE

A_b	Burning Surface Area
ρ	Solid propellant density
M	Mass flow
γ	Burning rate
I_t	Total impulse
I_s	specific impulse
b	web thickness
b_f	Web thickness
n	Burning index
a	Imperial Constant
σ_p	Temperature Sensitivity
π_k	Temperature Sensitivity Pressure
A_t	Nozzle throat area

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DESIGN AND OPTIMIZATION OF AN ISOGRID COMPOSITE CYLINDER USING FEA

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ABSTRACT

The isogrid structure encompasses a thin outer skin that employs a repetitive equilateral triangular sample of stiffness ribs. This triangular grid sample behaves in a gross sense as an isotropic material and as a consequence given the isogrid identity by means of this project work, it is expected that isogrid structure of one-of-a-kind grid configurations can be analyzed and through conducting a parametric be trained and the geometry will also be optimizing.

In this paper, the isogrid cylinder by varying the three different materials (E-glass fibre, carbon fibre and aramid fibres) and different forces of the cylinder under uni-axial compressive loading. So, we are conducting the static and buckling analysis of the isogrid structure. Static and buckling analysis is to determine the stress, deformation and load Load Multiplier

3D modelling done by parametric software CATIA and analysis done in ANSYS.

KEYWORDS: Isogrid; FEA & Composite Materials

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Original Article

INTRODUCTION

Matrix and grid structures are the shell like structures, which support the skin of any structure.

Kinds of Grid Structures: There are a few sorts of standard lattice structures, significant among them are as per the following:

- Grid structures with ribs running in four ways are alluded to as quadric-directional lattices.
- Grid structures with ribs that are in three ways are alluded to as tridirectional networks. An iso-lattice is a unique instance of a tridirectional matrix structure in which the ribs structure a variety of symmetrical triangles.
- Grid structures with ribs attracted just two directions are alluded to as point frameworks and in the event that the two headings are symmetrical, at that point this structure is alluded to as ortho-grid[1].

Use of Grid Structures: Grid structures are widely utilized in aviation, car and in common basic applications. The matrix structures comprise of characteristic protection from effect harm, delimitation and split engendering. Network structure conduct concentrate is inevitable, before usage. Since the aviation structures are exposed to joint stacking circumstances, an appropriate report must be done for the matrix structure model yet not under

Analytical, Numerical and Experimental Analysis of Double Collar Collet Chuck Holder by Combined Extrusion and Forging Processes

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Abstract

The present paper confers about design and analysis of Double Collar Collet Chuck Holder (DCCCH) by Combined Extrusion and Forging (CEF) process. The current work addresses the problem to estimate the parameters such as metal flow, heat transfer, friction, punch load and ram speed during the CEF process. It should be noted that complexity of shape and volume of the material are two major constitutes which ensign motivation for the present work. In this context, framework of the present *in-situ* focus on estimation of aforementioned parameters which enables us to develop complex shapes with minimal material wastage using CEF process. Henceforth followed by Analytical and numerical solution have been developed adjacent to the experimental procedure.

Introduction

Reliable tools are essential for long time service and hence desire better performance parameters in production industry. Tools developed from conventional machining process are preferred for its ease of manufacturing but imperiled with high volume of material wastage. To reduce the volume of material wastage, sustainable manufacturing methods have been adopted to develop tools more economically dropping negative environmental impacts as discussed in [1]. But reduction in volume of material wastage for complex components received less acknowledgement in literature. As a result it is noticed that processing parameters play an important role in achieving better product in terms of design and analysis. So, the present paper focuses on analysis of DCCCH during CEF process using Analytical, numerical followed by Experimental techniques.

Substantial amount of research was available for developing analytical methods to determine the forming load which is the most important parameter in design of die. Since the metal flow is non-uniform, justification of the forming load needs an exercise. In this context, [2] investigated the extrusion of square shape from a round billet mathematically and experimentally to predict the extrusion load and extruded length under different friction conditions by using upper bound analysis. Since upper bound analysis entails velocity fields to determine forming load, [3] used upper bound element technique for axisymmetric shaped bodies and found that the estimated values are in good agreement. One of the major constituent was power requirement which depends on factors like ram velocity and friction between the die-billet interfaces has been discussed in [4]. Few remarkable works like [5] investigated using Upper Bound Element Technique (UBET) to design the flash gap for forging

Demystifying the grid dependency of Severe Plastic Deformation during Combined Extrusion Forging Process

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Abstract

Plastic deformation during metal forming process involves very distinctive behavior of parameters [1], which results in complicated mathematical modelling to estimate the Forming load[2]. Alongside as the complexity of the shape increase, determination of Forming (Punch) load becomes intricate. In this context, the present work envelope parameters influencing the grid independency on Forming load (through Numerical analysis) during combined extrusion and forging of Single Collar Collet Chuck Holder which are predicted by numerical analysis followed by validation with experimental results. It can be observed from the numerical analysis that the grid dependency on the ram velocities shows negligible effect from Figure 1to Figure 4 whereas friction factor ensued a fragile variation, which can be inferred from Figure 4.

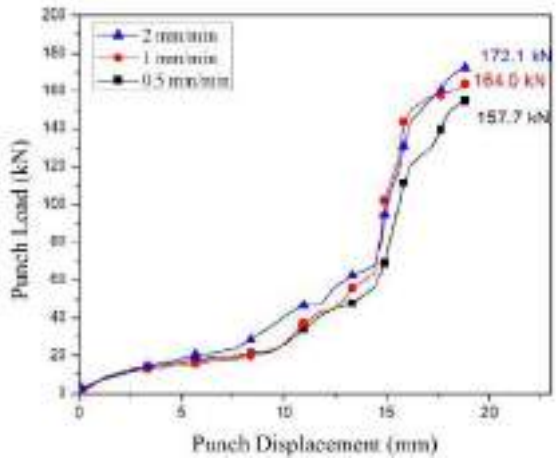

Figure 1: Variation of Forming load with Forming travel at friction factor of 0.13

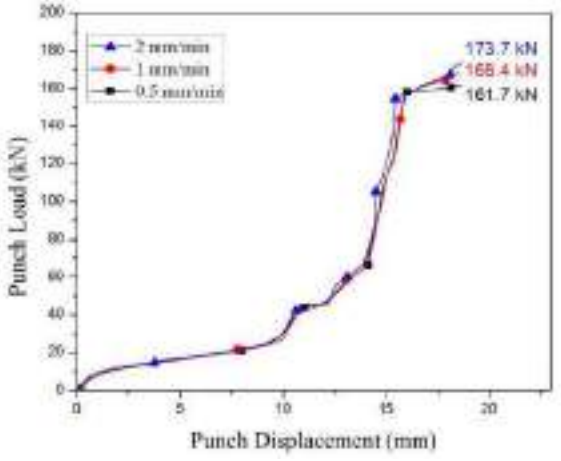

Figure 2:Variation of Forming load with Forming travel at friction factor of 0.19

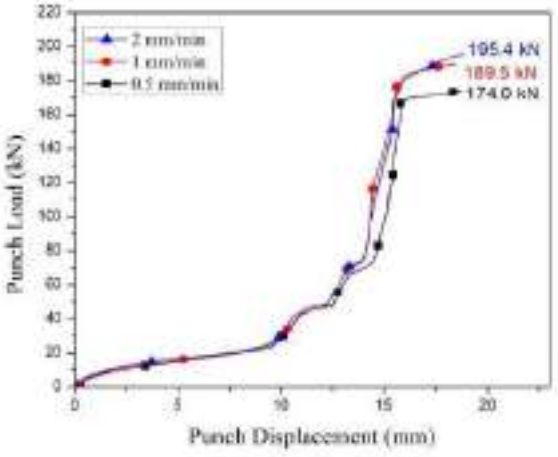

Figure 3:Variation of Forming load with Forming travel at friction factor of 0.38

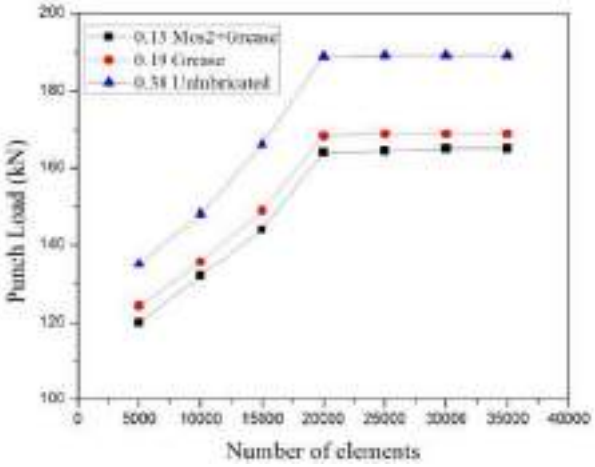

Figure 4: Grid independence test result

Keywords: *Grid dependency, Forming load, Single Collar Collet chuck Holder, Severe Plastic Deformation*

Overview

Conventional manufacturing procedures produce components with high precision in less time, but deviating few important properties. In this process, large volume of material wastage is observed, a subject which is addressed

FLOW CONTROL OVER AIRFOILS USING DIMPLES

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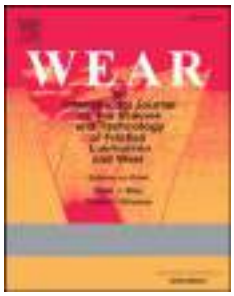
***Abstract*— Flow separation is among the most significant problems in aerodynamics. At present, different kinds of surface modifications on airfoil are being studied to improve the maneuverability of the aircraft by delaying flow separation to higher angle of attack. The present work describes change in aerodynamic characteristics of an airfoil by applying certain surface modifications in form of dimples. At first surface modifications that are considered here are outward and Inward dimples on the airfoil model. A comparative study showing variance in flow separation of modified airfoil models at different angle of attacks can be done. The airfoil profile considered in the present study is NACA-2412 with uniform cross-section throughout the length of airfoil. ANSYS ICEMCFD and CFX are used for simulations. Results has been extracted using ANSYS CFD POST with Velocity streamlines, Mach plots etc.**

Keywords—dual bell nozzle; CFD; secondary injection.

I. INTRODUCTION

Airfoils are the streamlined bodies which produce lift and less drag in the form of wings for an aircraft. As the angle of attack increases lift increases till stalling angle after which flow separates and pressure drag increases. During maneuvers aircraft travels at high angles of attack. Considering this problem surface modifications like dimples are being considered in the given study to avoid flow separation. Till now these have been ignored because dimples help in reduction of pressure drag. In case of aerodynamic bodies pressure drag is very little in streamlined bodies compared to bluff bodies. An airfoil is streamlined body so dimples do not affect to its drag much at zero angle of attack, but as soon as airfoil attains some angle of attack, wake formation starts due to boundary layer separation. Application dimples on aircraft wing model works in same manner as vortex generators. They create turbulence which delays the boundary layer separation and reduces the wake and thereby reducing the pressure drag. This also assists in Lift of the aircraft. Most importantly this can be quite effective at higher angle of attack and also can change angle of stall to a great extent.

The purposes of aircraft flow manipulation, as Gad-el-Hak [1] explains, are: increasing lift, reducing drag and enhancing the mixing of mass, momentum and energy. In order to meet these objectives 1) the laminar-to-turbulent transition has to be postponed or provoked, 2) the flow separation has to be avoided or initiated, 3) the flow turbulence has to be prevented or encouraged. Stall is a condition in aerodynamics and aviation where the angle of attack increases beyond a certain point such that the lift begins to decrease. The angle at which it occurs is called the critical angle of attack or angle of stall. Flow separation begins to occur at small angles of attack while attached flow over the wing is still dominant. As angle of attack increases, the separated regions on the top of the wing increase in size and hinder the wing's ability to create lift. At the critical angle of attack, separated flow is so dominant that further increases in angle of attack produce less lift and vastly more drag.



Investigation of tribological properties of biomass developed porous nano activated carbon composites

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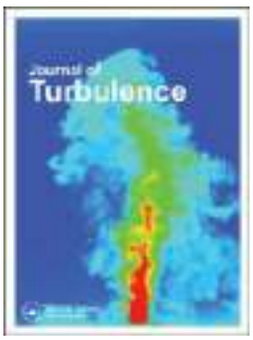

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Dynamic mode decomposition of supersonic turbulent pipe flow with and without shock train

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ORIGINAL ARTICLE

Intelligent exhaustion rate and stability control on underwater wsn with fuzzy based clustering for efficient cost management strategies

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Abstract

UWSN will find packages in information series, offshore exploration, pollution monitoring, oceanographic, disaster prevention and tactical surveillance. Underwater Wi-Fi sensor networks include some of sensors and nodes that engage to perform collaborative obligations and build up data. This form of networks must require to designing electricity-green routing protocols and tough due to the fact sensor nodes are powered through batteries, and are tough to update or recharge. The underwater communications are properly decreases because of network dynamics. The aim of this paper is to expand stability and exhaustion rate of the network with proposed algorithm Single-Hop Fuzzy based Energy Efficient Routing algorithm (SH-FEER) and cluster head selection algorithm. The particle swarm optimization approach helps to perform the Cluster head selection process. The experimental result of the work is offered and compared with the present strategies which shows that clustering Single-Hop Fuzzy based Energy Efficient Routing algorithm has the better performance than other techniques.

Keywords Underwater sensor networks · SH-FEER · Clustering algorithms

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1 Introduction

Recently, an effective strategy has developed that is submerged remote sensor arrange is keeping in mind the end goal to find and adventure this brutal condition (Tang et al. 2014). As more than 70% surfaces of the world is secured by water, it is favorable to convey submerged sensor systems to help utilizations of few classes. For example, pollution watching, failure balancing activity, oceanographic data gathering, toward the ocean examination, helped course and vital observation applications (Abdi and Guo 2009). To make these applications sensible, there is a need to engage submerged correspondences among submerged devices. The submerged correspondence may incorporate the transmission of data in three structures (sound, electromagnetic (EM), or optical waves). Every one of these strategies has focal points and disadvantages. Electromagnetic signs convey exceptionally poor execution submerged, giving transmission scopes of just a couple of meters at the common RF sensor transmission control (Li and Zhao 2017). Optical correspondence for submerged sensor systems utilizing light waves has likewise been researched; however these techniques either require high exactness or high power if the separations between sensor hubs are expansive (Jazayerifar and Salehi 2006; Zhang and Dong 2016). Subsequently, acoustic systems empowered by sound waves wind up perfect choices since acoustic signs proliferate well through water and require considerably less power than RF and light flags for a similar correspondence extend (Cui et al. 2006; Kaushal and Kaddoum 2016).

A submerged sensor arranges is generally framed by a few self-governing and individual sensor hubs used to gather and forward information to the uw-sink (Akhoundi et al. 2015). The most essential difficulties of sending such a system are the cost, the computational power, the memory, the correspondence range and above all else the constrained battery assets of every sensor hub (Akhoundi et al. 2016). The UWSN has a great extent limited lifetime in light of the fact that the sensor hub's quantity quit working because of the vitality wastage developments with the time of organization. The high vitality utilization is especially large oppose for scientists to achieve long working time without influencing the execution of framework at that point (Noshad and Brandi-Pearce 2013).

For the most part directing is the backbone for any system and guiding conventions are thought to be in control for discovering and keeping up the courses. A big portion of the proposed conventions for earthly sensor systems cannot be punctually utilized as a part of UWSN attributable to the course disclosure process in view of the flooding strategy (responsive specially appointed directing) or the ceaseless trade of overhead in connected messages (proactive impromptu steering) despite the fact (Wang and Wu 2010). That the real conventions are calculated for a stationary organization. Therefore these arrangements are not enough in substantial scale UWSN on the grounds that they exhaust data transmission and vitality assets. Thusly new vitality efficient conventions should be deliberated for UWSN.

In this paper we display a various leveled fluffy based vitality proficient directing calculations where the groups are framed by the Fuzzy C-Means strategy

(Hoang et al. 2013). The hubs are conveyed arbitrarily in three dimensional conditions. The principal proposed calculation utilizes a solitary jump transmission between group heads and the uw-sink. While the second recommendation utilizes the multihop transmission between group heads and uw-sink; the two calculations are recreated for SH-FEER and other system. Whatever is left of the paper might be sorted out as takes after. In Sect. 2 talk related works. In segment 3 we describe Single-Hop Fuzzy based totally Energy Efficient Routing set of rules and In phase 4 we present the test state of affairs. In Sect. 6 we present the results and evaluate it with gift strategies to show our dominance. Based on the following references we end the segment 7 with future art work.

2 Related work

Dahane et al. thought of another thought of Distributed and Safe Weighted Clustering Algorithm that is an improved version of their past work ES-WCA (Dahane et al. 2015). The security of the bunch has been improved in this approach by identifying and issuing the vindictive hubs present in the group in light of their conduct. At a low level, bunches' quantity was likewise reduced keeping the utilization of vitality. This impressively expanded the sensor organizes lifetime.

In Solmaz et al. developed an unequal grouping system in light of an enhanced Particle Swarm Optimization (IPSO) (Salehian and Subraminiam 2015). The IPSO make possible that itself with Energy Balanced Unequal Clustering (EBUC) which denoted to reduce the dead hub's quantity over some period of time. This thusly expanded the sensor system's lifetime.

Pengwei Li and Shilian Wang in the model the required transmission energy of sensor hubs, and the group head lingering vitality and the bunch head loads are among thought (Li et al. 2017). With the bunching model, we plan a novel grouping calculation in light of the discrete molecule swarm streamlining calculation (PSO). We utilize the proposed grouping calculation to bunch UASNs intermittently with the group head being turned progressively.

Tanveer Khan and Israr Ahmad In UWSNs, proficient usage of vitality is one of the significant issue, as the substitution of vitality sources in such condition is extremely costly (Khan et al. 2016). In this paper, we have proposed a Cluster Depth Based Routing (cDBR) that depends on existing Depth Based Routing (DBR) convention. In DBR, steering depends on the profundity of the sensor hubs: the hubs having less profundity are utilized as forward hubs and devours more vitality when contrasted with whatever is left of hubs. Subsequently, hubs closer to sink kicks the bucket first due to more load. In cDBR, bunch based approach is utilized. With a specific end goal to limit the vitality utilization, stack among every one of the hubs are conveyed similarly. The vitality utilization of every hub is similarly used as every hub has break even with likelihood to be chosen as a Cluster Head (CH). This enhances the solidness time of system from DBR. In cDBR Cluster Heads (CHs) are utilized for sending parcels that expands throughput of the system. We have contrasted our outcomes and DBR and Energy Efficient DBR (EEDBR).

Xingzhen Bai and Lu Li in sensor hubs direct a neighborhood evaluation in view of the Kalman channel for increasing the estimation soundness and further transmit information for upgrading the general vitality proficiency of the remote system to the actuator hubs under a multi-rate transmission mode (Bai et al. 2016). Thinking about the shared influence of related bunches, an actuator hub's collective incitation plan is interrelated into our proposed conspire for improving the meeting speed and evaluation exactness. With an exact evaluation of the adjustments in the parameters of natural, joining the fluffy neural system with the PID control computation, the dependable control has been applied by the actuator over the ecological parameters.

3 Architecture of underwater wireless sensor network for ocean monitoring

Submerged Wireless Sensor Network design has been characterized into (a) 2-D (b) 3-D with settled hubs and (c) 3-D with Automatic Underwater Vehicles (AUVs) (Abdi and Guo 2009). This grouping depends on the land appropriation of the hubs and their versatility. The design conveyed relies on the application. 2-D systems comprise of sensor hubs sent in a settled/irregular example on the ocean bed. 3-D systems with settled hubs have sensors conveyed along the whole sea section aimlessly profundities. Hubs are secured to the sea floor by links or to the surface through floats. 3-D with AUVs is a system of sensors at the sea base with submerged vehicles conveyed at various profundities. The organization design is meager in each of the three models of the different models proposed, the 3-D engineering with AUVs is most suited for various applications which require multi-parameter observing. Be that as it may, next to no work has been done in calibrating this engineering to meet the necessities of an entire submerged remote sensor framework. The accompanying subsection quickly depicts the submerged remote sensor organize that we propose (Abdi and Guo 2009).

3.1 An N-tier three dimensional architecture for underwater wireless sensor networks

The engineering of the proposed framework is appeared in Fig. 1. This design is comprised of sensors conveyed along the whole sea section at settled relative profundities from each other. Sensors at every level are sorted out in bunches with different group heads (Jamali et al. 2016; Wu et al. 2015). A bunch head choice calculation will be utilized at each group to choose the group head in light of the situation of the sensors in the group. Even acoustic connections are utilized for correspondence inside the groups. The length of an even acoustic connection is limited to under 50 m. As next to no information was accessible with respect to the qualities of submerged even acoustic joins, broad reenactments were completed on ns-2 (Kaushal and Kaddoum 2016) for different submerged situations. We have stretched out ns-2 to help the submerged acoustic channel display and also 3D systems. It was discovered that for even separations more noteworthy

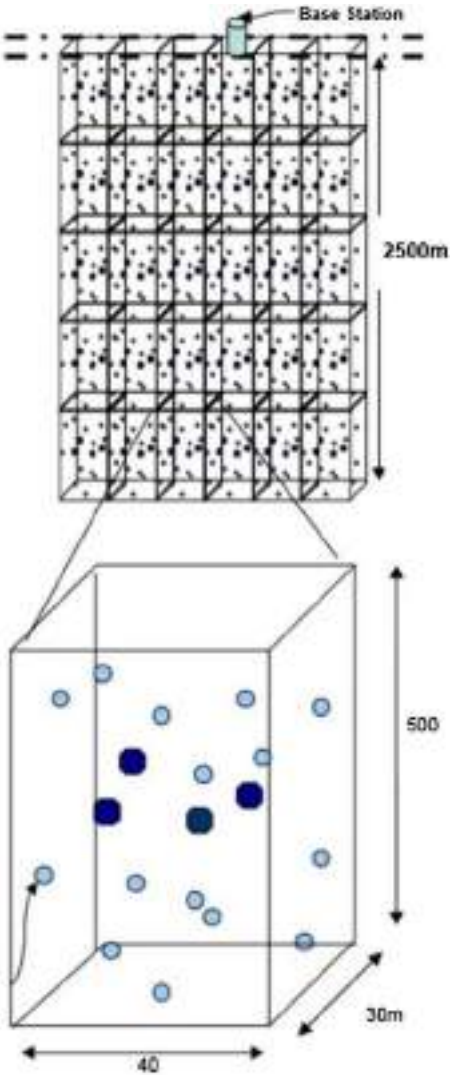

Fig. 1 N-Tier Architecture with the projection of a single grid

than 50 m the constriction is more than 50 dB. Thus the power required for transmitting signals for separations more noteworthy then 50 m will be amazingly high. Separations over 50 m are powerless to multi-way proliferation, lessening, ISI and blurring. The group heads gather information from the hubs in the bunch and hand-off the information to the group heads in the level quickly above them utilizing vertical acoustic connections. The length of the vertical connections is confined to 500 m. Broad investigation has been done on the qualities of vertical acoustic connections submerged (Tang et al. 2014). It has been demonstrated that the execution of the acoustic connection is ideal for separations fewer than 500 m.

Subsequently, the level's quantity in a framework will depend upon the sea's profundity. The seas worldwide normal profundity is 2500 m.Subsequently the level's quantity in the system will be 5. A piece of the system has shaped by that AUVs in the event, at that point the level's quantity in the system can be reduced with AUVs working as information donkeys. The models contemplated so far have been defined expecting that the system will take after a sensor's meager conveyance. It has been denoted on earthbound sensor organizes' account that a thick sensor's arrangement delivers favored outcomes over a meager appropriation. Thus, we advocate a thick organization of sensor hubs at the lower levels with a sparser circulation at the higher levels. Further, the thickness of the hubs could be balanced relying upon the accessibility of AUVs. The application for which the sensor organizes is conveyed decides the quantity of levels in the system, number of groups in every level, and the thickness of hubs in a bunch. In any case, the compositional system will continue as before for all applications.

4 The proposed algorithms

In the following, we in quick introduce the essential idea of Fuzzy C-Means (FCM) utilized in cluster formation of our propositions, and then we provide an intensive description of the proposed techniques.

4.1 Basic theory of fuzzy C-means

Fuzzy C-means clustering set of policies (Hoang et al. 2013), is a kind of clustering set of guidelines the usage of membership to describe the opportunity of cluster. However FCM is a local optimization algorithm, which may be very touchy to initialization and gets into the local minimum effortlessly.

The finite vectors xi (i = 1, 2,…, n) are divided into c (1 < c < n) training, and the clustering center of every magnificence is solved to make club minimal as the non-similarity index.

The goal characteristic can be described as follows:

$$[U, c1, C2, \ldots \ldots Cc] = \sum \sum Uijdij2$$

where Uij is the club of the group, ci is the clustering middle; dij is the special distance from vector ci to xj. M is the weighted index.

The steps of set of rules are as the subsequent:

Initializing the membership matrix U to make it satisfy the following formula.

$$\sum_{i=1}^{c} Uij = 1$$

Calculating the clustering center using the following formula.

$$\mathrm{Cj} = \frac{\sum_{j=1}^{n} U\frac{m}{ij}}{\sum_{j=1}^{n} U\frac{xj}{U\frac{m}{ij}}}$$

Calculating the goal feature according to the method (1). If the objective feature is much less than a threshold or the relative fee function exchange price ultimate time is less than a threshold, the set of rules stops.

Updating the matrix by the following formula and returning to step 2

$$\sum_{k=1}^{c} \left(\frac{dij}{dkj}\right)^{-\frac{2}{m}-1}$$

4.2 Single-hop fuzzy based energy efficient routing algorithm for UWSN (SH-FEER)

SH-FEER is a fluffy based thoroughly control productive calculation in which bunches are shaped with the guide of the use of the Fuzzy C-Means technique. We believe that submerged sensor hubs dependably have records to be sent to the sink and the arrangement of hubs has the equivalent amount of quality. We expect on this technique that the hubs orchestrate themselves inside groups haphazardly with unequal sizes and one hub is chosen as a bunch set out toward each bunch. All non-group head hubs ahead their data to their bunch head through a solitary bounce. From all group members, the bunch head hub gets insights and plays flag preparing highlights at records (e.g. Total) and the records has transmitted to the sink for find the utilization of unmarried-bounce directing. For making discussion among each extraordinary (between group coordination) and coordination among hubs inside their groups (intra-group coordination) we use the chargeable bunch heads.

SH-FEER includes rotation of the cluster-head some of the sensors to keep away from speedy draining of the batteries of unique underwater sensors. In this way, the energy intake is dispatched. The operation mode of SH-FEER consists to 3 levels: clusters formation at a few level inside the first step and secondly the cluster head are selected. Initially, the nearest node to the center is selected as cluster head and inside the subsequent rounds the choice is based totally on the residual power of every node; the 1/3 step is the transmission of facts inside the course of the sink.

The algorithm of this first proposition is mentioned as follows:

Step 1: Clusters formation

Apply FCM algorithm to form clusters.

- Each cluster K(i) contains a number of nodes, i=1, …, N
- Initially all nodes have the same amount of energy.

Step 2: Cluster head selection

maxE=zeros(1,N) ;

maxE is a row vector contains N zeros

R_max:

TE:

while(R_R_max || TE>0)

for i = 1 to N do

if R==1

else

for j=1 to length(k(i)) do

ifmaxE(i)<k(i).E(j)

maxE(i)=k(i).E(j)

end if

end for

CH(i)=maxE(i)

end if

end for

Step 3: Data transmission

Intra_cluster transmission

for i = 1 to N do

for j=1 to length(k(i)) do

k(i).j send data to CH(i)

end for

end for

• Transmission from CHs to the uw-sink

for i = 1 to N do

CH(i) aggregates and forwards directly the data to uw-sink

end for.

Table 1 Comparison of Clustering Techniques

Parameters	Value
Reenactment area	100*100
Initial energy	0.6 J
Base station	50 m*50 m and (99*99) m
Transmitter/receiver	50 nJ/bit
Number of hubs	100 and 350
$\varepsilon f s$	10 pJ/bt/m

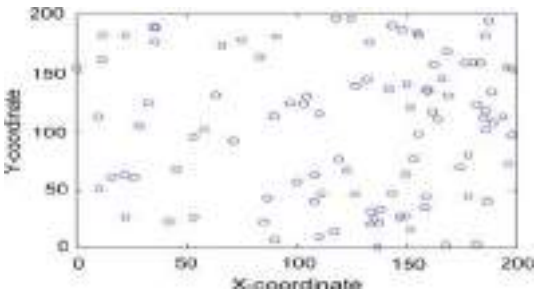

Fig. 2 Initial deployment of sensor nodes

5 Experimental Setup

The computation is tried in Matlab simulation tool. The procedure is attempted with various center's numbers in a 100 m × 100 m field. From Table 1, Every sensor center is distributed out a fundamental essentialness of 0.6 joules. If the hub's imperativeness level accomplishes 0 joules, its broadcasted dead. Following are the general recreation parameters.

6 Results and comparative analysis

This segment displays the recreation outcomes of the approach and has been resembled with the diverse existing strategies with indicate our technique's predominance. Figure 2 extending demonstrates the sensor hubs' underlying sending in the water body (Figs. 3, 4).

The proposed bunching model was different and contrasted procedures like Energy Balanced Unequal Clustering (EBUC) optimized Energy Efficient and Safe Weighted Clustering Algorithm (ES-WCA), by Improved Particle Swarm Optimization (IPSO) and Multi-Objective Weighted Clustering Algorithm (IMOWCA) from the Table 2 (Fig. 5).

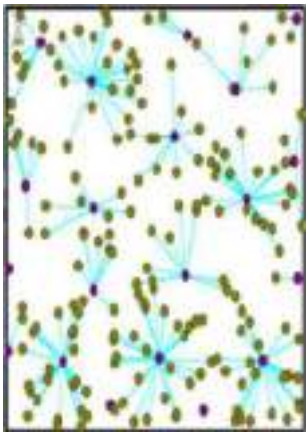

Fig. 3 Clustered groups in network

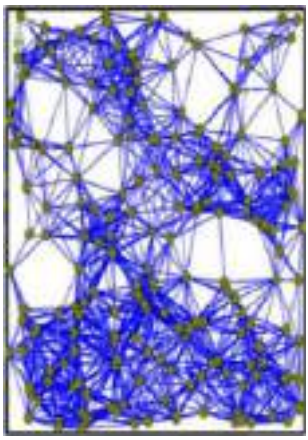

Fig. 4 Connectivity among nodes in cluster

Table 2 Comparison of clustering techniques

S. no	Model	Energy exhaustion rate	Stability
1.	SH-FEER	0.824	99.532
2.	ES-WCA	1.632	98.942
3.	EBUC-IPSO	1.893	98.513
4.	IMOWCA	2.342	99.374

*EER in terms of joules per second

7 Conclusion

In this paper, the proposed Single-Hop Fuzzy based Energy Efficient Routing algorithm(SH-FEER) has developed for providing better performance of group arrangement in Underwater Wireless Sensor Networks regarding stability and

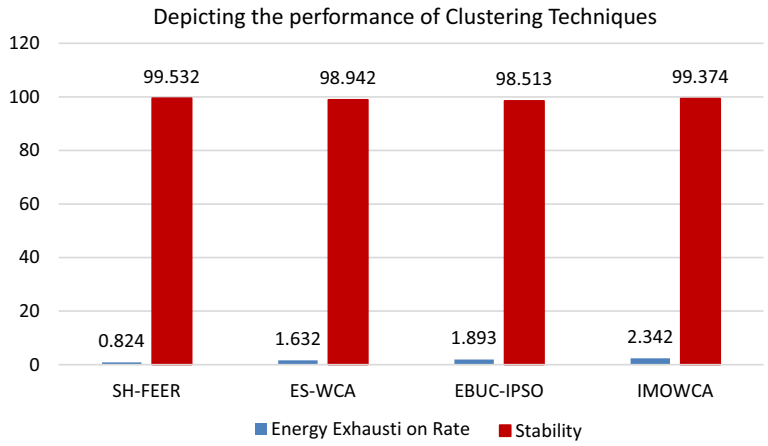

Fig. 5 Depicting the performance of Clustering Techniques

exhaustion rate. The SH-FEER procedure overcomes various calculations like Safe Weighted Clustering and Energy Efficient Algorithm. By improved Multi-Objective Weighted Clustering and Particle Swarm Optimization Algorithm, the Energy has Balanced Unequal Clustering in an advance manner. The proposed set of standards has examined on the circumstance that waves swing at simple style of customary.

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REVENUE OF LIMIT FOR CLOUD AGENT IN CLOUD COMPUTING

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ABSTRACT:

We attempt to plan a provider mechanism for income optimizations of each a cloud issuer and its more than one users. We think about the hassle from a sport theoretic standpoint and signify the relationship between the cloud issuer and its more than one customers as a Stackelberg game, in which the techniques of all customers are issue to that of the cloud provider. The cloud company tries to pick and provision fabulous servers and configure a appropriate request allocation method to limit power value whilst pleasing its cloud users at the equal time. We approximate its servers resolution house by means of including a controlling parameter and configure an best request allocation strategy. For every user, we format a utility characteristic which combines the internet earnings with time effectivity and attempt to maximize its price below the method of the cloud provider. We formulate the competitions amongst all customers as a generalized Nash equilibrium trouble (GNEP). We clear up the trouble by means of using version inequality (VI) principle and show that there exists a generalized Nash equilibrium answer set for the formulated GNEP. Finally, we advise an iterative algorithm (IA), which characterizes the total procedure of our proposed provider mechanism. We behavior some numerical calculations to confirm our theoretical analyses. The experimental outcomes exhibit that our IA algorithm can gain each of a cloud company and its more than one customers through configuring ideal strategies.

Keywords: Cloud computing, Generalized Nash equilibrium, Non-cooperative game theory, Profit optimization, Resource allocation, Variational inequality theory.

1. INTRODUCTION:

Cloud computing is an more and more famous paradigm of presenting subscription-oriented offerings to corporations and buyers [1]. Usually, the furnished offerings refer to Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS), which are all made on hand to the regular public in a pay-as-you-go manner [2], [3]. To assist more than a few services, greater and extra cloud facilities are geared up with hundreds of computing nodes, which consequences in super power value [4]. It is pronounced that about 50% administration finances of Amazon′ s facts middle is used for powering and colling the bodily servers [5]. There are additionally researchers who have studied the value of records facilities and concluded that round 40% of the amortized fee of a statistics middle falls into energy associated classes [6]. Hence, it is vital to minimize power value for enhancing the earnings of a cloud provider. However, it can regularly be considered that there are many under-utilized servers in cloud centers, or on the contrary, cloud companies supply much less processing potential and for this reason dissatisfy their customers for bad carrier quality. Therefore, it is essential for a cloud issuer to choose fabulous servers to grant services, such that it reduces price as an awful lot as feasible whilst fulfilling its customers at the identical time. For a cloud provider, the profits (i.e., the revenue) is the carrier cost to the aggregated requests from all cloud customers [7]. When the per request cost is determined, servers choice and request allocation approach are two widespread elements that have to be taken into account. The cause in the back of lies in that each of them are no longer simply for the earnings of a cloud provider, however for the appeals to extra cloud customers in the market to use cloud carrier and hence additionally influence the profit. Specifically, if the supplied computing potential is giant adequate (i.e., many servers are under-utilized), this will end result in top notch quantity of electricity waste with massive value and accordingly reduces the income of the cloud provider. On the different hand, if the cloud issuer presents much less computing capability or improperly configures the request allocation strategy, this will lead to low carrier satisfactory (e.g, lengthy assignment response time) and as a consequence dissatisfies its cloud customers or manageable cloud customers in the market. A rational consumer will select a method to use the provider that maximizes his/her

personal internet reward, i.e., the utility received with the aid of selecting the cloud carrier minus the fee [8]. In addition, the utility of a consumer is no longer solely decided via the internet earnings of his/her requests (i.e., how a lot gain the consumer can get hold of by means of ending the configured tasks), however additionally carefully associated to the urgency of the duties (i.e., how rapidly they can be finished). The identical quantity of duties are in a position to generate extra utility for a cloud consumer if they can be finished inside a shorter duration of time in the cloud middle [8]. However, thinking about from power saving and monetary reasons, it is irrational for a cloud company to grant adequate computing assets to whole all requests in a quick length of time. Therefore, more than one cloud customers have to configure the quantity of requests in extraordinary time slots. Since the requests from customers are submitted randomly, in our paper, we about symbolize the request arrivals as a Poisson method [9]. Since the fee and time effectivity of every of the cloud users are affected through the choices of others, it is herbal to analyze the behaviors of these customers as strategic video games [10]. In this paper, we attempt to graph a new carrier mechanism for income optimizations of each a cloud issuer and its a couple of users. We reflect onconsideration on the hassle from a sport theoretic standpoint and symbolize the relationship between the cloud issuer and its customers as a Stackelberg game, in which the techniques of all customers are challenge to that of the cloud provider. In our mechanism, the cloud company tries to pick excellent servers and configure a appropriate request allocation method to decrease electricity value whilst gratifying its customers at the identical time.

The primary contributions of this paper are listed as follows.

- We symbolize the relationship between the cloud issuer and its customers as a Stackelberg game, and attempt to optimize the earnings of each a cloud issuer and its customers at the identical time.
- We formulate the competitions amongst all customers as a generalized Nash equilibrium trouble (GNEP), and show that there exists a generalized Nash equilibrium answer set for the formulated GNEP.
- We remedy the GNEP by means of using varational inequality (VI) concept and advise an iterative

algorithm (IA) to symbolize the total method of our proposed provider mechanism. Experimental effects exhibit that our IA algorithm can gain each of the cloud issuer and its more than one customers via configuring appropriate strategies.

TERMINOLOGY AND PROBLEM STATEMENT

In general, a service provider rents a certain number of servers from the infrastructure providers and builds different multi-server systems for different application domains. Each multiserver system is to execute a special type of service requests and applications. Hence, the renting cost is proportional to the number of servers in a multiserver system. The power consumption of a multiserver system is linearly proportional to the number of servers and the server utilization, and to the square of execution speed. The revenue of a service provider is related to the amount of service and the quality of service. To summarize, the profit of a service provider is mainly determined by the configuration of its service platform.

To configure a cloud service platform, a service provider usually adopts a single renting scheme. That's to say, the servers in the service system are all long-term rented. Because of the limited number of servers, some of the incoming service requests cannot be processed immediately. So they are first inserted into a queue until they can handle by any available server.

The waiting time of the service requests is too long.

Sharp increase of the renting cost or the electricity cost. Such increased cost may counterweight the gain from penalty reduction. In conclusion, the single renting scheme is not a good scheme for service providers.

PROPOSED TECHNOLOGY

Since the requests with waiting time D are all assigned to temporary servers, it is apparent that all service requests can guarantee their deadline and are charged based on the workload according to the SLA. Hence, the revenue of the service provider increases.

Increase in the quality of service requests and maximize the profit of service providers.

This scheme combines short-term renting with long-term renting, which can reduce the resource waste greatly and adapt to the dynamical demand of computing capacity.

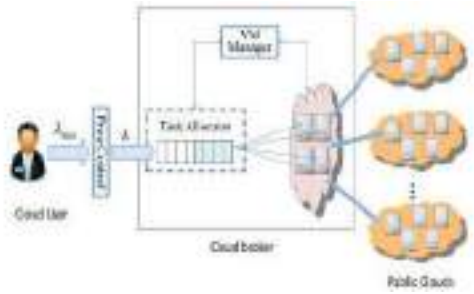

Figure 1: The M/M/n/n queue model.

The price of the on-demand VMs provided by the cloud broker be β per unit of time. The price affects the revenue of a cloud broker from two aspects. First, the price has a direct impact on revenue. Under a given demand, a higher price conducts a higher revenue. Second, the price affects the revenue indirectly. The explanations are given as follows. The cloud broker rents reserved instances from cloud providers with a discount compared with the on demand instances and outsources them as on-demand VMs in a lower price than the same VMs provided by cloud providers. The low price is the core competitive advantage of the cloud broker, and its objective customers are those customers whose service requests are submitted occasionally and the execution time is uncertain or short. This portion of customers are inclined to rent on-demand VMs rather than reserved VMs, but they also want to enjoy the discount that the cloud providers provide for long-term customers. The cloud broker can provide customers the needed resources at a lower price. Since the main advantage for the cloud broker to attract customers is its lower price compared with public clouds, the price certainly will affect the request arrival rate, thus affecting revenue, corresponding. Hence, proper pricing is an important issue for the cloud broker. To obtain profit, the VM sales price of the cloud broker should be greater than its cost price obviously; that is, the rental price that the cloud broker rents reserved instances from cloud providers. Meanwhile, the VM sales price should be lower than the on-demand price of cloud providers to attract customers. That is because customers are inclined to select the services of public clouds when the VM sales price of the cloud broker is same as public clouds. To sum up, the VM sales price of the broker, denoted as β, should be between the range of $[\beta_{re}, \beta_{od}]$.

Algorithm 1 Finding the optimal price

Input: λmax, t, n, β_{re}, β_{od}, p_{re}, and p_{od};

Output: optimal price opt β of resources and optimal profit opt pro;

1: opt $\beta = -\infty$, opt _pro $= -\infty$;

2: $\beta_{start} \leftarrow$ the minimal price satisfying $\rho < 1$;

3: $\beta_{end} \leftarrow \beta_{od}$;

4: calculate Der_{start} and Der_{end} ;

5: if $Der_{start} \times Der_{end} > 0$ then

6: opt _$\beta = \beta_{start}$;

7: calculate opt_{pro};

8: exit;

9: end if

10: while $Der_{start} - Der_{end} >$ error do

11: $\beta_{middle} = (\beta_{start} + \beta_{start})/2$;

12: calculate Der_{middle}

13: if $Der_{start} \times Der_{middle} > 0$ then

14: $\beta_{start} \leftarrow \beta_{middle}$;

15: else

16: $\beta_{end} \leftarrow \beta_{middle}$;

17: end if

18: end while

19: opt $\beta = (\beta start + \beta end)/2$;

Profit in one unit of time as a function of n and λ_{max}. Therefore, for each combination of n and λ_{max}, we find the optimal price for a cloud broker and the corresponding maximal profit it can obtain. The parameters are set to be same as . From the figures, we can see that under a given λ_{max}, the optimal price is decreasing with the increase in system size. This is explained as follows. It is obvious that more VMs lead to more cost. To utilize the resources sufficiently and improve the revenue, the VM price is lowered to attract more customers, which is so-called small profits but quick turnover (SPQT) strategy. However, the optimal profit is not monotone increasing with the increasing system size. When the system size reaches a certain point, the extra cost conduct by increasing VMs further starts to exceed the increased revenue by adopting the SPQT strategy. Hence, the total profit increases at the early stage and then decreases. Moreover, the figures show that the optimal price and the optimal profit are all related with the λ_{max}. Under a given system size, a greater λ_{max} will lead to a higher optimal price and more profit.

In Alg. 1, the partial derivative is calculated based on the estimation value of PL first, and then the extremal solutions are solved using the bisection search method. Hence, the solutions obtained by **Alg. 1** have a certain of error with the precise solutions. To verify the precision of the solutions, we compare the optimal solutions obtained by our method with that obtained by a brute force search method. The comparison results are given. In the comparison, the System size n is set from 50 to 450 in step of 50, λ_{max} is set as 100, and other parameters are

same. From the results, we can see that the error is less than 2% when the n is greater than 200. When the n is smaller than 200, with the decrease of n, the error becomes greater. That is because the error between the estimation value and precision value of PL is very large when n is small.

Algorithm 2 Iterative Algorithm (IA)

Input: ε, μ, a, b, r, τ,M

Output: S, pS .

1: **Initialization:** The cloud provider approximates its solution space, i.e., Q (ε) L ← Calculate Q (ε) L (ε, c, μ, E,M). Set πS ← 0.

2: for (each server subset S ∈ Q ˜ (ε) L) do

3: Set Sc ← N , and Sl ← ∅.

4: for (each time slot h ∈ H) do

5: for (each server j ∈ S˜) do

6: Set p h j = μj/ (∑ j∈S˜ μj) .

7: end for

8: end for

9: while (Sc ≠ Sl) do

10: Set Sl ← Sc, and λ ← Calculate λ(ε, S, pS , τ).

11: for (each time slot h ∈ H) do

12: Set p h S˜ ← Calculate pS˜ h (ε, μ, λ h Σ, S) .

13: end for

14: for (each user i ∈ Sc) do

15: if (Ui (λ (k) i ,λ (k) Σ) < vi) then

16: Set λi ← 0, and Sc ← Sc − {i}.

17: end if

18: end for

19: end while

20: Set πS˜ ← c ∑ i∈N ∑ h∈H λ h i − ET (S˜) .

21: if (πS˜ > πS) then

22: Set πS ← πS˜, S ← S˜, and pS ← pS˜.

23: end if

24: end for

25: return S, pS .

CONCLUSION

We focal point on the income maximization hassle of cloud brokers. A cloud broking is an middleman entity between cloud carrier carriers and customers, which buys reserved situations from cloud carriers for lengthy intervals of time and outsources them as on-demand VMs for a decrease charge and fine-

grained BTU with recognize to what the cloud provider companies cost for the identical VMs. Due to the decrease provider fee and the finer-grained BTU in contrast with the public clouds, the cloud dealer can retailer an awful lot value for customers. This paper tries to information cloud brokers on how to configure the digital aid platform and how to fee their carrier such that they can gain the maximal profit. To resolve this problem, the digital aid platform is modeled as an M/M/n/n queue model, and a income maximization trouble is constructed in which many profit-affecting elements are analyzed primarily based on the queuing theory, as properly as the relationship between them. The most efficient options are solved combining the partial by-product and bisection method. Lastly, a sequence of calculations are performed to analyze the altering style of income and the ratio of person fee savings.

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A NEW STABILITY ANALYSIS OF PERIODIC DELAY DIFFERENTIAL EQUATION (PDDE) WITH MULTIPLE TIME-PERIODIC DELAYS

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Abstract: Periodic Delay differential equations (PDDEs) are widely utilized as the mathematical models in engineering fields. In this paper, a method is proposed to analyze the stability characteristics of periodic DDEs with multiple time-periodic delays. Stability charts are produced for two typical examples of time-periodic DDEs about milling chatter, including the variable-spindle speed milling system with one-time-periodic delay and variable pitch cutter milling system with multiple delays. The simulations show that the results gained by the proposed method are in close agreement with those existing in the past literature. This indicates the effectiveness of this method, in terms of time-periodic DDEs with multiple time-periodic delays. Moreover, for milling processes, the proposed method further provides a generalized algorithm, which possesses a good capability to predict the stability lobes for milling operations with variable pitch cutter or variable-spindle speed.

Key words: Multiple Time Delay, Periodic Delay differential equations (PDDE), stability analysis.

I. INTRODUCTION

Time-delay systems widely exist in engineering and science, where the rate of change of state is determined by both present and past state variables, such as machining processes wheel dynamics feedback controller gene expression dynamics and population dynamics. However, for some of above applications, the time delay in the dynamic system may lead to instability, poor performance, or other types of potential damage. Therefore, it is necessary for engineers and scientists to research about the dynamics of these systems to reduce or avoid such problems.

Compared to the finite dimensional dynamics for systems without time delay, time-delay systems have infinite-dimensional dynamics and are usually described by delay differential equations (DDEs). Their stability properties can be analyzed through obtaining of stability charts that show the stable and unstable domains. For example, a stable milling process can be realized by choosing the corresponding parameter from a stability lobe diagram (SLD), which is a function of spindle speed and depth of cut parameters. Thus, more and more attention has been paid on this issue and many analytical and numerical methods have been developed to derive the stability conditions for the system parameters.

By using the-subdivision method, Bhatt and Hsu determined stability criteria for second-order scalar DDEs. Budak and Altıntaş, and Merdol and Altintas proposed a method in frequency domain called multifrequency solution. By employing a shifted Chebyshev polynomial approximation, Butcher presented a new technique to study the stability properties of dynamic systems by obtaining an approximate monodromy matrix. Insperger and Stepan proposed a

DYNAMICS STABILITY SOLUTION FOR DIFFERENTIAL EQUATIONS WITH TIME DELAY

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Abstract: Dynamic impulsive differential equations with delay are widely applied in different subjects, such as theoretical mechanics, chemistry, biology, medicine, cybernetics, and so on. The existence and stability of solutions for functional differential equations were obtained more and more attentions, and the functional analysis and comparative methods were generally used in the solution. This paper discussed the existence and stability of solutions for a certain differential equation with delay using iterative analysis. The results indicated that the solutions of the equation are closely related to the conditions with delay.

Keywords: Time Delay, Prey and the predator free equilibrium condition, kernals condition.

I. INTRODUCTION

Delays are inherent in many physical and technological systems. In particular, pure delays are often used to ideally represent the effects of transmission, transportation and inertia phenomena. Delay differential equations constitute basic mathematical models of real phenomena, for instance in biology, mechanics and economics. Stability of delay systems is an important issue addressed by many authors and for which surveys can be found in several, monographs (see e.g. Lakshmikantham and Leela, 1969; Hale, 1977; Stepan, 1989; Lafay and Conte 1995). In particular, some delay-independent stability conditions have been proposed for linear delay differential equations (Kamen, 1982, 1983). Delay-independent conditions are particularly interesting for uncertain systems when robust stability is requested. But they may be too restrictive, as noted by several authors (Cheres et al., 1989; Niculescu et al., 1994; Chen, 1995). On the other hand, it is also important to use available knowledge on delays and delay terms for control purposes.

The objective of this paper is to obtain stability conditions that provide better insights into the effects of delay terms on the system behavior also to use these conditions and insights in control problems. This paper deals with a perturbed autonomous delay differential system whose instantaneous state vector is constrained was belong to a polyhedral domain that may correspond to the admissible running conditions of the system. Some simple algebraic conditions are established to characterize the positive invariance of this domain. It is also shown that if the polyhedral domain is a compact set, its positive invariance implies asymptotic stability of the unperturbed system. The stability conditions obtained are independent of the delay values and are generally less restrictive than those previously presented in the literature. A control design technique is derived from these conditions. The proposed control law robustly stabilizes the system and the makes the use of information available about the delay terms. This concern distinguishes our approach from much memory less control schemes previously proposed in the literature (Klai et al., 1994; Niculescu et al., 1994).

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Attitude of English teachers toward using authentic materials in English class room at JNTUH

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I. THE PROBLEM OF THE RESEARCH

The choice of teaching materials in English language teaching has been a accepted subject in the education field because this concerns many, if not all, English teachers. From the point of view of authenticity, there are mostly two types of materials, namely authentic and non authentic. Morrow (1977:13) defined authentic materials as texts that are produced by a real speaker or writer for areal audience", for example, news paper articles and radio programmes. However some (Widdowson 2003) had an opposite view and claimed that the lexical difficulty of authentic materials which are at the right level of students and designing manageable learning task. However, this brings out a major difficulty of using authentic material. That is finding appropriate authentic material and design suitable learning tasks can be a time consuming process (Hughes &McCarthy 1988). As we can see, the opinions with regard to the use of authentic material are diverse.

II. THE AIM OF THE RESEARCH

The research aims at investigate the "attitude of English language teachers towards the use of authentic materials in JNTUH.

III. THE QUESTIONS OF THE RESEARCH

The research tried to answer these questions:
1. What are the attitudes of English language teachers towards the make use of of authentic materials in JNTUH?
2. Why do /do not English language teachers use authentic material?
3. English language teachers opinions, how might the use of authentic material or impede English learning of students?

IV. THE PROCEDURE OF THE RESEARCH

The research has pursued these practices to achieve the purpose of the research; they are:
1. Review of the literature studies of authentic material
2. Preparing questionnaire to collect data of the attitudes of English teachers of using authentic materials in classroom.
3. Making interviews with English teachers' about using authentic material in their lecture.
4. Analyzing the results of the questionnaire to answer the questions of research.

V. METHOD AND PROCEDURE OF THE RESEARCH

The current research has carried out in JNTUH University English teachers of this university has obtained part in this research at the academic year between 2018 to 2019 the sample of the research 40 English teachers. They were chosen randomly according their colleges.

DATA COLLECTION

The questionnaire aims to gather English teachers attitudes, and experience regarding the use of "authentic materials" in English language classes. In this questionnaire authentic materials are defined as texts that are made by real speaker or writer for real audience, for example, news paper, articles, radio programmes, and holiday brochures etc. This questionnaire consists of three parts. The questions in
Part A: aim to collect some general information about English teachers.

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Part B: asks about teachers' beliefs and attitudes towards the use of authentic material
Part C: explores the reflection concerning the use of authentic texts in the actual classroom.

DATA ANALYSIS

Descriptive statistics will be used to display the result of the questionnaires. Any marked findings such as special patterns of their response will be focused and explored. As for the interview, the relevant significant portion will be called from participants' response and further discussed in the research. By doing all these, a better understanding of English teachers' attitudes towards authentic material can be obtained.

VI. RESULT AND DISCUSSION

1. **What are the attitudes of English language teachers towards the make use of of authentic materials in JNTUH?**
On the whole, the participants of English teachers believed that, compared with English textbooks, authentic materials are more beneficial to students. Using authentic texts gives students real input of how the language is used in real life. Without the exposure to authentic material, learners may not be able to develop a good command of English which enables them to manage the conversation effectively in the real life.
Some of the teachers disagreed with the statement that students can still learn English well without exposure to authentic material.
2. **Why do /do not English language teachers use authentic material?**
The majority of the teachers thought it is not difficult is to find texts to the relevant to students lives and interest. The real difficult is to find texts that match the content of the curriculum.
3. **English language teachers opinions, how might the use of authentic material or impede English learning of students?**
The respondents gave different opinions on the questionnaire. Some teachers think using authentic material is beneficial to students learning where as some others think the other way round.

VII. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this research is to examine is to examine how English teachers see the usefulness of authentic material in English teaching. In general, a majority of the participants have appositive attitude towards the use of RM and think RM facilitate students' English learning. The result shows that all participants have used authentic material with different frequencies. This difference may be caused by
1. Whether they can actually see the positive effects of RM
2. Whether they are satisfied with traditional text books and
3. Whether they can spare time for selecting and adapting texts.
1 answer the result obtained from the questionnaire show that all participants of English teachers have employed authentic a material in their teaching by different degrees despite the fact that some of them consider their students English profiency "bad" and "very poor". This may be due to the fact that 100% responses agreed that students should not be denied the opportunity to interact with authentic material. Also, in some of the participants

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Intelligibility of Singaporean English towards Engineering Students JNTU Hyderabad

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Abstract

This article examines the different manners by which it is conceivable to estimate about the varieties of English on the planet, specifically Kachru's (1982) concentric circle model and Scheinder (2007) periods of improvement in post colonial varieties of English and I attempt to fit Singapore English into those models, despite the fact that in the two cases there are a few challenges. I then give the how English was spread to India and noticed that English is moving towards first language status the phonological highlights are out lined. I end by talking about a portion of the key components to recall while considering non – Anglo Englishes like Singaporean English.

Features of Singaporean English

Numerous vowels that are distinct in R.P. furthermore, G.A are converged in Singapore, generally subsequently the absence of differentiation among short and long vowels. In this way, these groups of words probably won't be recognized: cut and cart, pull and pool, cot and caught, set and sat, kin and keen. They can likewise consider in the light about Ris Low's English: there are clearly Singaporean who do make the long and short vowel distinction.

The set look as though /uə/ doesn't exist in Singaporean English. This has, nonetheless, to do with the keyword picked. Sure or poor would be articulated /uə/. This illustrate how monopthongisation of /uə/ to /ɔ/, is lexically constrained and in various manner from numerous British accents, where tour, sure, poor are monopthongised to /ɔ/ yet not pure and cure. The opposite seems to be the case in Singaporean pronunciations.

Other phonological features have been noted:

Reduced vowels are utilized not exactly in British accents.

There are greater reductions of consonant clusters than in equivalent British setting, and last stops can be substituted with glottal stop.

The consonant /θ/ can be raised as /θ/, /t/ or /f/; likewise, the consonant /ð/ can be acknowledged as /ð/ or /d/.

The Singaporean accent is also supposed to be syllable timed.

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British or American English: Emerging Trends in Indian English News Papers

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ABSTRACT: This paper examines the options of American English found in Indian English news papers and accounts for those options quantitatively with reference to British English. Indian print media English has the propensity to become additional Americanized in trendy amount period. There is move from British English or American English in Indian news papers and this transient study aims to seem the developing impact American English on Indian English. American English is taken into account the foremost dominant and effective style of English (Kirkpatrick). The impact of American English in newspaper writing suggesting that there is propensity among the Indian English speakers to pick out for American English instead of British English particularly at the lexical and also the grammar levels. The results demonstrate the utilize of American English is developing quickly in Indian English news papers. The quantitative findings of the study recommend that in spite of the actual fact that British English is favored in Indian newspapers nevertheless the traces of American English are quite clear and obvious. The sooner studies associated with Indian English investigated the dissection between Indian and British English at varied levels. On the other hand, Americanization is Indian English is not usually mentioned trend. This is less researched area in Indian English context and this study aims to fill this gap.

1. INTRODUCTION

English is used as a native language in American, United Kingdom, Australia, New Zealand and Canada. These native varieties of English particularly American and British English are thought-about of norm –providing for those who utilize as a second or foreign language. British English is used as a replica in most of the non native English speaking nations similarly Indian as these non –native varieties appeared at intervals the context of British exploitation. Indian was a British settlement before 1947 and English is held in high respect in India. British English provides standards to Indian English speaking community specific to the academicians. The dictionaries, reference and grammar books of British English are prescribed and favored in educational instructional in India. In any case, the presence of features of Americanization in Indian English newspapers reflects the globe have an effect on that is a natural result of the developing impact of American thought the world.

India English is very captivated with British English and in many cases the dissection in Indian English is investigated with respect to British English. Received Pronunciation (R.P) is employed as a replica to teach pronunciation to the students of English at totally different stages in India. On the other hand, the increasing communication between India and America is that the last few decades for economic, political, educational and geographical motives has lined the way to select for American English along with British English.

American English is obtaining reputation all around the world notably in Asia since of its social and political standing as American English " is not only the diversity that these participants are a lot familiar with given the U.S- dominant media exposure, it is also an powerful diversity, enjoying a immense deal of prestige" (Tan & Castelli 2013, p. 197). American English got this standing because of the power related to America as a tremendous power.

America has an enormous authority on the economic and political affairs of the many countries of the globe, thus people all around the worlds are persuaded towards American English. The constant trend is scrutinized in India notably in English newspapers. The purpose of this shift is that the international name and fame connected with the American English. British English and American English are measured the standardized forms of English and decision is accessible while writing through word doc in Microsoft office. As said by Kachru (1981), American English is "an example of linguistic pride and what may be termed a conscious effort toward establishing language identity (p.23). British English is utilized as a replica by many non- native speakers of English, but the American diversity is also an satisfactory and viable choice.

LINGUISTIC DIFFERENCE BETWEEN PUNJABI AND ENGLISH

Kandukuri Mariyadas

Abstract

The principle of this paper is to attempt to contrast and comprehend the commonalities and dissimilarity between the two languages Panjabi and English. The study of language involves the contrast of its linguistic elements. The two languages therefore studied from the vision of grasping their form, the content and pragmatics. Even though both the languages have their individual form, the content and use of the languages for communication looks to be slurred. The role of socio-cultural features in determining the content and usage of language is underlined.

Key words: Linguistics; English, Panjabi, differences

Introduction

In the present world point of view, English is a vital language. It is an internal language. It is spoken and understood by a enormous majority of people living on the globe. It is, therefore, a world language. Knowledge of English is essential for establishing intellectual, cultural, economic, commercial and political relations with the rest of the world. Therefore, English provides as a link language.

For such a dynamic participation, study of English must for it is a window to the world. Therefore, it has been assigned the role of a library language more and more knowledge produced through English language. Had made it a living stream of growing knowledge. Mastery of English means an easy access to the vast treasures of knowledge. Therefore, everyone should have the knowledge of English.

A mixture of two words “Punjab” and “Aab” meaning as “five” and “water” respectively makes “Panjabi” with meaning of five rivers. The resign of Punjab spreads in Pakistan and India and their language Punjabi as a first language. In India, it is an official language with other 21 official languages (Ethnologue.2016). The Punjabi language divided into three groups: central, the major dialect spoken in Lahore and Amritsar and it makes the library language. The Dogri in north Punjab; and the western dialects that gradually change into Lahnda (Campbell, 1991).

Background/methodology.

A sample of 25 students were selected for the study. To ensure that they are drawn from the different colleges of Punjab. The students are not capable to communicate in English and they are not capable to form simple sentence in English. Still if they attempt to speak in English, the pronunciation is blended with their mother language and it has their mother tongue intervention in it.

Rational of the examines phonemic differences and similarities between English and Punjab the chief rational of the study aims to cover up these. This purpose is accomplished by analyzing the similarities index between these linguistics structures. These differences are very significant to know as they set these two linguistic structures out. It is what makes structures different from each other and standing in their own individual way.

Statement of the problem/ purpose of the problem

The current study aims to analyze the phonemic similarities and differences between English and Punjabi. The intention of this analysationis to come across those sounds of English that are not current in the Panjabi phonemic structure and those sounds of Punjabi that are not present in the English phonemic structure and can cause difficulties to the learner to the learners of the language.

Significance of the study

The study objective is to examine the differences in phonemic variation between Punjabi and English, as it will assist the Punjabi speakers to learn English as their L2 through the demonstration of positive and negative transfer between these two languages.

Objectives

The most important objective of this study is computing the similarity level percentage between the phonemic systems of English and Punjabi.

Research questions

What are the similarities between consonants of English and Panjabi?

What are the differences the consonants of English and Panjabi?

Methodology

A combined methodology i.e., qualitative and quantitative technique is used to examine the phonemic differences and similarities. The phonetic inventories of both languages are utilized as date.

Investigation of English and Punjabi are the two diverse languages which belong to two different families of language. Yet they present phonemic similarities between them. Both of the languages may have less structural overlap, which cause to be minimum mutual intelligibility.

20 consonants sounds in English and Punjabi have zero difference and greatest similarity between them, but some sounds have phonetic differences also.

The sounds with distance of zero are considered similar sounds in the inventories. While the sounds used in the inventories.

The examination demonstrates that English and Panjabi have 56.25% phonemic similarities. in contrast, their distance in terms of proportion is 43.75%. The similarities and differences rendered in terms of proportion shows that English and Panjabi are two different languages. Both these languages have fewer similarities and more differences.

Conclusion

It can be concluded there are 24 consonants sounds in the English language and 32 consonants sounds in Punjabi. In the midst of these 56 consonants found in both English and Punjabi languages, 20 consonants sounds are exercised in both languages. Which share the similar way and place of articulation? On the other hand, there are 14 sounds in both the languages which are different in terms of their manner and place of articulation. hence, the similarity level, between the consonant of these languages is 43.75. These twenty consonants are exercised differently by the speaker of both English and Punjabi languages. while, the rest of the 14 sounds are exercised by the speakers of both English and Punjabi languages. As these two linguistics structures have a 56.25% similarity, the result of this research, testifies to the hypothesis, that a similarity proportion higher than 85% between two linguistic systems, normally signifies that one of the structures is likely a dialect of the language with which it is being evaluated.

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STABILITY ANALYSIS ON THREE SPECIES ECOLOGICAL NEUTRALISM WITH LIMITED RESOURCES

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Abstract

Neutralism is an absence of any interaction between members of a mixed population, i.e, The species may be living side by side but are unaware of each other and also cause no harm or nor beneficial to each other. A real life example is rabbits, deer, frogs live together in a grass land with no interaction between them. This paper is devoted to an ecological study on three species neutralism. Here all the three species S_1, S_2 and S_3 posses limited resources and with growth rates. The model equations constitute a set of three first order non-linear simultaneous differential equations. Criteria for the asymptotic stability of all the eight critical points are established. The system would be stable if all the characteristic roots are negative.

Keywords: Characteristic equation, critical point, neutral, stable, unstable.

2010 Mathematics Subject Classification: 92D25, 92D40

1. Introduction

Ecology is the study of the interactions between organisms and their environment. The organisms include animals and plants, the environment includes the surroundings of animals. So ecology relates to the study of living beings (animals and plants) in relation to their habits and habitats. This discipline of knowledge is a branch of evolutionary biology purported to explain how or to what extent the living beings are regulated in nature. Allied to the problem of population regulation is the problem of species distribution-commensalism, prey-predator, competition and so on. Significant researches in the area of theoretical ecology have been discussed by Gillman [2] and by Kot [3]. Several ecologists and mathematicians contributed to the growth of this area of knowledge. Mathematical ecology can be broadly divided into two main sub-divisions, Autecology and Synecology, which are described in the treatises of Arumugam [1] and Sharma [16]. Mathematical Modeling plays a vital role in providing insight into the mutual relationships (positive, negative) between the interacting species. The general concepts of Modeling in Biological Science have been initiated by several authors Ma [5], Murray [6] and Sze-Bi Hsu [18]. Srinivas [17] studied the competitive ecosystem of two species and three species with limited and unlimited resources. Further, Kumar [4] studied some mathematical models of

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ecological commensalism. The present author Prasad [7-15] investigated continuous and discrete models on two, three and four species syn-ecosystems.

2. Basic Equations of the Model

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2D-MoS_2 nanosheets as effective hole transport materials for colloidal PbS quantum dot solar cells†

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Abstract

Herein, we demonstrate for the first time matrix-free deposition of two dimensional (2D) MoS_2 nanosheets as an efficient hole transport layer (HTL) for colloidal lead sulfide (PbS) quantum dot

Inorganic metal iodide mediated solution phase surface passivation for quantum dot solar cell

Srikanth Reddy Tulsani, Saptam Ganguly & Arup K. Rath

Journal of Materials Science: Materials in Electronics **30**, 16234–16243(2019) | Cite this article

Abstract

The recent advancements in solution phase surface passivation of quantum dots (QDs) enable the development of production compatible QD ink for their large-area deposition, of a single coating. Surface passivation and colloidal stability

https://doi.org/10.26637/MJM0501/0126

Contra-continuity via topological grills

G. Sarabha Reddy Gurram[1] and N. Rajesh[2*]

Abstract
In this paper, $\mathscr{G}$-preclosed sets and $\mathscr{G}$-preopen sets are used to define and investigate a new class of functions called contra-$\mathscr{G}$-precontinuous functions in grill topological spaces.

Keywords
Grill topological spaces, $\mathscr{G}$-preopen sets, $\mathscr{G}$-preclosed sets.

AMS Subject Classification
54A05, 54C10.

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Contents

1. Introduction

The idea of grills on a topological space was introduced by Choquet [4] in his classical paper. It has been found out that there is some of similarity between Choquat concept and that ideals, nets and filters. It helps to expand the topological structure which is used to measure the description rather than quantity, such as love, intelligence, beauty, quality of education and etc. Also, it expands the topological structure by using the concept of grill changes in lower approximation, upper approximation and boundary region. In 2007, Roy and Mukherjee [14] established a new form of topological structure via grills. Quite recently, Hatir and Jafari [6] have defined new classes of sets via grills and obtained a new decomposition of continuity in terms of grills. The aim of this paper is to give a new class of functions called contra-$\mathscr{G}$-precontinuous in a grill topological space. Some characterizations and several basic properties of this class of functions are obtained.

2. Preliminaries

For a subset A of a topological space (X,τ), $\mathrm{Cl}(A)$ and $\mathrm{Int}(A)$ denote the closure and the interior of A in (X,τ), respectively. The power set of X will be denoted by $\mathscr{P}(X)$. The definition of grill on a topological space, as given by Choquet [4], goes as follows: A non-null collection $\mathscr{G}$ of subsets of a topological space (X,τ) is said to be a grill on X if

1. $\emptyset \notin \mathscr{G}$,
2. $A \in \mathscr{G}$ and $A \subset B$ implies that $B \in \mathscr{G}$,
3. $A, B \subset X$ and $A \cup B \in \mathscr{G}$ implies that $A \in \mathscr{G}$ or $B \in \mathscr{G}$.

Definition 2.1. *[14] Let (X,τ) be a topological space and $\mathscr{G}$ a grill on X. A mapping $\Phi : \mathscr{P}(X) \to \mathscr{P}(X)$ is defined as follows: $\Phi(A) = \Phi_{\mathscr{G}}(A,\tau) = \{x \in X : A \cap U \in \mathscr{G}$ for every open set U containing $x\}$ for each $A \in \mathscr{P}(X)$. The mapping Φ is called the operator associated with the grill $\mathscr{G}$ and the topology τ.*

Definition 2.2. *[14] Let $\mathscr{G}$ be a grill on a topological space (X,τ). Then we define a map $\Psi : \mathscr{P}(X) \to \mathscr{P}(X)$ by $\Psi(A) = A \cup \Phi(A)$ for all $A \in \mathscr{P}(X)$. The map Ψ is a Kuratowski closure axiom. Corresponding to a grill $\mathscr{G}$ on a topological space (X,τ), there exists a unique topology $\tau_{\mathscr{G}}$ on X given by $\tau_{\mathscr{G}} = \{U \subseteq X : \Psi(X \setminus U) = X \setminus U\}$, where for any $A \subset X$, $\Psi(A) = A \cup \Phi(A) = \tau_{\mathscr{G}}\mathrm{Cl}(A)$. For any grill $\mathscr{G}$ on a topological space (X,τ), $\tau \subset \tau_{\mathscr{G}}$. If (X,τ) is a topological space with a grill $\mathscr{G}$ on X, then we call it a grill topological space and denote it by $(X,\tau,\mathscr{G})$.*

Definition 2.3. *[6] A subset S of a grill topological space $(X,\tau,\mathscr{G})$ is $\mathscr{G}$-preopen if $S \subset \mathrm{Int}(\Psi(S))$. The complement of a $\mathscr{G}$-preopen set is called a $\mathscr{G}$-preclosed set.*

Definition 2.4. *The intersection of all $\mathscr{G}$-preclosed sets containing $S \subset X$ is called the $\mathscr{G}$-preclosure of S and is denoted by $p\mathrm{Cl}_{\mathscr{G}}(S)$. The family of all $\mathscr{G}$-preopen (resp. $\mathscr{G}$-preclosed) sets of $(X,\tau,\mathscr{G})$ is denoted by $\mathscr{G}PO(X)$ (resp. $\mathscr{G}PC(X)$). The family of all $\mathscr{G}$-preopen (resp. $\mathscr{G}$-preclosed) sets of $(X,\tau,\mathscr{G})$ containing a point $x \in X$ is denoted by $\mathscr{G}PO(X,x)$ (resp. $\mathscr{G}PC(X,x)$).*

Definition 2.5. *[11] A subset A of a topological space (X,τ) is called a preopen set if $A \subset \mathrm{Int}(\mathrm{Cl}(A))$. The complement of a preopen set is called a preclosed set. The intersection of all preclosed sets of (X,τ) containing A is called the preclosure of A and is denoted by $p\mathrm{Cl}(A)$.*

Definition 2.6. *A function $f : (X,\tau) \to (Y,\sigma)$ is said to be:*

1. *contra-continuous [5] if $f^{-1}(V)$ is closed in X for every open set V of Y.*
2. *contra-precontinuous [8] if $f^{-1}(V)$ is preclosed in X for every open set V of Y.*
3. *precontinuous [11] if $f^{-1}(V)$ is preopen in X for every open set V of Y.*

Definition 2.7. *[9] A topological space (X,τ) is said to be a pre-T_2 space if for each pair of distinct points $x, y \in X$, there exist disjoint preopen sets U and V containing x and y, respectively.*

Definition 2.8. *[6] A function $f : (X,\tau,\mathscr{G}) \to (Y,\sigma)$ is said to be $\mathscr{G}$-precontinuous if $f^{-1}(V)$ is a $\mathscr{G}$-preopen set in $(X,\tau,\mathscr{G})$ for every open set V of Y.*

Example 3.2. *Let $X = \{a,b,c\}$, $\tau = \{\emptyset, \{a\}, \{b,c\}, X\}$, $\sigma = \{\emptyset, \{c\}, X\}$ and $\mathscr{G} = \{\{b\}, \{c\}, \{a,b\}, \{b,c\}, \{a,c\}, X\}$. It is clear that the identity function $f : (X,\tau,\mathscr{G}) \to (X,\sigma)$ is contra-$\mathscr{G}$-precontinuous but not contra-continuous.*

Example 3.3. *Let $X = \{a,b,c\}$, $\tau = \{\emptyset, \{b\}, \{a,c\}, X\}$, $\sigma = \{\emptyset, \{a\}, X\}$ and $\mathscr{G} = \{\{b\}, \{c\}, \{a,b\}, \{b,c\}, \{a,c\}, X\}$. It is clear that the identity function $f : (X,\tau,\mathscr{G}) \to (X,\sigma)$ is contra-precontinuous but not contra-$\mathscr{G}$-precontinuous.*

Remark 3.4. *The following example shows that the notions $\mathscr{G}$-precontinuity and contra-$\mathscr{G}$-precontinuity are independent concepts.*

Example 3.5. *Let $X = \{a,b,c\}$, $\tau = \{\emptyset, \{a\}, X\}$ and $\mathscr{G} = \{\{b\}, \{c\}, \{a,b\}, \{b,c\}, \{a,c\}, X\}$. Then the identity function $f : (X,\tau,\mathscr{G}) \to (X,\tau)$ is $\mathscr{G}$-precontinuous but not contra-$\mathscr{G}$-precontinuous. Also the function $f : (X,\tau,\mathscr{G}) \to (X,\tau)$ defined by $f(a) = b$, $f(b) = c$ and $f(c) = a$ is contra $\mathscr{G}$-precontinuous but not $\mathscr{G}$-precontinuous.*

However, we have the following

Theorem 3.6. *If a function $f : (X,\tau,\mathscr{G}) \to (Y,\sigma)$ is contra-$\mathscr{G}$-precontinuous and (Y,σ) is a regular space, then f is $\mathscr{G}$-precontinuous.*

Proof. Let x be an arbitrary point of X and V an open set of Y containing $f(x)$. Since Y is regular, there exists an open set W in Y containing $f(x)$ such that $\mathrm{Cl}(W) \subset V$. Since f is contra-$\mathscr{G}$-precontinuous, so by definition, there exists $U \in \mathscr{G}PO(X,x)$ such that $f(U) \subset \mathrm{Cl}(W)$. Then $f(U) \subset \mathrm{Cl}(W) \subset$

Almost contra-continuity via topological grills

G. Sarabha Reddy Gurram[1] and N. Rajesh[2*]

Abstract
The purpose of this paper is, to introduce a new class of functions called almost contra-$\mathscr{G}$-precontinuous functions which is a generalization of contra-$\mathscr{G}$-precontinuous functions.

Keywords
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AMS Subject Classification
54D10.

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Throughout the paper (X,τ) and (Y,σ) (or simply X and Y) represent topological spaces on which no separation axioms are assumed unless otherwise mentioned. For a subset A of a topological space (X,τ), $\mathrm{Cl}(A)$ and $\mathrm{Int}(A)$ denote the closure of A and the interior of A in X, respectively. A subset A of X is said to be regular open [26] (resp. semiopen [15], preopen [17]) if (resp. $A=\mathrm{Int}(\mathrm{Cl}(A))$, $A\subset\mathrm{Cl}(\mathrm{Int}(A))$, $A\subset\mathrm{Int}(\mathrm{Cl}(A))$). The family of all regular open subsets of X is denoted by $RO(X)$. The complement of a semiopen (resp. regular open, preopen) set is called a semiclosed [7] (resp. regular closed, preclosed [17]) set. The intersection of all regular open sets containing A is called the r-kernal [10] of A and is denoted by $r\ker(A)$. The definition of grill on a topological space, as given by Choquet [5], goes as follows: A non-null collection $\mathscr{G}$ of subsets of a topological space (X,τ) is said to be a grill on X if

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$\Psi(A)=A\cup\Phi(A)=\tau_{\mathscr{G}}\mathrm{Cl}(A)$. For any grill $\mathscr{G}$ on a topological space (X,τ), $\tau\subset\tau_{\mathscr{G}}$. If (X,τ) is a topological space with a grill $\mathscr{G}$ on X, then we call it a grill topological space and denote it by $(X,\tau,\mathscr{G})$.

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Definition 2.5. *A function $f:(X,\tau,\mathscr{G})\to(Y,\sigma)$ is said to be $\mathscr{G}$-precontinuous [13] (resp. contra-$\mathscr{G}$-precontinuous [20]) if $f^{-1}(V)$ is $\mathscr{G}$-preopen (resp. $\mathscr{G}$-preclosed) set in X for each open set V of Y. A function $f:(X,\tau,\mathscr{G})\to(Y,\sigma)$ is said to be weakly $\mathscr{G}$-precontinuous [21] if for every $x\in X$ and every open set V of Y containing $f(x)$, there exists $U\in BO(Y,f(x))$ such that $f(U)\subset\mathrm{Cl}(V)$.*

3. Almost contra-$\mathscr{G}$-precontinuous functions

(vii) $f(p\mathrm{Cl}_{\mathscr{G}}(A))\subset r\mathrm{Ker}(f(A))$ *for every subset A of X;*

(viii) $p\mathrm{Cl}_{\mathscr{G}}(f^{-1}(A))\subset f^{-1}(r\mathrm{Ker}(A))$ *for every subset B of Y.*

Proof. (i)⇔(ii): Let $F\in RC(Y)$. Then $Y\backslash F\in RO(Y)$. By (i), $f^{-1}(Y\backslash F)=X\backslash f^{-1}(F)\in\mathscr{G}PC(X)$. We have $f^{-1}(F)\in\mathscr{G}PO(X)$. The proof of the reverse in similar.
(ii)⇒(iii): Let $F\in RC(Y,f(x))$. By (ii), $f^{-1}(F)\in\mathscr{G}PO(X)$ and $x\in f^{-1}(F)$. Take $U=f^{-1}(F)$, then $f(U)\subset F$.
(ii)⇒(iii): Let $F\in RC(Y)$ and $x\in f^{-1}(F)$. From (iii), there exists a $\mathscr{G}$-preopen set U_x in X containing x such that $U\subset f^{-1}(F)$. We have $f^{-1}(F)=\bigcup_{x\in f^{-1}(F)}U_x$. Since any union of $\mathscr{G}$-preopen sets is $\mathscr{G}$-preopen, $f^{-1}(F)$ is $\mathscr{G}$-preopen in X.
(iii)⇔(iv): Let V be any regular open set of Y non-containing $f(x)$. Then, $Y\backslash V\in RC(Y,f(x))$. By (iii), there exists $U\in\mathscr{G}PO(X,x)$ such that $f(U)\subset Y\backslash V$. Hence, $U\subset f^{-1}(Y\backslash V)\subset X\backslash f^{-1}(V)$ and then $f^{-1}(V)\subset X\backslash U$. Take $H=X\backslash U$. We obtain that H is a $\mathscr{G}$-preclosed set in X non-containing x. The converse can be shown similarly.
(i)⇔(v): Let G be an open subset of Y. Since $\mathrm{Int}(\mathrm{Cl}(G))$ is regular open, then by (i), it follows that, $f^{-1}(\mathrm{Int}(\mathrm{Cl}(G)))\in\mathscr{G}PC(X)$. The converse can be shown similarly.
(i)⇔(iv): It can be obtained similar as (i)⇔(v).
(iii)⇒(vii): Let $A\subset X$ and $x\in p\mathrm{Cl}_{\mathscr{G}}(A)$ and $F\in RC(Y,f(x))$. By (iii), there exists $U\in\mathscr{G}PO(X,x)$ such that $f(U)\subset F$. Since $x\in p\mathrm{Cl}_{\mathscr{G}}(A)$, we have $U\cap A\neq\emptyset$. Hence, $f(U)\cap f(A)\neq\emptyset$ and therefore $F\cap f(A)\neq\emptyset$. It follows that $f(x)\in$

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(viii) $p\mathrm{Cl}_{\mathscr{G}}(f^{-1}(A))\subset f^{-1}(r\mathrm{Ker}(A))$ *for every subset B of Y.*

Proof. (i)⇔(ii): Let $F\in RC(Y)$. Then $Y\backslash F\in RO(Y)$. By (i), $f^{-1}(Y\backslash F)=X\backslash f^{-1}(F)\in\mathscr{G}PC(X)$. We have $f^{-1}(F)\in\mathscr{G}PO(X)$. The proof of the reverse in similar.
(ii)⇒(iii): Let $F\in RC(Y,f(x))$. By (ii), $f^{-1}(F)\in\mathscr{G}PO(X)$ and $x\in f^{-1}(F)$. Take $U=f^{-1}(F)$, then $f(U)\subset F$.
(ii)⇒(iii): Let $F\in RC(Y)$ and $x\in f^{-1}(F)$. From (iii), there exists a $\mathscr{G}$-preopen set U_x in X containing x such that $U\subset f^{-1}(F)$. We have $f^{-1}(F)=\bigcup_{x\in f^{-1}(F)}U_x$. Since any union of $\mathscr{G}$-preopen sets is $\mathscr{G}$-preopen, $f^{-1}(F)$ is $\mathscr{G}$-preopen in X.
(iii)⇔(iv): Let V be any regular open set of Y non-containing $f(x)$. Then, $Y\backslash V\in RC(Y,f(x))$. By (iii), there exists $U\in\mathscr{G}PO(X,x)$ such that $f(U)\subset Y\backslash V$. Hence, $U\subset f^{-1}(Y\backslash V)\subset X\backslash f^{-1}(V)$ and then $f^{-1}(V)\subset X\backslash U$. Take $H=X\backslash U$. We obtain that H is a $\mathscr{G}$-preclosed set in X non-containing x. The converse can be shown similarly.
(i)⇔(v): Let G be an open subset of Y. Since $\mathrm{Int}(\mathrm{Cl}(G))$ is regular open, then by (i), it follows that, $f^{-1}(\mathrm{Int}(\mathrm{Cl}(G)))\in\mathscr{G}PC(X)$. The converse can be shown similarly.
(i)⇔(iv): It can be obtained similar as (i)⇔(v).
(iii)⇒(vii): Let $A\subset X$ and $x\in p\mathrm{Cl}_{\mathscr{G}}(A)$ and $F\in RC(Y,f(x))$. By (iii), there exists $U\in\mathscr{G}PO(X,x)$ such that $f(U)\subset F$. Since $x\in p\mathrm{Cl}_{\mathscr{G}}(A)$, we have $U\cap A\neq\emptyset$. Hence, $f(U)\cap f(A)\neq\emptyset$ and therefore $F\cap f(A)\neq\emptyset$. It follows that $f(x)\in$