IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Issue 2, February 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.165

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

Retrieving the Personal Photos in Web Data

*R.Udayakumar

Dean- Computer science and IT, Kalinga University, Raipur, CG., India

*deancsit@kalingauniversity.ac.in, rsukumar2007@gmail.com

ABSTRACT: In a real-time textual query-based personal photo retrieval system has been developed to retrieve the images and its rich textual descriptions like captions, categories from the web. The proposed method exploits the indexing technique to automatically find the images in the web after a user provides a textual query to retrieve both relevant and irrelevant web images are automatically retrieved. To further improve the image retrieval performance the system uses an effective linear SVM classifier method to classify the personal photos and ranking. In Linear SVM classifier visual features such as Colour Histogram, Shapes and edges will be added to classify the images in the training set. To further develop this system, relevance feedback methods can be via cross-domain learning, which will effectively utilize both the web images and personal images.

I. INTRODUCTION

With rapid popularization of digital cameras and mobile phone cameras has led to an explosive growth of digital photo albums. There is an going up interest in just beginning new photo retrieving technologies for helping users to organize and index their personal photos at the semantic level.

In recent decades, many Content-Based Image Retrieval (CBIR) systems have been considered. These systems frequently require users to provide example images as queries in order to retrieve personal photos, i.e., below the answer by case construction. The paramount challenge in CBIR is the so-called semantic gap between the low-level visual features and the high-level semantic concepts. To link the semantic space, bearing feedback methods is used

Web Image Retrieval

T.S. Huang [1], Lin Chen[14], Simin Liu [12]. Retrieve the images from the web using the textual query, but Lin Chen[14] retrieve the both personal and annotated web images.

Textual query is used to retrieve the both relevant and irrelevant images from the web. Web contains millions of the images in data base, all the images in the web database are annotated images and this images are retrieving by keyword. Personal image also retrieve by textual query.

Methodology used for retrieving the images from the web by indexing for retrieve the annotated images. KNN, Decision Stumps, and SVM classifiers are used to classify the images by adding the features and training set.

Ranking method is used for ranking the images and relevance feedback is also used for retrieving the more effective images.

Advantages

- Retrieve the both annotated and un annotated images effectively by using textual query.
- Helps to get top ranked images.

Dis Advantages

- Creation of training set is difficult.

Feature Extraction On Colour

Colour has been widely used for content based image retrieval in data base. Now a days research has been used by

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

effective and efficient tools for specifying visual queries and implementing retrieval strategies

The use of colour has been extensively experimented by

- Colour matching to find images containing specified colours in assigned proportions
- Similarity searches to find a ranked list of images
- HSV is used to retrieve the images by using colour
- Textual query is also used to search the images and categories the images

The colour histogram technique is a very simple and low level method and shows good results in practice for image indexing and retrieval tasks, Feature extraction has to be simple and as quick as possible. Spatial quality are lost, meaning to spatial relations between parts of animage cannot be used [3].

A colour is represented by a three dimensional vector responding to a position in a colour space [3]. This leaves us to select the colour space and the quantization steps in this colour space. As a colour space, we chose the HSV space (Hue-Saturation-Value), which is in bisection with the RGB (Red-Green-Blue) .

SVM

Support vector machine (SVM) [4][10][14], is a computer algorithm. SVM learn by example to assign labels to objects1. An SVM can learn to recognize the images activity by examining hundreds or thousands of trained images and classify the images based on features.

Alternatively, an SVM can learn to recognize the collection of scanned images of trained images by features using HSV and edges.

SVMs have also been successfully applied to an increasingly wide variety of biological applications. A general biomedical function of support vector machines is the automatic classification of microarray gene expression profiles. Biological applications of SVMs involve classifying objects as diverse as protein and DNA sequences.

SVM is a mathematical entity, an algorithm (or recipe) for maximizing a particular mathematical function with respect to a given collection of information. The basic data behind the SVM algorithm, still, be able to be explain without ever analysis an equation.

One needs only to grab four basic concepts:

(i) The separating hyperplane,

(ii) The maximum-margin hyperplane,

(iii) The soft margin,

(iv) The kernel function.

II.SYSTEM DESIGN

2.1 SYSTEM ARCHITECTURE

This system architecture consists of machine learn modules. The initial module is unusual Web image recovery, which initial interprets the semantic model of textual queries by a user. Based on the semantic concept and keyword the sets of relevant and irrelevant web images areretrieved from the web image database using the indexing method.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

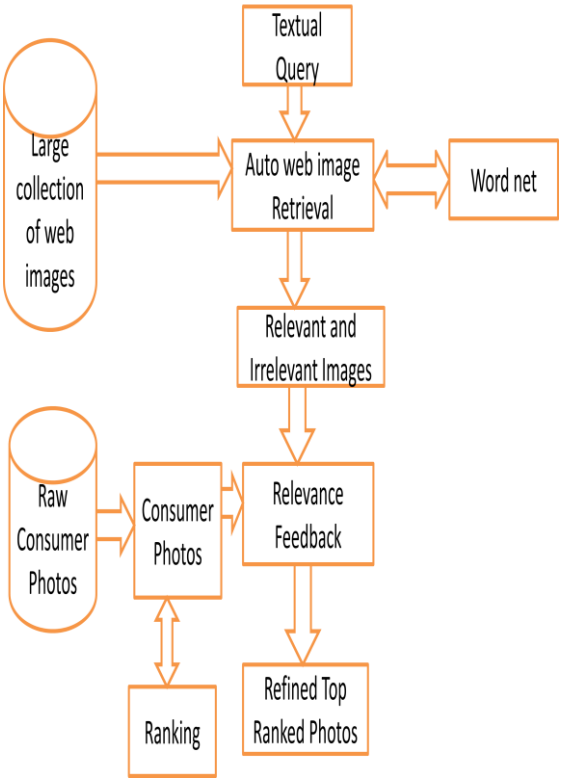


Fig 1. System Architecture

The second module then uses these relevant and irrelevant Web images as a labeled training set to train classifiers and these classifiers are then used to retrieve potentially relevant consumer photos from personal collections. In this framework a general textual query-based image retrieval and consumer photos retrieval is used.

The third module is ranking the consumer photos using the manifold ranking method and further improves the retrieval performance, relevance to refine the image retrieval results.

2.2 Auto Image Retrieval

In auto web image retrieval we retrieve the images based on the textual query given by the user.

In this architecture first we collect the large set of web images with surrounding text related to set of daily life semantic concepts. Assume that such a large scale web image database contains sufficient images to cover almost all of the daily life semantic concepts in a personal photos collection.

Construct the inverted file for retrieving the images in web using the textual query. If the word q in Cwthe followed by a list of all the images that contain q in surrounding text. To find the relevant web images we use word net for retrieving the images from the web. For irrelevant web images, we use word net models semantic relationships for normally used words, to classify the set Cs as the descendant texts of q. The below diagram shows the sub tree representing the two-level descendants of the keyword “water” in word network. Based on this sub tree, one can retrieve all irrelevant web images that do not contain any word in Cs in the surrounding texts.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

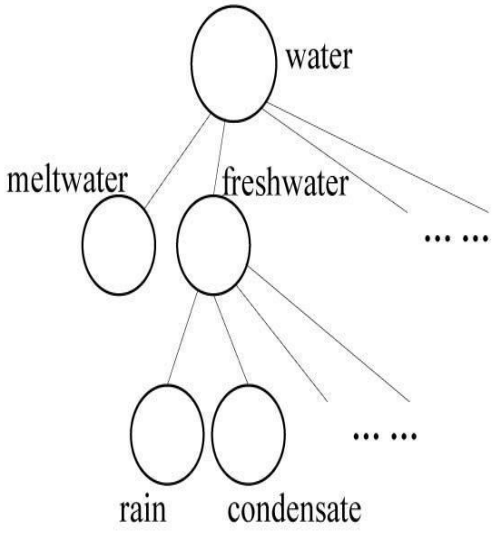


Fig 2. Sub Tree Representation in Word Net

2.2.1 Indexing Method

Indexing method is used retrieve the images from the web using the query given by the user. The keyword is searching in table and posting the file to index for retrieving the annotated images.

Algorithm

Indexing Method

1. Given q is a word
2. q in Cw
3. define the set Cs
4. D^w = (Xi^w , Yi^w)| i=1 to nw

Where

q is the Query

Xi^w is the ith web image

Yi^w € {+-1} is the label of Xi^w

nw is the number of Annotated web images

Cw semantic concept from web images

D^wis Annotated web Images

2.3 Consumer Photo Retrieval

In this system, Textual query is used to retrieve the both annotated images and consumer photos. To classify the personal photos choose an effective classifier, namely linear SVM classifier in which the training ofthe boosting classifier is performed in an offline way.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

2.3.1 SVM Classifier

To facilitate a large scale consumer photo retrieval use a SVM classifier for loosely labelled web images. In general total number of irrelevant images is more than the relevant images, So construct a small training set for combining the both positive and negative images and add the feature vector for normalized kernel space. The features for classifier are based on colour, shape, and edges. These featuresare useful to classify the images.In general trainer takes more time to train a linear SVM classifier than a decision stump ensemble classifier the prediction with linear SVM is much faster.For each test datum, there are only ns times of the calculation of exponential function in the experiment andcontain multiple futuredimensions.

Algorithm

SVM Classifier

Steps

1. Load the model stored in the file
2. Add the features for classify the model
3. Classify the model
4. Train a SVM on new model
5. Change some of SVM parameters
6. Retrain the SVM
7. Perform Cross validation on training set
8. Save the model to a file
9. Load the model in a file

Retrieve a classified model from SVM

2.3.2 Feature Extraction

2.3.2.1 Colour Histogram

The colour histogram technique is a very simple and low level method, it has shown good results in practice for image indexing and retrieval tasks, where feature extraction has to be as simple and as fast as possible. Spatial features are lost, meaning that spatial relations between parts of an image cannot be used.

A colour is represented by a three dimensional vector co-responding to a position in a colour space. This leaves us to select the colour space and the quantization steps in this colour space. As a colour space, we chose the HSV space (Hue-Saturation-Value), which is in bisection with the RGB (Red-Green-Blue).

In the HSV colour space, each colour is again determined by a three-component 'triple'.

The first component, Hue, describes the basic color in terms of its angular position on a 'colour wheel'. In this particular performance, kind is described in terms of degrees.

The second component of the HSV triple is diffusion, which, as described more than, be able to survive idea of as "how pure the colour is". In thisperformance, diffusion can group between 0 and 100, inclusive. Colours with a saturation of 100 are fully-saturated, whereas u with a saturation of 0 are completely de saturated.

The third component of the HSV triple is worth, which really should be called Intensity. It is a measure of how 'bright' the colour is. Value can range between 0 and 100, inclusive. A colour with a Value component of 100 will be as bright as possible, and a colour with a Value component of 0 will be as dark as possible.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

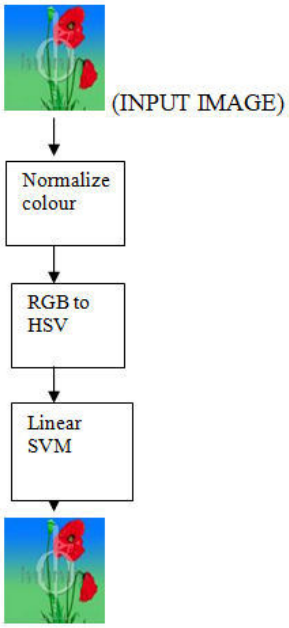


Figure 3.5 Feature Extraction using Histogram

2.3.2.2 Shape and Edge Detection

The edges extracted from a two-dimensional image of a three-dimensional scene can be classified as either viewpoint independent or viewpoint dependent. A viewpoint independent edgenaturally reflects inherent properties of the three-dimensional items, such as surface markings and surface shape. A viewpoint dependent relative edge may change as the viewpoint changes, and normally reflects the geometry of the scene.

In edge detection canny edge detector works efficiently it is good detection, good localization and minimal response.

An edge in an image may point in a variety of directions, so the canny algorithm uses four filters to detect horizontal, vertical and diagonal edges in the blurred image. The edge detection operator returns a value for the first derivative in the horizontal direction (Gy) and the vertical direction (Gx).

$G = \sqrt{x2 + y2}$

Gx = |(x+1,y)-|(x-1,y)

Gy = |(x,y+1)-|(x,y-1)

Where

Gy is the Horizontal direction

Gx is the Vertical direction

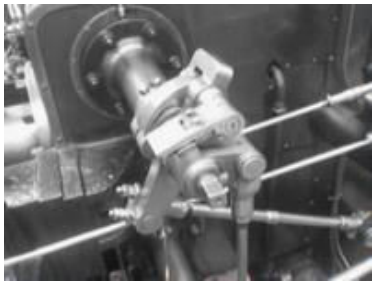
to one of four angles representing vertical, horizontal and the two diagonals. Using the above formulas gradient and direction can be determined. The edge direction angle is rounded

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

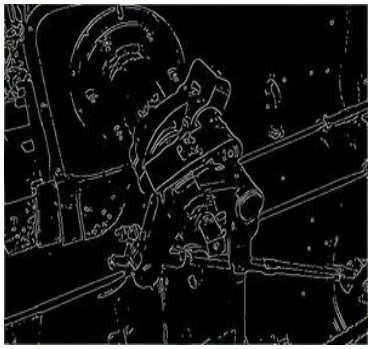
|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

Example



Normal image



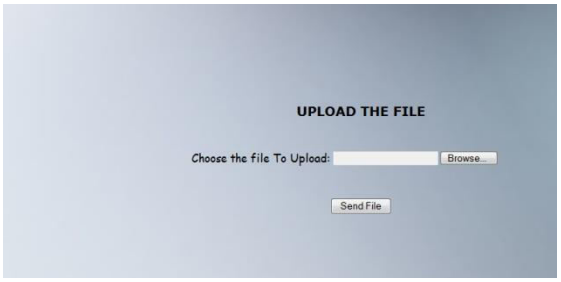
Edge detected image

III. IMPLEMENTATION

3.1 IMAGE UPLOAD

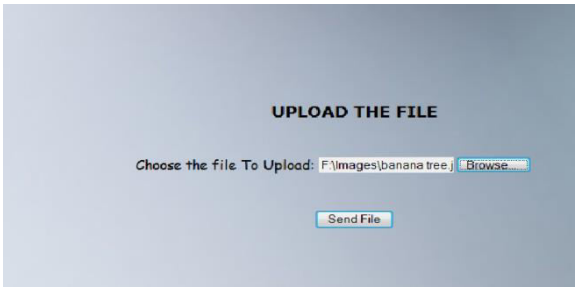
Create an web page for uploading images by using Java script, From that web page upload the images to database and retrieve them by using textual query.

Step 1:
Create a web page



Step 2:

Browse the image to upload in database



| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

Step 3:

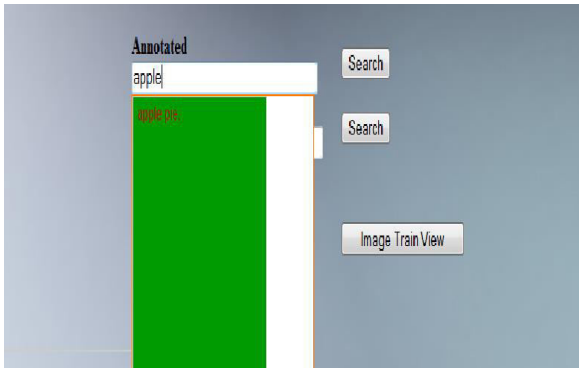
Send the file to database the show the uploaded successfully message in webpage

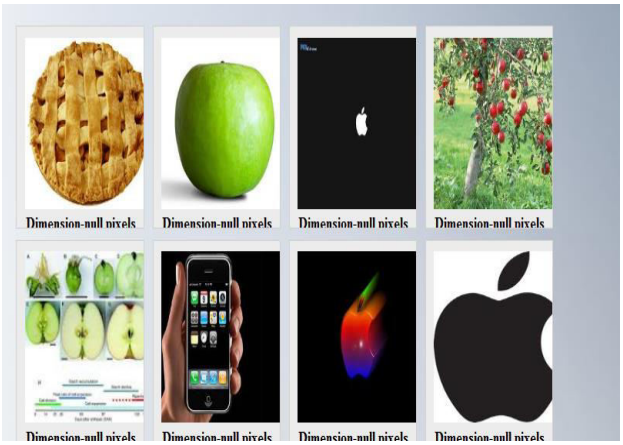
3.2 RETRIEVE THE IMAGE

Retrieve the images from the data base using the keyword searching method

Step1:
Creating the searching page for retrieve the images

Step 2:
Retrieve the properly annotated web images from the database





| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

Step 3:

Retrieve the Non annotated images by giving textual input

IV.CONCLUSION AND FUTURE WORK

4.1 CONCLUSION

This project has developed a real-time textual query-based personal photo retrieval system which retrieves the consumer photos without using any intermediate image annotation process in large scale web data. For a given textual query, this system can automatically and efficiently retrieve relevant and irrelevant Web images using the indexing technique. With these retrieved web images as the training data the system employsaefficient classification method linear SVM classifier forretrieving consumer photos. In SVM classifier two features are added to classify the images.

V.FUTURE WORK

In future for ranking we plan to use manifold ranking algorithm and for relevance feedback method use a regularised regression method is utilizing the pre-learned auxiliary classifier and the feedbackimages to effectively improve the retrieval performance atinteractive response

REFERENCES

[1] Kalaiprasath, R; Elankavi, R; Udayakumar, R; , Cloud security and compliance-a semantic approach in end to end security, International Journal on Smart Sensing and Intelligent Systems, V-10, I-5, PP:482-494, 2017.

[2] Elankavi, R; Kalaiprasath, R; Udayakumar, R; , Wireless Zigbee Network Cluster-Capacity Calculation and Secure Data Conveyance Using Indegree, International Journal on Smart Sensing and Intelligent Systems, V-10, I-5, PP:174-185, 2017.

[3] Kalaiprasath, R; Elankavi, R; Udayakumar, R; , A New Approach for Cloud Data Security: From Single to Cloud-of-Clouds, International Journal on Smart Sensing and Intelligent Systems, V-10, I-5, PP:604-613, 2017.

[4] Elankavi, R; Kalaiprasath, R; Udayakumar, R; , Data Mining with Big Data Revolution Hybrid, International Journal on Smart Sensing and Intelligent Systems, V-10, I-5, PP:560-573, 2017.

[5] Elankavi, R; Kalaiprasath, R; Udayakumar, Dr R; , A fast clustering algorithm for high-dimensional data, International Journal Of Civil Engineering And Technology (Ijciet), V-8, I-5, PP:1220-1227, 2017.

[6] Gajmal, Yogesh M; Udayakumar, R; , Blockchain-based access control and data sharing mechanism in cloud decentralized storage system, Journal of web engineering, PP:1359–1388-1359–1388, 2021.

[7] Gajmal, Yogesh M; Udayakumar, R; , A Bibliometric Analysis of Authentication based Access Control in Cloud using Blockchain, Library Philosophy and Practice, PP:0_1-16, 2021.

[8] Shirke, S; Udayakumar, R; , Robust lane identification by using EW-CSA based DCNN, J. of Critical Reviews, V-6, PP:18-21, 2019.

[9] Subhash, Ligade Sunil; Udayakumar, R; , A BIG SHARK ADAPTION ALGORITHM BASED RESOURCE ALLOTMENT APPROACH IN CLOUD COMPUTING ENVIRONMENT, PalArch's Journal of Archaeology of Egypt/Egyptology, V-17, I-7, PP:5374-5379, 2020.

[10] Gajmal, Yogesh M; Udayakumar, R; , Privacy and utility-assisted data protection strategy for secure data sharing and retrieval in cloud system, Information Security Journal: A Global Perspective, V-31, I-4, PP:451-465, 2022.

[11] Gajmal, Yogesh M; Udayakumar, R; , Analysis of Authentication based Data Access Control Systems in Cloud, PalArch's Journal of Archaeology of Egypt/Egyptology, V-17, I-7, PP:5319-5328, 2020.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

[12] Shirke, Suvarna; Udayakumar, R; , Evaluation of crow search algorithm (CSA) for optimization in discrete applications, 2019 3rd International Conference on Trends in Electronics and Informatics (ICOEI), PP:584-589, 2019.

[13] Shirke, Suvarna; Udayakumar, Ramanathan; , A novel region-based iterative seed method for the detection of multiple lanes, International Journal of Image and Data Fusion, V-11, I-1, PP:57-76, 2020.

[14] Shirke, Suvarna; Udayakumar, R; , Fusion model based on entropy by using optimized DCNN and iterative seed for multilane detection, Evolutionary Intelligence, PP:44940, 2022.

[15] Shirke, Suvarna; Udayakumar, R; , Hybrid optimisation dependent deep belief network for lane detection, Journal of Experimental & Theoretical Artificial Intelligence, V-34, I-2, PP:175-187, 2022.

[16] Subhash, Ligade Sunil; Udayakumar, R; , Sunflower whale optimization algorithm for resource allocation strategy in cloud computing platform, Wireless Personal Communications, V-116, PP:3061-3080, 2021.

[17] Subhash, Ligade Sunil; Udayakumar, R; , A Supremacy–Responsive Resource Distribution Technique for Controlled Workflow Implementation in Cloud Surroundings, Solid State Technology, V-63, I-5, PP:7662-7669, 2020.

[18] Sindhu, Velagapudi Swapna; Lakshmi, Kavuri Jaya; Tangellamudi, Ameya Sanjanita; Lakshmi, C; , A Deep Learning Approach For Detecting Type 2 Diabetes Mellitus, 2022 International Conference on Computer Communication and Informatics (ICCCI), PP:44936, 2022.

[19] Priyan, Siluvayan; Udayakumar, R; Mala, Pitchaikani; Prabha, Mariappan; Ghosh, Ananya; , A sustainable dual-channel inventory model with trapezoidal fuzzy demand and energy consumption, Cleaner Engineering and Technology, V-6, PP:100400, 2022.

[20] Elankavi, R; Kalaiprasath, R; Udayakumar, R; , Potential Exploitation of Broadcasting System Using Multiple Smart Directional Antennas-Help of Sensor Network, International Journal of Mechanical Engineering and Technology (IJMET), V-8, I-6, PP:678-687, 2017.

[21] Udayakumar, R; Kalam, Muhammad Abul; , Sentiment Analysis Using Machine Learning Algorithms, Mathematical Statistician and Engineering Applications, V-71, I-3s2, PP:1186–1200-1186–1200, 2022.

[22] GAJMAL, YOGESH M; UDAYAKUMAR, R; , Data Access Controls in Cloud: A Survey., International Journal of Pharmaceutical Research (09752366), V-12, I-4, 2020.

[23] Udayakumar, R; Khanaa, V; Kaliyamurthie, KP; , Optical ring architecture performance evaluation using ordinary receiver, Indian Journal of Science and Technology, V-6, I-6, PP:4742-4747, 2013.

[24] Udayakumar, R; Khanaa, V; Kaliyamurthie, KP; , Performance analysis of resilient fttharchitecture with protection mechanism, Indian Journal of Science and Technology, V-6, I-6, PP:4737-4741, 2013.

[25] Udayakumar, R; Khanaa, V; Saravanan, T; , Synthesis and structural characterization of thin films of sno2 prepared by spray pyrolysis technique, Indian Journal of Science and Technology, V-6, I-S6, PP:4754-7, 2013.

[26] Udayakumar, R; Khanaa, V; , Health monitoring system for induction motors, Int. J. Eng. Comput. Sci, V-2, I-4, PP:1117-1122, 2013.

[27] Udayakumar, R; Khanaa, V; , Quantum Computers-A Revolution InComputing, Quantum, V-8, I-4, PP:33-36, 2013.

[28] Khanaa, V; Udayakumar, R; , Protecting privacy when disclosing information: k anonymity and its enforcement through suppression, database, V-1, I-2, 2012.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

[29] Khanaa, V; Udayakumar, R; , Hybrid Fuzzy Approches for Networks, International Journal of Innovative Research in science, Engineering and Technology, V-12, I-3, PP:24-31, 2012.

[30] Udayakumar, R; Khanaa, V; Saravanan, T; Saritha, G; , Cross layer optimization for wireless network (WIMAX), Middle-East Journal of Scientific Research, V-16, I-12, PP:2013, 2012.

[31] Udayakumar, R; Thooyamani, KP; Khanaa, V; , Coarse-Grained Parallel Genetical Gorithm to Solve the Shortest Path Routing Problem Using Genetic Operators, Middle-East Journal of Scientific Research, V-15, I-12, PP:1651-1654, 2013.

[32] Khanaa, V; Udayakumar, R; , Efficient Pc Controlled By Hand Movement Using Mems Sensor Mouse, Indian Journal of science and Technology, V-12, I-6, PP:1438-1442, 2012.

[33] Udayakumar, R; Khanaa, V; , Sixth Sense Technology, International Journal Of Engineering And Computer Science, V-2, I-4, 2013.

[34] Udayakumar, R; Thooyamani, KP; Khanaa, V; , Secure Incentive Protocol for Multi-Hop Wireless Network with Limited Use of Public Key Cryptography, Middle-East Journal of Scientific Research, V-20, I-11, PP:1651-1656, 2014.

[35] Udayakumar, R; Kaliyamurthie, KP; Khanaa, TK; , Data mining a boon: Predictive system for university topper women in academia, World Applied Sciences Journal, V-29, I-14, PP:86-90, 2014.

[36] Udayakumar, R; Saravanan, T; , Tailored Image District Processing Precision Andwritten Appreciation, Middle-East Journal of Scientific Research, V-20, I-11, PP:1615-1625, 2014.

[37] Udayakumar, R; Thooyamani, KP; , Khanaa, Deploying site-to-site VPN connectivity: MPLS Vs IPSec, World Applied Sciences Journal, V-29, I-14, 2014.

[38] Udayakumar, R; Thooyamani, KP; , Random projection based data perturbation using geometric transformation, World Applied Sciences Journal, V-29, I-1, PP:24-31, 2014.

[39] Thooyamani, KP; Khanaa, V; Udayakumar, R; , Wide area wireless networks-IETF, Middle-East Journal of Scientific Research, V-20, I-12, PP:2042-2046, 2014.

[40] Khanaa, V; Thooyamani, KP; Udayakumar, R; , Modelling Cloud Storage, World Applied Sciences Journal, V-29, 2014.

[41] Khanaa, V; Thooyamani, KP; Udayakumar, R; , Elliptic curve cryptography using in multicast network, World Applied Sciences Journal, V-29, 2014.

[42] Khanaa, V; Thooyamani, KP; Udayakumar, R; , Two factor authentication using mobile phones, World Applied Sciences Journal, V-29, I-14, PP:208-213, 2014.

[43] Khanaa, V; Thooyamani, KP; Udayakumar, R; , Patient monitoring in gene ontology with words computing using SOM, World Applied Sciences Journal, V-29, 2014.

[44] Kaliyamurthie, KP; Parameswari, D; Udayakumar, R; , Malicious packet loss during routing misbehavior-identification, Middle-East Journal of Scientific Research, V-20, I-11, PP:1413-1416, 2014.

[45] Udayakumar, R; Saritha, G; Saravanan, T; , Modelling and Simulation of Electromechanical Systems Working with Nonlinear Frictional Loads and Controlled by Subordinated Control System of Coordinates, Middle-East Journal of Scientific Research, V-20, I-12, PP:1918-1923, 2014.

[46] Saravanan, T; Saritha, G; Udayakumar, R; , Cassette Steganography for Entrenched Metaphors in Squashed Videos, Middle-East Journal of Scientific Research, V-20, I-12, PP:2475-2478, 2014.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 11, Issue 2, February 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1102052 |

[47] Udayakumar, R; Khanaa, V; Saravanan, T; , Energy Demand Management Motor Control Using Multilevel Inverter, Middle-East Journal of Scientific Research, V-20, I-12, PP:2613-2619, 2014.

[48] Thooyamani, KP; Khanaa, V; Udayakumar, R; , Wireless cellular communication using 100 nanometers spintronics device based VLSI, Middle-East Journal of Scientific Research, V-20, I-12, PP:2037-2041, 2014.

INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 8.165

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details