

ISSN: 2518 - 6493



JOURNAL OF ENGINEERING AND TECHNOLOGY

Volume 1, No. 1, May 2016



From the Editor's Desk

I have the privilege to introduce the inaugural issue of the Amity Journal of Engineering and Technology (**AJET**), a peer-reviewed multidisciplinary scientific journal that focuses on emerging trends in various domains of engineering and technology. AJET aims to provide a platform to researchers to share their ideas and emerging trends, across varied themes related to the disciplines of engineering, technology, and allied areas.

The current issue of the journal is a compilation of twelve papers, wherein authors have discussed ideas ranging from contemporary technologies like Home Automation and Cognitive Radio Networks to discussion of traditional issues. This maiden issue also includes a case study on Eco-urban Retrofitting with a focus on sustainable re-creation of designing cities.

We would like to extend our sincere gratitude to the authors of the papers, from different countries, without whose dedication to research, this journal would not have been possible. We would also like to thank the reviewers for their valuable comments to the authors and the editorial committee, for extending support in bringing out this journal in its present form. The launch of AJET bears testimony to the zeal and commitment of the founding editors of the journal in providing a common forum to researchers to share their ideas and build upon them, adding to the process of knowledge creation.

We hope that academics, researchers, and industry experts will find AJET useful, as they set out to explore the fascinating world of advanced engineering, emerging technologies, and inspiring architectures.

Prof. Dr. Piyush Maheshwari
Editor in Chief

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A Graph Based Greedy Approach for Clustering Mixed Dataset

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Abstract: Clustering is one of the most important and useful concepts in data mining. Clustering in real world is very challenging because the traditional techniques that are given from 1965 (k-mean clustering algorithm) are only for numerical data. These techniques calculated distance either by Euclidian distance or Manhattan distance for the numerical data. Then based on the closed data point we can put them in some clusters (same or different). Clustering is a technique in which all the data inside a cluster has the highest similarity based on some parameters on which we perform clustering. The points which lie in different clusters have less similarity. Similarity between two different clusters should always be less than the similarity inside the cluster data. The similarity calculation and clustering is more typical in case of categorical attributes. Previously proposed k-mean clustering algorithm for mixed data set has very high complexity. Hence, it is not useful for large data sets. In this paper, we propose a simple graph based technique for clustering of categorical data. Then we will enhance this technique for mixed data sets which will have less complexity than previously proposed k-mean clustering algorithm for mixed data set.

Keywords - Clustering, Numerical Dataset, Categorical Dataset, Mixed Dataset.

1.0 Introduction

Clustering is one of the most important techniques which are included in unsupervised learning. It deals with finding a structure in a collection of un-labelled data. Simply, we can define clustering as “the process of organizing objects into groups whose members are similar in some way”. But two different clusters cannot have anything in common so that they can be merged in any way.

In general, clustering deals with the partitioning of a data set which consist of n points embedded in an m -dimensional space into k distinct set of clusters. Clustering can be used for pattern recognition, information retrieval, data mining, machine learning clustering algorithm such as k-mean and PAM for numerical data.

Many methods have been discovered in the field of information mining and grouping. K-mean is one of the popular methods for grouping numerical datasets. This algorithm takes the input as the number of clusters to be formed and then uses the Euclidean distance method to measure the distance between the data points. This method is only applicable for single attribute based clustering approach and not for multiple.

There are three sub-problems which are addressed by each clustering process (i) to define a similarity measure so as to find out how similar the elements are (ii) to implement an efficient algorithm to discover the clusters of the most similar elements in an unsupervised way (iii) to derive a description for characterizing the elements in a cluster. Traditional clustering algorithms use Euclidean distance to find out the similarity between two data elements. This method works fine when applied to the numeric data. But, Euclidean distance fails in case of categorical or mixed (both numerical and categorical data).

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A Review on Cognitive Radios Networks

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Abstract: Cognitive Radio (CR) shows potential for significantly improvement in the efficiency of spectrum utilization. Although some of the spectrum bands used by primary user's (licensed spectrum) are intensively used, while most of the spectrum bands remain underutilized. Today's wireless networks are characterized by a predetermined spectrum obligation policy. On the other hand, a large segment of the assigned spectrum is used intermittently and geological variations in the exploitation of assigned spectrum ranges from 15% to 85% with a high inconsistency in time. The inadequate available spectrum and the disorganization in the spectrum usage require a new communication standard to take advantage of the existing wireless spectrum opportunistically. This innovative networking model is referred to as 5G (Next Generation) Networks as well as DSA (Dynamic Spectrum Access) and CRN (cognitive radio networks).

Keywords - Cognitive Radios Networks (CRN), Medium access layer (MAC).

1.0 Introduction

The use of spectrum is rigorous on certain segments of the spectrum while a considerable amount of the spectrum remains underutilized or even unutilized. According to Federal Communications Commission (FCC) [1], chronological and environmental variations in the utilization of the assigned spectrum range from 15% to 85%. Even though the fixed spectrum obligation policy by and large served well in the past, there is a dramatic augment in the admittance to the inadequate spectrum for mobile services in the latest years. This increase is straining the helpfulness of the long-established spectrum policies.

The inadequate available spectrum and the disorganization in the spectrum handling necessitate a new communication standard to take advantage of the existing wireless spectrum opportunistically [2]. Dynamic spectrum admission is anticipated to explain these current spectrum ineffectiveness problems. DARPA's come close to Dynamic Spectrum Access network, the so-called Next Generation (xG) program aims to put into practice the rule based smart radios known as cognitive radios[3].

1.1 Cognitive Radio

Cognitive radio technology is the solitary solution that enables a subsequently invention to use spectrum in a dynamic method. The term, cognitive radio, can formally be defined as follows [20]:

“A ‘Cognitive Radio’ is a radio that can change its transmitter parameters based on interaction with the environment in which it operates.”

The disorganized handling of the vacant spectrum can be enhanced all the way through opportunistic access to the licensed bands devoid of interfering with the licensed users.

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Automated and Manual Designing Marble Cutter

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Abstract- The process of marble plates cutting in the Industry is done with both modes, automatically and manually. Nowadays as the Technology and Industry are growing and moving to Automatic mode which is expensive and the manual marble cutting requires time that are bit cheaper in the rate. We need Computer Numeric Control (CNC) machines to program, also control the hardware to find the correct direction of the marble cutting. Automated and Manual (AMM) designing machine operates both in manual and automatic mode. In manual mode it operates the machine in XY direction using manual keypad. We can cut any piece of marble by controlling the direction of motors that control the direction of XY axis. The motor will be controlled with the help of keypad. In Automate mode we operate motor with computer interface using Graphical User Interface (GUI).

Keywords - CNC, AMM, XY direction, Keypad and GUI.

1.0 Introduction

This designing plays an important in our daily life. We need designing for different purses i.e. Marble designing, leather designing, glass designing and painting etc. which required a precise designing. Man performs all these designing wok by hand so précising is an important issue in designing. For designing purposes man made a lot of struggle to make a several machines to solve this issue. In marble industry of Pakistan marble designing is the great issue, because peoples design the marble by hand. Now a day's worldwide marble is designed through computer designing graphics in which graphic user interface is used to design. Then cutting machine is controlled through computer to cut a specific design.

2.0 Steps of Cutting a Marble Piece

There are many marble cutters available in market. Their working totally depends on human effort if we want to cut a piece of marble then at least two person should be required to work on these type of cutter. First person will hold the cutter machine and second will adjust the marble piece. In this working will be very slow. Lot of time will be required to cut even single piece of marble [1][4].

Following steps are performed to cut a marble piece.

- Adjusting the huge marble sheet
- Measurement and point out a specific area
- Marble cutter remain fixed
- Spinner is use to hold a marble which break the marble
- Employ required lot of safety tools

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Home Automation Using Android Application via Wi-Fi

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Abstract: Today is a world of omnipresent mobile applications which are used exhaustively to save time and energy. These applications make human lives very easy. Hunger for automation brought many revolutions in the existing technologies due to its user friendly nature. Based on these applications and growing technologies a home automation system is presented in this paper. Aim of proposed system is to design a system to automate home appliances using Wi-Fi and android operating system. Home automation is automation of household appliances to provide more convenience, comfort and security. It helps elderly and disable person to switch ON/OFF household appliances as they do not have to move just for the purpose of switching home appliances. The controlling device for the automation is Arduino microcontroller. Control signals send from mobile phone over Wi-Fi will be received by Wi-Fi module connected to Arduino microcontroller. Microcontroller reads received signals and based on these signal information switch ON/OFF relays which are directly connected to home appliance.

Keywords - *Wi-fi, Home automation, Controlling device, Control Signals.*

1.0 Introduction

The current situation is such that people have to manually operate home appliances that at times are not feasible for busy families, elderly and disable person. Technology becomes better and more efficient with the passage of time; this efficiency is achieved by doing a deep technical research and analysis. Because of continuous increase in mobile technology its usage is also increasing in people's daily life [1]. Home automation is very promising area, which has various benefits such as providing increased comfort to people. By using this system a person can easily control home appliances remotely.

The system which is proposed in this paper is based on controlling home appliances using android mobile phone that is connected to hardware using Wi-Fi. All controlling tasks are done by using Arduino microcontroller that receives signals from mobile phone connected using Wi-Fi module and send signal to operate desired appliance.

2.0 Existing Systems

For the purpose to automate home appliances lot of work has been done by different peoples e.g. controlling home devices using Bluetooth, radio frequency, GSM module and using web server. All these system have some limitation like Bluetooth and radio frequency have limitation that user can access it from specific distance and have slow speed, so it is not very feasible. Home automation using GSM module work by sending sms to controlling devices, this system are slow and cost of sending sms is high. Now through the web server, it is not always possible to connect to internet for the sake of controlling home appliances.

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Inference Agent for Multi Criteria Decision Problems

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Abstract: In real life scenario, we may come across many situations where decision has to be made based on multiple criteria's. There may be a number of possible alternatives available to make decision but to dynamically get the optimal alternative out of the given constraints and options have always been a challenge. In this paper we presented an idea of decision making agent for problem solving through inferences. We proposed an inference based algorithm for a decision making agent to solve multi criteria decision making problems. In order to understand the proposed approach we discussed a task of identifying the best computer based on given criteria, the knowledgebase was developed using Prolog and experimental results obtained, indicates the validity and efficiency of the proposed approach.

Keywords - *Inferences, Decision making, MCDM, Optimal solution criteria.*

1.0 Introduction

Computing has automated the manual process and made much of the human task easier; evolving technology has contributing to make the job simpler and safe day by day. Soft computing techniques have a major role in decision making process. Our work in this paper, suggest an approach for evaluating the various possible alternatives to obtain the user requirements in an optimal way using inferences. This work has an attempt to make a decision making agent which can solve problems based on multiple criteria. The rest of the paper is organized as follows: First we give a brief introduction of multiple criteria decision making problems, linguistic variables. Next, then we discuss our proposed algorithm, this is followed by experimentation and evaluation. Finally we conclude with findings and scope for future work.

1.1 Multiple Criteria Decision Making (MCDM)

Multiple criteria decision making (MCDM) refers to making decisions out of given multiple criteria's. MCDM problems are common in everyday life and have widely come across in personal and business context. In personal context, for example if a person has to go for buying a personal house or a car, his decision may be based on certain criteria that can be characterized in terms of cost, size, company, style, safety, comfort, etc. In business context, MCDM problems are more complicated and usually of large scale. For example, many companies are conducting organizational self-assessment using hundreds of criteria and sub-criteria set. Purchasing departments of large companies often need to evaluate their suppliers using a range of criteria in different area, such as after sale service, quality management, financial stability, etc.

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Structural Analysis of Concrete Dam

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Abstract: The present work relates to the field of health monitoring and analysis of infrastructures such as dams, more specifically, to an integrated STAADPRO Software solution for evaluating the health status of an infrastructure based on numerical procedure to predict the crack propagation. This study deals with a three- dimensional finite element analysis of Wadi Dayqah Dam in Oman to simulate the stress distribution of the dam under a hydrostatic load.

Keywords - Gravity Dam, Structural Analysis, Stresses Distribution.

1.0 Introduction

The roller compacted concrete (RCC) dam is a combination of rock fill and conventional gravity dams. RCC dams due to their good structural behavior, fast execution, earthquake capacity and also from the economical point of view are attracted by many researchers and dam engineers in the world. The simulation of RCC dam behaviour especially its deformation and crack sensitivity has become an important field in structural analyses. Numerical simulations of the stress development may be evaluated in the design phase in order to predict the cracking development. To obtain a reliable and economical design of RCC dam, such simulations require simulating the construction processes and appropriate boundary conditions. All aspects that influence the structural behaviour with time have to be included. In addition to mechanical properties such as modulus of elasticity, tensile and compressive strength, the time dependent properties of concrete, must be considered. Saetta et al. (1995) proposed a finite-element procedure for a stress-strain analysis in the concrete structures exposed to time-variable environmental conditions. Heat generation phenomenon in massive concrete structures and seasonal and daily variations of temperature were taken into account in this work. The stress-strain-thermal analyses of 87 m height RCC Sa Stria dam located in Italy was carried out to demonstrate the effectiveness and reliability of this numerical method. Both temperature profiles and stress states due to temperature changes during and after the construction phases were evaluated. However, linear elastic structural analysis was carried out and the variation of the elastic modulus with time is not taken into account. In addition, time-dependent effect (in particular creep) was neglected.

Agullo and Aguado (1995) presented an analytical model for simulation of thermal behaviour of dams due to environmental thermal action during service. The presented model provides thermal behaviour of different sections at given height and variable thickness. In addition, it considered the presence of different variables that characterize the concrete such as; geometry, dam location and thermal environment. The result has demonstrated that, mean temperature of the section depends basically on the annual mean ambient temperature, the annual mean temperature of the water and the annual mean of total daily solar radiation at the site. However, this model is valid only during the operation phase only.

Zhu and Xu (1999) studied the thermal stresses and temperature control of the 200 m height RCC dams using two- dimensional finite element model.

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Analytical Techniques Used for Removal of Congo Red Eye Extract from Industrial Effluent Using Natural Adsorbent

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Abstract: Congo Red has been found to be one of the toxic dyes present in water obtained from industrial effluents. This study deals with the removal of Congo Red using used tea leaves which is a waste material. The sorption of Congo Red was done by batch method and its concentration determined using UV visible spectrophotometer at 550 nm. Parameters like pH, mass of adsorbate, concentration of adsorbent, time of contact and temperature were optimized. It was observed that under optimum conditions the percentage efficiency of removal of Congo Red was upto 85%. Adsorption studies were carried out using Langmuir and Freundlich adsorption isotherms. The value of ΔG , ΔH and ΔS were also calculated which showed that the process is spontaneous and the extent of adsorption decreases with increase in temperature. The kinetic studies were carried out and it was found that the reactions followed pseudo second order kinetics. This technique can be used for the removal of Congo Red from water obtained from industries.

Keywords - Adsorption, Congo red, spectrophotometry, tea leaves.

1.0 Introduction

Industrial waste water discharges coloured materials into streams and rivers which constitute one of the major sources of water pollution. Dye, a coloured constituent is widely used in textile, paper, plastic, food and cosmetic industries. Dyes cause several problems since they are stable to light and oxidation and hence they cannot be treated by conventional methods of aerobic digestion [1]. Congo Red (CR) sodium salt of 3,3'-([1,1'-biphenyl]-4,4'-diyl)bis(4-aminonaphthalene-1-sulfonic acid) is a benzidine based anionic diazo dye. This is known to metabolize to benzidine, a known human carcinogen [2]. Physico-chemical processes are generally used to treat dye laden wastewater. These processes include flocculation, electro flocculation, precipitation, electro-kinetic coagulation, ion exchange, membrane filtration, electrochemical destruction, irradiation and ozonation. However, all these processes are costly and cannot be used by small industries to treat wide range of dye waste water. [3] The adsorption process is the best technique for the removal of dyes from waste water especially if the adsorbent is inexpensive and readily available.

Activated carbon is the most widely used adsorbent due to its large surface area, microporous structure, and high adsorption capacity. However it has limited use due to its high cost. This has led to the search for cheaper adsorbents. Investigators have studied the feasibility of using low-cost substances [4] waste apricot [5], coconut shell [6] dairy sludge [7] orange peel [8], peanut shells [9], rick husk [10], bamboo [11], bagasse [12] as adsorbents for the removal of dyes from waste water.

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Vehicular Traffic Noise in Vellore Municipality, Tamil Nadu, India – An Analysis

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Abstract: Traffic noise was monitored at nine locations in Vellore on the basis of the functional classification of roadway type which comprised of three local streets, three arterial roads, and three expressways, during both day and night peak and off peak hours of traffic. Minimum, maximum, Leq, L₁₀, L₅₀, L₉₀, TNI, and L_{np noise} levels were computed. The noise levels in expressways and arterial roads were much higher when compared to the noise levels of local streets because the traffic flow volume in local streets were comparatively much lower than arterial roads and expressways. People living and working along major arterials and expressways were considerably more annoyed than those residing along local streets. Results indicate that exposure to higher traffic noise levels was naturally associated with increasing annoyance.

Keywords - Vellore, Traffic Noise, Leq.

1.0 Introduction

Noise is any sound which is unwanted or detrimental to health. Over the last two-and-a-half decades, noise pollution has become a pervasive aspect of working and living environments in most urban areas of industrialized nations. In urban areas of industrialized nations with their heavy reliance on the automobile as the primary mode of urban travel, traffic noise ranks very high on the list of environmental pollution and is considered a health hazard (Shrikanta Naik and K.M. Purohit 1999).

The study area chosen is Vellore town. Vellore, which is one of the developing cities in TamilNadu, with a population growth of 1, 75,061 as per census taken in 1991. The city besides being the headquarters of Vellore district is also an important tourist spot. The famous Jalakanteswara temple and Vellore Fort are the major spot of attraction for the tourists. The famous Christian Medical College is also situated in the heart of the city of Vellore. In addition to this it has many schools and colleges and government offices. Hence a large number of tourists and pilgrims visit this town. The city has developed in a rather imbalance form. While most of the economical/industrial activities are located in the outskirts areas, the residential colonies are growing in central and eastern parts, which are far off from industrial zones. This imbalance in the location of jobs and residences over space coupled with inadequacy of public transport system generates huge volumes of intermediate and personalized traffic especially on arterial roads.

Excessive noise due to motor vehicle depends on various factors such as (1) Condition and width of the roads (2) Presence or absence of buildings or other absorbing agents like trees on the sides (3) volume and structure of the vehicular traffic (4) Regularity of traffic flow (5) Ages of vehicles comprising the total volume (6) Disciplines of the drivers of these vehicles (7) Speed of the traffic. (Cohn .L.F. and Harris R.A. 1987)

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Video Compression Techniques -A Review Paper

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Abstract: Digital video compression technologies have become an vital part of the way we create, correspond and consume visual information .In order to fulfill the requirement of limited channel and of growing video demand like streaming media delivery on internet, and digital library, video compression is necessary and video compression has emerged as an effective technique to reduce spatial and temporal redundancy in video sequence. Temporal redundancy reduction deals with motion estimation and motion compensation. Among the different motion estimation algorithms block matching is the most common used technique. The spatial redundancy is removed by applying the DCT and the wavelet transformations. This paper is a review of block matching algorithms in temporal domain and the some transformations used in the spatial domain for video compression.

Keywords - Motion Estimation, Video Compression, Block matching algorithms.

1.0 Introduction

With vigorous advances in multimedia communication and due to those applications for digital video like Video telephony, streaming media delivery on internet, CD, DVD Cellular media, educational purpose etc. requires large storage space. Video Compression is necessary to eliminate picture redundancy, allowing video information to be transmitted and stored in a compact and efficient manner.

Why can video be compressed? The reason is that video contains much spatial and temporal redundancy. In a particular frame, nearby pixels are often linked with each other. This is called spatial redundancy, or the intraframe correlation. Another one is temporal redundancy, which means adjacent frames are highly interconnected, or called the interframe correlation. Therefore, our goal is to efficiently reduce spatial and temporal redundancy to achieve video compression.

2.0 Removal of Temporal Redundancy

In order to remove the temporal redundancy of the video we have to perform the following steps:

2.1 Motion Estimation

At first, we divide current frame into non-overlapping 16x16 macro blocks. For each macroblock, find the best matching block in a reference frame. That is to say, motion estimation of a macroblock involves finding 16 x 16 blocks in the search area in a reference frame that closely matches the current macroblock. The reference frame is a previously-encoded frame from the sequence and may be before or after the current frame in display order. The search area in the reference frame is centred on the current macroblock position.

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Organic Matter Strength in KALATHUR (klt), ADHANUR (adn) and PODUGAI (pdg) Soil Series of Mayiladuthurai Taluk - India

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Abstract: Organic Matter (OM) is an important source of nutrients for plants and it has essential macronutrients and micronutrients such as iron, manganese, zinc, copper, boron, molybdenum, etc.,. Increase in OM are seen as desirable by many farmers as higher levels are viewed as being directly related to better plant nutrition, ease of cultivation, penetration and seedbed preparation, greater aggregate stability, reduced bulk density, improved water holding capacity and enhanced porosity. Besides, organic matter in the soil that protects soil from its degradation. The location of experiment site was Mayiladuthurai Taluk that covers 67 revenue villages and extending 24,485 ha. It occupies 10.54% area of Nagapattinam district, Tamilnadu, India. There were 335 soil samples five from each village analyzed for soil organic matter. The strength was ranged between 0.24% and 0.84% with an average value of 0.58%. The low value (0.24%) was observed from Kozhaiyur village and the highest value (0.84%) was recorded from Ivanullur village. The distribution of soil samples of this taluk was 100 % low and none samples recorded under medium and sufficient level. The nutrient index class and nutrient Index value was calculated. The regular reclaiming process is suggested.

Keywords - Organic Matter, fertility, nutrient index, Village, Soil.

1.0 Introduction

Several elements take part in the growth and development of plants, and those absorbed from the soil are generally known as plant nutrients. Besides these, the plant takes up carbon, oxygen and hydrogen, either from the air or from the water absorbed by the roots. In all, 16 elements have been identified and established to be essential for plant growth. There are carbon (C), hydrogen (H), oxygen (O), nitrogen (N), phosphorus(P), potassium (K), calcium(Ca), magnesium (Mg), iron (Fe), sulphur (S), zinc (Zn), manganese (Mn), copper (Cu), boron (B), molybdenum (Mo), and chlorine (Cl). These elements serve as raw materials for growth and development of plants, and formation of fruits and seeds. Most of the essential elements are found in liberal quantities in the mineral soils. In spite of the fact that these are available in plenty, these may not be available to the plants, as they are tied up in mineral and chemical compounds. The roots cannot absorb and deliver them to the growing plants for synthesis, and hence, the need for assessing the plant available amounts of nutrients in the soil and meeting deficiency by application of manures and fertilizers to such soils for optimum crop production. Organic matter in the soil is the compose of many essential nutrients; on decomposition it gives such nutrients for the plant growth, so that plant growth, crop production and economy and income of the former depends on the fertile land. Sufficient Organic Matter (OM) in the soil plays important role and it is necessary to maintain such level of OM in the soil that protects soil from its degradation. Hence study OM in the soil gives much importance.

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Improved Security for Medical Images Using BIOCRYPT Systems

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Abstract- In this informative age everything is digitalized and the usage of digital images are found in almost all sectors. Some important information such as medical images are stored and retrieved in digital formats requiring high degree of security. There are many methods available for providing security, among those cryptographic encryption algorithms play a vital role. Nowadays, even the cryptographic keys are being hacked. In order to prevent this, the proposed method contains some additional security techniques applied to the key. Here security is provided by three methods – scrambling the image blocks, encrypting the scrambled image and applying biometrics to the key. Finger print is the chosen biometric as it is easy to retrieve and process. Encryption is performed using Blowfish algorithm which is the fastest and the strongest in processing and storing the image. At the decrypting end, the biometric template matching is adopted to check whether the given finger print at decryption side is authorized and the scrambling method adopted at encryption end should be applied in inverse.

Keywords - Image processing, Biometrics, Scrambling, Encryption, Decryption, Cryptography, Blowfish, Feistel network.

1.0 Introduction

In general, image processing is carried on with the two dimensional images and are known as digital image processing. The processed images are those images upon which the required operation can be performed. In order to use the images among various hardware devices, processing has to be adopted. Digital images are the best means for representing the information pictographically. Digital images are the recent efficient means of communication adopted almost in all fields. Medical images are obtained as the result of diagnosis upon human body by doctors and radiologists. Once the parts of human body are being visualized, it becomes easy for further diagnosis and also to identify the stages of improvement.

As for the current computerized world, these medical images have to be processed in such a manner that they are easily available for all basic operations on computer such as store, retrieve, process and transmit over the internet.. Medical images can be protected by cryptographic method. Even the encrypted image can be accessible by the intruders if the key is known. So the cryptography can be used with biometrics for enhancing the security of medical images.

1.1 Cryptography

Cryptography is the traditional and efficient means of providing security to the data. The two main steps followed in cryptography are encryption and decryption which involves transforming of original data into an unreadable format [cipher text] and then converting the cipher text back to the original format. Keys are essential to perform encryption and decryption.

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Eco-Urban Retrofitting – A Case Study

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Abstract: The idea of the Eco-Urban Retrofitting, needs to condense the actualized plan decisions, concentrated on the upgrade, re-use and re-structure of the current urban fabric through the convenient combination with new structures, new capacities and spaces of socialization, for example, squares, patios, private greenery enclosures, parks, kitchen gardens (with aggregate nurseries) and in addition strolling and cycling ways. The system embraced in planning urban settlements contemplates the passionate effect on the personal satisfaction of people made by the vicinity of recorded structures.

An immediate outcome of this is the preservation and practical change of part of the current structures in the urban connection. The future decent feeling exuded by this sort of new places must be given by the impression of being custom-made for individuals, removed from estranging space sensations. The effect of a heterogeneous settlement, grasping new structures of two, three and four levels together with old structures, will pass on sentiment tenability to the occupants, recuperating the zone's history and centering the human measurement in urban and building design outline.

The objective is to make Nyhavna district not only eco-friendly, affordable and sustainable in relation to energy use (targeting zero CO2 emissions) but, also featuring soft mobility, reuse of rainwater and of using natural materials in buildings in a way of linking the urban district to the human dimension. A modern lifestyle needs of reconnecting the social relations to daily life.

Keywords - Urban fabric, Retrofitting, Sustainability, Lifestyle.

Case Study in Trondheim, Norway

1. Introduction and Retrofitting Strategy

Very often the historical memory of an area is not an obstacle to construction, but rather an added value for the arrangement of public places, an irreplaceable element of urban quality, fruit of the long sedimentation of fragments of social life. And the historicity of a place itself already enfolds the solution for the integration of the new housing needs with connections at an urban level.

Nyhavna district is characterized mainly by a low rise urban fabric of protected cultural historical buildings and for this reason, the huge mass of Dora building, former Second World War bunker for submarines (Figure 01), is massively impacting the all area, requiring specific strategies to mitigate and integrate it into the urban pattern.

The quality of life is frequently measured in terms of chances to enjoy moments, places, areas to us familiar, in which we feel part of a community. The choice to maintain and updating part of the existent buildings, almost as to form an ideal “backbone” for the neighbourhood, with all its ramifications, is aimed at recreating a meeting point for the residents in which everyone can identify oneself.

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