

Prediction of NO_x Concentration in the Vicinity of Cement Industry Employing AERMOD Dispersion Modeling



S. Anand Kumar Varma, K. R. Manjula, and Jayato Nayak

Abstract NO_x is one of the major pollutants that evolves from the cement industries during the high-temperature calcination in the rotary kiln. Air quality modeling techniques are cost effective than measurement but are data intensive as modeling requires emission and meteorological data. In the present study, the prediction of the concentration of NO_x in and around the area of ULTRATECH cement Industry located at Tadipatri, Anantapur, India has been reported. A dispersion modeling technique AERMOD is used for the prediction of emission rate of criteria pollutants were obtained from supplier's specification and direct measurement. In Level 1, prediction and measurement of NO_x concentration for 24 hrs was performed where, in Level 2, assessment was carried out using refined AERMOD 9.1 model with site specific hourly data. Analytical results show that emission inventory obtained from supplier's specifications and direct measurement are comparatively equal. Predicted parameters of emission were evaluated for different key pollutants where previous emission data is not available. Yearly emissive flux were furnished from estimated values of emission factors and activity in the the study area. Low relative error (<0.05), high coefficient of regression (R^2 0.8–0.95) and willmott-d-index (≥ 0.95) reflects the accuracy of the study.

Keywords Cement industry · NO_x · Modeling · AERMOD · Prediction

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1 Introduction

Nitrogen oxide is one of the extremely prominent pollutants in the atmosphere. It is generally produced as an intermediate product while the large scale synthesis of nitric acid. In case of cement industries, for the production of portland and other cements, high temperature kilns are employed to enhance pyroprocessing for the production of calcium silicates. Cement Industries provide excellent job opportunities from basic labourer to higher authority and thus acts as a key reason of not only inflated local pollution but also deterioration of health of localite. Cement industry constitutes one among the major sources of production of nitrogen dioxide [1]. The evolving concentration of NO_x formed depends greatly on the average calcination temperature. As per Central Pollution Control Board of India, the permissible limit is prescribed as $\leq 80 \mu\text{g}/\text{m}^3$ to maintain the ambient air quality standards. NO_x , generally Nitrogen oxide or Nitrogen-di-oxide stands out to be excessively polluting with properties of sharp, biting, odor can create respiratory problems and neuro disfunctions. Moreover It is reckoned as the main ingredient to react with ozone and formation of peroxy-acetylene-nitrate, a secondary pollutant. Exposure to the laborers and working staffs in the industrial house face huge occupational health risks due to which, the National Institute for Occupational Safety and Health (NIOSH), USA has compelled to maintain exposure limits by safety standards [2]. This is why air quality modeling turns crucial in the present timeline of advanced industrialization and automation to be aware, monitor and minimize the detrimental effect of such pollutants. Lack of technical research in this area; specifically for the cement industries, this research need was felt to be fulfilled and this issue to be addressed. This can be performed by observing the behavior of pollutants, their evolution and reason for their propagation among the various pollutants. This is why this research was carried out on a large scale cement production plant of India i.e. ULTRATECH cement Industry at Anantapur, Andhra Pradesh. Analytical approach through dispersion modeling technique can predict the pollutant concentration in future and also for those cases where, existing data are not available. Such approach is extremely urgent making the industrial authority aware about the release/leakage of polluting gases in atmosphere from operating sites while bringing down the cost and complexity of data handling in air pollution modeling techniques.

2 Study Area

The ULTRATECH cement industry is the biggest cement company in India. The production site at Tadipatri, Anantapur, Andhra Pradesh, India is a large-scale unit with the production capacity of 4.9 Million Tonnes Per Annum with approximately 5000 working employees. The unit has also established thermal plant 2.25 MW. The geographical location of the site confines to average elevation is 223 m at latitude of 14.92° N and longitude of 78.02° E surrounded by a local human population of

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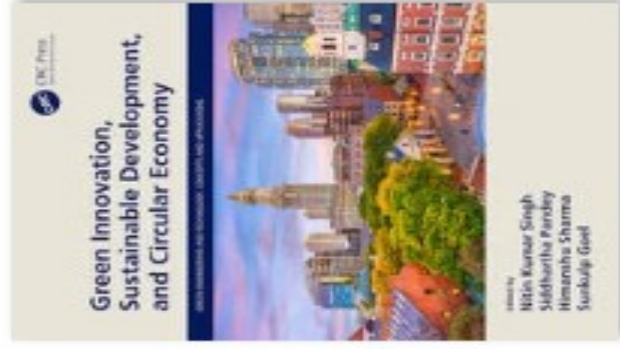
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On the Assessment of Microhardness and Microstructure of Electro Discharge Coated Magnesium Alloy

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C. Senthilkumar³, V. Navaneethakrishnan⁴

Abstract

Electrical discharge coating (EDC) is the surface modification process, is used to develop the hard composite coating on the workpiece surface with powder metallurgy electrode. In this present investigation, mixture of WC/Cu composite coating is deposited on the ZE41A magnesium alloy by using this technique. Parameters (compaction pressure, current and pulse on time) on micro hardness and microstructure are studied. EDC with low compaction pressured electrode, high current and pulse on time provides the higher material deposition rate (MDR) and micro hardness (MH). Further, deposited surface is characterized by scanning electron microscope (SEM) and energy dispersive spectroscopy (EDS). Craters and globules observed at deposited surface that affects the roughness.

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Performance validation of clustering algorithms using selection of attributes and application of filters in terms of data reduction

P. Hemavathy✉, M. Chinnadurai

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Summary

Clustering in unsupervised learning is a method to find inherent group of set of unlabeled data. Such set of groups are termed as Clusters. Grouping of datasets in to clusters involves minimization of the interclass similarity and maximization of the intraclass similarity. Therefore, clustering the large datasets introduces the concept called Data Reduction. Data reduction is a simple process of identifying a relevant feature subset, which is enough to represent the selected large datasets. Here, the data reduction is done in terms of applying two clustering algorithms like Expectation and Maximization-EM and K-Means with filters in unsupervised category (i) Normalize filter in Instance level and (ii) Randomize filter in attribute level and selection of attributes. The results shows that the Livestock dataset applied with selection of attributes and preprocessing filter named Normalize in attribute level and Randomize in instance level on which the EM and K-Means algorithm are executed, and the results are compared and analyzed in terms of data reduction. Therefore, the K-Means algorithm applied with Randomize filter at instance level and selection of attributes and finally K-Means algorithm show good performance in case of large datasets when compared with other clustering algorithms.

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PREDICTION OF SOIL MOISTURE USING KNN ALGORITHM FOR SMART AGRICULTURE USING IOT

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ABSTRACT

This venture uses the Arduino – UNO and various sensors. In India the greater part of the individuals can be live contingent upon agribusiness. The framework proposed right now an idea with respect to shrewd cultivation using Internet of Things (IoT). They are taking generally manual works in the cultivation land. It decreases the vitality level of human and it had numerous issues to recognizing the issues in the farming area. Right now, been decrease crafted by the human and it has been completely computerized framework to distinguishing the issue and start the work in the horticulture land. The paper takes every main consideration of agribusiness for example observing, water system and security. The approach utilized right now screen the dampness, dampness level and can even distinguish movements. As indicated by the information got from all the sensors the water siphon, shaper and sprayer

get consequently initiated or deactivated. Based on the humidity sensor reading heater or cooling fan is automatically turned on. Similar way the motion sensor if detects any theft then an alarm is turned on to notify the farmer. The KNN algorithm used for the prediction on the sensing system.

Keywords: IOT, Arduino UNO, Sensors, KNN, Prediction

I. INTRODUCTION

The Internet of Things (IoT) is that the web of things that's won't to access the items remotely [1]. Agriculture may be a hottest and customary source of income in India, about 70% of India's population depends on agriculture to fulfil their basic necessities. This shows a requirement for automating this process to reinforce the productivity of crops which successively will give us better revenues. Statistics says that within the past few years the assembly of crops in India has been fallen right down to a greater extent which successively



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HOTEL RECOMMENDATION SYSTEM BASED ON HYRID RECOMMENDATION MODEL.

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Abstract

This project develops a hybrid model that combines content-based with collaborative Filtering (CF) for hotel recommendation. This model considers both hotel popularity in input destination and users preference.

It produces the prediction with 53.6% accuracy on test data-4% improvement on purely content-based model. Additionally, three issues are well-resolved when implementing CF: sparsity in utility matrix, cold-start, and scalability.

Keywords: Collaborative Filtering, Content-based, SVD, Hierarchical clustering, Decision tree.

I. Introduction

The goal of the project is to develop a hybrid model for better hotel recommendation. At this moment, the majority of the recommendation systems are content-based models, which only consider the searching paramaters input by customers but not the users preference. For instance, Expedia focuses on the searching criterion and recommends the top popular local hotels. Personalizing the user search by their preference is a burning need for better hotel recommendation. Collaborative filtering is considered as the starting point of this project. It has been widely used in recommendation systems but rarely in hotel recommendation. Nevertheless, there are still related works. Ryosuke Saga. et al[1] created a preference transition-based network system to recommend hotels. By tranversing user booking history, a transition network of user preference is constructed to do recommendation. But the network is too

specific to accept new users and detect the further changes of old customers. Xiong Yun-ning.et al[2] came up with a personalized intelligent hotel recommendation system for online reservation. This research firstly extracts Hotel Characteristic factors, attempts to analyze customers browsing and purchasing behaviors and secondly constructs a personalized online hotel marketing recommendation system polymerization model for Multi-level customers. They combined user-item sytem and achieved positive outcomes. But it does not expand for new users. In this project, hybrid model is applied to combine user preference and item properties. Based on the final comparison of accuracy, the model achieves good results. More Details are as follows.

II. Methodology

In this part, three models will be introduced. Content-based model and collaborative filtering are traditional methods in recommendation system. Hybrid model compensates the shortcomings in two models by combining these two models successfully. At the same time, it introduces new methods.

A. Content-based Model

Content-based filtering is a common approach in recommendation system. The features of the items previously rated by users and the best-matching ones are recommended. In our case, the local popularity of the hotel clusters based on ratings by users is used to be the main feature in the contentbased model. More details will be explained later. There are three main shortcomings of this approach[3]:



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Distributed Dealership Network Analyzer and Sales Monitor

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ABSTRACT:

These days we observe large enterprises in manufacturing business. At such time estimating the live deals over all systems can't be cultivated through any manual technique here we have to utilize web to all in all get information from the live business systems and afterward process them at the framework. This procedure totally robotizes the procedure since the information is taken care of by each seller separately and the business information goes straightforwardly to the framework for the organization to dissect and make future interest expectations

KEYWORDS:

- ❖ Feasibility Analysis
- ❖ Technical Feasibility
- ❖ Operational Feasibility
- ❖ Economic Feasibility

INTRODUCTION:

A Distributed Dealership Network Analyzer dot net project report management system (DMS) or auto dealership management system may be a bundled management system created specifically for automotive business automobile dealer ships or massive instrumentality manufactures. Competition for market share is at an all-time high with unprecedented pressure to increase customer satisfaction, while making sales and service structures and processes more efficient. Our DMS features easy-to-use, fully integrated modules to suit your dealership needs in accounting, sales, parts, service, spares and more. DMS is effectively a "lite" version of the systems which are used by automotive company and their dealers to manage their operations.



Reinforcement Learning For Flight Ticket Pricing

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Abstract— Nowadays, airline ticket prices can vary dynamically and significantly for the same flight, even for nearby seats within the same cabin. Customers are seeking to get the lowest price while airlines are trying to keep their overall revenue as high as possible and maximize their profit. Airlines use various kinds of computational techniques to increase their revenue such as demand prediction and price discrimination. From the customer side, two kinds of models are proposed by different researchers to save money for customers: models that predict the optimal time to buy a ticket and models that predict the minimum ticket price. In this paper, we present a review of customer side and airlines side prediction models. Our review analysis shows that models on both sides rely on limited set of features such as historical ticket price data, ticket purchase date and departure date. we collected Google flights pricing data in the form of JSON files using the Google QPX Express API service.

Keywords— Survey Ticket price prediction, Demand prediction, Price discrimination, Deep learning line.

1. INTRODUCTION:

Airlines employ complex, secretly-kept algorithms to vary flight ticket prices over time based on several factors, including seat availability, airline capacity, the price of oil, seasonality, etc. At any point in time, a customer looking to purchase a flight ticket has the option to buy or wait (in the hope of the flight price reducing in future). However, since they lack knowledge of these algorithms, customers often default to purchasing a ticket as early as possible rather than trying to optimize their time of purchase. However, vast quantities of data regarding flight ticket prices are available on the Internet. Through this project, we hoped to use this data to help customers make their decisions. We created an airline ticket-buying agent that tries to buy a

customer's flight ticket to optimize for price of purchase. Kayak's price predictor/Hopper/Google Flights provide some directional help in the flight booking process but we are trying to improve up on them by creating an agent that can make the purchases on our behalf. As input, given a customer looking to purchase a particular flight ticket at X hours before departure, our algorithm outputs a decision of buy (purchase the flight ticket now) or wait (wait until the next time step to re-evaluate whether to make a purchase). The models we built include a baseline model, Q-learning, and a Deep Q-Network. These theories are not mutually exclusive. Nevertheless, the revenue management literature focuses primary attention on variation in prices associated with different customer groups, and does not provide the sharp predictions regarding the allocation of capacity in high demand states found in either Dana or Gale and Holmes. This paper tests between these groups of theories. The last two decades have seen steadily increasing research targeting both customers and airlines. Customer side researches focus on saving money for the customer while airline side studies are aimed at increasing the revenue of the airlines. Conducted researches employ a variety of techniques ranging from statistical techniques such as regression to different kinds of advanced data mining techniques.

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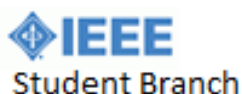
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IOT BASED SMART NAVIGATIONAL SHOES FOR THE WOMEN

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Abstract:

Now a days, women and children safety is a prime issue of our society. The counts of the victim are increasing day by day. Many unfortunate incidents have been taking place regularly. All they need is a device to notify the concerned regarding attack and that can be carried everywhere easily. Also in this age of technology, mobile phone is one of the gadgets that almost everyone uses to keep in touch with family and friends. This paper discusses the design of such an embedded device. This proposed model uses a microcontroller based embedded device to be placed inside the women shoe and an android application specially designed for Safety of Women. In this paper, an attempt has been made to develop a smart device that can assist women when they feel unsafe. This smart device will be clipped to the footwear of the user and can be triggered discreetly. On tapping one foot behind the other four times, an alert is sent via Zigbee module Low Energy communication to an application on the victim's phone, programmed to generate a message seeking help with the location of the device attached. In such situations, the aid of a safety device that will inform the victim's family members or the authorities (in severe situations) may help women feel safer, confident and reduce the chances of harassment.



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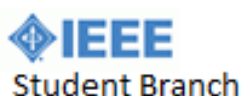
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WIRELESS POWER TRANSMISSION FOR HYBRID SYSTEM USING MAGNETIC RESONANCE COUPLING

Jenifer. M¹, Anandaraj. R², Dr. T. Suresh Padmanabhan³

Department of EEE, E. G. S. Pillay Engineering College, Nagapattinam, Tamil Nadu, India

Abstract:

Wireless Power transmission is the transmission of electrical power from the source to load without the use of wires thus increasing the mobility, convenience, and safety of an electronic device for all users. Previously wireless transfer of power has been achieved for AC source for charging batteries. In this project the wireless power transfer (WPT) of the hybrid system (solar and wind) using magnetic resonance achieved by using an intermediate resonant coil. Since the output from hybrid system is very small it has been stepped up to appropriate values using the DC-DC step up converter. A helical coil and a spiral coil with an additional capacitor are considered as resonant coils which is placed between the transformer setup generates the time-varying electromagnetic field to maintain the resonant state. The magnetic resonance frequency making the transmitter coil and receive coil works in the resonance state of strong coupling. The intermediate resonant coil is set up coaxially and perpendicular to both the Tx and Rx resonant coils in order to observe the efficiency change according to the change in resonance. The results show that the resonant frequency calculated through the magnetic resonance coupling model improves efficiency and extends the distance between the transmitter and receiver.



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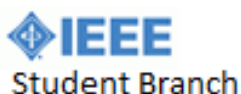
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SEVEN LEVEL MULTILEVEL INVERTER USING RV CONTROL TOPOLOGY WITH HIGH FREQUENCY OF AC POWER DISTRIBUTION

Rajeswari R¹, Dr. V. Mohan², Dr. T. Suresh Padmanabhan³

Department of EEE, E. G. S. Pillay Engineering College, Nagapattinam, Tamil Nadu, India

Abstract:

Multilevel inverters have been widely accepted for an essential part of high-power high-voltage applications. They have highly superior performance when compared to conventional inverters in terms of reduced harmonic distortion, lower electromagnetic interference, and higher dc link voltages. At the same time, they have certain disadvantages such as increased number of components, complex pulse width modulation control method, and voltage-balancing problem. A new topology that compensates to proposed in this work. This topology with a reversing voltage Multi Input switched capacitor component the inverter inherently solves the problem of capacitor voltage balancing as each capacitor is charged to the value equal to one of input voltage every cycle. Fewer components compared to existing inverter (particularly in higher levels), fewer carrier signals and gate drives. Hence, the overall cost and complexity are greatly reduced particularly for higher output voltage levels. Finally, a prototype of the seven- level proposed topology is built and tested to show the performance of the inverter by experimental results.



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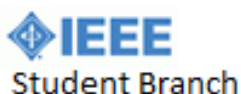
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DESIGN AND IMPLEMENTATION OF DRAINAGE CLEANING ROBOT FOR ECO-GREEN ENVIRONMENT

Dr. G. Ganesan @ Subramanian¹, S. Agathiyar², Dr. V. Sivaramakrishnan³,

G. Sundaravadivel⁴

¹*Department of EEE, E. G. S. Pillay Engineering College, Nagapattinam, Tamil Nadu, India*
²*ONGC, India.*

^{3,4}*Department of Mechanical, E. G. S. Pillay Engineering College, Nagapattinam, Tamil Nadu, India*

Abstract:

Nowadays, the recent development in robotics has enabled robot technology to solve many practical problems that humans encounter in day-to-day activities. But, even today manual scavenging of the drainage is practiced in all places of India, wherein men enters the manholes and clean the waste materials in the drainage manually with no technical equipment. It is a dreadful process where the drainage wastes are cleaned by the people that may include the basic tools like buckets, brooms for disposing the drainage wastes. This practice might jeopardize the lives of humans; therefore, a drainage cleaning robot is essential to replace the human intervention. The overflow of drainage water leads to several hazards to the environment. The method used nowadays contains pumps to suck the drainage water but it fails to clean the rock solids inside the drainage hole. In order to overcome this issue, this project presents a cleaning system of drainage using robot which is based on intelligent mechanisms which is an attempt made to design and develop an ARM robot, which can be controlled by us and efficiently cleaning and disposing the drainage wastages.



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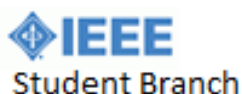
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CASCADED MULTILEVEL INVERTER WITH MPPT FOR GRID CONNECTED PV SYSTEM

Natarajan.S¹, M.Vijayakumar², Dr.T.Suresh Padmanabhan³

Department of EEE, E. G. S. Pillay Engineering College, Nagapattinam, Tamil Nadu, India

Abstract:

This paper presents a cascaded multilevel inverter with MPPT for grid connected application. The main purpose of this paper is to design a multilevel inverter based on simulation and develop the Simulink model of cascaded multilevel inverter for grid connected pv system. Used individual MPPT technique for each solar panel to extract maximum power from solar panel and it is improve the overall efficiency of system. The simulation model has been developed by using MATLAB/Simulink. The general cascaded multilevel H-bridge inverter design is also implemented in hardware to demonstrate a novel low-cost MOSFET driver build for this study. The hardware setups use MOSFETs as switching devices and low-cost ATmega microcontrollers for generating the switching pulses via level shifted in-phase disposition pulse width modulation. This implementation substantiated the effectiveness of the proposed design.



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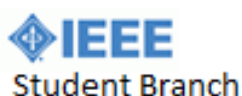
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PV BATTERY CHARGER USING L3C RESONANT CONVERTER FOR ELECTRICAL VEHICLE APPLICATIONS

Ramesh.M¹, Dr. T. Suresh Padmanabhan²

Department of EEE, E. G. S. Pillay Engineering College, Nagapattinam, Tamil Nadu, India

ABSTRACT

In Electric Vehicles with roof top PV panels, the solar irradiance and surface temperature can affect their performance and output voltages (e.g., $V_{pv} = 24-45VDC$). In these systems, the maximum energy must be extracted from the variable input voltage (PV panel), boosted by different gains, and stored in voltage battery packs. Furthermore depending on the battery state of charge, the charger should operate in constant voltage, constant current, or constant power modes, all the way from complete discharge condition, up to the charged floating voltage phase ($V_{bat} = 230 - 430VDC$). This combination of the variable PV input voltage and different states of charge creates a significant regulation challenge for the converter. In this paper, a high efficiency fourth order *L3C* resonant converter is proposed with an extreme voltage regulation capability that can effectively extract the maximum power from the PV panels and respond to the battery states of charge at different voltage and current levels. The experimental results from a 350W prototype prove the features of the proposed *L3C* resonant converter and demonstrate its ability to track the maximum input power while responding to the battery various states of charge.



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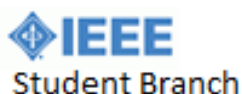
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MINI SURVEILLANCE CAMERA USING APK BASED ON IOT

Sathyanarayanan¹, Dr. T. Suresh Padmanabhan²

Department of EEE, E. G. S. Pillay Engineering College, Nagapattinam, Tamil Nadu, India

Abstract:

Internet of Things offers user interoperability and connectivity between devices, systems, services, networks and in particularly control systems. This paper details the design and development of IoT based security surveillance system using Raspberry Pi Single Board Computer (SBC) with Wi-Fi network connectivity. Adding wireless fidelity to embedded systems will open up various feasibilities such as worldwide monitoring and control, reliable data storage etc. This system comprises of sensor nodes and a controller section for surveillance. Remote user alerts, video streaming, and portability are the prime features of the system. Wi-Fi enabled microcontroller processes the sensor-based events upon receiving the event notification, the controller enables the camera for capturing the event, alerts the user via email and SMS and places the video of the event on client mail. Raspberry Pi eliminates the need for a wireless transceiver module in a sensor node, thus it makes the node compact, cost-effective and easy to use. The biggest advantage of the system is that the user can seek surveillance from anywhere in the world and can respond according to the situations.


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Use case on Robust Visual Tracking via Neuro Fuzzy Inference System for Societal communities

M. Srinivasan, R. Sudha, +1 author, D. A. S. Raj • Published 2020 • Computer Science

Object tracking has becoming a huge part in many real-time applications like video surveillance, human-computer interaction, and various automation process. Tracking of an object in real-time process is very complicated because the object is in motion. Algorithm used for image processing are inefficient for this process because they are taking a considerable time for processing a real-time video. Hence this paper proposes a technique to the social communities for object tracking using... [Expand](#)

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A Social origin of application in the Detection of Accident Location and Ambulance Rescue System Using GSV

L. Ramachandran¹, R. Nadhiya², S. Senthilkumar³ & Dr. A. Sundar Raj⁴

^{1,3}Assistant Professor, Department of ECE

²PG Scholar, Department of ECE

⁴Associate Professor, Department of ECE

^{1,2,3,4}E.G.S. Pillay Engineering College, Nagapattinam, India.

Abstract

In present days, number of accidents is in increasing number all over the world and the death rate due to accidents is also increasing. Many of the accidents become unnoticeable due to many reasons, especially accidents happening in night time and out of the city are in worst case. Loss of lives due to accidents are mainly because of the delayed treatment given to the patient. Hence this paper proposes a fully automated system for detecting the accidents. By using this system we can reach the accident victim by time. This system includes accelerometer for sensing the velocity and amount of tilt of the vehicle. Global Positioning System (GPS) and Global System for Mobile Communication (GSM) is used for tracking the location of the vehicle and sending alert message regarding the accident respectively. Arduino controls the overall process. An average velocity is pre-defined for the vehicle, if the accelerometer senses velocity above the maximum pre-defined velocity the system will automatically warn the user. And an alert message with the latitude and longitude value of the accident location will send to the family members of the person in vehicle, ambulance and police station. So that the user in the vehicle can get rescued quickly. This proposed method also includes an ambulance unit and hospital unit for the timely treatment of the individual person and also to the group of peoples keenly in mind as a social cause.

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