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Real-Time Sign Language Recognition System for Hearing and Speech Impaired People

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Abstract: People with hearing loss frequently use sign language to interact with their community and communicate with others because it is largely a visual form of communication. It requires the use of manual gestures, nonverbal facial clues, and body motions, unlike spoken language, to express thoughts and convey meaning. The goal of Sign Language Recognition (SLR) is to identify, interpret, and translate these signs into the appropriate speech or text. For those with speech and hearing impairments, sign language is an essential tool for communicating with others and exchanging ideas. This paper proposes a novel method for recognising individual alphabet signals in sign language so that words can be formed from them. This is accomplished through the application of a deep learning network, which can detect the signs and output the corresponding text. Additionally, the recognized individual characters can be sequentially utilized to form words, which can then be converted into voice output.

I. INTRODUCTION

Sign language is a crucial means of communication for tens of millions of individuals worldwide who experience hearing disabilities and an estimated 28 to 32 million people globally, and around 28 to 32 million people uses American Sign Language (ASL) in the United States for communication alone. Unfortunately, the vast majority of non-hearing-impaired individuals have limited familiarity or understanding of sign language, leading to a communication barrier. While sign language recognition (SLR) systems have been created, effectively identifying sign language is challenging due to its complex structure, involving both delicate finger movements and broad arm gestures. Many SLR systems are vision, acoustics, radio frequency (RF), and inertial measurement unit (IMU) sensors based, but most of these systems are unable to continuously recognize sign language, which results in issues with accuracy. They divide sentences into gestures and perform isolated recognition, which is imprecise due to the challenge of detecting gesture boundaries in continuous signals. While certain vision-based systems can continuously recognize entire sentences, they are not effective in capturing delicate finger movements and are vulnerable to background noise and texture. To tackle these obstacles, we have produced a real-time end-to-end SLR system that employs an innovative approach for detecting manual or hand gestures.

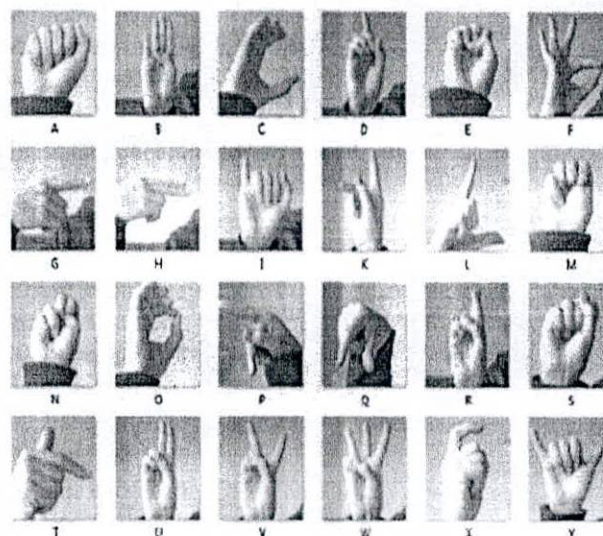


Fig. 1. Sign Language Hand Gestures

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Analysing Cryptocurrency Pump and Dump Scams through Social Media

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Abstract: Over the past few years, despite their vulnerability to market manipulation owing to limited liquidity, cryptocurrencies have attracted a lot of public attention and investment. More than \$100 billion is currently traded on cryptocurrency exchanges each month, and individuals who are not necessarily experts in the field have begun purchasing these digital assets. A multi-modal technique is being utilised to identify and measure coordinated pump and dump scams that are carried out on bitcoin exchanges using social media platforms like Telegram. This strategy attempts to anticipate if a pump effort will be effective by evaluating a variety of parameters.

Index Terms: Pump-and-Dump, Cryptocurrency, Market Manipulation, Social Media, (Convolution neural network) CNN, LSTM (Long Short Term Memory), deep learning, Candidate Elimination.

I. INTRODUCTION

The popularity of cryptocurrencies as a form of investment has increased lately but the absence of regulation and transparency in the sector has made it susceptible to market manipulation, particularly in the form of pump-and-dump schemes. A group of traders artificially inflate the price of a certain cryptocurrency by coordinating their purchases and disseminating false information about the asset's potential value. The traders sell their shares when the price hits a certain point, which causes the price to fall and leaves other investors with huge losses. The establishment of the well-known cryptocurrency Bitcoin (BTC) was a crucial milestone enabled by the advent of blockchain technology. Following the first debut of various new cryptocurrencies, trading platforms suffered significant price volatility. These price movements increased the attraction of cryptocurrencies by allowing some investors to earn significantly. Despite the fact that the bulk of investments are made in more well-known cryptocurrencies such as Bitcoin (BTC) and Ethereum (ETH), there are hundreds of additional smaller cryptocurrencies. The fraudulent "pump and dump" method of market manipulation is increasing the price of a particular investment that belongs to the manipulator and then selling it to other investors at a much higher price.

A. Problem Statement

The issues with bitcoin pump-and-dump schemes could significantly influence investors' financial well-being, particularly those who are new to the market or lack experience in discerning such fraudulent operations.

A few crucial questions are raised:

- 1) Pump-and-dump schemes can artificially inflate a cryptocurrency's price, leaving investors who invested at the peak with significant losses when values fall.
- 2) Because the Bitcoin market is mostly unregulated, dishonest individuals can take part in pump-and-dump schemes without worrying about facing penalties.
- 3) Pump-and-dump scams may rely on coordinated efforts by large groups of traders who use social media and other online forums to spread false information and inflate the value of a particular currency, making it hard for investors to spot them.

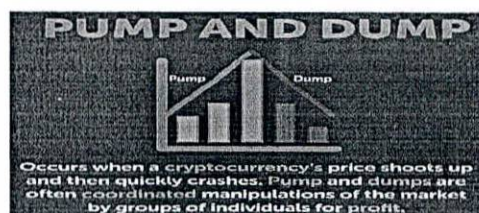


Fig 1: Visualization of a pump-and-dump scheme



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Deepfake: Creation and Detection using Deep Learning

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Abstract: The aim of this study is to develop customized photo-realistic talking head models, which refers to the creation of systems capable of generating believable video sequences that mimic the speech expressions and facial movements of a specific person. The authors propose a system that can produce talking head models using just a few photographs, a technique known as "few-shot learning," and with minimal training time. This system is capable of generating a plausible outcome using just one photograph, and additional photographs enhance the level of personalization. The authors present a system that can perform few-shot learning by conducting meta-learning on a vast collection of videos, which allows it to address the neural talking head models of new and unseen individuals as adversarial training problems with high-capacity generators and discriminators. The system can personalize both the generator and the discriminator's parameters based on each person, enabling training to be performed quickly with only a few images, despite the need to fine-tune millions of parameters.

Index Terms: deepfake, deep learning, few shot learning, one shot learning, convolutional neural networks.

I. INTRODUCTION

Deep learning, which is also referred to as deep structured learning, is a category of machine learning techniques that is based on artificial neural networks with representation learning. This type of learning can be done through supervised, semi-supervised, or unsupervised methods. Deep learning has played a significant role in image processing by providing powerful models that can automatically learn and extract features from images. One example of such models is Convolutional Neural Networks (CNNs), which can be used for various tasks including image classification, object detection, segmentation, super-resolution, and more. Compared to traditional image processing techniques, CNNs have outperformed and are currently considered state-of-the-art in many tasks.

Deepfake is an example of a deep learning-powered application that has recently emerged. It refers to the use of artificial intelligence (AI) techniques to create manipulated videos or images that appear to be authentic but are actually synthetic. This is done by training deep neural networks to learn facial features, body movements, and speech patterns, and then using that information to generate new content that imitates them. While Deepfakes can be used for harmless entertainment, such as creating humorous videos, they can also be exploited for malicious purposes, such as spreading misinformation, propaganda, or creating e news.

The technology has raised serious concerns about its potential to undermine the integrity of visual media, erode trust in public institutions, and threaten privacy. Deepfake technology is a controversial and disruptive technology with far-reaching impacts on society. It has been associated with several issues such as election biasing, cyberbullying, and the potential to manipulate public opinion. In this project, we propose an integrated system with –

The proposed integrated system includes a face forensics model that combines the conventional image forensic approach with the fake face image forensic approach a system where we can detect manipulated or altered media with convolutional approaches. Deepfake creation involves training a deep neural network to generate highly realistic synthetic images and videos by learning from a large dataset of real images and videos. These techniques can be used to create highly convincing forgeries of people appearing to say or do things they never actually did, which can have serious implications for privacy, security, and democracy. On the other hand, deepfake detection aims to identify and distinguish real videos and images from fake ones using machine learning algorithms that can identify anomalies in visual and audio signals. This involves training a deep neural network to distinguish between authentic and manipulated media based on patterns in the data. Deepfake creation and detection are important topics in the field of AI and computer vision, as they have the potential to greatly impact various industries, such as entertainment, journalism, and politics. As deepfake technology advances, it becomes increasingly important to develop robust detection methods to prevent the spread of malicious and misleading content.

RESEARCH ARTICLE

Solar drive-in EV charging hub

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Abstract – While electric vehicles are generally seen as clean vehicles, The concept of using solar power to charge electric vehicles is a significant step towards achieving a truly sustainable and environmentally friendly transportation system. While electric vehicles themselves are cleaner than those powered by fossil fuels, the production of electricity used to charge them can still result in emissions. The current solar energy ecosystem in India is not well-structured, with numerous solar power plants operating independently without any means of analytical analysis. However, advancements in sensor technology make it possible to connect these systems to the GSM and carry out analytical operations to improve efficiency. By connecting solar-powered electric vehicle charging stations to the GSM, users can receive messages about the performance, productivity, and efficiency of the stations. This information can then be used to optimize the use of solar power and increase efficiency, ensuring that solar power is maximized in charging electric vehicles.

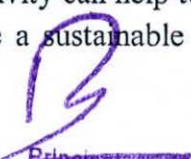
Index Terms – EV Charging, GSM, Electric vehicles , charging hub

1. INTRODUCTION

The over-reliance on fossil fuels as the primary source of energy can lead to a scarcity of these resources in the future. To overcome this problem, several ways have been proposed, including designing more energy-efficient systems that consume less fuel, transitioning to alternative sources of energy with storage such as hydrogen or battery, and promoting the use of electric cars that consume clean and alternative fuels. Innovative solutions such as mobile solar car park roofs, solar car parks that are mobile grid-connected solar systems, and mobile multifunctional solar charge stations that allow direct DC charging from the solar panel to vehicle traction batteries can help to promote utilizing sustainable energy sources and reduce our dependence on fossil fuels.

Furthermore, the latest developments in micro-electronics and the Internet of Things have made it possible to connect the entire infrastructure to the internet at a significantly low power consumption and cheaper price. This connectivity can help to optimize the use of energy and improve the efficiency of energy systems. To ensure a sustainable future and reduce our reliance on non-




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SURVEY / LITERATURE REVIEWS

Survey On Object Detection, Face Tracking, Digital Mapping and Lane Following For Remotely Piloted Aerial Systems (RPAS)

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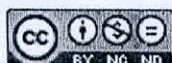
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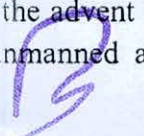
Abstract – Remotely Piloted Aerial Systems (RPAS) for remote sensing, a significant way of obtaining geographic data, has benefits like real-time, adaptability, high-resolution, cost-effectiveness, etc., and it can acquire data in risky environments without jeopardizing flight crews. It has great potential and a promising future since RPAS remote sensing is a powerful companion to airborne and spaceborne remote sensing. This work provides a comprehensive view of recent advancements in the field of Remotely Piloted Aerial Systems (RPAS) with machine learning features. The focus is on some specific areas: Face tracking, Object Detection, Surveillance. The paper describes the methods and algorithms used for these applications, discusses their performance and accuracy, and highlights the challenges faced in the implementation of such systems. The paper also provides an overview of the various platforms and tools used for the development of these systems, including hardware and software components. The review concludes by highlighting the future directions for research and development in this field.

Index Terms – Remotely Piloted Aerial Systems; remote sensing application; Object detection; Face tracking;

I. INTRODUCTION

A remotely piloted aerial system (RPAS) is a type of aerial vehicle which requires minimum human control for its operation. We propose a RPAS which is capable of video-based surveillance, object detection, face tracking, lane following and a digitally mapped system which takes coordinates from the user instantaneously and follows the path given out by the user on a screen. The RPAS is usually called an Unmanned Aerial Vehicle (UAV) which employs aerodynamic forces to lift the vehicle, is scalable or recoverable, can fly autonomously, and can carry a lethal or nonlethal payload. Its usage is currently limited by difficulties such as satellite communication and cost, but the advent of programmable drones has enabled engineers to implement various technologies in an unmanned aerial vehicle which has




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RESEARCH ARTICLE

Enhancing the Capabilities of Remotely Piloted Aerial Systems Through Object Detection, Face Tracking, Digital Mapping and Gesture Control

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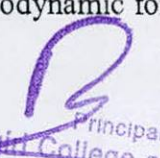
Abstract – Remotely Piloted Aerial Systems (RPAS) for remote sensing, a significant way of obtaining geographic data, has benefits like real-time, adaptability, high-resolution, cost-effectiveness, etc., and it can acquire data in risky environments without jeopardizing flight crews. It has great potential and a promising future since RPAS remote sensing is a powerful companion to airborne and spaceborne remote sensing. This work provides a comprehensive view of recent advancements in the field of Remotely Piloted Aerial Systems (RPAS) with machine learning features. The focus is on some specific areas: Face tracking, Object Detection, Surveillance. The paper describes the methods and algorithms used for these applications, discusses their performance and accuracy, and highlights the challenges faced in the implementation of such systems. The paper also provides an overview of the various platforms and tools used for the development of these systems, including hardware and software components. The review concludes by highlighting the future directions for research and development in this field.

Index Terms – Remotely Piloted Aerial Systems; Remote sensing application; Object detection; Face tracking; Gesture control; Digital mapping

I. INTRODUCTION

A remotely piloted aerial system (RPAS) is a type of aerial vehicle which requires minimum human control for its operation. We propose a RPAS which is capable of video-based surveillance, object detection, face tracking, lane following and a digitally mapped system which takes coordinates from the user instantaneously and follows the path given out by the user on a screen. The RPAS is usually called an Unmanned Aerial Vehicle (UAV) which employs aerodynamic forces to lift the vehicle, is scalable or




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Survey on Abnormal Event Detection and Signalling in Multiple Video Surveillance Scenes Using CNN

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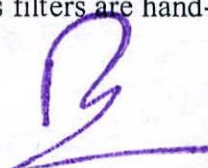
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Abstract — With the growth of urbanisation, the flow of people is increasing steadily every year. The likelihood of stampedes in public areas rises as a result of this trend. Monitoring the audience for the occurrence of odd circumstances and acting quickly to prevent them is necessary. Crowd analysis is typically done for purposes of security and public safety. It is difficult to continually handle for human operators to continuously scan the visual screens for any occurrence of interest. There has been a lot of study done in the area of anomalies identification in crowds by the computer vision and signal processing groups, which pushes researchers to design an autonomous system for doing so and assisting the operators. Recent attempts have been made to avoid using any labour-intensive hand-crafted feature extraction and processing methods by utilising deep learning models. There are shortcomings such ground truth availability, anomaly type, etc. that are highlighted in despite the extensive research and achievement in this area. The development of effective anomaly detection systems still presents numerous difficulties for computer vision community. This includes the lack of cameras, bad weather, problems with night vision, etc. We have used several special methods that enhance the system's overall performance.

Index Terms — Convolutional Neural Network, Anomaly Detection, Generative Adversarial Network, Deep Reinforcement Learning.

I. INTRODUCTION

A Convolutional Neural Network (ConvNet/CNN) is a Deep Learning method that can take in an input picture, give various elements and objects in the image importance (learnable weights and biases), and be able to distinguish between them. Comparatively speaking, a ConvNet requires substantially less pre-processing than other classification techniques. ConvNets have the capacity to learn these filters and properties, whereas in basic techniques filters are hand-engineered.



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RESEARCH ARTICLE

Abnormal Event Detection and Signaling in Multiple Video Surveillance Scenes Using CNN

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Abstract – Computer vision's key duty of abnormal situation identification has applications in surveillance, anomaly monitoring, and industrial inspection. This presentation offers a summary of the methods and developments in abnormal event detection with a particular emphasis on the application of Convolutional Neural Networks (CNNs). In a variety of computer vision applications, such as object detection and picture categorization, CNNs have achieved astounding success. CNNs have been widely used for abnormal event detection because of their capacity to extract hierarchical and spatial characteristics. CNN models may learn to distinguish between normal and abnormal patterns by being trained on huge datasets of typical occurrences. This allows for efficient anomaly identification. The effectiveness of CNN-based abnormal event detection has been greatly enhanced via transfer learning. For specialized abnormal event detection applications, pre-trained CNN models, like those trained on ImageNet, offer a foundation of learnt characteristics that may be fine-tuned. The model's capacity to generalize to new datasets and previously undiscovered anomalies is improved by this transfer of information.

Index Terms – Convolutional Neural Network, Abnormal Event, Pooling Layer, Classification, Sequential model, Back Propagation.

I. INTRODUCTION

Since the topics in computer vision such as visual saliency, interestingness prediction, dominant behavior detection, and others, abnormal event detection in intelligent tape has attracted increasing attention from academic and industrial communities in recent years. Due to the ambiguous concepts of normalcy and abnormalities and the reliance of the dentitions on the background situation, abnormal event



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Implementation on IoT Based Traffic Management System for Emergency Vehicles

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Abstract: In many Indian cities along with those in other nations, congestion caused by traffic is a serious issue. Traffic congestion is caused by signal failure, ineffective law enforcement, and poor traffic administration. The economy, the environment, and general quality of life are all negatively impacted by traffic congestion. Therefore, it is imperative that the traffic congestion issue be managed efficiently. The proposed system's goal is to suggest a smart traffic control and management system that makes use of the Internet of Things, a decentralised strategy and algorithms to handle all traffic circumstances more precisely. The shortcomings of the existing traffic control systems will be fixed by the proposed system. To reduce traffic congestion, a forecast of upcoming traffic density will be made using an algorithm. The proposed method enables an emergency vehicle to travel directly to its location by turning all red lights on its route into green ones, thereby reducing traffic congestion. The system manages traffic signals and reduces wait times during emergencies. This makes it an endeavour that can save a life.

Keywords: Smart cities, sensors, RFID, internet of things, traffic control, and monitoring of emergency vehicles.

I. INTRODUCTION

Reduced velocities, extended travel durations, and elongated vehicle queues are among the repercussions of traffic congestion on highways. The occurrence of traffic congestion arises when the number of vehicles on a particular route surpasses its capacity. This is a prominent issue in the primary urban areas of India. Traffic congestion materialises when the demand outstrips the capacity of the highways.

In the contemporary era, rapid mobility has become ubiquitous. This has led to a surge in traffic on highways, often resulting in uncontrollable congestion and high volume. These occurrences are particularly prevalent in major metropolitan areas, forcing numerous individuals to endure extended periods of stagnation in tedious traffic jams. Furthermore, traffic congestion increases the likelihood of road accidents, impeding the response time of emergency vehicles such as paramedics, fire engines, and police cars, thus contributing to the loss of innocent lives. This project is intended for densely populated urban areas with high traffic volumes. In the city of Bangalore, for instance, traffic congestion is a prevalent issue. It is common for traffic to extend over a minimum distance of 100 metres. Under such circumstances, the sound of the ambulance siren may not reach the traffic police officers in a timely manner. Consequently, paramedics are compelled to wait until the traffic clears before proceeding with their emergency response, which could result in adverse outcomes for the patient. The implementation of this project mitigates these challenges.

This project aims to address the challenges posed by traffic congestion in densely populated urban areas with high traffic volumes, such as Bangalore. In such areas, it is common for traffic to extend over a minimum distance of 100 metres, making it difficult for the sound of an ambulance siren to reach the traffic police officers in a timely manner. As a result, paramedics may have to wait for the traffic to clear, potentially endangering the patient's life. However, our system provides a solution by automatically halting the traffic lights and granting the ambulance a green light when it approaches a traffic signal. This is achieved through an IoT-enabled device that monitors and controls traffic signals, reducing traffic congestion and providing emergency vehicles with expedited access through designated green lanes. The proposed system involves the installation of Radio Frequency (RF) readers at traffic junctions, which are designed to read the Radio Frequency ID tags on approaching vehicles. Radio Frequency ID technology utilises integrated circuits to store digital data, which is transmitted to Radio Frequency readers via a small antenna embedded within the Radio Frequency ID tag.

II. LITERATURE REVIEW

- 1) The authors propose an autonomous traffic diversion system that utilises sensors and a computer to modify traffic signals based on vehicle volume, with an emergency override for emergency vehicles. The main aim is to enhance traffic flow and alleviate congestion. MATLAB simulations demonstrate that the suggested approach substantially boosts transportation efficiency and reduces traffic congestion.



Survey on Virtual Dressing Room System Using Deep Neural Networks

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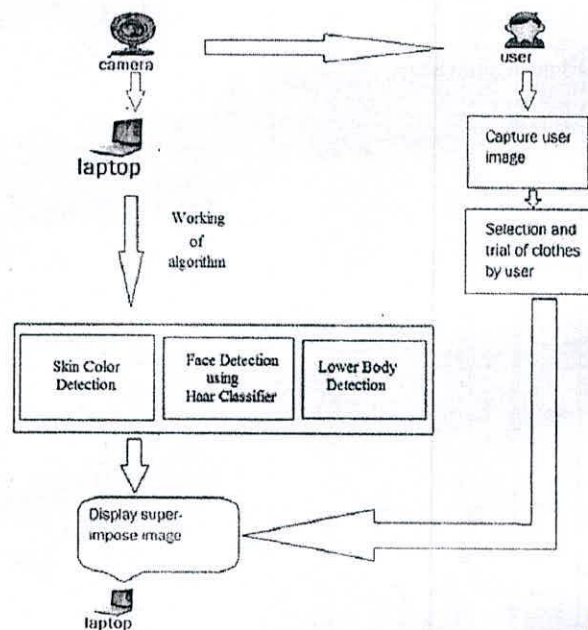
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Abstract: In earlier twenty first century, fashion trends has evolved into a way of life. Depending on skin tone, physical stature, gender, as well as social and geographic factors, the amount and style of clothes which we worn might vary significantly. For the huge chunk of population, the in-store buying experience (buying in the shops) is still what comes to mind when they think of shopping. The customers can try on clothing in real time, but this process takes too long when there will not be enough trial rooms in the dressing store. The goal here is to create an engaging, interactive, involving and incredibly realistic virtual system allow the users or customers to select from a wide variety of clothing designs before simulating those outfits on the people or customers virtually. In this study, we have proposed a system that aids in the synchronization of daily attire of the people. The Virtual styling room using live video feed may alter how a person will shop for and tries on new clothing. Customers or people can try on a wide range of clothing items without a need to actually wear them by making use of the idea of "Virtual Reality". The benefit of doing things in this way is that it would take less time and effort of the people or customers to physically try the garments on. The project we did also aids in market management, reducing the requirement for customers to try on each and every article of clothing in clothing store. Additionally, retailers can save time, money, and space by not keeping a large inventory on hand (in store).

Keywords: Virtual styling room, Virtual reality, Wide range of Clothing Designs.

I. INTRODUCTION

Real world and virtual world are the two worlds. When humans first discovered computers, they began to operate digitally. Human has been making an trouble to easily integrate the digital and virtual worlds. numerous technologies were developed in an trouble to close the gap between the virtual and physical worlds



Architecture of Virtual Dressing Room

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Virtual Dressing Room System using Deep Neural Networks

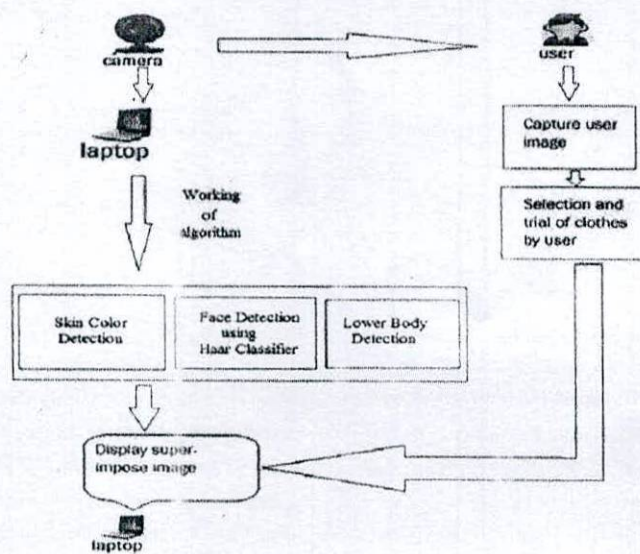
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Abstract: In earlier twenty first century, fashion trends has evolved into a way of life. Depending on skin tone, physical stature, gender, as well as social and geographic factors, the amount and style of clothes which we worn might vary significantly. For the huge chunk of population, the in-store buying experience (buying in the shops) is still what comes to mind when they think of shopping. The customers can try on clothing in real time, but this process takes too long when there will not be enough trial rooms in the dressing store. The goal here is to create an engaging, interactive, involving and incredibly realistic virtual system that allow the users or customers to select from a wide variety of clothing designs before simulating those outfits on the people or customers virtually. In this study, we have proposed a system that aids in the synchronization of daily attire of the people. The Virtual styling room using live video feed may alter how a person will shop for and tries on new clothing. Customers or people can try on a wide range of clothing items without a need to actually wear them by making use of the idea of "Virtual Reality". The benefit of doing things in this way is that it would take less time and effort of the people or customers to physically try the garments on. The project we did also aids in market management, reducing the requirement for customers to try on each and every article of clothing in clothing store. Additionally, retailers can save time, money, and space by not keeping a large inventory on hand (in store). This project aims at transferring a target clothing image onto a reference person. Generative adversarial network involves three modules semantic generation, cloth wrapping and try on module.

Keywords: Virtual styling room, Virtual reality, Wide range of clothing designs.



Architecture of Virtual Dressing Room

I. INTRODUCTION

Real world and virtual world are the two worlds. When humans first discovered computers, they began to operate digitally. Human has been making trouble to easily integrate the digital and virtual worlds. Numerous technologies were developed in trouble to close the gap between the virtual and physical worlds. Virtual reality, stoked reality, and mixed reality are three exemplifications of software that connects the virtual and real worlds. This gave rise to a cornucopia of bias that enables users to contemporaneously witness virtual and real worlds.

Radio Resource Allocation for 5G Network Using Deep Reinforcement Learning

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Abstract: Resource allocation is a critical task in 5G networks that determines how network resources are assigned to different devices and services. Traditional methods rely on predefined rules or heuristics, which may not always be optimal. Deep reinforcement learning (DRL) is a promising approach for radio resource allocation in 5G networks as it can learn to optimize resource allocation based on feedback from the network. In DRL, an agent learns to make decisions based on rewards and penalties received from the environment. In radio resource allocation, the agent would learn to allocate resources, such as frequency bands and power levels, to different devices and services to maximize some performance metric, such as throughput or energy efficiency. The main challenge in applying DRL to radio resource allocation is designing an appropriate reward function that incentivizes the agent to improve the performance metric while avoiding undesirable behavior. Additionally, the radio resource allocation problem is complex, requiring the agent to consider many variables and constraints, such as channel conditions, interference, and QoS requirements. To address this, researchers have proposed various techniques such as hierarchical RL, multi-agent RL, and curriculum learning. Despite the challenges, DRL has shown promising results in radio resource allocation for 5G networks. It has outperformed traditional methods in some scenarios, especially when network conditions are dynamic and unpredictable. However, further research is necessary to explore the scalability and robustness of DRL-based approaches in practical 5G networks. In this method we suggest an algorithm for voice and data carriers in sub-6 GHz and millimeter wave (mmWave) frequencies respectively. The mmWave ranges between 30GHz to 300GHz.

I. INTRODUCTION

Allocation of resource and utilization is considered one of the main challenges of contemporary cellular transmission.

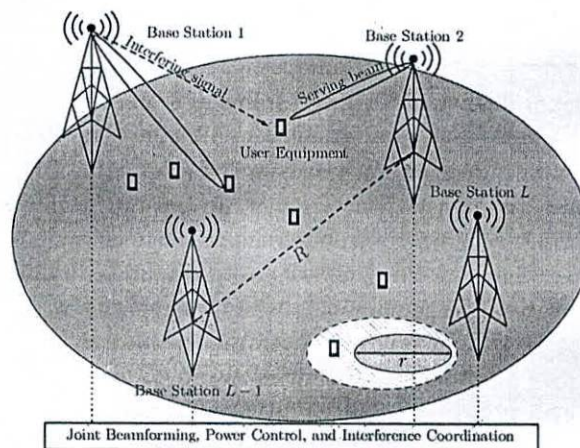


Fig. 1. Nexus of BF, PC, IC.

In wireless networks, Radio Access Networks (RANs) are becoming increasingly sophisticated and complex as they become a component of the LBSs they blend, the explosion of intelligent routing products as well as the services and features they support that are disruptive to the industry. With this advent of quinary generation wireless technology (5G), the gigantic growth of business capacity and rate of data continues. With a better codec and better responsibilities, voice calls are also improving. A RL frame is a basis for our proposed online knowledge-based algorithm.

Review on Intrusive Detection to Secure Social Internet of Things in Edge Computing

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Abstract: This review paper presents an analysis of the latest developments in Intrusion Detection Systems (IDSs) for securing the Social Internet of Things (SIoT). The authors focus on the limitations of conventional IDSs and underscore the importance of leveraging advanced techniques, particularly deep learning, for efficient and effective intrusion detection in SIoT. The article evaluates various recent research studies that have utilized deep learning models for intrusion detection in SIoT. It discusses the types of deep learning models employed and offers valuable insights into the current state-of-the-art in IDSs for securing SIoT. The review concludes by highlighting the potential of deep learning techniques in achieving accurate and effective intrusion detection in SIoT networks.

Keywords: Intrusive Detection System, deep learning technique, Social Internet of Things.

I. INTRODUCTION

The advent of the Internet of Things (IoT) in recent years has created vast opportunities for innovative services and technologies. IoT allows numerous devices and sensors to connect to the internet and share data, leading to new possibilities for advancement. However, the increasing number of connected devices also poses a significant security risk. Thus, ensuring security has become a top priority in the development of IoT technology.

One particular area of IoT that requires special attention is the Social Internet of Things (SIoT) refers to the integration of social media technologies and IoT, which allows for social interactions between individuals and smart objects. It involves the connection of physical objects to the internet and their integration with social media networks, allowing for real-time communication and collaboration among users and objects. This integration has the potential to create new opportunities for social interaction, knowledge sharing, and collaborative problem-solving. Examples of SIoT devices include smart homes, wearable health devices, and social robots. These devices have the potential to collect sensitive information about users, such as their personal preferences, health data, and social interactions. As such, it is crucial to ensure that SIoT devices are secure and protected from cyber-attacks.

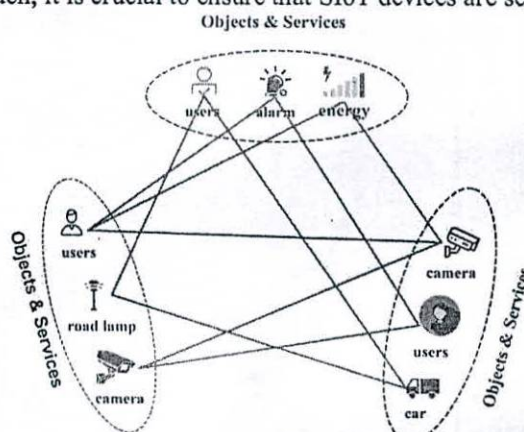


Fig.1.Example of SIoT

A cyber attack is a deliberate and malicious act that exploits computer systems and networks for various purposes, such as stealing information or disrupting services. Cyber attacks can manifest in various ways, such as malware, phishing, and denial-of-service attacks. They can have severe consequences, leading to financial losses, reputational damage, and physical harm. As technology reliance increases, organizations must remain vigilant against cyber attacks.



Review on Efficient Multi-Objective Optimization for the Vehicle Routing Problem with Time Window to Enhance Resilience

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Abstract: *The Vehicle Routing Problem under time window uncertainty A new type of travel time disturbance is constructed to capture the characteristics of the life scenario, and its disturbance region is determined by the maximum disturbance degree Two objectives are defined to minimise the total distance and the number of vehicles An advanced Robust Multi Objective Particle Swarm Optimization approach is developed using advanced coding, decoding model, reliability metrics and local search strategies to identify optimal solutions Due to the particles in the decision space, the properties of the problem space are fully loited to drive the robust optimization, while the proposed metric measures the robustness of the solutions during the process rurther improvements are achieved by problem based local search and route based local search strategies Several robust optimization benchmarks, where perturbations are applied to selected problems, demonstrate that our proposed algorithm can generate sufficiently robust solutions and ensure their optimality.*

Keywords: Particle swarm optimisation, robust optimisation, and vehicle routing problem with time frame.

I. INTRODUCTION

The VRPTW is a typical optimisation issue that arises in a variety of real-world applications such as logistics, transportation, and distribution. VRPTW's purpose is to find the best set of routes for a fleet of vehicles serving a specified customer group in a given period of time while minimising total distance travelled, travel time, and vehicle count. The problem is NP-hard and has been studied extensively in the literature. In recent years, researchers have focused on developing multi-objective optimization techniques to address the limitations of traditional VRPTW models, which often optimise a single objective function. Multi-objective optimization aims to optimise multiple targets simultaneously, providing a more comprehensive and effective solution. In particular, powerful multi-objective optimization seeks to optimise objectives while taking into account the uncertainty and variability of the problem parameters. To solve the VRPTW problem, we suggest a sophisticated multi-objective optimisation method that minimises the total distance travelled, the time required, and the number of vehicles needed. The proposed method takes into account the uncertainty related to travel time, demand and the number of available vehicles.

This article's goal is to propose a powerful multi-objective optimisation strategy to the vehicle Routing Problem with Windows of

e. VRPTW is a well-known combinatorial optimisation problem that seeks the best set of routes for a fleet of vehicles in order to serve a group of clients in a certain time period while minimising total travel distance. or the number of vehicles on the road. VRPTW has many real-world applications, including transportation and logistics, food delivery, waste management, and more. The problem is difficult due to its combinatorial nature and the presence of time constraints. In addition, real-world problems are often uncertain and intermittent, such as traffic jams, vehicle breakdowns, or unexpected fluctuations in demand. Therefore, it is important to develop robust optimization methods capable of handling such uncertainties to ensure the feasibility and effectiveness of solutions. The proposed method aims to solve the limitations of traditional deterministic optimization methods by considering the uncertainty and reliability of the solutions. The article has designed VRPTW as a multi-objective optimisation problem, with the aims of minimising overall distance driven, vehicle number used, and departure from the expected timetable.

Vehicle routing problems with Windows Time (VRPTW) and difficulties in resolving them under uncertain conditions. He emphasised the importance of VRPTW in real-world applications and noted that current algorithms for solving VRPTW assume that demand and travel time are known with certainty, but in reality are not. . It must be. always true in practice. a new algorithm called R-MOPSO with PBLs can generate solutions against uncertainty.

Polypyrrole Preparation by Chemical Oxidation of Pyrrole in Aqueous Ferric chloride Solution

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Abstract:

In conducting polymer science Polypyrrole has gaining more attention due to its ease of preparation and has many advantages. In this article polypyrrole was prepared via chemical oxidation employing ferric chloride as an oxidant, along with a surfactant and a natural directing agent. Electrical conductivity, XRD, FT-IR, SEM and EDX were used to analyses the synthesized polypyrrole. The prepared sample shows the best result in electrical conductivity with the value of 14×10^{-3} . Peak in the range of 21° shows the prepared sample was polypyrrole. SEM study demonstrates the morphologies of conducting polymer and diameter of the particles, which are in the range from 132 to 190 nm. The proposed synthesis is very ease and low cost with many applications.

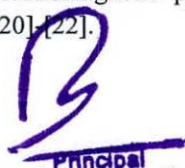
Keywords: Pyrrole, Ferric chloride, Polypyrrole, Directing agent, Conductivity.

I. Introduction:

Recent years conducting polymers (CPs) attracted the community of researcher, scientist and electronic industries in the field of material science. This attraction is due to their wide range of applications like, Electrochemical sensors, [1] Biosensors [2] Storage batteries [3] Gas sensors [4]-[7] Chemical sensors, Transistors and Switch, Data storage, Supercapacitor, Photovoltaic Cell, Field emission Display, Surface protection Tissue engineering.[8-9] Among these conducting

polymers polypyrrole (PPY) has much attention from last two decades due to its significant properties like reversible redox activity [10] good electrical conductivity, environmental stability, facile synthesis, magnetic property [11] Catalytic effect [12].

PPY can be synthesised by many methods in that Electrochemical or chemical oxidation methods are important. It can be synthesised in the medium of various organic solvents and in aqueous solvents [13]. In chemical oxidative polymerisation method different oxidants have been used, such as ferric chloride, ferric perchlorate, ammonium peroxydisulfate ammonium persulfate and others. Ferric chloride is a flexible oxidizing agent for the synthesis of PPY because the oxidizing potential appropriately matches the oxidation potential of pyrrole molecules ($\text{Fe}^{3+} + 1e^- \rightarrow \text{Fe}^{2+}$, $E^0 = 0.77\text{V}$). Because of the above reason the synthesised PPY is not over oxidized and shows high conductivity [14]-[15]. Synthesis of PPY and its composites can be achieved by many authors using FeCl_3 as oxidizing agent [16]-[17]. Usage of surfactants in the synthesis of nanostructure PPY in aqueous and non-aqueous media is well known. [18]-[19]. Surfactants allows the growth of CPs on them as templates by decreasing the surface tension of water. Including these some researchers used organic acids as directing agents to know the various morphologies, conductivity and electromagnetic properties of PPY nanoparticles. [20]-[22].



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Assay of Pharmaceutically Important Drugs in Bulk And Dosage Forms

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Abstract: A simple, precise Ultraviolet–Visible spectrophotometry method was developed and validated to determine Dobutamine Hydrochloride (DOB) and Linezolid (LZD) in bulk and dosage forms. The method is based on the redox reaction of drugs with Folin Ciocalteu (FC) reagent in sodium carbonate medium and the resulting blue colored chromogen is measured at 755 nm. Beer's law is obeyed in the concentration range of 1–10 µg/ml (DOB) and 2.5–70 µg/ml (LZD) respectively, with the corresponding molar absorptivity values of 3.2080×10^4 and $6.299 \times 10^3 \text{ l mol}^{-1} \text{ cm}^{-1}$. The method is validated for accuracy, precision, LOD, LOQ, robustness and ruggedness as per the current ICH guidelines.

Keywords: Dobutamine Hydrochloride, Linezolid Form-1, Folin Ciocalteu reagent, Spectrophotometry, Pharmaceuticals

INTRODUCTION

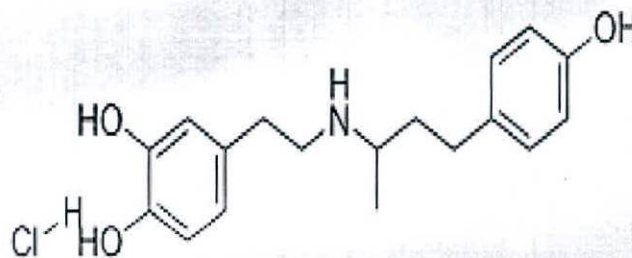
Dobutamine Hydrochloride (DOB), is chemically known as 4-(2-((1-methyl-3-(4-hydroxybenzene propyl) amido) ethyl-1,2-dihydroxybenzene hydrochloric salt is a sympathomimetic with direct effects on β_1 -adrenergic receptors, giving it a prominent inotropic effect on the heart. It also has some α and β_2 -agonist properties. Dobutamine is used in the case of congestive heart failure to increase cardiac output. It is indicated when parental therapy is necessary for inotropic support in the short-term treatment of patients with cardiac decompensation due to depressed contractility, which causes the cardiac disease. The drug is also commonly used in the hospital setting as a pharmacologic stress testing agent to identify coronary artery disease.

The literature survey revealed that several analytical methods have been reported for the determination of DOB in pure drug, pharmaceutical dosage forms and in biological samples. British Pharmacopoeia [1](BP) (Her majesty's stationary office. 1st ed. London; 2007), Capillary gas chromatography [2], Voltammetry [3], Chemiluminescence [4], RP-HPLC [5] and Spectrophotometry [6].

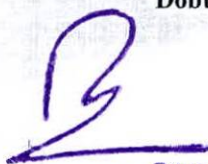
Linezolid (LZD), chemically (S)-N-[[3-[3-fluoro-4-(4-morpholinyl) phenyl]-2-oxo-5-azolidinyl] methyl] acetamide was the first oxazolidinone to be developed and approved for clinical use. Linezolid is a synthetic antibiotic used for the treatment of serious infections caused by gram-positive

bacteria that are resistant to several other antibiotics. Linezolid is active against most gram positive bacteria that cause disease including streptococci, vancomycin-resistant enterococci and methicillin-resistant staphylococcus aureus. The main indication for Linezolid is the treatment of severe infections caused by gram positive bacteria that are resistant to other antibiotics; it should not be used against bacteria that are sensitive to drugs with a narrower spectrum of activity, such as penicillins and cephalosporins. The literature survey includes British pharmacopoeia method [7] (BF) (Her majesty's stationary office. 6th ed. London; 2010. p.410) Capillary electrophoresis [8], RP-HPLC [9], Derivative spectrophotometry [10], Spectrophotometry [11-13].

Visible spectrophotometry is by far the most widely used technique for the assay of the mentioned drugs. The above mentioned different methods suffer from one or more of the disadvantages such as drastic experimental conditions, use of organic solvent, long standing time, poor sensitivity and narrow linear range. Folin Ciocalteu (FC) reagent has been widely used for the sensitive determination of a wide ranging phenol and amine organic compounds of pharmaceutical importance [14, 15]. The main objective of the present work was to investigate the utility of FC reagent in the assay of drugs i.e., DOB and LZD. The method has sufficiently good accuracy and presented a simple and time saving assay of the mentioned drugs. The novelty of the method is that the proposed method is used in drug formulations and also in quality control laboratories. The suggested method was further applied for the determination of drugs in commercial pharmaceutical dosage forms, which were compared statistically with reference methods by means of t-test and F-test and were found not to differ significantly at 95% confidence levels. The structure of studied drugs are



Dobutamine Hydrochloride


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Synthesis and Characterization of Yttria Stabilized Zirconia by Solution Combustion Method

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I ABSTRACT

The combustion approach was used to create 8 mol% yttria stabilized zirconia (YSZ) powders in nanoscale utilizing two different fuels (urea and glycine). The phase structure, particle size, and microstructure of the resulting YSZ ceramics were examined in relation to the type and quantity of fuel. The findings demonstrated that urea-derived YSZ powders had bigger crystallite sizes and less specific surface area than glycine-derived powders. The temperature of the combustion flame has a direct impact on this behavior. Large aggregates formed more readily during the combustion synthesis using urea than the loose, porous particles that were seen during the glycine method due to the higher temperature. As a result, the pellets made via sintering of powders produced the best results in terms of densification.

Keywords: A: 8YSZ, SCS, Tetragonal phase. XRD, Exothermic

II INTRODUCTION

According to reports, Zirconia (Zr) nanoparticles possess a variety of special qualities, including excellent refractoriness, chemical resistance, good mechanical strength, high ionic conductivity, low thermal conductivity at high temperatures, along with a relatively high thermal expansion coefficient and good thermal stability [1,2]. There are several industrial uses for dense ceramics, including the production of sensors, batteries, capacitors, coatings that are thermally and corrosion resistant, solid electrolytes for fuel cells, catalysts, and more [3,4]. To produce a high-performance zirconia material, a high-quality starting powder is necessary. There are numerous approaches for creating high-quality oxide powders, including hydrothermal [5], sol-gel [7, 8], combustion [9-10], and precipitation [11,12] procedures. All of these methods rely on a kind of chemistry

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Preparation and Characterization of Microcrystalline Cellulose Produced from wet organic waste

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Abstract: Components in garbage which can be utilized, through a simple and inexpensive treatment procedure, thus were permitting the Production of structurally usable 'products from garbage. Cellulose which was isolated from cellulose of fiber of wet organic waste was hydrolyzed with hydrochloric acid (2.5N) at 80°C to produce microcrystalline cellulose (MCC). In this study, MCC, were Characterizations were made using some equipment such as Fourier transform infrared (FTIR), and Infrared spectroscopies were studied to determine crystallinity and molecular structure of MCC, where scanning electron microscopy images were conducted for information about morphology of MCC.

past prevented this approach from being utilized to any substantial extent.

We have discovered that there are components in garbage which can be utilized, through a simple and inexpensive treatment procedure, thus permitting the Production of structurally usable 'products from garbage. More specifically, virtually all garbage contains cellulose. The proportion of cellulose in garbage will vary depending upon the particular locality, but in modern industrialized areas the proportion of cellulose in garbage is quite high. A very large proportion of waste material which is disposed of by municipalities today consists of cellulose rich material.

I. INTRODUCTION

The present invention relates to a method for forming useful products from cellulose-containing garbage. The effective disposal of waste products is becoming an ever more critical problem in recent days. A modern society produces massive amounts of waste material, and that waste material must be treated and disposed of. Various types of garbage treatment have been proposed, such as land fill or can be used as fertilizers. The cost of garbage disposal is a very important matter to municipalities, and when the end products of that disposal are not useful or are only of limited utility, the overall cost of the garbage disposal procedure is maximized. Garbage treatment so as to form relatively useful products, such as structurally usable thin Biofilms, membranes, insulators. While such structurally usable objects have more value than mere land fill, and thus potentially represent a source of great saving to a municipality, several drawbacks in the

II. LITERATURE SURVEY

Cellulose is the most abundant biopolymer in the world. It consists of both crystalline and amorphous regions which are bonded together by intra- and intermolecular bonds [1].

Cellulose in crystalline region is called cellulose crystallite and they are formed by cellulose chains due to vanderWaals interaction and hydrogen bonding. While cellulose in amorphous region is weak and readily hydrolyzed when subjected to an excessive amount of mineral acids [2]. Thus, crystalline cellulose is obtained through hydrolyzed of amorphous regions in microfibrils of alpha cellulose, leaving the crystalline phases.

In all biomass processing methods, the main technological problem is to liberate the cellulose material from the plant in a reasonable yield without large losses. This process is generally referred to as "treatment or pretreatment" of the biomass. The effect of the pretreatment has been



Efficient Analysis of Social Media Comments by Using Machine Learning Techniques

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Abstract- The rapid growth in social media along its users has given rise to the need of Sentiment analysis also called Opinion mining or emotion abstraction, whose goal is to extract, determine, analyze and present the sentiments of the user and drawing a conclusion about the overall information they contain in less cost and efficient time complexity. Opinions or sentiments in the form of a forum, comment, review sites, blogs, etc. can be about the product, people, services, events, politics, etc. The aim is to calculate the polarity of the data and classify it as positive, negative, or neutral. This paper presents a review of techniques and methods in sentiment analysis with their challenges.

Keywords- *Bayesian Algorithm, Feature Extraction, Machine learning, Opinion, Sentiment Analysis, Sentiment Classification, SVM, Twitter*

I. INTRODUCTION

Sentiment analysis uses Natural language processing (NLP), statistics evaluation, and records to study and examine client sentiments. Businesses want to apprehend the sentiments of their customers which can be observed on online platforms like Twitter, blogs, and so on which include tweets, feedback, evaluations, etc. Sentiment Analysis systems use their coded software to understand and analyze these emotions. Using machine learning techniques and natural language processing we can extract the subjective information of a document and classify it according to its polarity which includes positive, negative, and neutral. One's Sentiment shapes the thoughts, ideas, and opinions of others. With the rise of social media, one can easily get access to one's review, comment, or opinion about a product, service, or event. This content serves the purpose of both producer and consumers in reviewing feedback. This research domain is called sentiment analysis or opinion mining or subjective analysis or appraisal

extraction. Sentiment analysis is a submachine learning task of mining reviews, opinions, and emotions from the text, data, or a given document. It classifies the text of positive, neutral, and a negative genre. We will be working on detecting subjectivity that is to determine whether a document has sentiments or not or it is just a fact based document. Further, we will determine the polarity score also called sentiment prediction. Subjectivity can be calculated by the polarity score.

Sentiment Classification is usually done at Document, Sentence, or Aspect Level. Considering different levels and trying different Machine learning-based approaches with a given data we will experiment with its accuracy of polarity score.

There has been a positive quantity of appropriate basis being finished closer to sentiment analysis these days. We find that big approaches to enhance the performance of sentiment analysis are through SVM and Naïve Bayes. Sentiment evaluation is additionally investigated on Indian Language, Chinese Language, and English Languages. This paper will present a comparative study and analysis of some machine-learning techniques.

Section 2 provides some most commonly used techniques in sentiment analysis. In Section 3 we have discussed some related work. In section 4 we have analyzed comparisons between different techniques. In section 5 there is a comparative study using Twitter data and the result is shown by graphical representation. Finally, in section 6 we have concluded it all with future possible improvements.

In this paper, we will discuss the classification, when we talk about classification problem in which our output variable is a category.

We will be considering supervised machine learning-based algorithms where two data sets are needed: training and test data. By training set, we teach our classifier to learn to differentiate among various characteristics of a document and test set, checks the accuracy in performance. Techniques of Machine learning like support vector machine (SVM) and Naive Bayes (NB) have performed well in many past types of research. Our research began with the collection of data set for training and testing. In the next step, we train our model. Then after selecting a selection technique, we selected the features.

High Voltage Engineering Lab

Assistance Robot

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Abstract— The robot in the proposed paper is designed to be used in High voltage engineering laboratory. The dangerous environment created within the HVE lab during high voltage experiments makes it dangerous for human assistance. In the proposed project we are mainly concentrating on the discharging of electrode in HVE lab. Manual discharging is followed till date and is quite risky if proper precautions are not taken. The proposed project helps the person to carry out this discharging process easily by controlling a Robot from a distance, which eliminates risks of High voltage. The controller can sit at ease and control the robot using an android smartphone by using Bluetooth technology. It is designed with a AVR architecture based Atmega328pmicrocontroller at its core. The microcontroller is complemented with a motor driver circuit and a Robotic arm arrangement. Further, the proposed project also helps in adjustment of electrodes for which a rotating arm mechanism shall be implemented to facilitate clockwise and anticlockwise rotation of the adjustment handle. The complete robot will be controlled by android smartphones which eliminates the requirement of special dedicated remote controls. A mounted camera will give live feedback of the robot's whereabouts and working.

I. INTRODUCTION

High voltage laboratory is concentrated on all types of relays, protection schemes for electrical machines, measurement of HVAC and HVDC, breakdown strength of transformer oil and field mapping using electrolytic tank for capacitor and transmission lines. Various protective schemes, measurements of HVAC and HVDC are dealt in this lab. A robot can be defined as a programmable, autonomous/controlled device consisting of electronic, electrical, or mechanical units. More generally, it is a machine that functions in place of a living agent. Robots are especially desirable for certain work functions because, unlike humans, they never get tired; they can work in physical conditions that are uncomfortable or even dangerous; they can operate in airless conditions; they do not get bored by repetition; and they cannot

be distracted from the task at hand. There are so many hazardous situations in day to day life. There are so many occasions where the human can't work. In that situations without a considerable amount of safety precautions like, the disposal of hazardous wastes, radioactive substances, remote handling of explosive devices and righting and hostage situations among others. It can safely work at hazardous conditions. These robots ensures the human safety and replace massive human work force. It can be also applied in medical science, surgeries, and to carry out risky jobs. The proposed project will introduce a new method in HVE labs to use automated machine and robot for more precise, safe and reliable work. This robot is able to work in HVE laboratory for picking the discharge Rod and placing it in the desired location for discharging the electrodes. Additionally for precise adjustment of the distance between electrodes a rotatable arm mechanism shall also be implemented. In this proposed project, smartphones phone is used to control an unmanned vehicle (a robotic vehicle) using Bluetooth. This technique overcomes all the shortcomings of aforementioned technologies like signal interference issue, communication problems over obstacles and required line of sight. This technique establishes a secure connection between the master and slave so that no other devices can interfere during the operation of the robot. A dedicated app shall be designed for the controlling of the Robot. [8] Before adjusting the sphere gap we have to discharge all the equipment inside the HV room (manually) to ensure safety. Later on, the gap is adjusted for required mm (manually). There are so many hazardous situations in day to day life. There are so many occasion where the human can't work. In that situations robots ensures the human safety and replace massive human work force. Hall Effect sensor, fire detection sensor and obstacle sensor is used. Hall Effect sensor is a device that is used to measure the magnitude of a magnetic field. Its output voltage is directly proportional to the magnetic field strength through it. A flame detector is a sensor designed to detect and respond to the presence of a flame or fire, allowing flame detection. Responses to a detected flame are intermediate beep using a buzzer. Obstacle sensor is used to detect the object in front of the robot up to 20cm as per the program

Survey on Hate Speech Detection in Online Social Network

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Abstract— Due to the advancement in technology and the explosion of the information age, people communicate with each other indirectly via using the online social networks (OSNs), such as Facebook Snapchat, Instagram, and Twitter. Users of OSNs can post anything without any control or constraint of the content, which leads to increase in spreading of hateful and offensive speech among users, thus resulting in an increase in crimes, murder, and terrorism. Hence, this paper provides a survey and state of the art natural language processing (NLP) technique that is used in automatic detection of the hate speech on OSNs, such as dictionaries, bag-of-words, N-gram etc. Keywords—hate speech, OSN, online social network, automatic detection, offensive, hateful dictionaries, bag-ofwords, N-gram.

Keywords- *hate speech, OSN, online social network, automatic detection, offensive, hateful dictionaries, bag-ofwords, N-gram.*

I. INTRODUCTION

In the past, people used to communicate with each other either by meeting at home or in a public place or by using the telephone or mobile phones etc. But, nowadays, with the advancement of the technology and the explosion of the information age, the communication between people has become indirect, and the world has become a global village. So, people can easily and quickly communicate with each other by using social networking sites such as Twitter, Facebook, and Snap Chat. However, each person may have one or more accounts on each social networking site and can post anything without any control or constraint.

“Hate speech has no place on Facebook and in our community,” says Mark Zuckerberg, the creator of

Facebook [8]. According to the Facebook’s Community Standards, the definition of hate speech is conduct that uses direct assault with words on people who have particular traits, and this kind of assault usually has a tendency of violence or carries a tone of debasement. The perpetrators tend to encircle those people who they intend to attack into smaller groups [7]. Even though Facebook has been making efforts in reducing hate speech by adopting artificial intelligence, there is still a lot to be done. According to CNBC, Facebook admits that artificial intelligence is not good enough yet to precisely determine whether someone is promoting hate or simply describing something that happened to them [9]. Chinnasamy and Manaf [10] indicate that there are also subtle ways to promote hate speech, and these ways can be “indirect”, like discussing controversial topics to instate hate in the comment sections. This also increases the complexity of hate speech detection.

In another previous study [2], the authors proposed a variety of hate categories to distinguish various kinds of hate being expressed. They leveraged morpho-syntactical features, sentiment polarity and word embedded lexicons to design and implement two classifiers for the Italian language. They utilized Support Vector Machines (SVM) and Long Short-Term Memory (LSTM) networks [2]. In this paper, we investigate new ways to unearth hate speech on Facebook, especially those less visible types of hate that occur in the comment areas discussing controversial topics. Specifically, we first identify a set of pages from websites known for discussing controversial topics (e.g., immigration, skin color and religion). We use the related Facebook IDs as seeds to crawl the Facebook graph and construct a network by using the “follows” relation. With graph analysis techniques, we are able to identify the most influential pages, and crawl their latest posts along with the comments. We apply sentiment and emotion analysis to detect the posts that contain highly negative tones, namely posts suspected to instigate hatred. We finally transform

FACE HALLUCINATION WITH FINISHING TOUCHES

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Abstract— Recovering high-resolution (HR) face images from their low-resolution (LR) counterparts, known as face hallucination, obtaining a high-quality frontal face image from a low-resolution (LR) non-frontal face image is primarily important for many facial analysis applications. main-streams either focus on super-resolving near-frontal LR faces or frontalizing non-frontal high-resolution (HR) faces. we present a novel Vivid Face Hallucination Generative Adversarial Network (VividGAN) for simultaneously super-resolving and frontalizing tiny non-frontal face images. VividGAN consists of coarse-level and fine-level Face Hallucination Networks (FHnet) and two discriminators, i.e., Coarse-D and Fine-D. The coarse-level FHnet generates a frontal coarse HR face and then the fine-level FHnet makes use of the facial component appearance prior. face recognition and expression classification, compared with other state-of-the-art methods. Face super-resolution (FSR), also known as face hallucination. First, we summarize the problem formulation of FSR and introduce popular assessment metrics and loss functions. Second, we elaborate on the facial characteristics and popular datasets used in FSR. Third, we roughly categorize existing methods according to the utilization of facial characteristics. In each category, we start with a general description of design principles, then present an overview of representative approaches, and then discuss the pros and cons among them. Fourth, we evaluate the performance of some state-of-the-art methods. Fifth, joint FSR and other tasks, and FSR-related applications are roughly introduced. Finally, we envision the prospects of further technological advancement in this field. hallucination, or hallucination followed by frontalization produces Conventional and emerging face frontalization methods. often rely on facial landmarks for warping 2D face images onto 3D models, and thus require the input images to have a sufficient resolution where such landmarks are detectable. This renders them ineffective for tiny face images. Without a proper frontalization, directly employing face hallucination methods may cause severe artifacts due to large pose variations and misalignments, for very low-resolution non-frontal face images, applying either face frontalization followed by degraded results.

Keywords— face super-resolution, Face hallucination, super-resolution, face frontalization, generative adversarial network.

I. INTRODUCTION

Face recognition, a highly researched subject in computer vision, has gained significant attention due to its broad range of applications in law enforcement, biometrics, marketing, and more. In recent times, deep learning-based techniques have led to substantial advancements in face recognition.

In recent years, the process of recovering high-resolution (HR) face images from their low-resolution (LR) counterparts, commonly known as face hallucination, has garnered significant attention. Current face hallucination methods primarily focus on super-resolving nearly frontal faces, which provide crucial perceptual information for the human visual system. However, in many cases, LR faces may not be in a frontal pose. Super-resolving non-frontal LR faces either requires frontalizing them first and then applying existing face hallucination techniques, or super-solving first (which relies heavily on an available pose-specific exemplar dataset) and then frontalizing. Nevertheless, both of these options pose significant challenges.

Traditional and modern techniques for face frontalization often depend on detecting facial landmarks to warp 2D face images onto 3D models. As a result, these methods require input images with high enough resolution for accurate landmark detection, making them unsuitable for tiny face images. When dealing with low-resolution non-frontal face images, using face frontalization followed by face hallucination, or vice versa, can lead to poor results due to significant pose variations and misalignments causing artifacts.

Our goal is to simultaneously perform face frontalization and face hallucination on a given input image to mitigate the artifacts that may arise when these tasks are performed separately. The Transformative Adversarial Neural Network (TANN) is an advanced technique in computer vision that focuses on face frontalization and face hallucination. The Transformative Adversarial Neural Network (TANN) is a method that seamlessly combines face frontalization and face hallucination by automatically transforming low-resolution (LR) faces into frontalized LR feature maps, while also upscaling the images by a factor of 8x in an end-to-end manner. TANN aims to generate high-quality frontalized face images, even from low-resolution inputs, making it valuable for applications such as face recognition, facial expression analysis, and virtual reality. TANN represents a significant advancement in facial image synthesis and holds great potential for various real-world applications in the field of computer vision and image processing.

To begin with, a subnetwork is created with the aim of transforming a non-frontal LR face into a latent representation. This transformation ensures that the latent representation of the non-frontal LR face closely resembles

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Peerless Medication Counter For Medication Self-Appportioning For Public

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Abstract— Meds assume a pivotal part in looking after wellbeing, forestalling ailment, overseeing, persistent conditions and relieving sickness. Record-breaking Medication (ATM) is a machine which conveys the medication in crisis cases and guarantee accessibility of medications 24x7 and thus the name "Record-breaking Medication". ATM will be valuable in saving life in the event of a mishap on thruways, far off zones, country territories and spots where clinical stores are not inside the span if there should arise an occurrence of crisis. At any rate first help can be made effectively open with the assistance of this framework. This task comprises of Cutting edge RISC Machine PIC miniature regulator which controls the other sub frameworks like RFID Peruser, Worldwide Framework for Portable correspondence, medication container, and stock control. RFID tag identifies the specific client. GSM sends the message to the stock control when the medications should be refill. Medicine

Keyword: Medicine, RFID, GSM, LCD, Motor, Dispenser.

I. INTRODUCTION

Several people in India die due to lack of diagnosis in first place and non-availability of medicine on time. Problem arise when need of some medicine is urgent and drug stores are not open or drug is not available in stock, especially during night time. In remote areas, rural areas and places where public turnover is less, the availability of medicines within the patient's reach is a critical issue. These are some of the main problems that are being faced by the society in present scenario. ATM will help in solving these problems by providing the medicines 24x7.

II. LITERATURE SURVEY

This chapter explains existing problem that the society is facing. Under medicines legislation, General Sale List (GSL) medicines (i.e., those that may be purchased from ordinary retail outlets such as supermarkets) may be sold or supplied from a vending machine. Life will become a little easier with an innovative vending machine that dispenses

medicines. Users will be able to get basic Over-The-Counter (OTC) medicine at any time (24x7). Minor illnesses have a strange way of inviting people in the middle of the night when pharmacies are already closed. Over-the-counter (OTC) drugs are a class of medicines sold directly to a consumer without a prescription from a health care professional, as compared to prescription drugs, which may be sold only to consumers possessing a valid prescription. People will able to access the medicine with the help of this machine even at the night time. With this, first aid can be provided in time to the user. Medicines sold or supplied from a vending machine should satisfy the condition laid down by the Medical Council of India. Medicines which these restrictions apply are mainly aspirin and paracetamol. Products containing these substances should not exceed 16 tablets in a package for sale.

III. OBJECTIVE

The objective of the project is to develop a system to deliver medicine 24x7 to the people. The machine can deliver mainly Over The Counter(OTC)drugs, pain killer, first-aid products etc., so it will be very useful to the society. Medicine dispensing process is done in four steps.

1. Authentication of registered user.
2. Selection of required medicine.
3. Payment.
4. Collection of requested medicine.

First the user needs to register in a particular authorized center with prescribed drugs. Then user will be provided with RFID Tag and password. During transaction user must first swipe the card Request for the required medicine should be made by the user by scrolling through the menu displayed on the screen. The machine will search for the requested medicine in dispenser. If the medicine is present in the machine, then the payment has to be made for the requested/available quantity of the medicine. Finally, the medicine is collected.

Stock Market Price prediction using Deep Learning Technique

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Abstract— Now a day's one of the most often used deep learning models is called Long Short Term Memory (LSTM). Additionally, it is used to predict time series, which is a particularly challenging problem to resolve because it involves long-term trends, seasonal and cyclical fluctuations, and random noise. The selection of a number of hyper-parameters, which must be done with great care in order to achieve good results, heavily influences how well the LSTM performs. Since LSTM is a new model, there are no established standards for its configuration. This paper addressed this research gap. An LSTM model was generated using a dataset derived from the Indian stock market. Then, it was tuned for the number of hidden layers and stateless vs. stateful model comparisons.

Keywords: LSTM; Hyper-parameters; Stateful Stateless; Hidden layers; Time series prediction

I. INTRODUCTION

The process of forecasting future stock prices based on earlier prices is known as stock price prediction. Investors can boost their trading profits by using stock price forecasting. The two conventional methods of prediction are technical analysis and fundamental analysis. While fundamental analysis concentrates on the economy as a whole, the company's financial health, and its management, technical analysis looks for patterns in historical data [1]. Predicting stock prices is a very difficult undertaking since they are very volatile, non-linear, and dynamic and are affected by a variety of factors, including political and economic circumstances, trends, seasonality, investor psychology, and many more.

A significant amount of data has become available online as a result of the recent information explosion, making manual analysis of this data impractical. Machine learning algorithms have been created to automatically collect, analyse, and predict data as well as

perform unsupervised and supervised learning. Deep learning approaches have emerged as the hottest tool for achieving cutting-edge outcomes in a variety of fields, including computer vision, speech recognition, and NLP issues. However, there are particular difficulties associated with deep learning techniques.

Deep learning models' performance is influenced by a variety of so-called hyper-parameters. Before training the model, hyper-parameters are manually selected training variables. There have been several automatic tuning strategies presented, however these systems don't inform the end-users about the relationships between various hyper-parameters and their relative significance [2]. The key hyper-parameters for the LSTM deep learning model employed in this study are [3] the activation function (sigmoid, tanh, softmax, etc.), the optimizer (Adam, Adadelata, RMSprop, etc.), the batch size, the number of epochs, the number of hidden layers, etc. LSTM can either have a state or not. The model can be improved by testing and comparing different LSTM configurations using a dataset of stock prices from the Indian stock market and an LSTM model to forecast stock prices.

II. LITERATURE REVIEW

Time series forecasting has traditionally been accomplished using neural networks. Foster et al.'s study [4] examined exponential smoothing, linear regression, and neural networks for forecasting noisy time series. The predictability of linear regression was initially higher. After removing seasonal variation from the series, neural networks were more accurate at forecasting the future. In order to anticipate financial time series, [5] suggested employing independent component analysis and support vector regression with two stage modelling. It was stated that the presence of noise and the requirement to make financial time series immovable posed the biggest barrier to dealing with them.

Artificial neural networks were employed by Hamzacebi et al. [6] for multiperiodic forecasting utilising iterative and

An Effective Algorithm for Image Compression Using SCWP

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Abstract— In the conventional sub band/wavelet decomposition is performed on the spatial-domain image. But here may be using a decomposition Technique where the sub band decomposition is performed on the global DCT spectrum of the image.

That is, the two-dimensional spectrum rather than the image is represented by a sum of basis functions, each weighted by the transform coefficients. The spectral sub band decomposition is then used as the basis for a new image coder, building on the spectral condensed wavelet packet (SCWP) algorithm. Ironically, this method is may expected to have lower arithmetic complexity than conventional sub band/wavelet coders that directly decompose a time or spatial domain signal. This new method may have lower complexity and higher compression performance. image coding, the sub band.

Index Terms — Condensed wavelet packets, decomposition of spectrum, overlapped block transform, sparse transform for coding and compressive sampling/compressed sensing.

I. INTRODUCTION

Visual information plays an important role in almost all areas of our life. Due to the vast amount of data associated with images, compression is a key technology. A digital image is a representation of a two-dimensional image as a finite set of digital values, called picture elements or pixels, digitization implies that a digital image is an approximation of a real scene. Pixel values typically represent gray levels, colours, heights, opacities etc. Digital image processing focuses on two major tasks : Improvement of pictorial information for human interpretation and Processing of image data for storage, transmission and representation for autonomous machine perception. Sparse transforms have received much attention over the years because of their ability to decorrelate signals and provide a compact representation. As a result, they have played an important role in image processing, most notably in signal coding and compressive sampling. Such transforms include DCTs [9], DFTs [9], LOTs and lapped transforms [6], GenLOTs [7], and wavelet transforms [2], [3].

Conventional subband /wavelet transforms typically involve multirate filtering, down sampling, and up sampling of a spatial domain signal, such as a natural image. In this paper, we consider the dual scenario where by the DCT spectrum of the image is used as the input to the sub band/wavelet transform for the purpose of obtaining a compact signal representation

II. LITERATURE SURVEY

Early 1920s: One of the first applications of digital imaging was in the news paper industry:

- The Bartlane cable picture transmission service
- Images were transferred by submarine cable between London and New York
- Pictures were coded for cable transfer and reconstructed at the receiving end on a telegraph printer.

Mid to late 1920s: Improvements to the Bartlane system resulted in higher quality images

- New reproduction processes based on photographic techniques
- Increased number of tones in reproduced images

1960s: Improvements in computing technology and the onset of the space race led to a surge of work in digital image processing.

1964: Computers used to improve the quality of images of the moon taken by the *Ranger 7* probe. Such techniques were used in other space missions including the Apollo landings.

1970s: Digital image processing begins to be used in medical applications.

1979: Sir Godfrey N. Hounsfield & Prof. Allan M. Cormack share the Nobel Prize in medicine for the invention of tomography, the technology behind Computerised Axial Tomography (CAT) scans.

1980s - Today: The use of digital image processing techniques has exploded and they are now used for all kinds of tasks in all kinds of areas

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STUDY OF NON-LINEAR EQUATIONS BY HOMOTOPY ANALYSIS METHOD

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Abstract— The Homotopy Analysis Method of Liao. Beyond Perturbation: Introduction to Homotopy Analysis Method has proven useful in obtaining analytical solution to various non-linear differential equations. In this method one has great freedom to select auxiliary functions, operators and parameters to increase the rate and region of convergence. We describe, very briefly, the basic idea and current development of the Homotopy Analysis Method. Semi analytic approach to get convergent series solution of strongly non-linear problems is discussed.

I. INTRODUCTION

Most phenomena in our world are essentially nonlinear and are described by nonlinear equations. Traditionally, solution expressions of a nonlinear problem are mainly determined by the type of nonlinear equations and the employed analytic techniques, and the convergence regions of solution series are strongly dependent of physical parameters. Since the appearance of high-performance digit computers, it becomes easier and easier to solve a linear problem. However, generally speaking, it is still difficult to obtain accurate solutions of nonlinear problems. In particular, it is often more difficult to get an analytic approximation than a numerical one of a given nonlinear problem, although we now have high performance supercomputers and some high-quality symbolic computation software such as Mathematica, Maple, and so on. The numerical techniques generally can be applied to nonlinear problems in complicated computation domain; this is an obvious advantage of numerical methods over analytic ones that often handle nonlinear problems in simple domains. However, numerical methods give discontinuous points of a curve and thus it is often costly and time consuming to get a complete curve of results. Besides, from numerical results, it is hard to have a whole and essential understanding of a nonlinear problem. Numerical difficulties additionally appear if a nonlinear problem contains singularities or has multiple solutions. The numerical and 3 analytic methods of nonlinear problems have their own advantages and limitations; and thus it is unnecessary for us to do one thing and neglect another. Generally, one delights in giving analytic solutions of a nonlinear problem. There are some analytic techniques for nonlinear problems, such as perturbation techniques

that are well known and widely applied. By means of perturbation techniques, a lot of important properties and interesting phenomena of nonlinear problems have been revealed. One of the astonishing successes of perturbation techniques is the discovery of the ninth planet in the solar system, found in the vast sky at a predicted point. Recently, the singular perturbation techniques are considered to be one of the top 10 progresses of theoretical and applied mechanics in the 20th century. It is therefore out of question that perturbation techniques play important roles in the development of science and engineering. Perturbation techniques are essentially based on the existence of small or large parameters or variables called perturbation quantity. Briefly speaking, perturbation techniques use perturbation quantities to transfer a nonlinear problem into an infinite number of linear sub-problems and then approximate it by the sum of solutions of the first several sub-problems. The existence of perturbation quantities is obviously a cornerstone of perturbation techniques; however, it is the perturbation quantity that brings perturbation techniques some serious restrictions.

4 • Firstly, it is impossible that every nonlinear problem contains such a perturbation quantity. This is an obvious restriction of perturbation techniques. • Secondly, analytic approximations of nonlinear problems often break down as nonlinearity becomes strong, and thus perturbation approximations are valid only for nonlinear problems with weak nonlinearity. Some non-perturbative techniques, such as the artificial small parameter method, the δ -expansion method and the Adomian's decomposition method, have been developed. Different from perturbation techniques,

Asymptotic estimation of two-dimensional boundary layer flow and heat transfer

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Abstract

This paper studies the influence of Prandtl number and pressure gradient in the two-dimensional laminar boundary-layer flow of a viscous fluid and heat transfer over a constant wedge. The flow outside the boundary-layer is assumed to obey the power-law manner that is the mainstream varies as the power of the distance from a leading edge and the flow is on an impermeable wedge. The system of non-linear ordinary differential equations is obtained from the partial differential equations with suitable similarity transformations. We solve the governing system which is linearized far away from the wedge using the asymptotic approach. Exact solutions of the linearized governing equation are obtained in terms of the confluent hypergeometric functions of first kind. The velocity and temperature profiles, the temperature gradient, wall shear stress are obtained. It is observed that the momentum boundary layer thickness are found to be thinner for accelerated flows and smaller values of the Prandtl number. The results on wall shear stress and temperature gradients are found to decrease initially and become flatter as the Prandtl number increases. The various interesting results and corresponding physical dynamics are discussed in some detail.

1 Introduction

The study of two-dimensional boundary layer flow of a viscous fluid has attracted many investigations during the past several decades. Because of their increasing applications in industrial engineering such as aerodynamic extrusion of plastic sheets, power generators, purification of crude oil, aircraft and space vehicles, paper production, wire drawing, etc. In one such industrial application, when the polymer sheets are drawn from the slit through the quiescent fluid, these usually get stretched. This delicate nature of the model necessarily dictates that the magnitude of stretching rate needs to be controlled and this has to be sufficiently small so that the surface should not break, and the precise property of perfectly flat surface can be achieved. These processes are such that they facilitate the utilization of boundary-layer theory [1]. The above model has been studied in different aspects by various authors [2, 3, 4].

The solutions involving the Blasius flow over a flat plate and stagnation point flow which are special cases, such as, Craven and Peletier [5], Oskam and Veldman [6] and Sachdev *et al.* [7] have shown that boundary layer equations admit self similar solutions in which multiple solutions for some range of parameters. In the present model, we assume that following Batchelor [8] and Sachdev *et al.* [7] that the outer mainstream flow is approximated in a power-law manner, that is, the boundary-layer grows as a power of the distance along the wedge of the wall from the leading edge since the pressure is

NIR Nonlinear Optical Attributes of Pr_6O_{11} Loaded Alkali Boro Zinc Bismuth Glasses

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Abstract— For achieving superior nonlinear optical (NLO) attributes of glass samples, we have incorporated rare earth oxide (in this case, it is Pr_6O_{11}) in the compositions. The NLO properties are rare earth concentration-dependent and, therefore, it is crucial to investigate the concentration effect on the NLO attributes of glasses. The effectiveness of Pr_6O_{11} concentration on NLO characteristics of the borate-based glass specimens in the near-infrared region in the femtosecond regime is being investigated in the current work using the Z-scan technique. The two-photon absorption coefficient values were almost constant up to 0.5 mole % of Pr_6O_{11} and then showed increased behaviour. The nonlinear index of refraction magnitudes was improved with Pr_6O_{11} content in the glass compositions. However, the optical limiting threshold values were found to be decreased with Pr_6O_{11} quantity in the glass compositions. These increases in NLO features and optical limiting efficiencies are attributed to the non-bridging oxygens, polarizability and molar refractions of the glasses. The outcomes of Z-scan characterization unveil that the high Pr_6O_{11} glass specimens are favourable for the production of NLO devices and optical limiters to execute the functioning in the near-infrared region.

1. Introduction

Nonlinear optical (NLO) attributes of any material play an significant role in the growth of novel optical and related devices. This can be utilized in various industries, including integrated optics, telecommunication, optical switches, optical communication systems, integrated photonics, and many more [1]. For the effective demonstration of materials to be used in the above devices it is crucial in achieving enhanced NLO features. To this end, investigations on diverse advanced materials such as carbon-based materials, graphene, perovskites, coordination polymers, metal organic frameworks (liquids, crystals and amorphous forms in recent years) etc. has been going on for the past few years [2–7]. Of course, high optical nonlinearities have been achieved in wide spectral regions under different pulse regimens in the mentioned advanced materials. However, the preparation of those advanced materials in the bulk form and in three-

dimensional scale is highly difficult. This difficulty can be overcome when one uses glassy materials since glasses can be moulded to any shape and size (in all three dimensions). Therefore, achieving superior optical nonlinearities in glassy systems is important for practical utility in device fabrications. Recent works demonstrated that NLO coefficients/properties are used to meet the requirements of gas sensors related instruments for efficient functioning based on the improvement of evanescent field (on the surface of the waveguide) and also to maintain maximum probability of interaction between the light and the molecules of the gas absorbed (on the surface of the materials) [8].

In order to tune the NLO features of glasses in near infra-red (NIR) regions many routes have been accomplished and reported which includes embedding the noble metal nanoparticles [9], ceramizing [10], activating the nanocrystals [11] loading the heavy metal oxides and transition metal oxides [12,13]. The inclusion of rare earth (RE) ions to borate glass systems is method following by many researchers to tune NIR NLO features to significant levels [14]. In view of this the RE ions such as Sm^{3+} [15], Eu^{3+} [16], Er^{3+} [17], Gd^{3+} [18] and Tb^{3+} and Yb^{3+} [19] have been investigated. The Pr^{3+} ions doped glasses has not been investigated till now, to the best of our knowledge. In addition to the photoluminescence (PL) and linear optical attributes of Pr^{3+} doped glasses the view on NLO properties is also essential for the effective utilization in photonic devices, particularly in nonlinear photonic devices [20,21]. Moreover, it is important highlight here that the NLO attributes vary from RE-to-RE ions. Since the hyperpolarizability of RE ions causes the improvement in polarizability of the glass specimen as a whole, which helps in attaining the high NLO features of the parent glass. Even outer shell of electrons of RE ions undergo large charge removal when subjected to intense laser radiation causing a significant enhancement in the third order NLO susceptibility [$\chi^{(3)}$] of the glass specimens [22]. To achieve the enhancements in the NLO coefficients of borate-based glass specimens in the near IR region through the loading of Pr_6O_{11} the present investigation has been undertaken. The NLO attributes of RE doped glass specimens are dependent

Photoluminescence studies of Eu doped CaAl_2O_4 nanophosphor for WLED's Applications

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Abstract: Novel $\text{CaAl}_2\text{O}_4:\text{Eu}^{3+}$ (1-9 mol%) nano phosphors were fabricated by ultrasonic Sonochemical method where bio sacrificial fresh lemon juice is used as a fuel. The monoclinic phase in all samples is revealed by PXRD profiles. Morphologies of the NPs were mainly dependent on Eu^{3+} , lemon juice, sonication time, pH and sonication power. The PL measurements exhibit sharp peaks at ~ 577, 588, 615, 654 & 702 nm, related to $^5\text{D}_0 \rightarrow ^7\text{F}_j$ transitions respectively. CIE chromaticity diagram shows orange to red region of the phosphor. The dipole-dipole interaction between the activator ions leads to concentration quenching. Hence these nano phosphors might be used for White Light emitting diodes and advanced LFP's.

Key words: Ultrasound, Nano phosphor, Light emitting diodes, Photoluminescence

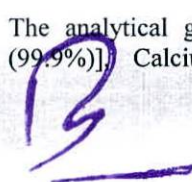
INTRODUCTION

The combination of Nanoscience and nanotechnology, particularly the emergence of engineered nanoparticles results in most promising development of devices in variety of fields like photonic materials, field emission displays, Nano electronics, biomedical, biological and chemical probes, light emitting and laser diodes [1-2]. Luminescent materials exhibit various applications and drag the attention of research community, due to their noticeable doping capability, thermal stability, spectroscopic, physical, chemical and structural properties [3-4]. White light emitting diodes (WLED's) are replaced by incandescent and fluorescent lamps for higher energy efficiency, small size, short decay time and environmental protection. [5-6]. Hence, Nano phosphors are effectively excited near UV light and emit in visible range plays an important role [7-8]. Among different kinds of host materials, aluminates (CaAl_2O_4) have received a kind of interest due to its easy preparation, wide band gap, low cost and excellent physical and chemical stability [9-10].

The rare earth ions when incorporated with such host matrix give excellent luminescence results. In these, Eu^{3+} ions were an important dopant because of its high luminescence efficiency and proper CIE coordinates, further one of the most suitable sources corresponds to the red color of visible light spectra with a transition from ($^5\text{D}_0 \rightarrow ^7\text{F}_2$) [11]. $\text{CaAl}_2\text{O}_4:\text{Eu}^{3+}$ has more advantages for display applications, due to their higher stability, high quantum yield and higher emission intensity. Until today many synthesizing methods like solgel, combustion, hydrothermal, co-precipitation, solvothermal, hydrothermal etc., [12]. The ultrasound method is used in preparing wide range of nano phosphors, including metals / sulphates /alloys/ aluminates / carbides/fluorides etc. This method also develops an interest for the synthesis of Nano phosphors because of its high potential uses like, controllable and fast reaction rate, smaller size distributions, high homogeneity, uniform mixing, less synthesis time, and least energy requirement and can be scalable to industrial needs. [13], this method is simple to operate and maintain also it is a convenient yet comparatively inexpensive tool. In this method the prepared solution was subjected to ultrasound irradiation, the micro bubbles (cavities) created in the solution was imploded collapsed by sound waves with which very high temperature and high cooling rates can be achieved which leads to the synthesis of many nanostructured materials including metals, alloys, oxides, sulphides and nanostructured supported catalysts. Considering these points, in this work, $\text{CaAl}_2\text{O}_4:\text{Eu}^{3+}$ (1-9 mol %) nano phosphors were synthesized by ultrasonic Sonochemical method using fresh lemon juice as fuel. The phase purity of the synthesized phosphors were studied by PXRD analysis. Photoluminescence behavior (PL) also studied extensively for their possible usage in lighting applications.

MATERIALS & METHODS

The analytical grade Aluminum nitrate [$\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$ (99.9%)] Calcium nitrate [$\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$ (99.9%)],



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