Proceedings of

National Convention of Electronics and Communication Engineers

NCECE-23

May 9th 2023

Organised by

Department of Electronics and Communication Engineering,

Grace College of Engineering,

Tiruchendur Road, Mullakkadu, Thoothukudi District – 607106,

Tamilnadu, India.

Preface

The National Convention of Electronics and Communication Engineers (NCECE-23) organised by the Department of Electronics and Communication Engineering, Grace College of Engineering on 9th May 2023.

Conferences pave way to bring together people with common interests and discuss issues and ideas related to various topics. The National Convention of Electronics and Communication Engineers provide a platform for professionals and researchers to share their knowledge and experiences in the field of Electronics and Communication Engineering (ECE). The conference aims to explore the latest trends, innovations, and challenges in ECE, with a focus on the theme of "Digital Transformation of ECE: Opportunities and Challenges." The theme recognizes the rapid pace of digital transformation across various sectors and industries, and how ECE plays a vital role in enabling this transformation. The conference will feature keynote speakers and technical sessions that will cover topics such as emerging technologies in ECE, digital communication, signal processing, microelectronics, nanoelectronics and other related fields such as wireless communication, optical communication, embedded systems, control systems, artificial intelligence, machine learning, and cybersecurity. The conference will provide a comprehensive overview of the latest advancements in ECE and related fields, with a particular focus on their applications in various industries and domains. The National Convention of Electronics and Communication Engineers will provide a unique opportunity for professionals and researchers to network, collaborate, and exchange ideas and best practices.

The objective of this National conference is to provide opportunity for the participants to interact and exchange ideas, experience and expertise in the current trend and strategies. Besides this, participants will also be enlightened about vast avenues, current and recent technological developments in various domain and its applications will be thoroughly explored and discussed.

The proceeding is a compilation of the 76 accepted papers and represent an interesting outcome of the conference. This year, NCRDSET'22 has attracted Academicians and students across the country who has submitted their contributions with their latest advances. The accepted papers reflect the current trends in the following 5 broad research areas. 1) Computer Science, 2)

Electrical 3) Electronics and Communications 4) Engineering Science and 5) Management Sciences.

Before concluding this preface of these proceedings, I would like to express my thanks to all authors, members of the program committee, members of the organizing committee and the rest of the people involved in planning and developing of NCECE-23 for their unconditional support, their great effort, and their valuable time. I would like to devote special thanks to the members of the program committee for providing excellent reviews of the submitted papers. I also wish to give special thanks to all the non-teaching members for their hard work and devotion, which made the conference a great success. All of them have made possible the successful accomplishment of NCECE-23.

Special thanks to the authors, the committee members and the sponsors. I hope all the participants can obtain useful information from the proceedings.

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Mr. M. Krishna Kumar,

Assistant Professor and Head,

Department of Electronics and Communication Engineering,

Grace College of Engineering, Mullakkadu

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Message from Keynote Speaker

I am extremely delighted about this National Convention of Electronics and Communication Engineers organized by the Department of Electronics and Communication Engineering of Grace College of Engineering, Mullakkadu, Thoothukudi on 9th May 2023. Over the years, intense improvements have been made in the field of Science, Engineering and Technology. This forum will address various research challenges and latest innovation. The developments in these areas have made the world get closer, communication easier and faster. The need of the hour is to bridge the gap between the academia and industry. This conference is sure to provide a venue for researchers and practitioners to address the research problems and identify better solutions. I believe it will also aim at increasing the synergy between the academic and industry professionals.

I congratulate the organizing committee members, supporting staff, scholars and delegates for their initiatives. My sincere and best wishes for the success of the conference.

Dr. S. Darwin,

Assistant Professor,

Department of Electronics and Communication Engineering,

Dr. Sivanthi Aditanar College of Engineering, Tiruchendur

Message from Principal

It gives me immense pleasure that the Department of Electronics and Communication of Grace College of Engineering is organizing National Convention of Electronics and Communication Engineers on 9th May, 2023. This conference aims to bring novel ideas from inquisitive minds to a common platform for deliberation, consideration and appreciation. Besides that, candidates get an opportunity to showcase their talents in their respective fields. We are pleased with the enthusiastic response we have received from participants across the country.

Quite a lot of commitment and hard work has gone into organising this conference and I sincerely congratulate the convener and the organizing team, and all coordinators for their united efforts.

I sincerely convey my heartily congratulation to all authors and participants from our and other institutions for their efforts and interest in participating in this conference. I am sure that this conference will help the next generation researchers to gain insight knowledge in their area of interest. I wish the conference all the success. Heartfelt wishes to all.

Dr. S. Richard,

Principal,

Grace College of Engineering, Mullakkadu

Conference Preamble

The National Convention of Electronics and Communication Engineers provide a platform for professionals and researchers to share their knowledge and experiences in the field of Electronics and Communication Engineering (ECE). The conference aims to explore the latest trends, innovations, and challenges in ECE, with a focus on the theme of "Digital Transformation of ECE: Opportunities and Challenges." The theme recognizes the rapid pace of digital transformation across various sectors and industries, and how ECE plays a vital role in enabling this transformation. The conference will feature keynote speakers and technical sessions that will cover topics such as emerging technologies in ECE, digital communication, signal processing, microelectronics, nanoelectronics and other related fields such as wireless communication, optical communication, embedded systems, control systems, artificial intelligence, machine learning, and cybersecurity. The conference will provide a comprehensive overview of the latest advancements in ECE and related fields, with a particular focus on their applications in various industries and domains. The National Convention of Electronics and Communication Engineers will provide a unique opportunity for professionals and researchers to network, collaborate, and exchange ideas and best practices.

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Online Tourism Management System

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Abstract

Utmost of the people in this world like to travel from one place to another no matter whether it's a small or large distance. The need for a tourism operation system that can manage tourism information with ease is sought after by every stint operation company. Tour Management system is a dynamic website for tourism business. By using this, the stint company can knitter stint packages gauging colorful destinations at nearly every price point. The also enforced search module allows the director to find and modernize or upgrade the stint packages with ease. This module can also indeed be extended to a client operation runner by which guests can find the right stint package for them at every budget, depending on the stint locales. The main purpose is to help tourism companies to manage stint packages. The system can also be used for both professional and business passages. The proposed system maintains a centralized depository to make necessary trip arrangements and to recoup information fluently.

Keywords: Online, Tourism, Travel

1. Preface

Tourism has turned out to be a profitable supporter contributing to the profitable development of numerous countries over the last many decades. People see leaves as a necessity, and not as luxury in the present script. Tourism has a many major rudiments − destinations, lodestones, spots, accommodation, and all ancillary services. The need for a robust and dynamic stint operation has been around since the arrival of the tourism conception. Therefore we've developed an operation to give the stylish travelling services to the guests and trip agents. The Tourism Management System provides a hunt platform where a sightseer can find their stint places according to their choices. This system also helps to promote responsible and intriguing tourism so that people can enjoy their leaves at their favorable

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places and develop tourism with different societies so that they enrich the tourism experience and make pride.

The Tourism Management System is a web grounded operation. The ideal of this design is to develop a system that automates the processes and conditioning of a trip agency. It's tedious for a client to plan a particular trip and have it executed duly. This design is developed to replace the presently being system, which helps in keeping records of the client details of destination as well as payment entered.

The proposed system is largely automated and makes the travelling conditioning much easier and flexible. The druggies can get the veritably right information at the veritably right time. This will increase the trust of the client into the tourism company as well. This design is designed with SQL Garçon as aft end. All the data will be stored in the garçon and in case of any data losing situation, a backup will be available by this garçon. The details related to every aspect of the sightseer will be available independently. The admins just have to click formerly and all the details will be available to them.

2. Being System

In the present system a client has to approach colorful agencies to find details of places and to bespeak tickets. This frequently requires a lot of time and trouble. A client may not get the asked information from these services and frequently the client may be deceived. It's tedious for a client to plan a particular trip and have it executed duly.

3. Proposed System

The proposed system is a web grounded operation and maintains a centralized depository of all affiliated information. The proposed system maintains centralized depository to make necessary trip arrangements and to recoup information fluently. The system allows one to fluently pierce the applicable information and make necessary trip arrangements. druggies can decide about places they want to visit and make bookings online for trip and accommodation. The tourism operation system allows the stoner of the system access all the details similar as rainfall, position, events, etc. The main purpose is to help tourism companies to manage client and hospices etc. The system can also be used for both

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professional and business passages. This particular design deals with the problems on managing a stint and avoids the problems which do when carried manually.

4. Functional Conditions

Number of Modules After careful analysis the system has been linked to have the following modules

   a) Director module

   b) Stoner (rubberneck) module

   c) Guest stoner

 a) **Director Module**: This module provides director related functionality. Director manages all information and has access rights to add, cancel, edit and view the data related to places, peregrination, routes, bookings, Enquiries etc.

➢ *Packages* - Admin will produce the packages and Manage the packages (produce, Update, delete).

➢ *Druggies* - Admin view all Information of all druggies.

➢ *Reserving* - Admin will responsible for manage booking. Admin can confirm and cancel a booking of rubberneck.

➢ *Manage issues Complaints* - Admin can take action on any issue/ complaint raised by stoner (rubberneck) and Put comment.

➢ *Manage Enquiries* - admin can manage all enquiries raised by druggies (rubberneck).

➢ *Manage runners* - Admin can edit the word of all runners that are display on the website.

➢ *Dashboard* - Then admin can view all count of booking, issues, Enquiries and druggies.

➢ *Change word* - Admin can change own word.

 b) **Stoner (Rubberneck) Module:**

➢ *Signup* - stoner can register your tone for booking.

➢ *Signin* - Then stoner can login with valid username and word.

➢ *Forgot Password* - stoner can recover his/her own word.

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- ➤ *My Profile* - stoner can modernize own profile.
- ➤ *Tour history* - After login stoner can bespeak any stint that will show in Tour history. Stoner can cancel his/her booking before 24 hr of travelling.
- ➤ *Change word* - stoner can enjoy word.
- ➤ *Write - use* - Then stoner can raise any issue related to booking. Cancelation etc.

c) **Guest Module:** Guest stoner can visit the website and view the all content of website. Guest stoner can also Enquiry.

5. System perpetration Design

The affair module of this system is a stoner-friendly window. The stoner enters their username and word for login. New druggies give their completed particular details, address, dispatch, and phone number for enrollment. Pages are designed to cut through the home, sign in, my account, feedback, about us, and communicate us sections. However, also it's stored in the database differently the stoner is advised by a communication, If the entered data while sign- heft satisfies all the conditions. However, also the stoner can pierce all runners differently the stoner is informed by a communication showing an incorrect username / word, If the username and word are valid. The stoner also gets complete information about the colorful sightseer places. The stoner views the stylish deals after entering the needed data about the stint and can bespeak their stint. A runner is designed for showing the stylish deals with reduction prices according to stoner preferences. A separate runner is intended for 'About us,' showing the information about the trip agency. A runner for 'communicate us' displays the contact details. Also, the druggies can give their feedback. This system also included the point to cancel, update, and display the stoner details from the database.

6. Database Design

A relational database schema helps you to understand and organize the structure of a database. It's helpful when we design a new database or being database is modified to incorporate new functionality.

Database Tables and Structures

- ➤ Table druggies
- ➤ Table issues

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- ➤ Table booking
- ➤ Table enquiry
- ➤ Table runners
- ➤ Table admin

7. Conditions

a) Tackle Conditions

- ➤ Processor Intel Core Duo2.0 GHz or further
- ➤ RAM 1 GB or further
- ➤ Hard fragment 80 GB or further
- ➤ Examiner 15 " CRT, or TV examiner
- ➤ Keyboard Normal or Multimedia
- ➤ Mouse Compatible mouse

b) Software Conditions

- ➤ Front End PHP
- ➤ Back End MySql
- ➤ Operation System Windows XP,
- ➤ unborn compass

Tourism is growing and so is the compass in tourism adding. There's a good employment in the tourism sector. Therefore too snare similar openings you need to prepare yourself with the knowledge in tourism. Any sightseer agency can make use of it for saving client details in database. Tourism group can use it for managing their position, hostel, vehicles details. This operation can fluently enforced under colorful situations. We can add new features as and when we bear. Reusability of this operation is also possible.

8. Conclusion

Tourism is presently honored as a global assiduity which is growing at a high rate like any other assiduity. Access to applicable and accurate information is at the heart of tourism. Then, the proposed design on Tourism Management System tries to bridge the gap by noting what a sightseer perceives as applicable. Hence, the end of this design entails the design and perpetration of a platform that will help excursionists in gaining access to travel to colorful

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sightseer locations. The design also helped to give knowledge about the rearmost technology used in developing web enabled operation and customer garçon technology that will be great demand in future.

It's worth mentioning that this design work is open for farther improvement, with the anticipation that it becomes more robust and better enhanced; covering every single sightseer spots. For a modified system, the stoner need to just login into the operation and can find the routes, costs, hospices, adventure, sports, and transportations and book incontinently and complete the booking process for a successful sale. In the aspect of tourism, Internet and web technologies have made more readily available information on sightseer locales, lodgment, transportation, shopping, food, carnivals, and other lodestones, therefore perfecting the whole tourism experience.

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Multiple Object Detection Using Conventional Neural Network

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Abstract

The object detection based on deep learning is an important application in deep learning technology, which is characterized by its strong capability of feature learning and feature representation compared with the traditional object detection methods. To overcome these challenges, a novel approach is developed for object detection applications. However, compared to image classification the object detection tasks are more difficult to analyze, more energy consuming and computation intensive improve the accuracy and energy efficiency of the detection process. This is achieved by integrating the Convolutional Neural Networks (CNN) with the attention algorithm. Here, we obtain high accuracy output with small sample data to train the model by integrating the CNN and attention features. The proposed detection model is a cluster of multiple deep convolutional neural networks and hybrid CNN-Attention algorithm. The reason to use the attention to amplify the model"s capacity to detect small data or features. The Simulation results show better performance in accuracy when compared with the conventional CNN method.

Keywords: Network, CNN, Technology

Introduction

The field of machine learning has made major development in recent years. A significant improvement in the machine learning is "deep learning," which exploits deep networked architectures comprised of several linear or nonlinear transformations to model high-level data abstractions. Deep learning, also known as deep structured learning or hierarchical learning, is a subset of machine learning techniques that emphasizes the interpretation of data representation. Deep neural networks (DNNs) have made substantial advancements in various computer vision applications, including face recognition without constraints [1]. However, modern highly-accurate face recognition systems are often built on

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extremely CNNs [2- 4], and as a result, they are composed of a succession of convolutional layers. Deep learning models require a substantial amount of computational resources, such as massive memory and powerful GPUs, in order to produce high-performance results. To circumvent these limitations, current research focuses on designing neural networks that are both small and economical without losing performance. In recent years, the construction of lightweight deep neural networks has become popular for improving the speed-accuracy trade off [5-8]. Google Net [9], Alex Net [10], Squeeze Net [5], Shuffle Nets [6, 7], and Mobile Nets [8,1 8], VGG models [20] are some of the most well-known neural network architectures for conventional image identification tasks, and they achieve exceptional results. However, only a very few authors have offered precise lightweight facial recognition architectures.

In this paper, we present Google Net and Squeeze Net, two novel lightweight architectures for face recognition. The results reveal that the Squeeze Net deep CNN model is more effective than the Google Net deep CNN method. The remainder of this work consists of the following: The 2nd section describes the materials and methods utilized for this study. The 3rd section examines over- and under fitting of training data. The 4th section describes the methodology and implementation procedure. Section 5 provides performance measures, while Section 6 discusses conclusions and future work

Materials and Methods

Convolution Neural Networks

In deep learning, a CNN is a specialized neural network designed to handle data via many array layers. CNNs are particularly suited for applications involving image recognition and are widely used for face recognition. Convolutional layers are the fundamental components that allow CNN to perform its wonders. In a typical image recognition application, a convolutional layer consists of a large number of filters for recognizing the image features. Figure 1 shows the various layers of CNNs, including the convolutional layer, the pooling layer, and the fully connected layer.
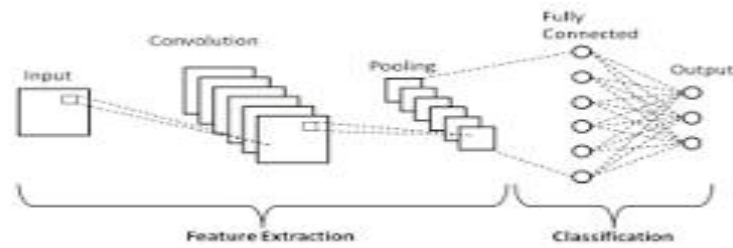
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Fig. 1. CNN Schematic [17]

Convolutional layer

The essential component of a CNN is a convolutional layer. It includes a collection of filters (or kernels) whose parameters must be learned during training. Typically, the size of the filter is smaller than the image's size. In order to produce an activation map, each filter is applied to the image. For convolution, the filter is slid across the image's height and width, and the dot product between each element of the filter and the input is computed at each spatial position. Figure 2 depicts the convolution process.

Pooling layers

Pooling layer is an essential component of CNN. CNN's pooling layer is used to reduce the size of the feature maps. It is advisable to reduce the set's number of values. The idea is that they will only extract relevant information and remove all irrelevant information. There are several ways to pool resources. Average pooling and Max pooling filter is applied to the image.

For convolution, the filter is slid across the image's height and width, and the dot product between each element of the filter and the input is computed at each spatial position. Figure 2 depicts the convolution process.

Fig. 2. An illustration of a computational activation map.
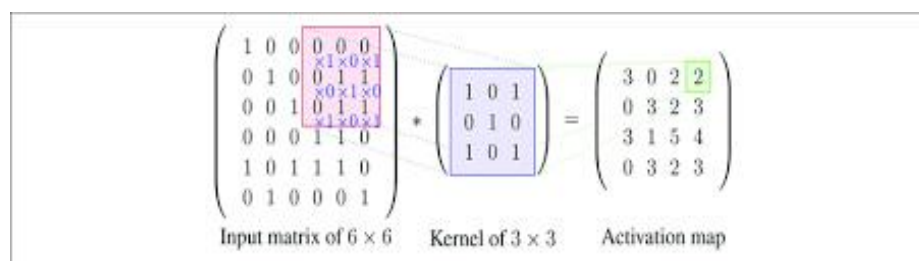
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Average pooling

Average pooling computes the average of the components present in a region in a feature map. The area of the feature maps is governed by the size of the filter. The goal of average pooling is to calculate the mean of the patch's features. The average pooling process is depicted in Figure 3.
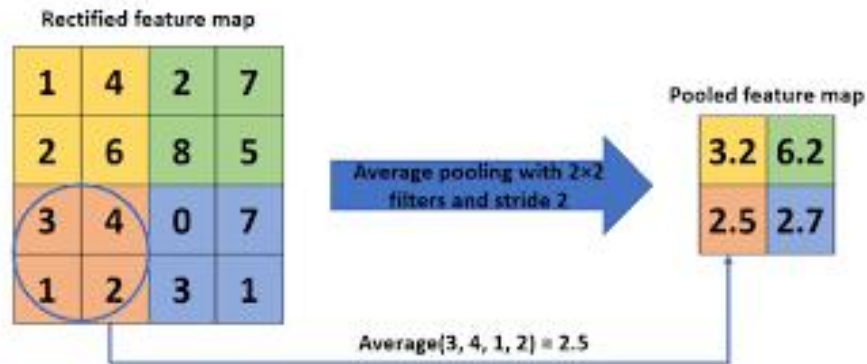
Fig. 3. An example of average pooling process

Max pooling: Max pooling is one of CNN's most used pooling algorithms [12]. During max-pooling, the maximum element from the feature map's region is chosen. As a result, max-pooling produces the most prominent features from the preceding feature map. Figure 4 depicts an example of max-pooling.

Fig.4. An example of Max pooling process

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Fully Connected (FC) Layer

The FC layer is a CNN block found in the final network stages. It connects neurons from one layer to another. The FC layer receives the output of the pooling layer. Moreover, the FC layer is responsible for classifying the data into multiple categories.
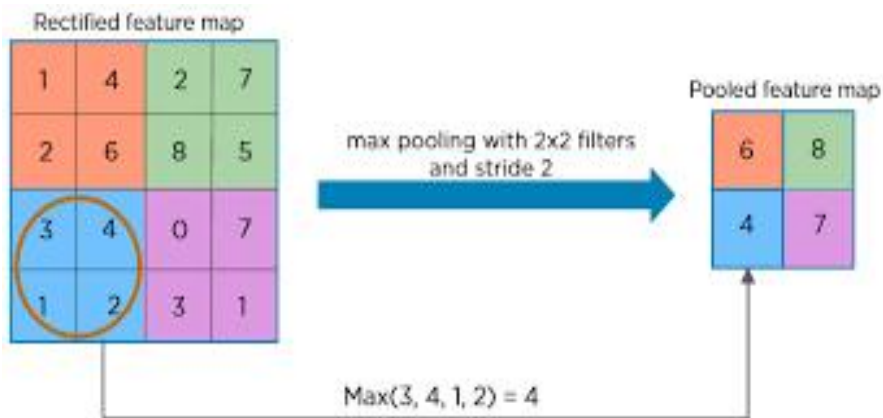
CNN Pre-Trained Models

Pre-Trained Google Net CNN Model

Google Net is a 22-layer CNN initially presented at ILSVRC2014 (ImageNet Challenge) [13] hence its architecture is known as inception architecture. There are nine linearly stacked inception modules. The inception modules' terminals are linked to the global average pooling layer. It uses various techniques, such as 1x1 convolution and global average pooling, to produce a more complex architecture 1x1 convolutions: The Inception architecture employs 1x1 convolutions in its design. These convolutions were used to reduce the amount of architecture parameters (weights and biases). By decreasing the parameters, we increase the architecture's depth. Global Average Pooling: Global Average Pooling replaces the fully connected CNN layers. These GAP layers reduce the amount of model parameters to reduce Overfitting. Inception Module: In this architecture, the convolution size of each layer is fixed. At the input of the Inception module, 1x1, 3x3, 5x5, and 3x3 max pooling are carried out in parallel, and their outputs are stacked to produce the final result.

Fig. 5. A naive version of an inception block
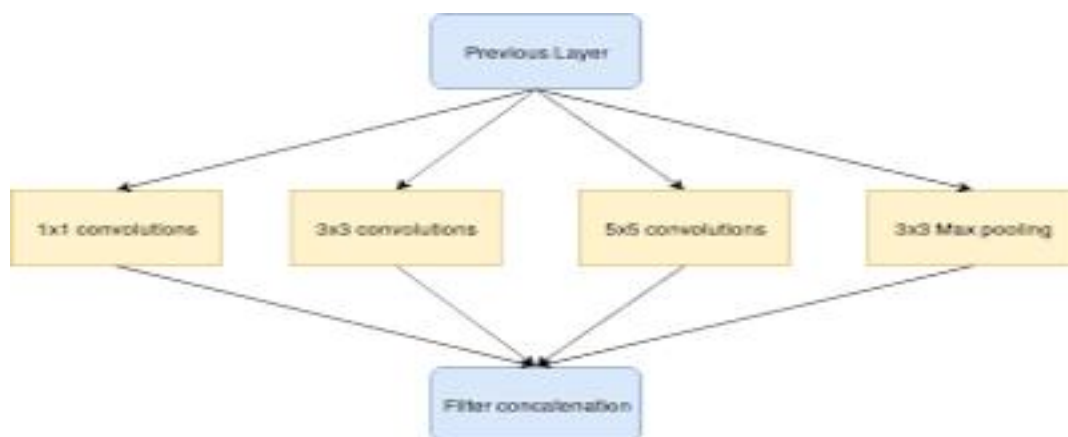
Figure 6 demonstrates that the dimensionality reduction of the 11 convolution kernel can decrease the number of parameters and boost the network's depth.
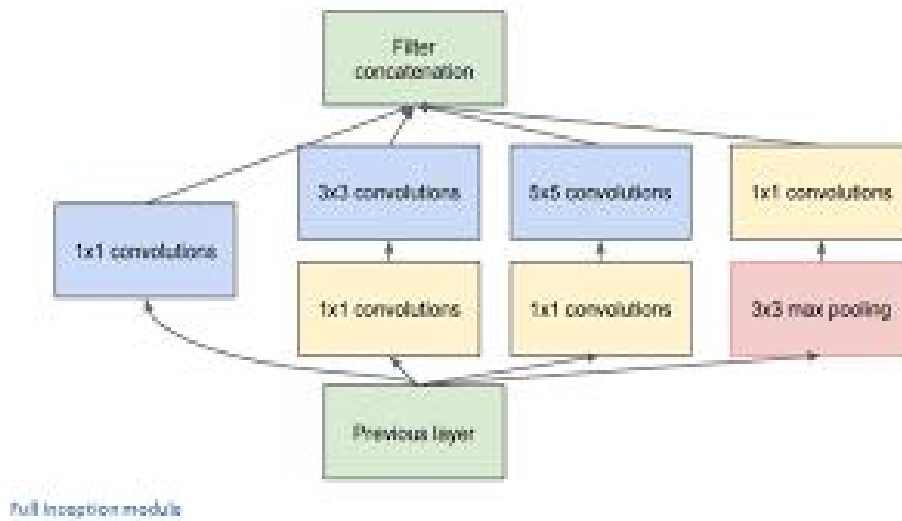
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Fig. 6. Dimension reductions in the Inception module

Pre-Trained Squeeze Net Deep CNN Model

Squeeze Net is a CNN architecture that reduces the number of parameters through the use of multiple design strategies. In comparison to Alex Net, we are able to reduce the size of our models by a factor of 50 using Squeeze Net, while still maintaining or improving upon Alex Net's top-1 and top-5 accuracy [5]. In this design, fire modules serve as the fundamental element. Squeeze Net is designed with three primary strategies: (1) Reduced network size by substituting 3x3 filters with 1x1 filters; (2decrease in the number of inputs for the remaining three 3x3 filters; and (3) Late network down sampling so that convolution layers have substantial activation maps. Figure 8 shows the fire module of the squeeze Net. The Fire module is made up of two layers: a Squeeze layer that reduces the number of input channels by using a limited number of 1x1 convolutions and an Expand layer that increases the number of output channels by using 1x1 and 3x3 convolutions. This technique is known as a bottleneck structure. In addition, the Fire module's Expand layer contains 1x1 convolution filters to further minimize the number of parameters. Figure 9 shows the architecture of the Squeeze Net CNN.

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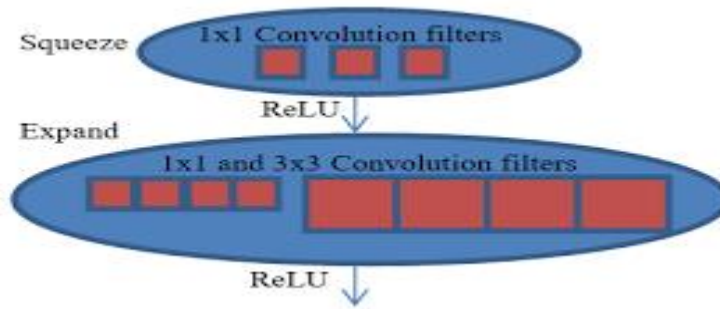
Fig. 8. Squeeze Net CNN Fire module
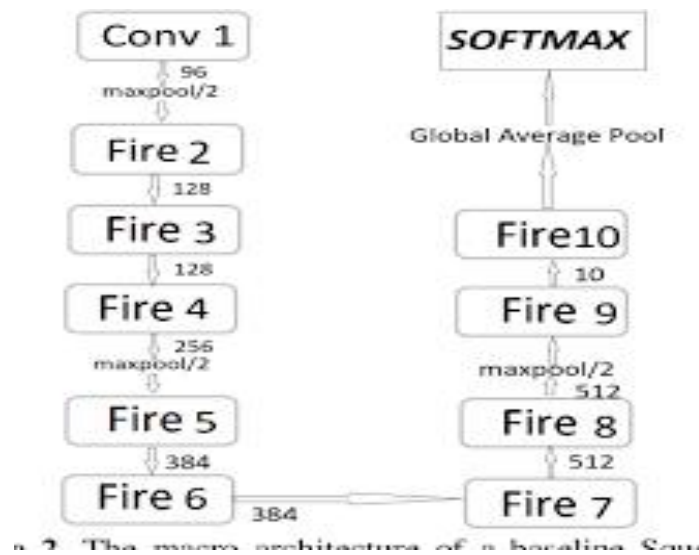
Fig. 9. Architecture of Squeeze Net CNN

Overfitting and Under fitting of training

Deep neural networks have several parameters. With so many parameters, the network may fit a wide variety of complex datasets. This flexibility can cause Overfitting [14].When a model is over trained on a particular set of training data, it is more susceptible to overfitting. This type of model will perform exceptionally well on the training dataset, but its performance will not improve on the new or unseen dataset. This causes Overfitting. If the model performs poorly on both the training dataset and the new or unknown data, this is generally the result of under fitting.

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Under fitting typically occurs when there is inadequate training time or when the learning algorithms are insufficient to model the training data. Figure 10 shows the under fitting, overfitting and optimal training data.

Fig. 10. Under fitting, optimal, and Overfitting of training data

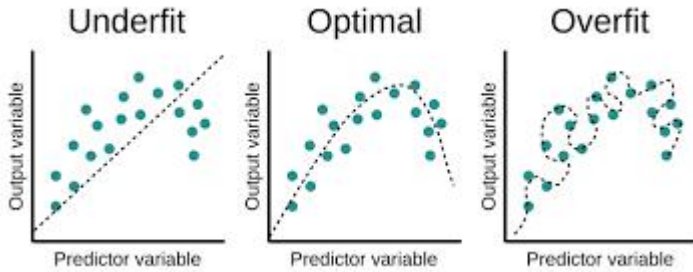Regularization is a technique for avoiding Overfitting and under fitting. Regularization is a machine learning approach, particularly employed in deep learning that adjusts the learning algorithm to improve model generalization to previously unseen data [15].

Early Stopping (ES)

Methodology and implementation

Early Stopping is a regularization approach in machine learning that monitors the model's generalization error and helps in stopping the training process if the model's performance on the validation dataset begins to worsen. This prevents the training data from becoming over fit.

This technique is the most often used kind of regularization in deep learning [16] due to its simplicity, effectiveness, and ease of implementation.

The process begins with the acquisition of facial images from individuals, followed by the pre-processing of those images to achieve standard normalization. After that, the images are convolved using a pre-trained CNN transfer learning approach for feature extraction and classification, as shown in Figure 11. In this paper, we applied Google Net and Squeeze Net pre-trained CNNs for face recognition.

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Preparing the Dataset

The first step is to gather information. We looked at 40 photos of the 4 subjects to come up with this conclusion. For each subject in the database, the photographs are stored in a separate folder. There are four folders established here, each containing ten photos. All photos that may be included in the dataset are of varying dimensions. Consequently, pre-processing /image augmentation is necessary to ensure that the network accepts the training images as input images and prevents them from being over- or under-fit

Load the Dataset and pre-trained CNN

After data preparation, the next step is to load the data. The dataset is separated into the training set and the validation set. We can use the 'split Each Label ()' function in MATLAB to accomplish this. This function has two required arguments. The first argument represents the dataset to be split. And the ratio of splitting is the second argument. The ratio is set to 7/10. It indicates that the data will be divided into two groups, with one group having 70% of the data and the other obtaining 30% of the data. Based on the transfer learning model, the system loads the pre-trained network (Google Net/Squeeze Net), and the trained network takes these training parameters into account. Table 1 shows the various training parameters and its values.

Parameters/Networks	GoogleNet CNN	SqueezeNet CNN
Mini batch size	10	4
Max epochs	6	10
Initial learning rate	0.003	0.004
Max.Iterations	42	70
Iterations for epoch	7	7

Table 1. Training parameters

Testing the Face Recognition Network

The network has undergone extensive training. Now we send images to testing network, which will classify them.

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Evaluation Metrics

Model evaluation helps comprehend the model's performance. There are a number of evaluation measures available. Among these, the confusion matrix is considered as an effective classification technique.

Confusion matrix

The confusion matrix demonstrates an algorithm's performance in terms of true positive (TP), true negative (TN), false positive (FP) and false negative (FN).

	PREDICTED VALUES	
ACTUAL VALUES	TP	FN
	FP	TN

Table 2 Confusion matrix

As seen in the Table 2, TP indicates that the model predicts exactly the presence of the positive class; TN denotes that the model accurately predicts the negative class; FP shows that model predicts the positive class incorrectly and FN specifies that model predicts the negative class incorrectly. To evaluate the performance of Google Net and Squeeze Net CNNs in this paper, various metrics including precision, recall, F1 score, and accuracy are employed.

Precision:

Precision is a metric that describes the accuracy of a model. It computes the overall number of accurate forecasts.

Precision (P) =TP/ (TP+FP) (1)

Recall:

Recall is a metric that computes the total number of actual positives captured by a model.

Recall (R) = TP/ (TP+FN) (2)

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F1-Score: The F1 score is a weighted sum of recall and precision.

F1 - Score= (2*P*R)/ (P + R) (3)

Accuracy:

Accuracy is the ratio of the number of correct predictions to the total number of data samples.

Accuracy= (TP+TN)/ (TP+TN+FP+FN) (4)

Experimental results

The Google Net and Squeeze Net CNNS are trained and evaluated in the MATLAB R2021b environment.

Experimental results of transfer learning based pre-trained Google Net CNN

Google Net is one of CNN's pre-trained models. Figure 12 shows the pre-trained Google Net network architecture and specifications. Figure 13 shows face recognition results with 88.24 % validation accuracy. The operation takes 2 min 51 seconds to finish with a maximum of 42 iterations and 7 epochs/iteration. The constant learning rate schedule is 0.0003. The testing process achieves 86 % accuracy. Figure 14 depicts the testing result of Google Net.
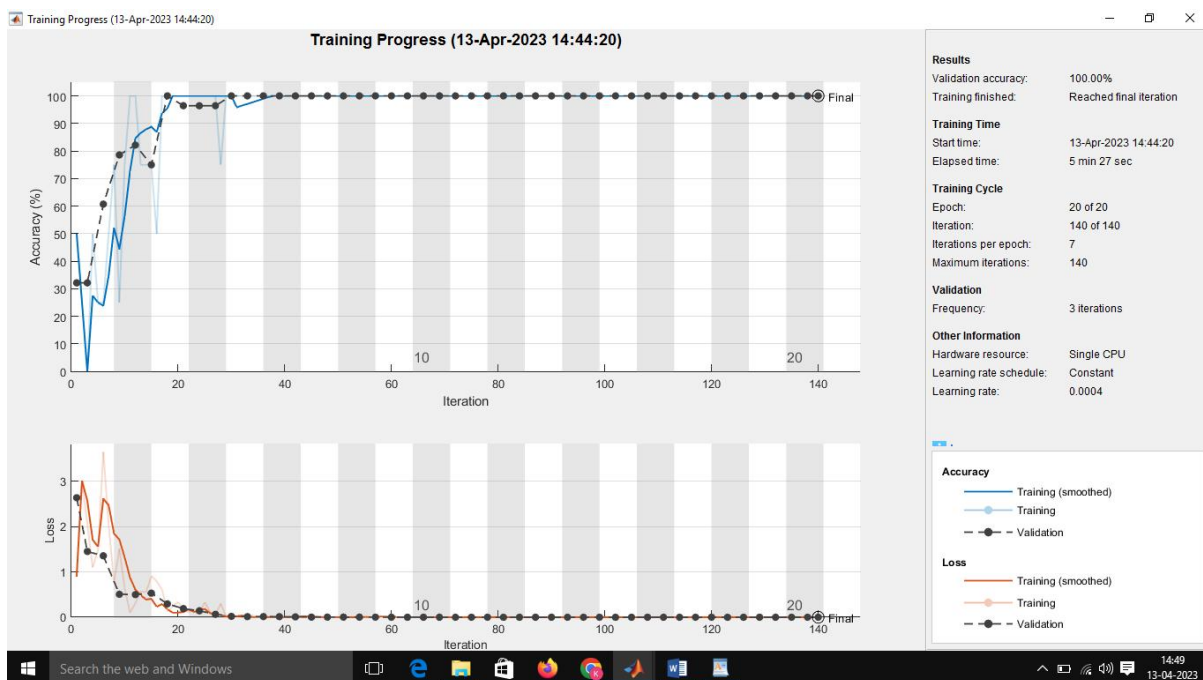
Training progress graph of Squeeze Net CNN

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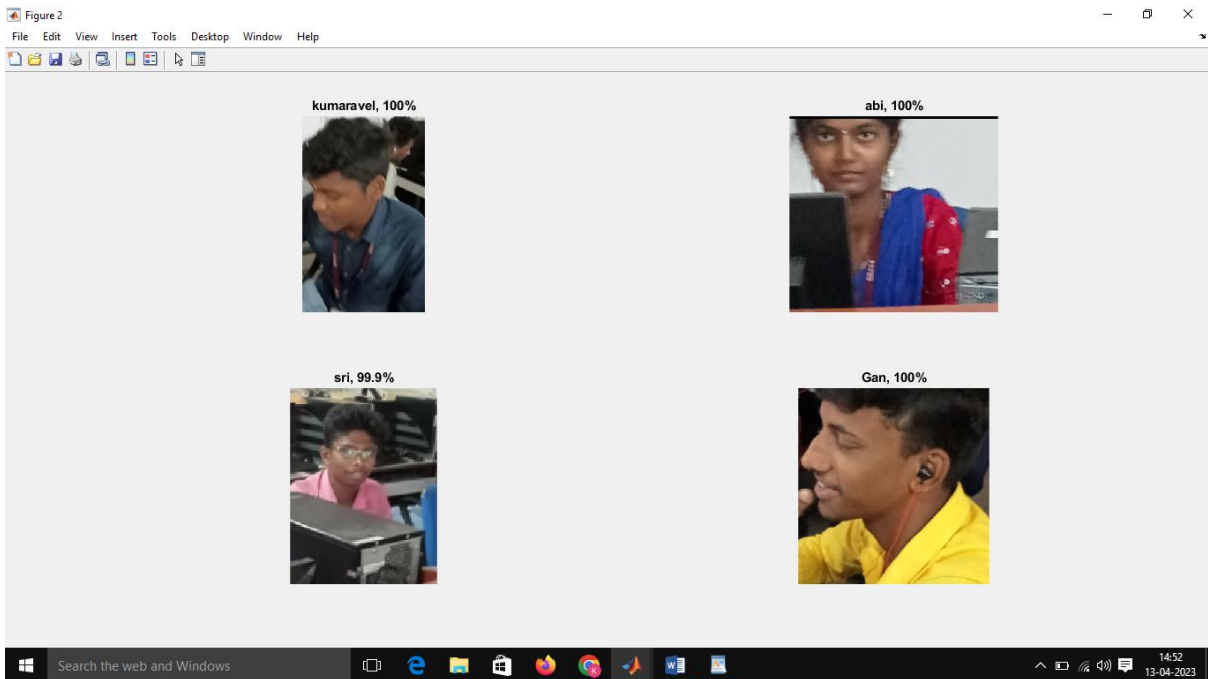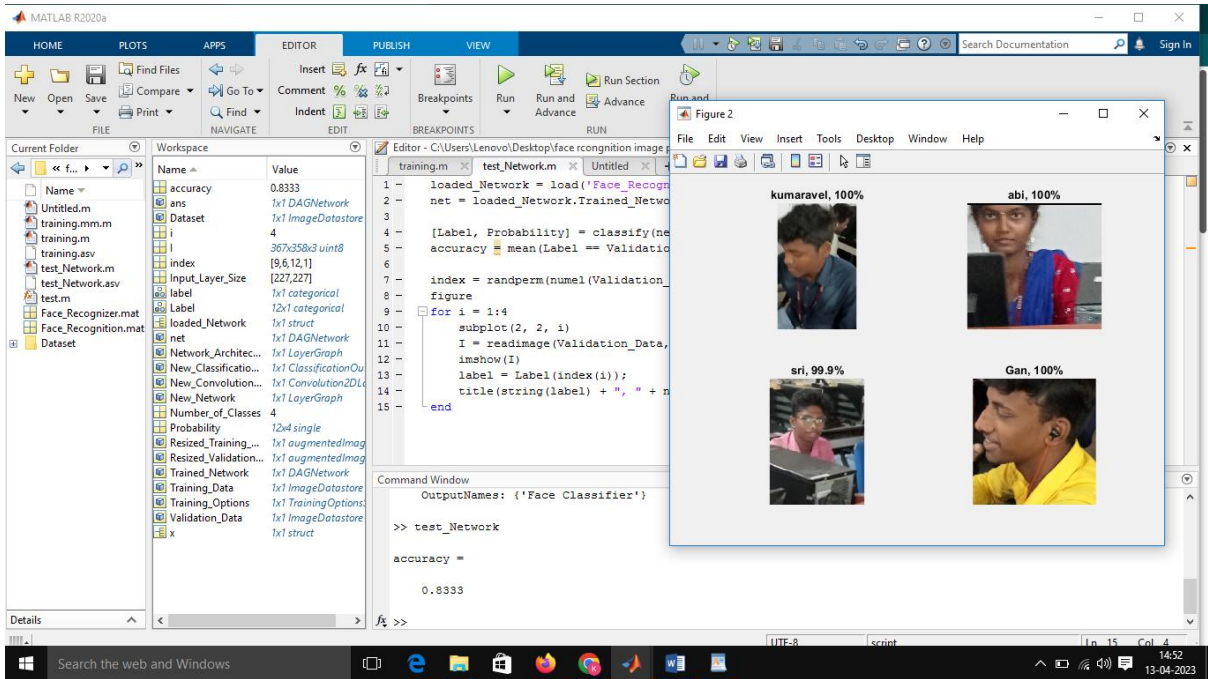
Squeeze Net CNN testing result

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Experimental results of transfer learning based pre-trained Squeeze Net CNN

Squeeze Net is another CNN's pre-trained models. Figure 15 shows the pre-trained Squeeze Net network architecture. Figure 16 shows face recognition results with 100 % validation accuracy. The operation takes 1min 51 seconds to finish with a maximum of 70 iterations and 7 epochs. The constant learning rate schedule is 0.0004. The testing process achieves 93% accuracy. Figure 17 depicts the testing result of Squeeze Net CNN. List may be presented with each item marked by bullets and numbers.

S. No	Network Type	Validation accuracy	Training time
1	Google Net CNN	88.24%	2 min 51 sec
2	Squeeze Net CNN	100%	1 min 45 sec

Conclusion and future work

This work explores the application of transfer learning on the Squeeze Net CNNs to do real time face recognition. The performance of this model is compared with the Google Net CNN with a considerably deeper neural network that was trained exclusively for face recognition. The study demonstrates that squeeze Net CNN performs better than Google Net CNN for face recognition tasks. In the future, we intend to extend the presented framework to solve more difficult recognition tasks, such as multiple face recognition and object recognition in general. In addition, we intend to conduct an exhaustive comparison of several deep learning models on large dataset for face recognition.

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Advance Vehicle Access System Using SIoV

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Abstract

Due to the enormous potential to guarantee road safety and improve driving experience, Social Internet of Vehicle (SIoV) is becoming a hot research topic in both academic and industrial circles. As the ever-growing demand for service quality of automobiles, the way to provide users with a range of security-related and user-oriented vehicular applications has become significant. This paper concentrates on the design of a service access system in SIoVs, which focuses on a reliability assurance strategy and quality optimization method. First, due to the instability of vehicular devices, a dynamic access service evaluation scheme is investigated, which explores the potential relevance of vehicles by constructing their social relationships. Next, this work studies a trajectory- based interaction time prediction algorithm to cope with an unstable network topology and high rate of disconnection in SIoVs. At last, a cooperative quality-aware system model is proposed for service access in SIoVs. Simulation results demonstrate the effectiveness of the proposed scheme.

Keywords: Internet of Vehicles, access systems, social relationship, routing protocol

1. Introduction

Smart city is a term leveraged for the integration of innovative technologies and solutions to manage a city's assets, including information systems, power plants, transportation, and other critical infrastructures and key resources [1]. The ultimate goal of smart city is to offer the high quality of citizens' life. In this regard, the transportation sector has drawn intense interests due to the rapidly increasing   number of vehicles in big cities.

Moreover, people spend a large amount of time in vehicles on roads after homes and offices. Therefore, efficient management of heavy traffic to avoid congestion and accidents, as well as providing interactive services to the drivers and passengers on roads is an urgent demand nowadays [2, 3]. Vehicular Ad Hoc Network (VANET) is one part of the earliest technologies designed for vehicular networks. It is essentially a subset of mobile Ad Hoc networks, where vehicles carry the wireless communication devices with high mobility. Due to the high

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mobility and rapid change of a network topology, VANETs offer a challenging task of efficiently routing information to a specified destination with high link connectivity. Therefore, efficient routing protocol design has become a hot research topic for several years. To overcome the connectivity issue in VANETs, researchers have been trying to explore alternative solutions. One promising solution is Delay Tolerant Networks (DTNs), whose vital feature is that an end-to-end connection is not necessary for link establishment. Instead, they are employed in a store-carry-and- forward manner. To achieve this connection-less communication, DTN protocol stack offers a special layer called a bundle layer. Its function is to store the initial packet and pass it on as a bundle to other nodes upon contact, until the packet reaches its destination. Smaldone *et al.* [4] proposed a social framework for vehicular communication, along with an application named Roadspeak. Through this application, drivers on the road can join interest- based voice chat groups to engage in dialogue with each other for entertainment. They called this framework as Social Internet of Vehicle (SIoV) and defined it as: A social network of vehicles, enabled by spatial and temporal localities on the road. This has opened up a new paradigm in vehicular networks by enabling drivers and passengers to socialize on roads.
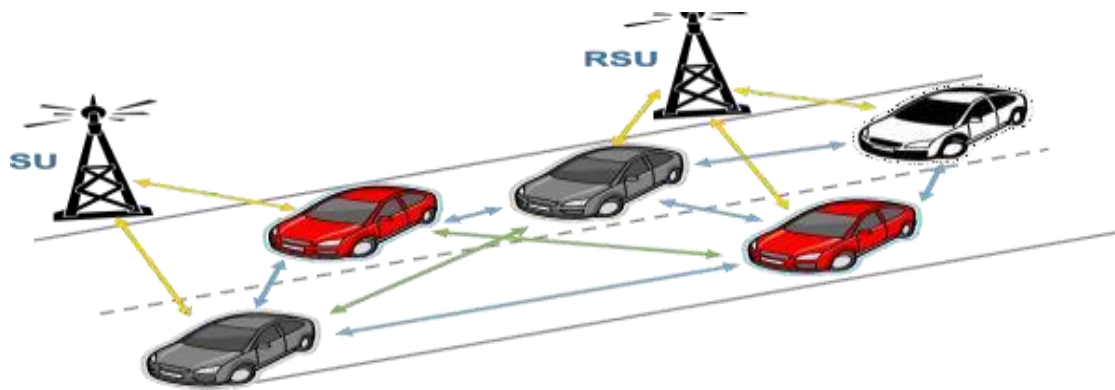
SIoVs make use of the human social behaviors (relationship, similarity, community, mobility, and social ties etc.) and incorporate them into physical vehicular networks. Due to the huge potential for the realization of smart cities, the utilization of SIoVs has been extensively studied in road safety guarantee, transportation efficiency optimization, conveniences and comfort improvement for driving. As the continual integration of Table PC and on-board controller, the communication requirement between human to human, Vehicle to Vehicle (V2V), and Vehicle to Infrastructure (V2I) can be satisfied in SIoVs. Furthermore, as on-board equipment becomes

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more and more intelligent. Users' requirements on the diversification and optimization of vehicle services increase largely, which bring challenges to the service access of SIoVs, such as network complexity and personalization [5, 6].

As the foundation of vehicular applications, service discovery and network access directly affect the safety and availability of SIoVs, which determine the whole quality of users' experience. Furthermore, the related methods have to provide vital information for the upper layer vehicular applications. Generally speaking, current studies mainly focus on three aspects: network frameworks, discovery techniques and routing protocols [7, 8]. Although the intelligence degree of vehicular devices improves continually, the expectation of users' requirements for network services also increases. Because a single device cannot meet all the requirements due to its limitation of information acquiring and processing, the establishment of information sharing, service access and mutual cooperation mechanism among vehicular devices becomes inevitable. However, service dimensionality, and network complexity together with security risk would increase if multiple nodes are engaged for information interaction, such that vehicular applications are inclined to reliable and safe information access and services. This is the motivation of our study. Our work designs a Cooperative Quality-aware Service access (CQS) system for SIoVs. Its main contribution can be summarized as follows:

We put forward a dynamic access service evaluation scheme. It comprehensively considers the direct and indirect service quality evaluations, and can cope with the interference and effect brought by the dynamic change of network topology and node instability by introducing a time attribute, attenuation mechanism, and feedback regulation mechanism of the historical record.

We propose a social relationship construction method for intelligent vehicles. Based on the foundation of occupation similarity and social relationship in SIoVs, we establish a realistic and scalable social relationship model by exploring the implicit internal similarity inside vehicles to promote the accuracy and success rate of a service access method.

We propose a prediction method according to vehicle movement trajectory for interaction time estimation. By analyzing the movement rate and attributes of vehicles, their movement trajectory can be predicted, and the variation tendency can be calculated for the reference of moving vehicles.

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We construct a CQS system for SIoVs. At first, a node-centric generation tree is leveraged to evaluate the access quality. Then, different access service routing selection strategies are employed to select the access path according to the current network state. After that, a bi-direction buffering algorithm is given to promote the response efficiency and accuracy of routing. Performance evaluations demonstrate that, comparing with the existing schemes, our CQS scheme can increase the average service quality, number of packets sent per access and network success rate by around 25%, 20% and 5%, respectively. An access service selection scheme is introduced the presented CQS system, containing topology construction, routing strategy selection and a buffer mechanism.

Social Internet of vehicle

The main vision of the Internet of Things (IoT) is to equip real-life physical objects with computing and communication power so that they can interact with each other for the social good. As one of the key members of IoT, Internet of Vehicles (IoV) has seen steep advancement in communication technologies.

The Internet of Things (IoT) paradigm aims to lead us to a new era of computing where the Internet will expand to include billions of new types of devices. The IoT is based on the idea of integrating everyday smart objects equipped with sensors to the Internet. This way these heterogeneous objects become capable to communicate with each other and to provide ubiquitous services, which opens a new vista of possibilities. All this pervasiveness will be enabled by sensors that range from battery-less Radio Frequency Identification (RFID) to sensor devices equipped with many sensors. These devices sense different physical phenomenon and can actuate different tasks. The Cloud and Fog computing will provide the required infrastructure to gather and analyze the data generated by these sensors. This infrastructure will enable different applications by enabling the provision of end-to-end service. The analysis of this data will be important for businesses and governments, and eventually will become a key to create new business models. The Social Internet of Things (SIoT) concepts envisions to enable consciousness in the IoT by enabling social networking among the IoT devices. These devices will be able to socialize with each other and create social circles based on mutual interests and goals. This application of social networking will re-use the existing social network models and will address the IoT specific issues such as scalability. Furthermore,

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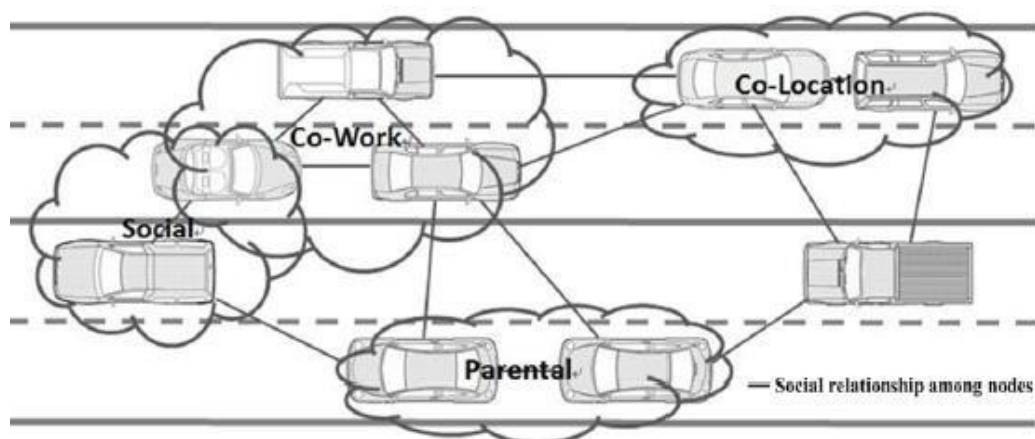
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the IoT devices will build trust-based relationships and will leverage these relationships for service provisioning. SIoT will enable the feasibility of managing the ever-growing number of devices in IoT. Internet of Vehicles (IoV) is an emerging concept derived from its parent domain, Internet of Things (IoT). The idea of IoV refers to the dynamic mobile communication between vehicles, infrastructure, drivers and the passengers. This communication is sub-divided in to V2V (Vehicle to Vehicle) when vehicles communicate with each other, V2I (Vehicle to Infrastructure) when vehicles communicate with RSUs (Road Side Units) and V2H (Vehicle to Human) when vehicles communicate with drivers or the passengers of the vehicles. The key advantage of IoV is information sharing between different entities that can greatly benefit in improving the traffic on road. IoV promises great commercial interest and wide horizon for research that attracts a lot of researchers and companies.

A Quality-Aware Access Service Selection Scheme

In this section, we first illustrate our concerned network system, and define the parameters. Finally, we describe a novel quality- aware access service selection scheme.

System description

As shown in Fig. 1, we consider a heterogeneous and decentralized network scenario, where no fixed trust authority exists to provide trust evaluation. Node equipment moves with users, and joins or leaves the network dynamically. Each device contains its own information, such as the interest and provided service. User interest represents the characters and focuses of the provided service, which can be viewed as a map between user social connection in the real world and the social relationship among devices in the network system.

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Since devices with various feature information would provide different evaluations to the same service, nodes form different groups and exhibit distinct social relationship. Since similar feature preference and connection with semblable evaluation criterion exist in the same group, similar ability of access services can be provided. Each node in the network may perform normally or abnormally. The former can provide qualified service and suitable recommendation to other devices positively.

However, inferior service, incorrect feedback evaluation or recommendation may be provided in the latter circum stance, such that network service quality and stability would be affected.

Cooperative Quality-Aware Service Access

Since link connections are unstable in SIoVs, a network structure varies over time and interference conditions are complex. Therefore, how to select a suitable access object and transmission link is an important issue. Unfortunately, it is difficult to optimize the selection of both access node and transmission link. In this section, by fully considering network access from the viewpoint of both network nodes and links, we present the CQS method.

Network model

According to the studied scheme in Section 3, nodes can perceive and evaluate other devices from the aspects of access QoS, node social relationship and connection time prediction, based on which access request can be launched by suitable devices. In SIoVs, since nodes communicate with each other by wireless technologies (such as Bluetooth and WiMAX), communication among devices is restricted by the propagation path. In order to effectively detect network service with a larger range, we further extend the QoS-aware access service selection scheme to multi-hop dynamic network environment. With the objective of interacting with other devices outside their communication range, a local dataset, including access service record and configuration information, is leveraged to evaluate service quality and explore node social relationship. Furthermore, the information of routing, buffer, and neighbor should also be maintained by node devices. Details are illustrated below. According to the played role during the process of network access, node devices can be generally classified into:

1) Service requester, i.e., the node that launches a service access request;

2) Service provider, including devices that can provide services to others;

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3) Service collaborator, i.e., the node that provides the service of network access or route.

It is noted that the role of any node device may change or play multiple roles. A node receives packets from its surrounding nodes periodically, and performs routing according to their types. During each cycle, a node also broadcasts its configuration and neighbor information, and sends packets for a service request if necessary

QoS-priority routing strategy

Under the QoS-priority routing strategy, a request node starts the access requirement to the node with the highest evaluation value of an access service. If the service failure packet (SNTF) is received, the corresponding node sends the request to the node with the next highest evaluation value of the access services and so on. As shown in Algorithm 1, a node first ranks its local neighbors according to the evaluation result of the access services. When the requirement for an access service is generated, a node first sends the request to the node with the best evaluation result. Then, it sets Time-To-Live (TTL) as the product of single-hop Round Trip Time (RTT) and the number of routing hops between these two nodes.

After that, node starts to sense packet transmission in the network. If the received packet exceeds its TTL, the node would discard the current request and restart the request toward the suboptimal node in the neighbor node table and so on until the node has successfully acquired the access service or all the requests of nodes in the neighbor node table have been traversed.

```
Algorithm 1. QoS-priority routing strategy
Requester Process:
01   when u genetates an access requirement request do
02       s_i←request.servceid
03       TTL(u, s_i) ← hop(u, NodeList(u).Top) × RTT
04       t_send(si)←t_cur
05       Send SREQ(u, NodeList(u).Top, s_i) to NodeList(u).Top
06   end
07   when u receives SRSP(v, u, s_i) from v do
08       Update receivelist(u) and save S_i to the local
09   end
10   when (u receives SNTF(v, u, s_i) from v )||( t_cur >tsend(s_i) +
     TTL(u, s_i)) do
11       if NodeList(u).Next != NULL then
12           TTL(u, s_i) ← hop(u, NodeList(u).Next) × RTT
13           t_send(si) ←t_cur
14           Send SREQ(u, NodeList(u).Next, s_i) to
             NodeList(u).Next
15       else
16           Rebuilt NodeList(u) and Restart from Top
17       endif
18   end
Collaborator Process:
19   when w receives SREQ(u, v, s_i) form u do
20       Transfer the packet to Route(w, v)
21   end
22   when w received SRSP(v, u, s_i)||SNTF(v, u, s_i)||
     STRN(v, u, s_i) from v do
23       Transfer the packet to Route(w, u)
24   end
```

Link quality-priority routing strategy

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Compared with the method focusing on the evaluation of access QoS, the proposed link quality-priority strategy is more stable to fulfill the service requirement and network access. When a service request is generated, a node selects the nodes according to the optimal evaluation value in the node collection within one hop. The evaluation value is computed by the ranking consequence of node table in the neighbor network. Then, the node sends a service request packet with a cooperative request identifier. If the service forwarding packet from its cooperative node is received by the request node, it modifies the TTL of this request and keeps monitoring the new feedback information until the service is successfully accessed. If the received request from the request node is failed or exceeds the corresponding TTL, this request is given up. If all the attempts have failed, its neighbor network would be reconstructed and node table would be recomputed to restart request from the node with the optimal evaluation value in the node collection.

Simulation Results

Parallel driving   Separated driving   Encounter driving
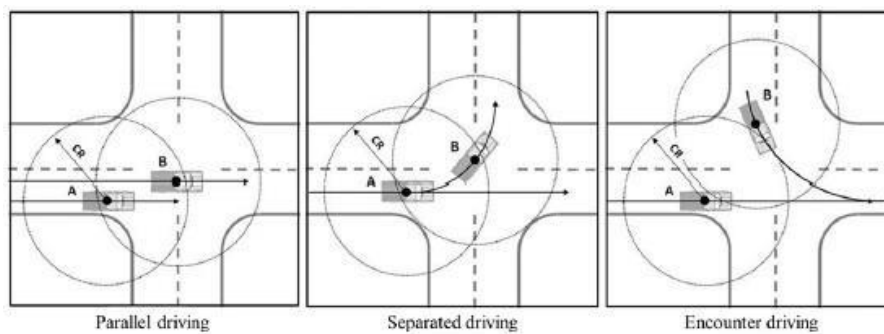
The considered system model has been illustrated in Fig. 3, which consists of the most common moving behaviors of vehicles, i.e., parallel driving, separated driving, and encounter driving. In the parallel driving, nodes A and B keep the same movement in the horizontal direction. In the separated driving scenario, node A keeps moving in the horizontal direction, while node B travels from the horizontal direction to the vertical one. In the encounter driving situation, node A keeps moving in the horizontal direction, while node B travels from the vertical direction to the horizontal one. Tab. 3 is the parameter setting of different simulation situations We then evaluate network performance of average access QoS, and set the communication range of node as 300m. The obtained QoS value under successful requests is the value that can be provided to a network service for a node.

Conclusion

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In this paper, we construct a CQS system, focusing on reliability guarantee and service quality promotion in SIoVs. We first study a dynamic access service evaluation scheme to cope with the effect brought by the dynamic network change. Then, we present a social relationship evaluation method to explore the internal and external similarities among vehicles. Furthermore, we investigate a prediction method according to vehicle movement trajectory for interaction time estimation. At last, we introduce a CQS method, which first constructs a node-centric generation tree structure to compute the access quality, then selects an access path according to the current network state.

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Power Generation using Low-cost Thermoelectric Generator

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Abstract

This paper proposes a induce the power using Thermoelectric Generator. In numerous areas large quantum of heat and cold wave is wasted, by exercising the heat and the cold wave used to induce the electrical power by using thermoelectric creator (TEG). In the TEG, we're going to apply the heat on one side of the thermoelectric creator and cold wave on the other side of the thermoelectric creator, by applying the different temperature on TEG electric power is generated on the affair outstation of the thermoelectric creator. By using the one thermoelectric creator we can induce small quantum of power by connecting number of thermoelectric creators in series we can going to produce large quantum of power from the thermoelectric creator. crucial words Thermoelectric creator (TEG), Heat, Cold.

Keywords: Power, Low-cost, Generator

Introduction

The ideal of the design is to induce power by using thermoelectric cooler. In numerous areas large quantum of heat and cold wave is wasted, by exercising the wasted heat and cold energy I'm going to induce electric power by using thermoelectric creator. By using thermoelectric creator, we directly convert thermal energy into electrical energy. This design proposes an effective thermoelectric power generation by using thermoelectric heating and thermoelectric cooling. In the proposed power operation system, two groups of batteries are efficiently and interspersing charged and discharged similar that the information of the circuit can be covered in real time. Eventually, the energy feedback circuit combined with bettered coetaneous switching technology is designed to reclaim the energy to drive the detector. By inputting current of 3.1 A, a wide range of temperature control from 1.437 to 60.187 °C was enforced. While targeting a temperature of 10 °C at an ambient temperature of 22 °C, the proposed temperature control system had a control time of 30.5 s, compared with 287 s when using the conventional system, with an delicacy of 0.1 °C, and an error of only ± 0.35 °C. The results confirm that electric energy at a peak voltage of 1.2 V and current of 24 μ A can be recovered.

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Analysis for TEG

The TEG technology is grounded on the Seebeck effect set up in 1821 by Thomas Johann Seebeck, which proposed that two common distinctness have the temperature difference (ΔT) at the joints, and there are the thermo-current and thermo-electromotive force produced in the common circuit. With adding the temperature difference between two joints (ΔT), the voltage difference (ΔV) improves. The Seebeck measure α is determined mathematically as follows $= \Delta V / \Delta$ (1). The parameter ZT is used to represent the Peltier effect of a TE material $ZT = 2/$ (2) where α- Seebeck measure π-Peltier measure β-Thomson measure σ-Electrical conductivity x-Captain length ke, kI-Thermal conductivity (electrical and chassis independently) T-Temperature I-Electric current E-Electrical implicit T'-Temperature difference The high-quality TE accoutrements must gain high Seebeck measure to increase the electrical eventuality, and low thermal conductivity to reduce the heat dispersion at the joints, and low electrical resistance. The relationship between the Thomson and Seebeck portions and power W through the cargo is as follows $= /$ (3) $= 2/r$ (1) 2Δ 2 (4) The thermal conversion effectiveness can be shown as (11) $= \Delta$ T 1 1 1/ ZT − Δ 2T(1)(5) and (12) $= \Delta$ T(−1)/(')(6) 1 (a) and (b) show the schematic of TEG rudiments and the system illustration of a TEG system, independently. In order to maintain and stabilize the affair voltage under different surroundings and temperatures, a voltage controller circuit has been connected to the TEG in the affair harborage. also, the proposed system should give colorful affair voltages for the outfit of the vehicle, as a matter of fact, a buck motor is needed in the system.

Design and Implementation

An overall block diagram of the project design is shown in the fig.2

In this block diagram we $A = \pi r2$ generating power with the help of thermoelectric generator. The Heat and Cold is applied to thermoelectric generator, a small amount power is generated, by connecting the number of TEG in series we can produce a large amount of energy. The generated energy is feeder to the converter the converter boosts the energy and store in the battery. The stored energy is directly used by the dc load and it is feed to dc to ac converter an power is step up by transformer it is used by domestic load and grid.

Result

The LCD display, display the output of the sensor voltage sensor current, battery voltage and battery charge in percentage. The diagram shows the output of LCD display.

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Discussions

In the proposed system of the thermoelectric power generator four thermoelectric generators are used to generate electric power, also MOSFET is used in the inverter circuit for its high switching speed so that the switching loses is reduced. By using this power is generated and store in the battery and it is inverted and used for the ac loads.

Conclusion

This project has a good output power generated. it is very easy to electric power from the waste heat and the cold. from the project we can directly convert the wasted heat and cold by using the thermoelectric generator. By using this we can generate the electric energy at rural area where it is difficult to construct the transmission and power lines, we can also generate energy from the IT companies where the air conditioner is always in ON, by using this waste cooling we can generate electricity by using thermoelectric generator.

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Fig.1 (a) Schematic of TEG elements, and (b) system diagram of a TEG system.

A)

B)

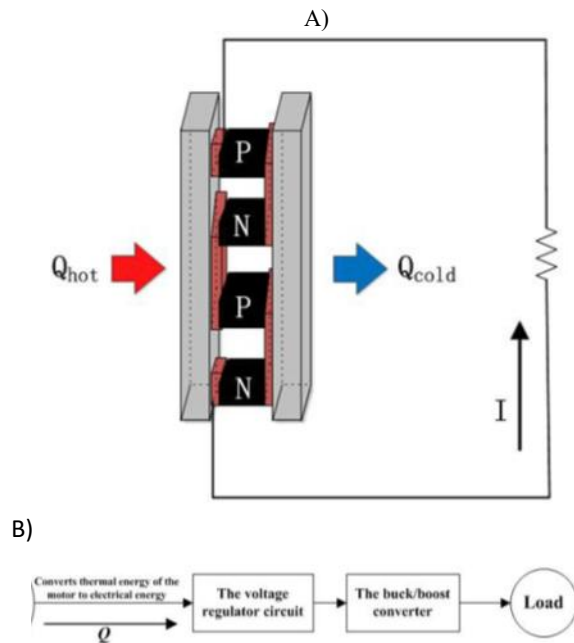Fig.2 Block diagram of thermoelectric power generation
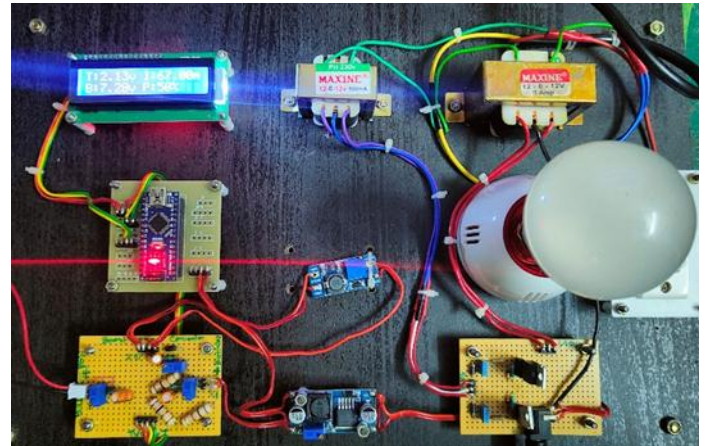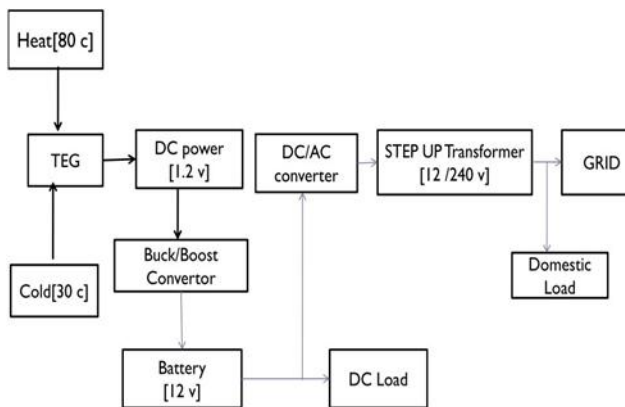

Fig.4 Experimental Setup of Thermoelectric Generator

Fig.4(a) Output of LCD for without TEG

Fig.4(a) Output of LCD for with TEG

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Smart Centralized Fully Automatic Face with Fingerprint Voting Machine with Blockchain Technology

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Abstract

An electronic voting machine is a computerized device used in elections to record and count votes. While these machines can increase efficiency and speed in voting processes, they also raise concerns about security and reliability, as well as the potential for hacking and manipulation of election results. The lack of a physical paper trail also makes it difficult to conduct audits or recount votes in case of disputes. This project presents a novel concept of a smart centralized fully automatic voting machine that combines facial recognition and fingerprint biometrics with blockchain technology. The machine aims to improve the security, accuracy, and transparency of the voting process. The use of facial recognition and fingerprint biometrics ensures that each voter is uniquely identified, and the integration of blockchain technology provides an immutable record of the voting results. The centralized control system allows for easy and efficient administration and management of the voting process. The proposed solution is expected to revolutionize the traditional voting process and pave the way for secure, transparent, and efficient elections in the future.

Keywords: Blockchain, IOT, Machine learning, Biometric, Face Recognition, Hash Function, Arduino uno.

I. Introduction

Elections are the organized system that promote democracy into nations. In the future of the nation and the people of the country, the electoral process plays an essential role. Since it's a very important process for each person who is involved in the election process due to this the election process have to be conducted in a very well organized manner and it should be a trustworthy elections. Keeping in mind about the people's privacy of votes and its security it's very important to have elections in transparency way.

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The authorities which are involved in election process should have all the responsible from the election starts to its end completely like the authority should not take more time in counting votes since taking more time might cause manipulation and missing of votes and which effects the elections results which bring bad impact to the country. Due to many issues like this the areas depending on this require more trust and which is great issue now a days. There was always a danger of manipulating the results early in the paper elections by a centralised authority. Moreover time factor has become the challenging issue for announcements of results.

Face recognition is one of the Machine Learning technique which involves a study of artificial intelligence also where various algorithms are used for the face detection. Face detection is one of the advanced technology used to determine the positions and dimensions of human faces in digital images, which senses the only the facial features and rest ignores anything present in image like tress, building and bodies.

According to research human face perception is an active area in the computer vision field. In technique first step is to detect the human face localization in applications like image database management, human computer interface and videos surveillance. Location and tracking face of human is the basic for facial expressions or face recognition assuming that normalized face image is available. In our project for face recognition, we implement haar classifier.

Blockchain is an easy and unalterable system. It is one of the technique of recording the information in which later that makes impossible to change or any other hacker can't hack or cheat the system. It acts as a ledger of transactions are stored and making a duplicate copy and it is distributed across the entire network of system.

Due to this significant reason blockchain can be an alternative method to traditional elections to secure the votes. It brings one the smart solutions that be used in central authority problems where each block has a data stored and it forms like a chain of information. Therefore it's very difficult to change the information of data in the blocks since other blocks that contain the full data are detected. The necessity to use Blockchain improves information

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security by keeping all data safe in all blocks and due to this there is no need of manually safeguarding and securing the votes by humans.

As we know old election system requires more time to count the votes and announces the results to public, blockchain solves this major problem as the last node of the chain keeps all the information so we can easily look for last node of the chain for the results of the elections conducted. This can save the time dramatically and the some extent of incomplete results can be given at same time.

Biometrics is one of the evolved science and technology of measuring and analysing biological data. Fingerprint refers to identifying of an individual identity based on finger comparison .It is one of the well know biometric and used in authentication on computer system. The technologies involves measuring and analysing of human body characteristics such as DNA, fingerprint, voice patterns and hand measurements.

This area biometric has been formed to expand on my types of physical identification and it has been successfully used. Due to many fingerprints and face recognition a very common identifier the biometric method has been used among the law enforcement also. Since the technique of identification have led to give a way in Election Commission also of finger print scanners, web cameras that serves very quickly to identify the individuals and assigns access to each and every one.

II. **Existing System**

In this existing system we have paper ballot and EVM-voting where paper ballot is old method using papers, pen and pencil. Electronic voting Machine stores the votes in to CPU memory.

Then we have fingerprint recognition that identifies every elector, counts votes and prevents false ballots. The current system is no longer digital, technology-based and secure. If the fingerprint matches user information, the user may choose the candidate to vote from the buttons panel. The final vote is shown on LCD for voters' pleasure. The current voting system suffers from various threats, DDOS attacks, vote alteration and manipulation of votes, polling booth capturing and many malware attacks.

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Some of the disadvantages of existing system:

- Centralized architecture.

- Attack prone.

- Not trustable.

- Non-transparent vote casting process.

III. Methodology

A. Proposed System

Election polling may either be a complicated system as an expensive method. Here, we propose a new Secure, Privacy Preservation and cost efficient polling approach where data storage is carried out on Blockchain. This system has two kinds of users: Booth Manager, Booth Manager System created with voter functionality where voters go to poll.

Voters must travel to the stand where the Booth Manager verifies the voter and allows him to vote on the Booth laptop where the electoral system operates. Voters are recognised with the Fingerprint and Face Recognition Authentication for false voters, and the Fingerprint and Face people match or not. Authentication This suggested system provides a way to perform encrypted data operations without decrypting them which, after computation, may provide us similar results as if we were directly involved with raw data. Perform encrypted data operations without decrypting them which, after computation, may provide us similar results as if we were directly involved with raw data.

B. Implementation

The follow process takes place:

The election officer must provide the booth manager and user information. The Booth Manager then sets Voter and Fingerprint information. Once fingerprint is matched data will be sent serially to the python IDLE.

Once data received in python, face recognition part will merged and camera will trigger and match the face with the id. Once both are matched then data will be sent to the blockchain part. Verification of voters in Booth. One the vote is casted the respective vote is stored in block chain database. Then the election is completed. Then the output is displayed.
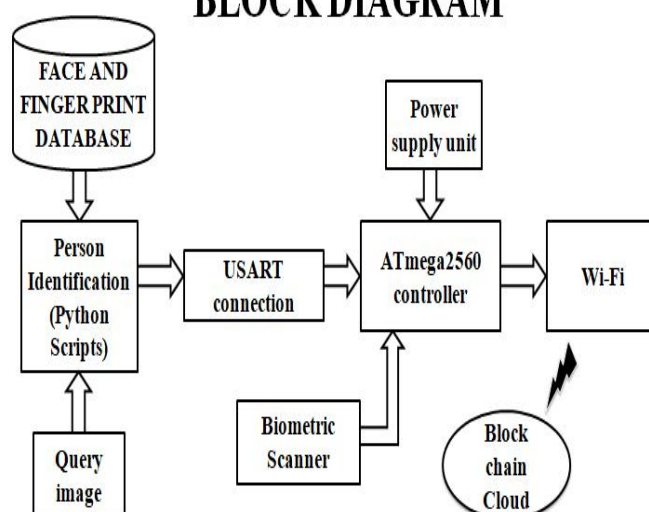
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BLOCK DIAGRAM

Fig.1:-System Architecture

It Works in three Phases –

a) Face Recognization
b) Fingerprint Authentication
c) Block Chain

a) Face Recognization

Haar cascade is ml object recognition calculation used to recognize dissents in an image or video and reliant on features proposed by Paul Viola and Michael Jones. It is an ML based methodology where a course work is prepared from a great deal of positive and negative pictures. It is then used to distinguish protests in different pictures. The calculation has four phases:

➢ Haar Feature Selection

➢ Making Integral Images

➢ Adaboost Training

Cascading Classifiers

It is remarkable that it is possible to differentiate faces and body parts in a photograph, but may be prepared to identify almost any item. For example, we shall take face location. At computation process it needs a ton of positive images and negative images without appearance to prepare the classifier. We will remove highlights from the calculation. Our initial step is to gather the Haar Features.

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A Haar include contemplates bordering rectangular districts at a specific territory in a location window, abridges the pixel controls in each locale and registers the complexity between these totals.
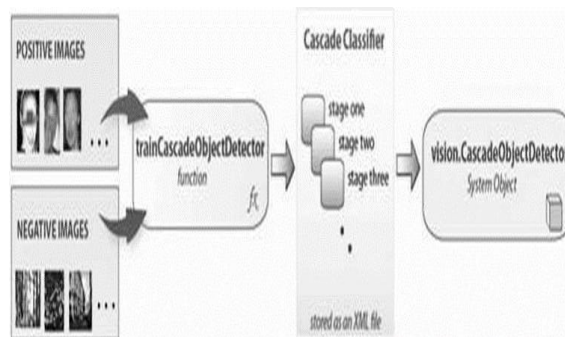
b) Fingerprint Authentication
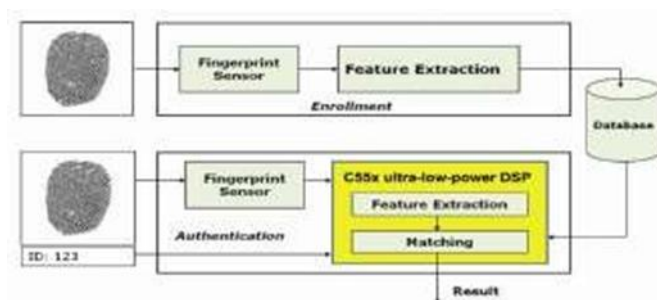
The Fingerprint algorithm consists of two major components which make the fingerprint picture pre-processed to improve its quality and signature extraction. Pre-processing in the algorithm is a highly essential step. In fact, it allows the picture to be improved to simplify the job in the second phase and to optimise image processing.

Grayscale Transformation: Usually a fingerprint sensor produces a colour picture. For this method, the colour planes do not seem to be needed to process, so that each pixel is represented by 8 bits(ranging from 0 to 255 grey levels) rather of 24 bits (RGB or YCrCb), thereby optimising the image's overall look andbiometric processing.

Image normalization:

The technique isused to normalise picture intensity levels by changing the grey value range and improving image contrast. The primary objective of normalisation is to reduce the variation in the grey level throughout the cables so that following processing processes are facilitated.

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Segmentation: Segmentation is essential to remove the side of the picture and regions that are excessively noisy. It is based on the computation of the grey level variance. This stage enables the size of a portion of the picture to be reduced and the extraction phase for biometric data to be optimised.

a) Blockchain

This is last step in which we store the casted votes in form of blocks. We are using **AES ALGORITHM (Advanced Encryption Standard)**, The AES Encryption algorithm (also known as the Rijndael algorithm) is a symmetric block cipher algorithm with a block/chunk size of 128 bits. It converts these individual blocks using keys of 128, 192, and 256 bits. Once it encrypts these blocks, it joins them together to form the ciphertext. It is based on a substitution-permutation network, also known as an SP network. It consists of a series of linked operations, including replacing inputs with specific outputs (substitutions) and others involving bit shuffling (permutations).

In this paper we are implementing AES with python in our project. We first need to import library then the vote casted is undergoes AES and gets encode in the hash value. Then we apply hexdisgest method to return the hash value in hexadecimal format and then finally the values gets stored in excel sheet. The excel sheet contains the previous hash, block hash (present hash), the count of votes casted for different parties and the time the vote casted.
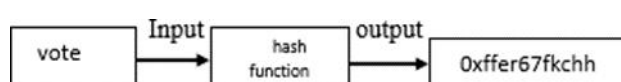

Fig.4:-Creation of Hash values

IV. Result
The Hardware components of the Project are shown below which are Arduido uno Fingerprint sensor and a LCD Display

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Fig.*5:-Hardware***

***Fig.*6:-** *Fingerprint Enrollment*

Fig.*7:-Face Dataset***

The initial page of the project shows the Admin and User Button, as the user button gets pressed the fingerprint sensor gets triggered after successful verification camera triggers on for the face authentication.
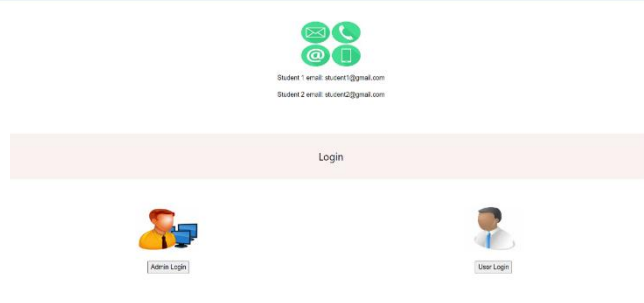
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Fig.8:-Initial Page

V. Conclusion

The main aim of this paper is to create a secure voting system using blockchain. No Ledger technology and Blockchain-based apps are available to properly evaluate if this technology is superior to the existingvoting method. There was no complete deployment of Blockchain-based e-voting(BEV) for a national election. Democracies rely on trustworthy elections and voters ought to trust the election system for a robust democracy we tend to believe a good model to ascertain trustworthy birthplace for e-voting, we use Fingerprint and face recognition for fake voter's identification. We have been successful in implementing project. Finally, BEV should decrease paper-based elections and boost voter turnout. This method ensures more votesand records the votes correctly, securely andopenly.

VI. Future Enhancement

Blockchain technologies have tremendous potential to create sensible city solutions to create, operate, consume and market within the close to future in E-governance, medical, IOT apps, etc. with relevancy, security, privacy, efficiency, transparency, and fault-resistances. In Future the e – voting system can be implemented through online based where the votes can be stored in real time cloud servers. Synchronization and higher algorithms in blockchain can be implemented and improved for higher performance and security.

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Digital Library Operation System

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Abstract

This report describes the design development of Library Management System that was developed to manage the diurnal book sale and manage the member, books record more effectiveness. It can ameliorate operation of the book property in the library. This library operation system is substantially use by librarian and library admin. Normal Librarian is suitable to manage the member conservation module, book conservation module and also the most important module in a library which is book sale module. Besides that, library operation system also allows stoner to manage the publisher as well as lost book module. On the other hand, other type of stoner which is admin position staff is suitable to handle the staff module and view the report module.

Keywords: PHP, HTML, CSS, MySQL

Database preface

A Library Management System is a design that tries to produce an automated and computerised interpretation for a library so that the diurnal work of a library can be managed and covered fluently and efficiently. Before, the librarian used to manage the whole work in homemade mode in the form of lines and record books. Also, the process of adding new books, new scholars, issuing and returning books had to be managed in a homemade manner which is veritably slow and hamstrung. The library operation system resolves this problem and give a better result to this. It provides a stoner-friendly interface operation to the librarian where he can do all the operations of a library veritably fluently. The operation substantially consists of three modules which are admin module and pupil module. The admin module will be managed by the system director. He manages the overall functioning of the operation. The admin module will be penetrated by the librarian. He can perform colorful operations inside the operation similar as add new scholars, new books to the database, issuing and returning of

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books, streamlining pupil's details, book's details, generating daily / yearly reports etc. The pupil module can be penetrated by the registered scholars only. The operations that can be performed by the pupil includes view all books available in the library, search the vacuity of a particular book, number of books he has issued, overall forfeiture he has to pay etc. These three modules are connected with each other and also with the database. The operation is erected using PHP and Sql database Proposed System Library Management System using PHP and MySQL is a web grounded operation. Library operation system is a design which aims in developing a motorized system to maintain all the diurnal work of library. This design has numerous features which are generally not available in normal library operation systems like installation of stoner login and an installation of admin login. It also has an installation of admin login through which the admin can cover the whole system. It has also an installation where pupil after logging in their accounts can see list of books issued and its issue date and return date.

The main ideal of Online Library Management System is developing a motorized system to maintain all the diurnal work of the library. It has two sides

> Stoner side (pupil)
> Admin side

Stoner side (pupil)
- ✓ Only registered druggies can get every installation of this website.
- ✓ They can log in to their account and see their particular information and modify them.
- ✓ They can search for a book by the name or search it in a particular department
- ✓ They can fluently order a book.
- ✓ After the admin authorize it they can see the issue and return date beside the book name.
- ✓ An automatic timekeeper will set up on the stoner's id. It'll show how important time left until the return date.
- ✓ If they need further time they can shoot a communication to the admin.
- ✓ Also, there's a public comment section where registered druggies can note on their suggestions and can ask questions.

Admin side

On the other hand admin can-

- ✓ See which pupil is online right now.

- ✓ See all the pupil information.

- ✓ Add new books and cancel a book from the list.

- ✓ Shoot an announcement to scholars before their return date and they can also communicate through communication.

- ✓ Reply in the comment box. There's a runner where all the information of the pupil is available who has espoused a book with the return date.

Overall Web-grounded Library Management System is a design to help the scholars as well as the staff of the library to maintain the library in the stylish way possible and also to reduce the mortal sweats.

Top of Form

System Conditions tackle Conditions. The minimal respectable tackle demand that are needed for the proper functioning of the operation are given below

- ✓ PC

- ✓ Hard Fragment

- ✓ Examiner

- ✓ Keyboard

- ✓ Mouse

Software Conditions

- ✓ Operating System Window 10

- ✓ Front End HTML, CSS, Bootstrap and JavaScript

- ✓ Back End PHP

- ✓ Database MySQL

- ✓ Tools XAMPP SERVER

- ✓ MySQL Database

For produce Library Management System Database, you have to run following SQL script in your original phpmy admin. But ahead run this script, you have to produce one blank database in it and also after you have run below script, which will produce needed table for Library Management System.

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Architecture:
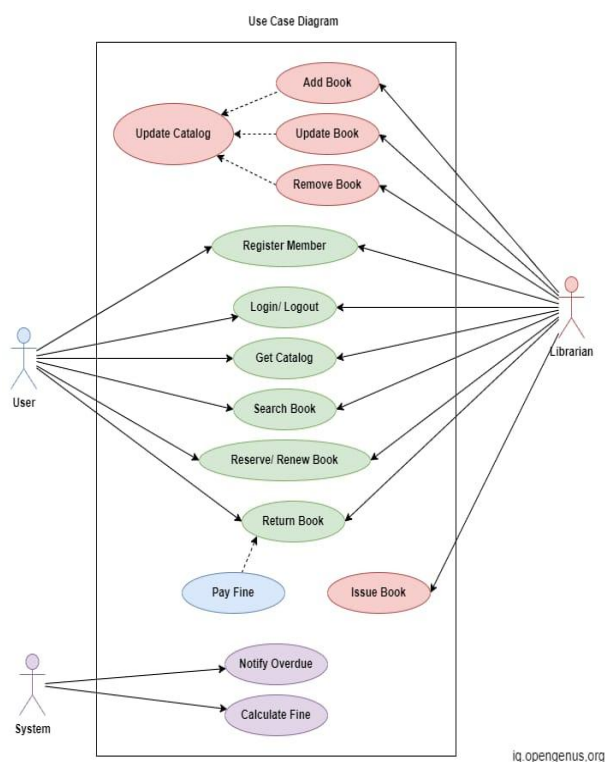
Source: iq.opengenus.org

Module description: Operation Module

The whole software operation is divided in to three modules which are Admin Module and Student Module. These two sections are accessible through the operation's three different panels, making it user-friendly. The modules are connected with each other so that they can communicate the information between them. For illustration, admin module is connected to the librarian module and only those people can pierce the librarian module which are authorised by the director under the admin module. Also, the scholars will be suitable to pierce the pupil module only if they are registered in the library database by the librarian.

Admin Module

The librarian has full access to the admin module. So, whenever a librarian opens the operation, he has to login in the operation with the user id and word handed by the admin. The various conduct that he can take over are visible on the home screen after a successful login. The operations he can perform includes add new scholars, add new books, issue books, return books, streamlining pupil's details, streamlining book's details, transferring dispatches

to the scholars regarding various issues (like overdue of the issue book), generating diurnal / monthly reports, covering any distinction in the books stock.

Student Module

The pupil module contains details about all the scholars registered with the library. Only the librarian can register the scholars with the operation after successful verification. The operations that pupil can perform inside the pupil module includes view all books available in the library, search the vacuity of a particular book, number of books he has issued from the library, overall penalty that he has to pay, submit the queries. Piecemeal from this, the scholars can cancel their registration from the library.

Results and Discussion

Labors when the librarian opens the operation, a login runner will come on the screen. After successful login by the librarian, a home screen will come in front of it where he can do all the operations. He can go to different sections on the home screen to perform various operations. The below image shows the home screen of the pupil module. The scholars can login in to the operation and also a home screen will come in front of him. He can perform all those operations that are listed below in the pupil module.

Future

Compass In the future, multitudinous farther features and installations can be added to the operation. As we know with the increase in number of scholars, books, complexity other workloads, there can be a need of shifting the library data from the original database to the pall. So, this software operation can be transferred to a pall database by doing necessary changes to it. With the help of pall technology, you will get data provisory installation, ever streamlining and syncing of lines, farther security of data, continuance storage etc. Online lectures, former time examination papers, vids and an assignment submission section are all possible additions. Instructors can shoot the vids of their lectures and upload them on it. A group discourse function might be included to the app so that scholars can partake their enterprises and uncertainties which will ultimately makes it more interactive and useful for an academic institution.

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Conclusion

This paper mainly focuses on how we can meliorate the traditional system of working of a library because the traditional system includes doing all the goods in manual mode which is slow, less effective, less secure, and delicate to manage. The result to this is an online library operation system which take care of all the work by automating and digitizing the whole process. Our operation is predicated on PHP and is linked to a relational database (MySql). The frontend part has been coded using CSS, HTML and JavaScript. The backend is supported and connected with data baseusing PHP. With the increase in the workload of the library, new features can be added to the being operation to make it applicable in the future as well.

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Smart Irrigation System Using IOT

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Abstract

This design proposes an IOT grounded smart irrigation system which is cost effective and can be used by a middle class planter in ranch field. This IOT grounded Agriculture covering system makes use of wireless detector networks that collects data from different detector stationed at colorful bumps and sends it through the wireless protocol. And it's powered by Arduino Microcontroller and Node MCU. It consists of temperature detector and moisture detector. In this paper, we show the work done by our cost effective and dependable device with end to cover fields and to give information.

Keywords: Arduino, wifi-module, IOT, DHT11-sensor, Motor, pH Level sensor

Introduction

The information is transferred to the growers by using pall website called Bylnk App. The growers can cover their ranch's field using simply by just using the Bylnk App. This design uses Arduino Microcontroller, Node MCU ESP8266, Soil humidity detector, pH position detector and DHT11 for taking the reading of pH position, temperature and moisture. All the data is uploaded by Wi-Fi module inbuilt in microcontroller to Bylnk App cloud database. Preface husbandry plays an important part in all part of the India. Due to unforeseen change in climate and lower downfall in all over India, the compass of husbandry becomes down. Without wasting the water, civilization should yield outside. In traditional system, the land get rinsed with redundant quantum of water than the cropneeds. The destruction of redundant water can be overcome by ultramodern irrigation system similar as drip irrigation, sprinkle irrigation etc. The design and perpetration of a clever irrigation contrivance are astronomically settled in different situations and utmost dependable price performance on the electric contrivance. Internet of effects (IoT) is the network of connected bias, mechanical and digital machines, vehicles, home appliances and other objects bedded with detectors, software, switches and connectivity which enable these effects to connect to a network and collect and change data. The system creates the compass of connecting the non-internet enabled physical bias and machines to be connected over the internet and ever covered and

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controlled. A thing in the Internet of effects can also be a person with a heart monitoring implant or a machine with handicap detector or home appliances connected to an operation platform. This is also applicable to artificial machines like drill of an oil painting carriage or a spurt machine of an aeroplane. These effects are assigned to an IP address and are suitable to transfer data over internet. Principally, this is the conception of connecting any bias or machines we can suppose of moment with the internet. Preliminarily, home-mechanized widgets were kindly essential and introductory, with choices running from light timepieces to programmable inner controllers. Presently, these fabrics are consolidating information from home exercises, neighborhood climate fabrics and also some; to adjust to optimal way of life and help for better deal with home. Indeed more, they can affiliate with one another to shape an establishment unit to enable to work entire house this exploration intends to propose armature for home robotization using near field and mobile communication along with a mobile application. The introductory armature or frame consists of connecting bias which will use protocol (MQTT or Zigbee) to connect Edge gateway; and pall stores the data information using backend storehouse system. Along with smart control of the appliances, we will be fastening on energy consumption operation system through which consumers can reduce redundant energy consumption by ever controlling the bias. This can save inordinate use of any appliance energy, time and contemporaneously abate redundant wealth expenditure.
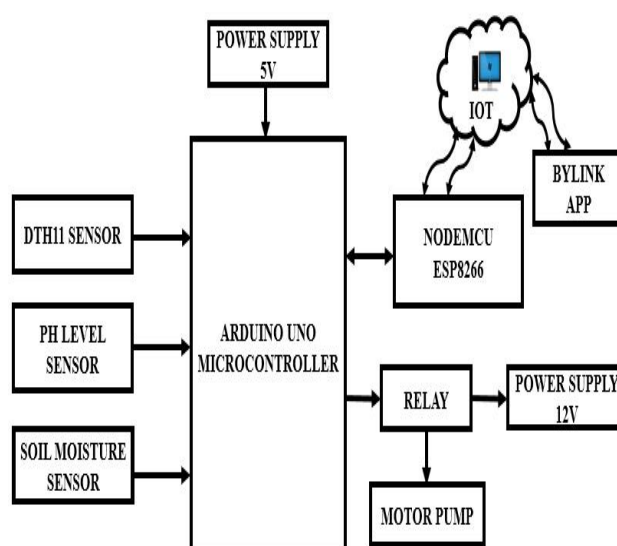
Literature Review

Dmitrii Shadrin *et. al*., (2020) we present a bedded system amended with the AI, icing the nonstop analysis and in situ vaticination of the growth dynamics of factory leaves. The bedded result is predicated on a low-power bedded seeing system with a plates processing unit (GPU) and is suitable to run the neural network-grounded AI on board. We use an intermittent neural network (RNN) called the long short-term memory network (LSTM) as a core of AI in our system. The proposed approach guarantees the system independent operation for 180 days using a standard Li-ion battery. We calculate on the state-of-the- art mobile graphical chips for "smart" analysis and control of independent bias. This airman study opens up wide outlook for a variety of intelligent monitoring operations, especially in the husbandry sphere.

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Francisco Yandun Narvaez *et. al.*, (2017) presents a check of the state-of-the-art in optic visible and near-visible diapason detectors and ways to estimate phenotyping variables from intensity, spectral, and volumetric measures. The seeing methodologies are classified into three areas according to the purpose of the measures 1) factory structural characterization; 2) factory/ fruit discovery; and 3) factory physiology assessment. This paper also discusses the progress in data processing styles and the current open challenges in agrarian tasks in which the development of innovative seeing methodologies is needed, similar as pruning, toxin and fungicide operation, crop monitoring, and automated harvesting.

Proposed Methodology

The modernized husbandry system consists of two units – Detector units and a regulator with communication unit. The Sensor unit includes detectors like Gas detector, temperature and moisture detector, etc. These signals from the detectors should be transferred to the Arduino microcontroller in the form of digital signals. DHT11 detector is used to cover the moisture and temperature on field. This helps the planter to know whether the climate conditions of atmosphere are good or bad separate of theircrop. The soil humidity detector senses whether the soil it's wet or dry and the pH position detector is used to cover the pH position. A vision that's being enforced by numerous in the world is an expansive range of everyday objects connected and communicating cheaply with each other across a global network-" the Internet of effects."

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Arduino

The Arduino Compute Module (CM1), Compute Module 3 (CM3) and Compute Module 3 Lite (CM3L) are DDR2-SODIMM-mechanically-compatible System on Modules (SoMs) containing processor, memory, eMMC Flash (for CM1 and CM3) and supporting power circuitry. These modules allow a designer to leverage the Arduino hardware and software stack in their own custom systems and form factors. In addition these module have extra IO interfaces over and above what is available on the Arduino model A/B boards opening up more options for the designer.
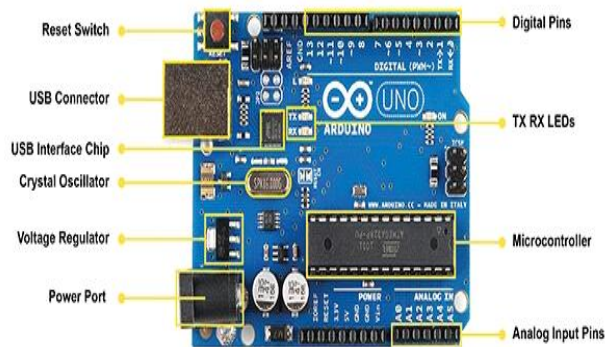
Wi-Fi Module
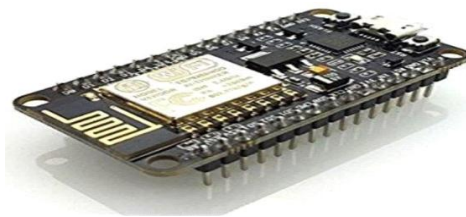
The Node MCU (Node Microcontroller Unit) is an open source programming and equipment improvement condition that is worked around an exceptionally modest System-on-a-Chip (SoC) called the ESP8266. It is a gigantic weight for specialists, programmers, or understudies who need to try different things with it in their own IOT ventures.

pH Level Sensor

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A pH meter is a scientific instrument that measures the hydrogen ion concentration in the solution to decide its acidity and alkalinity. The pH meter measures the difference between the electrical potentials of the pH electrode and the reference electrode. The pH meter is manufactured by comparing various pH readings of the sample solutions to the defined solution with a defined reference pH, such as buffers.

Soil Moisture Sensor
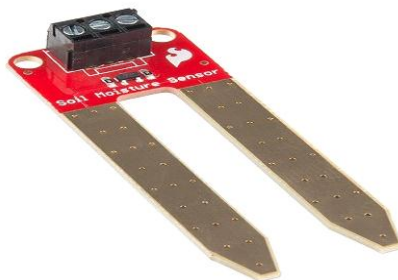
The moisture of the soil plays an essential role in the irrigation field as well as in gardens for plants. As nutrients in the soil provide the food to the plants for their growth. Supplying water to the plants is also essential to change the temperature of the plants. The temperature of the plant can be changed with water using the method like transpiration. And plant root systems are also developed better when rising within moist soil.

DHT11 Sensor
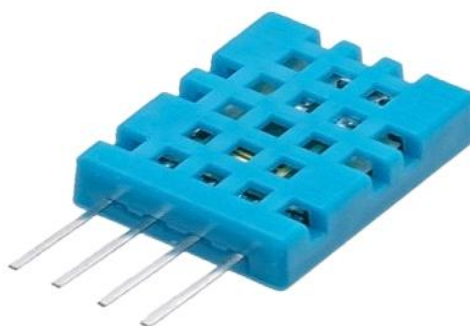
Humidity is the measure of water vapor present in the air. The level of humidity in air affects various physical, chemical and biological processes. In industrial applications, humidity can affect the business cost of the products, health and safety of the employees. So, in semiconductor industries and control system industries measurement of humidity is very important.

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Motor

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism either electromechanical or electronic, to periodically change the direction of current flow in part of the motor.

Relay

A relay is an electromagnetic switch operated by a relatively small electric current that can turn on or off a much larger electric current. Voltage source: 230 V. Current: 10 A. Relay acts like a Switch.Latching relays require simplest a single pulse with a manipulate strength to perform the switch consistently.

Result

The system will be best applied for medium size agriculture field.LED in the sink node denotes the status of pump motor. LED will glow, when the motor is switched ON. The output is displayed on the Arduino IDE. Moisture value along with the crops that can be planted is displayed. Pump motor status will also be displayed. I denotes the ON status and 0 denotes the OFF status.

Discuss

Husbandry is the heart of the world. In the world, husbandry is veritably important for the systemic requirements of the mortal race in view of the rapid-fire growth of the global population. Agriculture uses water for irrigation purposes. Water is essential for every factory,

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mortal and beast. Water destruction is one of the big complications in husbandry. Also, there are issues involved in huge force and also in irrigation systems. One of the results, for the below- described problems, can be given by the Internet of effects. The bias are getting smarter each day from smart television to smart auto to hurt kitchen to Smartphone. Now everything is connected to the internet. IoT transforms the agrarian sector and empowers growers to attack the major difficulties they face. By using the Internet of effects (IoT), the below problems can be overcome. Agriculture IoT helps to increase crop product by manipulating and controlling crop water operation. Acceptable water force is an important part of husbandry and crops can be damaged by inordinate water force or water failure (10). IoT can significantly ameliorate the application of water product. IoT is concerned with connecting connected objects at different locales from each other. IoT is a type of network technology that senses information from colorful detectors and adds anything to the Internet for communication.

Conclusion

Our proposed system of husbandry monitoring and control system monitors the variation in the temperature, moisture and as well the gas position of the terrain. The colorful detectors were suitable to spark a selector grounded on the colorful changes in the terrain. For the achievement of the development of this system, detectors (temperature, moisture, humidity and pH position) were incorporated into the system in order to smell the changes that do in the terrain. This new idea is to promote convenience and ease of factory growth for small scale growers. The proposed system will enable small scale growers to plant healthy crops all time round with little supervision.

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An Approach to Design Photonic Crystal Alcohol Sensor Using Machine Learning - Review

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Abstract

This paper outlines an ML- grounded methodology for casting a photonic demitasse (PhC) alcohol detector able of detecting and quantifying different groups of alcohol like methanol, ethanol, propanol, butanol and phenol. The approach capitalizes on the refractive indicator variations within the photonic bandgap (PBG) transmission diapason caused by changes in the disfigurement subcaste positions. Colorful structural configurations are proposed to distinguish between different alcohol types. Originally, apre-trained classifier is employed for alcohol identification, with Random Forest (RF) classifier assessed for performance and hyperactive-parameter optimization. Latterly, three distinctpre-trained artificial neural networks (ANNs) are employed to prognosticate alcohol consistence for each of the target alcohols. The issues demonstrate that this approach facilitates the creation of a largely accurate alcohol detector, indeed when employing a straightforward PhC structure.

Keywords: Photonic demitasse, Machine literacy, ANN, Alcohol estimation

Introduction

The critical necessity to cover alcohols due to environmental and health enterprises has significantly propelled the growth of the global alcohol detector request (1). Multitudinous exploration sweats have been devoted to assessing alcohol situations. Utmost presently available marketable alcohol detectors bear high-temperature operation, leading to complications and high costs, which hamper their farther development. Also, enterprises regarding electromagnetic hindrance disguise design challenges for these detectors. Exercising Photonic Chargers (PhC) for alcohol detectors can address these issues (2). PhC offers colorful profitable attributes for similar operations, including effectiveness, perceptivity, stability, miniaturization, portability, and real-time monitoring capabilities (3). An essential point of PhC is the Photonic Band Gap (PBG) created by optic periodic structures (4,5). Any dislocation

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in the periodicity of the PhC is appertained to as a disfigurement, performing in the conformation of localized countries within the PBG (6). The position of these localized countries depends on the refractive indicator of the disfigurement subcaste, a pivotal factor in relating different alcohols. Colorful PhC structures have been proposed in the literature for alcohol detectors. nevertheless, different dimensional PhCs like 1D, 2D and 3D structures have motivated the experimenters towards exploring new photonic operations; exploration on 1D PhC structures are substantially impregnated, whereas 3D PhCs are delicate to fabricate due to their structural complexity issues (7–11). On the other hand, 2D PhCs have surfaced as a burgeoning exploration field, which have attracted scientists across the globe, owing to their outstanding characteristics, precise control of band gap, effective light confinement, easy styles of fabrication and expansive operations in the design of nano-scale optoelectronic bias (12–14). Another attractiveness of 2D PhCs lies with the easy manipulation of light signal by the means of realizing photonic band gap in their dissipation relations (wvs.k), by judiciously opting different structure parameters and dielectric constant of chassis (15). This paper introduces a PhC-grounded alcohol detector that leverages ML for the identification and viscosity estimation of hothouse alcohols.

Review

Lately, Palai *et.al*., explored noteworthy features of photonic band gap in 2D square chassis vis-à-vis seeing different attention of sucrose, sugar, sodium chloride and potassium chloride (16–19), but the authors haven't stressed the measuring parameters for detector performance like perceptivity and resolution. Palai *et.al*., (20) reported a 3D photonic structure to sense different attention of glycerol in B-H-G result, where chassis constant is considered as 1000 nm and periphery of indirect air holes is taken as 880 nm. Although the authors have acquired some good results pertaining to seeing, fabrication of 3D PhC structures in nano-scale range is really grueling in the current exploration script.

Solli *et.al.,* (21) handed a detail explanation of band gap characteristics for the design of PhC bias. Wang *et.al.,* (22) reported colorful types of chassis structures with

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indirect, triangular, hexagonal and square rods and assayed the PBG with reference to filling rate. A 2D PhC-grounded pressure detector is studied through the band gap analysis (23, 24), where the authors observed a direct variation of reverberative wavelength with respect to different pressures, but they concluded with low perceptivity. Anghel *et.al.,* (25) delved the PBG of 2D PhC in the NIR region by the ray ablation process on titanium oxide film.

Zhang *et.al.,* (26) reported the effect of filler factor, dielectric constant of background material and different chassis shapes with respect to band gap characteristics. In particular, variation in PBG has been successfully employed for realizing photonic detectors to sense pressure, gas, temperature andmicro-organisms (27–29). Piecemeal from this, many workshop are executed on alcohol discovery using face plasmon resonance (SPR) structures (30, 40), but their principle of operation is fairly complicated and the cost for consummation of the system is also high. Owing to the wide use of different alcohols in libation diligence and chemical diligence, the process of discovery of colorful alcohols should be simple, precise and cost-effective. When dealing with colorful alcohols, former results cannot be directly applied. Still, employing Machine literacy (ML) on the database enables rapid-fire alcohol bracket, significantly reducing the time compared to counting solely on PhC detectors. Likewise, ML innately offers advanced delicacy (41).

Proposed Sensor Structure and Module

The figure in Fig. 1 illustrates the schematic structure of a 1D Photonic Crystal featuring a defect layer in the middle. Each period of this Photonic Crystal is composed of two dielectric layers with thicknesses represented by d1 and d2, having respective dielectric constants ε1 and ε2. Additional parameters for this structure are detailed in the caption of Fig. 1. The widths of these layers are determined as follows: ( ) x ( ) and d2 = ( ) x ( ) Here, n1 and n2 II.

Methodology

The envisioned alcohol sensor is created through the amalgamation of three key components: database construction, knowledge-driven classification, and density prediction methodology. The construction of this sensor involves a two-fold process,

consisting of the "Dataset Formation Stage" and the subsequent "Training Stage." To effectively train the classifier and artificial neural networks (ANNs), it is imperative to establish a meticulously crafted dataset. i) Dataset Formation The calculation of the defect layer position within the Photonic Band Gap (PBG) is carried out under different temperature and pressure conditions. As illustrated in the flowchart in Fig. 2, this process involves computing the transmission spectrum of the structure across a wide range of wavelengths and pinpointing the location of the defect layer within the band gap. $n1$ 4 $n2$ 4 denote the refractive indices of layer 1 and layer 2, and $\lambda0$ represents the central wavelength (e.g., 1.55μm) of the stop band. This structure forms the core of the sensor's design.

Initially, the Alcohol Identifier receives input data, which includes temperature, pressure information for the alcohols, and a data bank. The Alcohol Identifier incorporates a pre-trained classifier with optimized hyper-parameters. Subsequently, the density of each alcohol is predicted using artificial neural networks (ANNs), with separate ANNs trained for each alcohol. Additionally, the output from the temperature and pressure sensors is transmitted to all three ANNs in the system.

In the "Data Formation Stage" depicted in the Fig. flowchart, the conventional approach for determining the PBG and defect layer position is outlined. This is achieved using the Scattering Matrix Method (SMM), enabling the identification of the defect layer position under a wide range of temperature and pressure settings. The corresponding refractive index values, which vary with temperature and pressure, are sourced from [42].

Analyzing the qualitative aspects of λdef position within the PBG paves the way for the development of a straightforward algorithm to replace the iterative wavelength search method across the entire PBG.

We can readily determine the position of the defect layer by employing Algorithm 1. Given the structural details of the Photonic Crystal (PhC) and the defect layer, our focus is solely on calculating the defect layer's position for alcohol identification and

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density prediction. It's important to note that the other structural parameters, including layer widths, ε1, ε2, and defect layer position, remain constant. Consequently, λdef for the same alcohol, under identical pressure and temperature conditions, can vary significantly between two different PhC structures. Any variation in device parameters will result in a corresponding change in λdef. Thus, it can be asserted that each alcohol sensor of this particular type necessitates individual training using data tailored specifically to that sensor's specifications. Additionally, alcohol sensors with distinct PhC structures require separate datasets generated based on their respective specifications. In this paper, the dataset used for training is specifically designed for the structure depicted in Fig. 1; therefore, the sensor's performance can only be assessed using this dataset. The computed λdef serves as input for both the alcohol classification and density prediction stages.

Training stage

The training stage consists of two sub-stages, the "Alcohol Classification stage" and the "Density Prediction Stage".

Alcohol classification stage

The group of alcohols cannot be discriminated only by taking λdef as the feature for classification. In the context of a fixed structure, λdef is solely contingent on εdef, where εdef depends on temperature and pressure, and consequently, the refractive index of the alcohol. Interestingly, it's possible for different alcohol combinations to share the same refractive index values at various temperature and pressure levels. From the standpoint of paraconsistent feature engineering, we can assess the high interclass similarity of the λdef feature.

In this scenario, we address the classification challenge by considering the defect layer's position, temperature, and pressure as features. The dataset for this classification task is constructed using the datasets provided in [42]. Initially, we compile a chart that depicts the variations in dielectric constants for the three alcohols under different temperature and pressure conditions. The value of ' λdef ' is computed using the Scattering Matrix Method (SMM) for all these cases. Through empirical

observation, it becomes evident that the change in dielectric constants for various alcohols under varying temperature and pressure is relatively small. Similarly, the variation in these changes among different alcohols is not notably high. Due to this observation, to calculate ' λdef ', we must confine the value of $\Delta\lambda$ to 0.001μm in Algorithm 1. For each of the alcohols, dielectric constants are documented across three distinct temperature ranges and a broad spectrum of pressure variations.

The Random Forest classifier is a machine learning algorithm that belongs to the ensemble learning family. It is used for both classification and regression tasks. The key idea behind Random Forest is to build a "forest" of decision trees during the training phase. Each tree in the forest is constructed independently, and the final prediction is made by aggregating the predictions of all the individual trees *Density prediction stage*

After the classification of the alcohols, in the next step, the model aims to predict the density of the alcohol. This again being a datadriven approach, it requires the density versus λdef data. The density also depends upon temperature and pressure. In [42], the relation of refractive index of an alcohol with its density is depicted. It can be stated that λdef would depend upon density. This density prediction stage is integrated after the alcohol classification stage in the proposed alcohol sensor. Three different neural networks are separately trained for three different alcohols. From the point of view of the sensor, the density is to be modelled against the position of the defect layer. So, again for the case, the dataset prepared before by calculating the λdef for different density, temperature and pressures is used to train the ANNs. Training inputs are the temperature, pressure and λdef. Shallow networks are designed for each of the three alcohols. For the prediction, 75 % - 25 % train-test split of the dataset is used in case of each of the alcohols.

Conclusion

In this paper, design of an alcohol sensor is presented that exploits machine learning based approach to classify among the group of alocohols and also to predict the densities of the alcohols separately. The alcohol sensor uses a PhC with single

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defect layer as the sensing layer which results in different positions of the defect layer in the transmission spectrum for different alcohols of the device. As the refractive index of the alcohol changes with temperature and pressure, so the position of the defect layer in the PBG also depends on these two parameters. Therefore, the classifier is designed with temperature, pressure and position of defect layer as inputs. Since the effectiveness of both the machine learning classifier and the ANN models relies on the size of the training dataset, it's worth noting that having a substantial number of data samples could enhance the accuracy of density prediction. Additionally, the algorithms outlined in this context are applicable to other 1D PhC structures as well.

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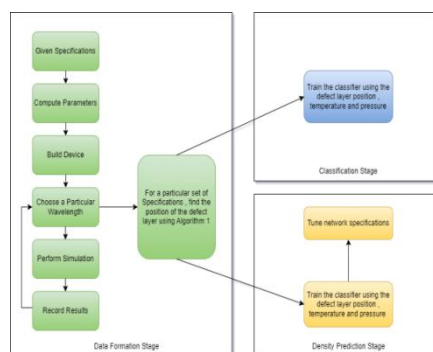
Fig. 1. Schematic PhC structure used in design of the proposed alcohol sensor. The defect layer is shown with N1 and N2 periods on either side of it. εdef , ndef and ddef arethe dielectric constant, refractive index and thickness of thedefect layer respectively.

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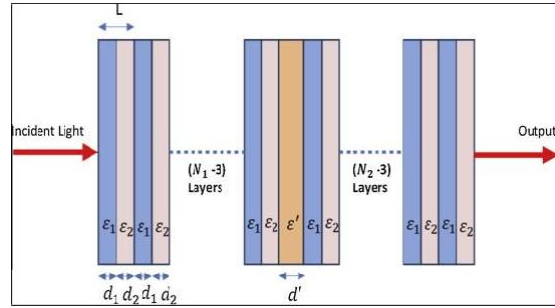Fig. 2. Flowchart of dataset formation for training the alcohol identifier and density predictor.

Algorithm 1:

Input: $n_1, d_1, n_2, d_2, \Delta\lambda, T$.

Output : λ_{def}

Initialize: $\lambda_0, \lambda_{temp1}, \lambda_{temp2}$

Step 1 : Find the central wavelength of the PBG, $\lambda_0 = 2 \times (n_1 d_1 + n_2 d_2)$

Step 2 : $\lambda_{temp1} \leftarrow \lambda_0, \lambda_{temp2} \leftarrow \lambda_0$

Step 3 : Until T (λ_{temp1}) 0.7, decrease λ_{temp1} by $\Delta\lambda$.

Step 4 : Until T (λ_{temp2}) 0.7, increase λ_{temp2} by $\Delta\lambda$.

Step 5 : If $\lambda_{temp1} > \lambda_{temp2} \lambda_{def} = \lambda_{temp2}$.

Step 6 : Else, $\lambda_{def} = \lambda_{temp1}$.

where T() is the SMM function of the structure, i.e. T(λ) returns the transmittance at wavelength λ.

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Impact of Social Media on Youngsters

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Abstract

Future of our country depends on the youngsters. We might become the largest producer of goods and services if our youth population grows in creativity and productivity. The problem is most of the youngsters have been addicted to social media which may affect their morale. Living in a false identity makes them consume unnecessary and unproductive information. As the information they consume is not relevant to the real world problems, most of the youth are discouraged to face the reality of life. True education is not the quantity of data consumed but the quality of information persuaded. Direction of consumption of information decides the future of a young person. And. Thus, we build the future of our country or we could destroy it. To find the impact of social media, we did a survey among 40 candidates who are aged between 15 and 25 in Thoothukudi district. The findings are listed in the article.

Keywords: Productivity, Identity, Information

Impact of social media on Youngsters

The great advantage about social media is that a business can rightly target the exact audience they need to trap them to buy their product. The businesses today enjoy the freedom of social media marketing. At the same time start-up businesses have less ability to rank their advertisement as they compete with giant companies. All the companies share the same platform and it is easier for a large company to sustain than a small company to survive. Greater issue than this is, as the future of our country is, the youngsters are becoming seed size consumers of productive information and sea size consumers of false and negative information through social media. They'd never know the difference between what is productive and healthy and what is irrelevant and exaggerated. This made us wonder whether there is a future for the youth or not?

Power of Youngsters

Times of India says that, "The growth is driven by India's large, dynamic and youthful population,

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with 65 of Indians being under 35 times old. While China faces challenges including a shrinking pool with a growing population, 600 million people are progressed between 18- 35 in India at present". Which means, we've a great occasion to develop our nation as each has innovative and creative ideas. The youths are important whatever direction they go. It may be positive or negative grounded on what direction they drive. But anyone to take a direction there must be a director. The marketing acquainted, targeted trends, social media being the director is what's hanging the future of the youths.

Danger in Disguise

Social media has shown itself as the savior of youngsters from loneliness and foolishness as it provides high profile friends and skimmed sharpened education. It seems that social media has more positives than negatives. It poses the question why the impact of social media has to be all negative in this paper. Social media has proved its success by getting the approval of almost everyone. But maybe it is not what it looks like. The more a person uses social media the lonelier the person gets in real life. They separate themself to chat with persons online while they have the opportunity to build trust and grow love in family relationships. They think that they are smart and intelligent as they keep up with current cinema and sports trends and the affairs of the people around them. But, the information they consume are cropped and trimmed as per the benefit of the corporations who want to sell their products. And, the trends and information the algorithm of the social media shows are designed by professionals to make more consumers and less producers. The social media consumers' minds become more lazy, uncreative and unproductive.

Lack of Direction in Education

The reason why a youthful person isn't rehearsed to consume productive information is because they noway had a trainer to tell them what to consume and what to not. They've had no directors which direction they must go in order to live to the full eventuality of their life. They had noway met their warder who could spot the vestments of their life. The direction is more important than the speed. Utmost of the people moment want to know effects veritably presto but noway want to have an administrator or a companion or a tutor who can help them consume true and healthy information. They just lock the doors and enjoy connections that aren't helpful in real life, they

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enjoy the pleasure of getting declarations that are empty, they prove their worth or beauty by posting unrealistic snaps and markers that they end up feel bad about their retired real- tone and they've no bone to ask help because they noway had a director in education. Mahatma Gandhi formerly said " speed is inapplicable if you're going in the wrong direction "True Identity" Showing to the world one thing and living another and creating a profile that isn't real to earn the acceptance of a lot of people", is what then mentioned false identity. There's no bone to accept them for their true identity because they noway learned to be vulnerable to real people for expressing their true tone. They aren't rehearsed to face the data of their weakness and be empowered by the reality of life to live up to the eventuality of life. They noway move past the weakness to get to their real strength. Rather they covered all the sins and created a false identity to be accepted by the people the easy way. That ended up forgetting the True Identity.

Depression and Discouragement

The young people are discouraged to live a visionary and inventory life as they are being fed that they are not enough to face the true identity. They are depressed. They are pressed by outdated dreams, unanswered life questions. They are discouraged to live. They are dealing with suicidal thoughts so often.

Survey

Questions

- We have included Ten important highly subject related questions in the questionnaire.

Sample details

- 40 young candidates are met in Tuticorin College going student's community.

Survey results

- 75.5% of the respondents say social media is beneficial and helps them being surrounded by people and helps them become smarter.
- 37.5 % believes that social media kills their consistency in their daily responsibility
- More than half of the respondents i.e. around 58% believe that social media is a successful invention.
- A major 63% opines that social media helps in killing their loneliness.

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- Almost every three out of four people express their gratitude towards social media.
- Half of the respondents don't want to use social media but still they use it because they don't know any other place to spend useful time.
- 42.5% say that the usage of social media often ends up in watching pornography and they secretly feel guilty and they are afraid that they will not be accepted by friends and family if they confess to anyone for help.
- Half of the respondents often feel discouraged and depressed and lonely.
- Among the respondents who said that social media is a successful invention, still 18% of them secretly deal with suicidal thoughts and they found it hard to explicitly ask for help. Totally 22.5% deal with suicidal thoughts and find it hard to share it to anyone.
- 42.5% desperately need and want help in finding a healthy and productive way to be addicted to social media (porn), etc, and they confessed that they couldn't find a trustworthy person that they could ask help for.

Encouraging Education

This devastating reality we face as a threat to the youth population of our country cannot be solved by youngsters. When a child is playing with things there may be an electronic device in a vulnerable state that could hurt the child, would the father scold the child? Of Course not. Why? Because the child does not know the difference between a toy and an electric cable. Likewise the youth does not know how to properly handle these technologies as they seem to be new to everything and they have given the impression they have to face every modern day problem themselves. But, the problems are the same as they were in the early days but the problem reaches the youth in a new way. As the youth are affected, somebody needs to help them out of the sickness of social media and lead them to a productive lifestyle. Anyone who is affected by a disease needs a doctor. Like that everyone needs help to give them hope for a new succeeding life. The one who gets this message should start leading young people towards true education. The discouraged must need encouragement and we must provide that. Support group must be formed. Values and beliefs must be taught. We have to direct the youngsters towards big visions. We have to encourage their small steps towards their goal.

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Some helpful suggestions to help young people, we found in this research are Development of Value-based education, conducting awareness programs and training campaigns to help youth set valuable vision and mission. Most of all this suggested solutions, every one of two young people you meet in your daily life needs help so why don't we start taking responsibility for supporting youth by spending quality time with them instead of being always busy living for ourselves. This could be a satisfying experience to anyone who has a heart.

Conclusion

The topic "Impact of Social media" is popular. But the emphasis on youngsters is what makes it so worth studying. The conclusion is simple: 10% of young people say social media is the powerful invention of human beings and among the same people nearly 50% want to quit social media to find productive ways to invest their valuable time. This shows us that the youth are sure that they are fast and confess that they are moving in the wrong direction and they feel the lack of direction. Thus, we must act immediately toward this issue. There is always hope in any situation if we do something about it.

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