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TECH TODAY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

KARPAGAM COLLEGE OF ENGINEERING

2020-2021

COMPUTER SCIENCE AND ENGINEERING

VISION

To create computer professionals with a strong academic and technical background to achieve special distinction at the national and international arena and also to serve and lead the society.

MISSION

- Providing excellent learning opportunities for students in Computer Science and Engineering to meet the needs of Nation as a whole.
- Establishing centers of research in areas of immediate needs to society.
- Develop ICT based solutions for the development of the nation.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Programme Educational Objectives (PEOs)

1.PEO1:

Graduates will be able to comprehend mathematics, science, engineering fundamentals, laboratory and work-based experiences to formulate and solve problems in Computer Science and Engineering and other related domains and will develop proficiency in computer based engineering and the use of computation tools.

2.PEO2:

Graduates will be prepared to communicate and work effectively on the multidisciplinary engineering projects practicing the ethics of their profession with a sense of social responsibility.

3.PEO3:

Graduates will recognize the importance of lifelong learning to become experts either as entrepreneurs or employees and to widen their knowledge in their domain.

Programme Outcomes

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering Problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental Considerations .

PO4: Conduct investigations of complex problems: Use research-based knowledge and Research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and Information Technology tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 : The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES

PSO-1: Analyze, design, implement, test and evaluate computer programs in the areas related to algorithms, networking, web design, cloud computing, Internet of Things (IoT) and data analytics of varying complexity.

PSO-2: Develop innovative ideas to provide solutions for complex problems and apply advanced knowledge of computer science domain to identify research challenges in Computer Science and Engineering.

TECH TODAY MAGAZINE 2022-2023

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ABOUT THE DEPPARTMENT

The Department of Computer Science and Engineering was established in the year 2000 and it offers four year undergraduate program in Computer Science and Engineering. The Department is located in a newly constructed 70000 Sq.ft high-tech Computer Science and Information Technology block. The Computer Science and Information Technology block also includes a separate laboratory block and an Open Air Theatre with a capacity to accommodate 500 students. The Department has a separate library of more than 1000 books, international journals, national journals, magazines, back volumes, project reports and lecture CDs. The department maintains exclusive question bank library comprising vast collection of courses related to computer science and engineering. The department has good record of student placements in national, international and multinational companies.

The Department imparts value addition to the students by providing weekend courses on fundamentals and also by aiding students with industry sponsored programs offered through the coordinated efforts of the faculty and industry partners from IBM, Infosys, RedHat Academy, ICT Academy and Oracle Workforce Development Programme (WDP).

Department of Computer Science and Engineering has signed MOU with IBM, Oracle, Global Edge, Microsoft India Ltd, Red Hat Academy and Infosys to help the students in training and to instill them with skilled resources based on leading software technologies. Periodic faculty Enablement Programmes are offered to our faculty members by technical experts from Infosys and ICT Academy. The department has 9 laboratories with 567 computers.

Program Offered

B.E COMPUTER SCIENCE AND ENGINEERING

STUDENTS ARTICLE

COLORIZATION BY MULTIDIMENSIONAL PROJECTION

Most image colorization techniques assign colors to grayscale images by embedding image pixels into a high dimensional feature space and applying a color pattern to each cluster of high-dimensional data.

A main drawback of such an approach is that, depending on texture patterns and image complexity, clusters of similar pixels can hardly be defined automatically, rendering existing methods prone to fail. In this work we present a novel approach to colorize grayscale images that allows for user intervention. Our methodology makes use of multidimensional projection to map high-dimensional data to a visual space.

User can manipulate projected data in the visual space so as to further improve clusters and thus the colorization result. Different from other methods, our interactive tool is ease of use while still being flexible enough to enable local color modification.

We show the effectiveness of our approach through a set of examples and comparisons against existing colorization methods.

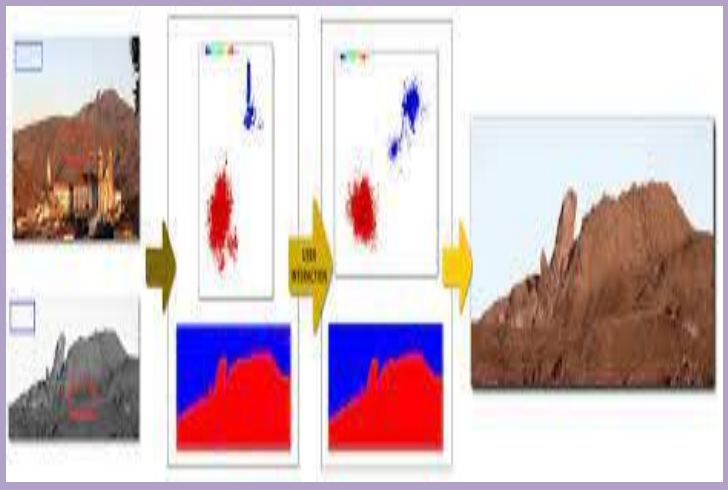
DISCUSSION AND LIMITATIONS

The comparisons presented in Section III clearly show the effectiveness of the proposed coloring method, surpassing, in requisites such as accuracy and flexibility, existing methods. The local control of neighborhood structures enables the user with a sharp control of color propagation within pixel clusters, a characteristic not present in any other colorization method.

CONCLUSION

In this work we proposed the use of multidimensional projection as a basic tool for image colorization applications. The evaluation we provided shows that Project color outperforms existing techniques in terms of accuracy as well as flexibility. Besides enabling a local modification of badly colored regions, the proposed methodology turns out to be robust when dealing with complex textured images.

In summary, flexibility and effectiveness render the proposed method one of the most attractive alternatives in the context of image colorization.



NAME: POORNAA Y(III)

ROLL NO.: 18P226

STUDENT ATTENDANCE SYSTEM BYQR SCAN

In past days students marked their attendance on paper but sometimes there were chances of losing the paper. In that case we cannot calculate the attendance of students. So to overcome these issues we implement a system that will hide all student information (identity card) inside the QR Code. So that when a student will scan that QR Code at that time , date and time of scanning the QR Code will be stored in the database.

A system that takes down students' attendance using in this work we proposed the use of multidimensional projection as a basic tool for image colorization applications. The evaluation we provided shows that Project color outperforms existing techniques in terms of accuracy as well as flexibility. Besides enabling a local modification of badly colored regions, the proposed methodology turns out to be robust when summary, flexibility and effectiveness render the proposed method one of the most attractive alternatives in the context of image colorization.

QR code: Every student is provided with a card containing a unique QR code. Students just have to scan their cards in front of a webcam and the system notes down their attendance as per dates. Each QR code contains a unique id for students. System then stores all the students' attendance records and generates a default list. It also generates an overall report in excel sheet for admin. This type of application is very useful in school as well as in college for daily attendance.

Introduction

Among the various types of attendance systems that have been developed, using punch cards, log books, fingerprint systems, barcodes, QR codes and also RFID still cause lots of problems such as providing incorrect information to the users.

The purpose of the smart phone based attendance system is to computerize the traditional way of recording attendance and provide an easiest and smart way to track attendance in institutions nowadays, the most common device that have come into account

in marketing and business are smart phone devices. Moreover, it comprises lots of them running Android OS.

Main objective

"QR Code Based Attendance Management System" is a combination of two android applications developed for taking and storing the attendance of the students on day basis in the college. Here the professor, who is handling the subjects, will be responsible to mark the attendance of the students. Each staff member will be given an android application that is used for taking attendance and generating the overall attendance status.

An accurate report based on the student attendance is generated here. Report of the student's attendance on a weekly and monthly basis is generated as desired. The main objective of the automated attendance system is to computerize the traditional way of recording attendance and provide an efficient and automated method to track attendance in institutions.

Advantages of QR Code: Based Smart Attendance System: Provide better security. Maintenance of the system is easy and cost effective. Generate the result quickly. Provide accurate and efficient data, User friendly.

Feasibility

Economic feasibility: The developed system is time effective because attendance is marked automatically. It is also cost effective because of no use of paperwork.

Technical feasibility: The system is economic and it does not use any other additional Hardware and software. Behavioral feasibility: The system is user friendly.

Software requirement

- Android Studio
- Android OS 4.2+
- (Mobile)MS Excel

Hardware requirement

- Android Smartphone running Android OS version 4.0.3(API level 15)

Conclusion

The developed system presented in this paper has been successfully designed and tested. The student's attendance status will be analyzed and exported. Attendance monitoring is very important in our daily life. It possesses a really great advantage, among the whole types of code scanning technology, QR Code Based Smart Attendance System is the most accurate. In this project report, we have given an introduction of the Attendance monitoring system and its advantages. It is an efficient method to store the attendance in the smart phone rather than wasting the paper.

NAME: G.P.DEEPIKA(III)

ROLL NO: 18P110

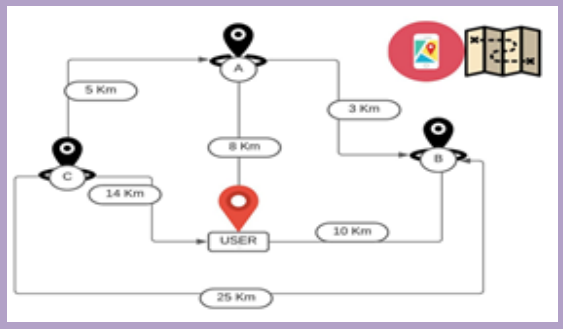
INTELLIGENT TOURIST GUIDE

Nowadays people use mobile phones and other mobile devices. Most of us have a small computing device that is always with us. People use it as an example for calling, as a calendar and organizer.

Mobile devices with GPS receivers are also used to find paths in navigation. The main idea of this thesis was to design a system that will run on most phones and palms and will be helpful when visiting some new places and cities. This system should be able to find a route using usercriteria.

Those criteria should be simple and natural, like for example: a list of museums, the most famous historical objects, restaurants to visit, constraints to travel by bus and by walking. The system should find a path that fulfills those criteria, show it on screen, show names of objects, some short descriptions and photos of them and possible entrance costs.

It should also be able to estimate time needed to travel from one object to the next and if it is possible, advise which bus line or other public means of transport may be used. It should be helpful for people that want to visit a city without having much information about it. Paths that are output of this system are only a proposition for travel



Advantages

- Registered user gets the recommendation of the places of their preferences. They can find the places using this system.
- User can easily view the place on map with its description, image and address . The system also provides one food place in the results.

Disadvantages

- Users cannot book a tour package using this system.
- It may provide in accurate results if data entered in correctly.

NAME: DINESH E(III)
ROLL NO:18P310

MOBILE PHONE BASED DRUNK DRIVING DETECTION

Drunk driving, or officially Driving under the Influence (DUI) of alcohol, is a major cause of traffic accidents throughout the world. In this paper, we propose a highly efficient system aimed at early detection and alert of dangerous vehicle maneuvers typically related to drunk driving. The entire solution requires only a mobile phone placed in the vehicle and with an accelerometer and orientation sensor.

A program installed on the mobile phone computes accelerations based on sensor readings, and compares them with typical drunk driving patterns extracted from real driving tests. Once any evidence of drunk driving is present, the mobile phone will automatically alert the driver or call the police for help well before the accident actually happens.

We implement the detection system on Android G1 phones and have it tested with different kinds of driving behaviors. The results show that the system achieves high accuracyand energy efficiency.

INTRODUCTION

Crashes caused by impairment of alertness in vehicle drivers pose a serious danger to people, not only to drivers themselves but also often to the general public. According to the U.S. National Highway Traffic Safety Administration (NHTSA), more than a million people have died in traffic crashes in the United States since 1966. During these tragedies, drunk driving is one of the main causes.

The concern related to drunk driving is not only the high crash rate, but also the type of crashes that are most likely to happen. In the last two years, 2007 and 2008, 13,041 and 11,773 alcohol-impaired driving fatalities happened, respectively. Both are 32% of the total fatalities of that year. During these crashes, ten of thousands of people killed, and many more people injured. Besides being a great threat to public safety and health, drunk driving also imposes a heavy financial burden on the whole society, especially on the healthcare

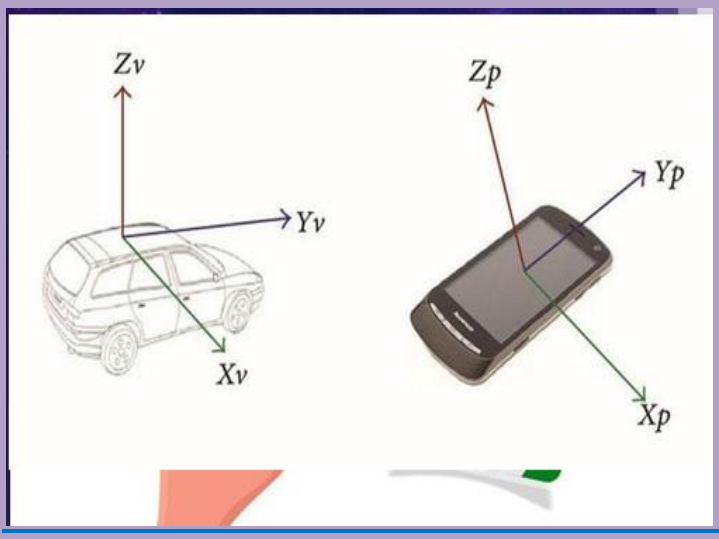
sector. According to U.S. Central of Disease Control (CDC), the annual cost of alcohol related crashes totals more than $51 billion in 2008. Lee et al. pointed out in their work that the emergency department spends $4, 538 more on average in treating alcohol-impaired motor vehicle crash victims, especially for patients who are minimally injured, because of their impaired reasoning and blunted sensation.

We develop the prototype of the drunk driving detection system on Android G1 phone. The G1 phone provides an accelerometer sensor and an orientation sensor.

In the following part, we describe the implementation details of the prototype. We implement the prototype in Java, with Eclipse and Android 1.6 SDK. It consists of 7 class files, which include 4 Activities, View, 1 Service and 1 Resource.

They can be divided into five major components: user interface, system configuration, monitoring daemon, data processing and alert notification. After the system is started, it finishes the configuration automatically. The monitoring daemon keeps running in background as a Service in Android, collecting and recording the readings of sensors. These readings are processed and used to detect drunk driving. In the data processing component, according to real situations, the time windows are set to 5 seconds.

When drunk driving is detected, the alert notification component works to alarm and remind the driver of dangerous driving or call the police for help. We compile and build the system project, create and sign the .apk file and install it onto G1 phone by ADB tool. The size of the apk application file is about 215 KB. Ultimately, we may create the .apk file in release mode, sign it with our release private key and publish it on Android Market, making it available to Android mobile device users for download.



DISCUSSION

In this section, we discuss some untouched issues in the general design and implementation. 1) GPS: Since all our detection approaches rely on driving patterns and vehicle movements, it is intuitive to think of GPS as a helpful auxiliary. With GPS, it is easy to delineate the vehicle movement trace and compare it with the road directions.

Some simple graphic processing techniques may be sufficient to pinpoint any abnormal curves present in the trace. Moreover, GPS can provide us with another valuable parameter, the speed of the vehicle. Though we can infer the speed based on the integral of accelerations, cumulative error will make the inference meaningless after a period of several minutes. With this speed information, we can identify dangerous driving patterns with finer granularity.

For example, if the vehicle runs at a very high speed, a small lateral acceleration is enough to make it drift or swerve with large dangerous S-curves. So the acceleration threshold of alerting should be dynamically adjusted according to the speed readings.

Another benefit from the speed information is that we are able to calculate the radius of curvature of the vehicle moving path with Radius = speed2/acceleration lateral. The radius can be a very accurate indication whether the driver is making irregular and consecutive sharp turns.

Though the integration of GPS information is worth exploring and is one direction of our future work,

We argue here that GPS is not the best choice for our current solution. First, while accelerometers and orientation sensors, which we have adopted in our solution, are cheap and available on many mobile phones, GPS is a fairly sophisticated functionality that is only present on high-end smart phones. So the generality of our detection mechanism is compromised if it depends heavily on GPS. Another major concern about GPS is its localization accuracy. It is common sense that a localization error at the magnitude of several meters can take place with GPS [18]. As we can see from the NHTSA cue patterns, a single abnormal vehicle maneuver normally happens within a distance of 10 to 20 meters. So the GPS localization error may cause great impact on the detection accuracy, if we consider the already achieved accuracy at around 100% with accelerometer and orientation sensors alone. On the other hand, while accelerometers and orientation sensors are mainly mechanical sensors and consume little energy, GPS, if turned on all the time, is highly energy consuming, as it constantly receives signals from satellites and performs considerable amount of computations.

CAMERA:

Most mobile phones are equipped with a camera with tolerable quality, e.g., 2 Megapixel resolution probably with other functionalities such as auto focus and exposure compensation. So a mobile phone is usually capable of acquiring visual information. It can be a great help to remedy some weaknesses of the solution presented above.

For example, cameras can be used to follow drivers' sight lines and capture distinctive road signs or marks to help analyze driving patterns. However, several factors prevent us from adopting this option. First, in order to capture useful visual information, there are many requirements on the position and posture of the phone.

A mobile phone must be meticulously set in a vehicle to face the front at an appropriate angle.

A little position shift or sliding can totally ruin the camera view.

So it is not feasible even to ask normal drivers to maintain an accurate position of his mobile phone, not to say a drunk driver. Second, the algorithm behind the visual identification must be very complicated to accommodate various and changeable traffic conditions.

A lot of intensive computations must be performed in a real time fashion and, hence, a potential high false positive/negative rate is possible given the limited computation capability of mobile phones. Third, camera operations and intensive image processing consume a lot of energy, particularly if the visual monitoring is conducted with a relatively high frequency. So in short, we think it is impractical at present to include camera and visual monitoring into our solution. However, it is a potential extension to our system with the fast development of mobile phone hardware in the future.

CONCLUSION

In this paper, we present a highly efficient mobile phone based drunk driving detection system. The mobile phone, which is placed in the vehicle, collects and analyzes the data from its accelerometer and orientation sensor to detect any abnormal or dangerous driving maneuvers typically related to driving under alcohol influence.

Experiments show that our solution sees very low false negative and false positive rates, as well as tolerable energy consumption. In our future work, we plan to improve our detection system by integrating all available sensing data on a mobile phone, e.g., GPS data and camera image.

NAME: BANU PRASANTH E(III)

ROLL NO:18P206

PARKING OCCUPANCYB PREDICTION AND PATTERN ANALYSIS

Parking Occupancyb Prediction and Pattern Analysis

According to the Department of Parking and Traffic, San Francisco has more cars per square mile than any other city in the US . The search for an empty parking spot can become an agonizing experience for the city's urban drivers. A recent article claims that drivers cruising for a parking spot in SF generate 30% of all downtown congestion.These wasted miles not only increase traffic congestion, but also lead to more pollution and driver anxiety. In order to alleviate this problem, the city armed 7000 metered parking spaces and 12,250 garages spots (total of 593 parking lots) with sensors and introduced a mobile application called Sparks,which provides real time information about availability of a parking lot to drivers. However, safety experts worry that drivers looking for parking may focus too much on their phone and not enough on the road.

Furthermore, the current solution does not allow drivers to plan ahead of a trip. We wish to tackle the parking problem by

(i) predicting the occupancy rate, defined as number of occupied parking spots over total number of spots, of parking lots in a zone given a future time and geolocation,

(ii) working on aggregated parking lots to explore if there is estimation error reduction pattern in occupancy prediction,

(iii) classifying daily parking occupancy patterns to investigate different travel behavior at different region.

Car parking has been a major issue in urban areas worldwide. Most countries are facing issues related to the lack of parking places. With the increasing economic development and urbanization, a ownerships are growing rapidly, which exacerbates the imbalance between parking supply and demand .

The Ministry of Public Security of China released data of car ownership nationwide in 2018, showing that the

number of cars reached 240 million with an annual growth rate of 10.51%, but the total number of parking spaces was only 102.5 million including private and public parking spaces, which is lower than half of the total number of cars. Moreover, around 30% of the traffic congestion in Chongqing and Shanghai, major cities of China, is due to lack of car parking spaces.

This issue is mainly caused by ineffective parking management. According to the latest research report , the parking space utilization rate of more than 90% of cities in China is <50%. With the limited areas in the cities, increasing parking area would not be a sustainable solution, but the implementation of efficient parking management would be a practical solution. The intelligent parking system is an essential part of efficient parking management. In an intelligent parking system, the time-sensitive parking occupancy prediction will be of great significance for decision makers and city planners regarding parking.

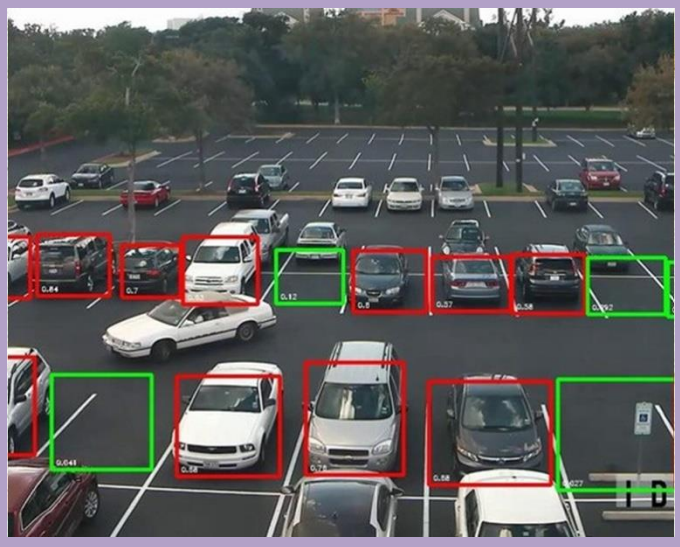
The number of available parking spaces plays an important role in drivers' decision-making processes regarding parking . According to Caicedo et al.., drivers that possess types are useful for accurate and cost-effective estimation of traffic volumes in Wyoming roads. Deshpande and Bajaj discussed the implementation of the traffic flow prediction model using SVM based on the traffic data obtained near the Perungudi toll plaza in the IT corridor in Chennai, India. They used a rough set to validate the prediction result.

The prediction results were fully satisfactory. Chen and Wang proposed the combination of support vector regression and genetic algorithm (GA) to predict the tourism demand, forecasting the inbound tourism flow in China and the tourist flow in Shanxi, respectively. Hong et al. combined GA and support vector regression to predict the inbound tourism flow in Barbados and achieved high-quality prediction results. Flagler et al. used a neural network to predict the parking space availability in urban areas of Munich based on the following factors: the day of the week, time, location, temperature, events, traffic, vacation time, and

rainfall. It shows that publicly available information can be a good initiation point for prediction, but we still need to rely on the historical data of parking. Chen predicted the parking occupancy in San Francisco using neural network, ARIMA, linear regression, and support vector regression. It is found that neural networks provide the best prediction results among the aforementioned models.

However, neural network needs training of over 90 min, which is really long. Haviluddin and Rayner developed a BPNN model to predict daily network traffic. The model showed a pretty good mean squared error (MSE) value, and two- hidden layers could be used as a model to predict traffic volume. Based on the BPNN model, Purnawansyah and Haviluddin predicted daily network traffic at Universitas Mulawarman, East Kalimantan, Indonesia, based on BP and radial basis function (RBF) neural network models and achieved excellent predicted results. Wang developed a BPNN model to forecast the traffic flow in Guangzhou, China, from August to December in 2014. They analyzed the network structure and parameters of BPNN to predict bus traffic.

Do used ARIMA to predict traffic flow at several time periods and provided numerical examples on the field data to testify the accuracy of their model. Gustavsson and Nordstrom used ARIMA to forecast the passenger flow of different types of Swedish inbound tourism and achieved high-quality prediction performance.



The rest of the paper is organized as follows. Section 2 elaborates on the methodologies, including research

framework, data collection and processing effort, forecasting methods and models, model parameter selection, and evaluation indexes. We discuss empirical experiments to predict the hourly parking occupancy with real-world data in Section 3, followed by the comparison analysis of the performance of four different models using two forecasting methods considering parking type and parking scale. Finally, Section 4 concludes the article, along with the discussion regarding future studies.

NAME:SHREE NETHZRA(III)

ROLL NO:18P239

INDIAN STOCK MARKET NATIONAL STOCK EXCHANGE OF INDIA

Indian Stock market National Stock Exchange of India

How AI Trading Technology Is MakingStock Market Investors Smarter?

"Artificial intelligence is to trade what fire was to the cavemen." That'show one industry player described the impact of a disruptive technology on a staid industry.

In other words: AI is a game changer for the stock market

AI STOCK TRADING

AI stock trading uses robot-advisors to analyze millions of data points and execute trades at the optimal price. AI traders also analyze forecast markets with greater accuracy and trade firms efficiently which mitigate risks and provide higher returns.

While humans remain a big part of the trading equation, AI plays an increasingly significant role. According to a study by U.K. research firm Coalition, electronic trades account for almost 45 percent of revenues in cash equities trading.

And while hedge funds are more reluctant when it comes to automation, many of them use AI-powered analysis to get investment ideas and build portfolios.

What Is AI Trading?

AI trading companies use various tools in the AI wheelhouse — machine learning and algorithmic predictions, for example — allowing brokers to customize exchanges and secure stocks. One benefit of AI stock trading is that it can be executed on ordinary networks and PCs.

When wall Street statisticians realized they could apply AI to many aspects of finance, including investment trading applications, Anthony Antenucci, vice president of global business development at Intelenet Global Services, had insight to share.“They could effectively crunch millions upon millions of data points in real time and capture information that current statistical models couldn’t,” he told ITPro Today.

“Machine learning is evolving at an even quicker pace and financial institutions are one of the first adaptors.”of course, Antenucci isn’t the only one to recognize AI’s stock potential. Online trading is expected to reach a market value of approximately $12 billion by 2028. Much of this anticipated growth will be thanks to AI.

As the global online trading market grows, so will the demand for AI tools that make trading easier. Here are several AI trading companies changing the game.

High-Frequency Trading

A popular form of algorithmic trading is high-frequency trading (HFT). Currently, most of the regulators and regular stock market investors have moved in the direction of HFT and algo-trading. HFT is a category of algorithmic trading where vast volumes of stocks and shares are sold and bought mechanically at very high speeds. HFT tends to develop continuously and will become the most authoritative form of algorithmic trading in the future.

Algorithmic trading has transformed the way trading is done Stock traders are using algorithms to bring higher speed and efficiency to trading in securities.

The algorithms that are developed will tend to become more complicated as it will be able to do. Thus, a happy union of algorithmic trading and ML can potentially be defined as AI trading.

AI-Powered ETFs and AI Stock Pickers: Example of AI managed portfolios

The advent of exchange- traded funds (ETFs) has rocked the world of portfolio investment. In fact, most ETFs are index funds, they incur a low expense ratio because they are not actively managed. An index fund is much simpler to run since it does not require security selection and can be done l argely by computer.

A current example of an ETF fueled by AI, is the AI- powered equity example, Black Rock, the largest U. S. Investment management firm, has started to replace human stock- pickers with the full automated investment program based on self- l earning artificial intelligence algorithms. According to Black Rock CEO Laurence Fink, the likely reason for the relative underperformance of active equity funds is the limitation of a human discretion in active portfolio management and stock-picking.

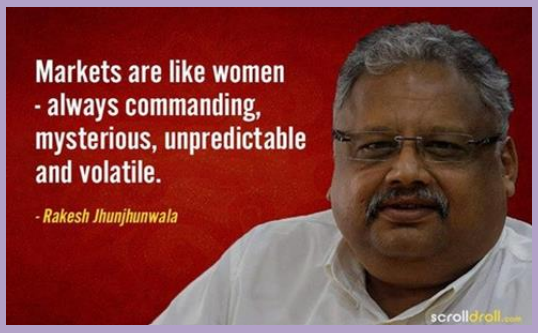
According to him, the democratization of information has made it much harder for active management. Active portfolio management has to rely more on big data, AI, factors and models within quant and traditional investments trategies.

Black Rock executive Mark Wiseman added, " The old way of people sitting in a room picking s tocks, thinking they are smarter than the next guy— that does not exist anymore."The above trends can create the f ear of human advisors gradually replaced by these Robo advisors, which can create large scale However, it is too early to conclude as the data on performance from these AI managed portfolios are sparse.

The academic jury is still out on the market volatility (risk) consequences of AI trading in the stock market." Even though it is less costly and more efficient in some cases to employ AI investment advisors, personal contact and human discretion will be imperative at certain s tages of investing."

Suchismita Mishra

Besides, even though it is less costly and more efficient in some cases to employ AI investment advisors, personal contact and human discretion will be imperative at certain stages of investing. In fact, a hybrid system may be a more sustainable future for the finance industry. Thus, the direction of higher education may change towards infusion of data science (Fin Tech) applications where machines (AIs) and humans coexist.



NAME: DINESH KUMAR R(III)

ROLL NO:18P311

BLOCK CHAIN

Block Chain:

A blockchain is a distributed ledger with growing lists of records (blocks) that are securely linked together via cryptographic hashes. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data (generally represented as a Merkle tree, where data nodes are represented by leaves).

Since each block contains information about the previous block, they effectively form a chain (compare linked list data structure), with each additional block linking to the ones before it. Consequently, block chain transactions are irreversible in that, once they are recorded, the data in any given block cannot be altered retroactively without altering all subsequent blocks.

Block chains are typically managed by a peer-to-peer (P2P) computer network for use as a public distributed ledger, where nodes collectively adhere to a consensus algorithm protocol to add and validate new transaction blocks. Although block chain records are not unalterable, since block chain forks are possible, block chains may be considered secure by design and exemplify a distributed computing system with high Byzantine fault tolerance.

A block chain was created by a person (or group of people) using the name (or pseudonym) Satoshi Nakamoto in 2008 to serve as the public distributed ledger for bit coin cryptocurrency transactions, based on previous work by Stuart Haber, W. Scott Stornetta, and Dave Bayer.

The implementation of the block chain within bit coin made it the first digital currency to solve the double-spending problem without the need for a trusted authority or central server. The bit coin design has inspired other applications and block chains that are readable by the public and are widely used by crypto currencies. The block chain may be considered a type of payment rail.

Structure and design:

Block chain formation. The main chain (black) consists of the longest series of blocks from the genesis block (green) to the current block. Orphan blocks (purple) exist outside of the main chain.

A blockchain is a decentralized, distributed, and often public, digital ledger consisting of records called blocks that are used to record transactions across many computers so that any involved block cannot be altered retroactively, without the alteration of all subsequent blocks. This allows the participants to verify and audit transactions independently and relatively inexpensively. A block chain database is managed autonomously using a peer-to-peer network and a distributed time stamping server.

Blocks:

Blocks hold batches of valid transactions that are hashed and encoded into a Merkle tree. Each block includes the cryptographic hash of the prior block in the blockchain, linking the two. The linked blocks form a chain. This iterative process confirms the integrity of the previous block, all the way back to the initial block, which is known as the genesis block (Block 0). To assure the integrity of a block and the data contained in it, the block is usually digitally signed.

Sometimes separate blocks can be produced concurrently, creating a temporary fork.

Block time

The block time is the average time it takes for the network to generate one extra block in the block chain. By the time of block completion, the included data becomes verifiable. In crypto currency, this is practically when the transaction takes place, so a shorter block time means faster transactions. The block time for Ethereum is set to between 14 and 15 seconds, while for bit coin it is on average 10 minutes.

Finality:

Finality is the level of confidence that the well-formed block recently appended to the block chain will not be revoked in the future (is "finalized") and thus can be trusted. Most distributed block chain protocols, whether proof of work or proof of stake, cannot guarantee the finality of a freshly committed block, and instead rely on "probabilistic finality": as the block goes deeper into a block chain, it is less likely to be altered or reverted by a newly found consensus.

Disadvantages of permissioned blockchain:

Nikolai Hampton argued in Computerworld that "There is also no need for a '51 percent' attack on

a private block chain, as the private block chain (most likely) already controls 100 percent of all block creation resources. If you could attack or damage the block chain creation tools on a private corporate server, you could effectively control 100 percent of their network and alter transactions however you wished."This has a set of particularly profound adverse implications during a financial crisis or debt crisis like the financial crisis of 2007–08, where politically powerful actors may make decisions that favor some groups at the expense of others, and "the bitcoin blockchain is protected by the massive group mining effort.

Standardisation:

In April 2016, Standards Australia submitted a proposal to the International Organization for Standardization to consider developing standards to support blockchain technology. This proposal resulted in the creation of ISO Technical Committee 307, Blockchain and Distributed Ledger Technologies. The technical committee has working groups relating to blockchain terminology, reference architecture, security and privacy, identity, smart contracts, governance and interoperability for blockchain and DLT, as well as standards specific to industry sectors and generic government requirements.[non-primary source needed].

Many other national standards bodies and open standards bodies are also working on block chain standards. These include the National Institute of Standards and Technology (NIST), the European Committee for Electro technical Standardization (CENELEC), the Institute of Electrical and Electronics Engineers (IEEE), the Organization for the Advancement of Structured Information Standards (OASIS), and some individual participants in the Internet Engineering Task Force (IETF).

Centralized block chain:

Although most of blockchain implementation are decentralized and distributed, Oracle launched a centralized blockchain table feature in Oracle 21c database. The Blockchain Table in Oracle 21c database is a centralized blockchain which provide immutable feature. Compared to decentralized blockchains, centralized blockchains normally can provide a higher throughput and lower latency of transactions than consensus-based distributed blockchains.

Name: Dr.S.Arul Antran Vijay
Designation: ASP/CSE

QUANTUM COMPUTING

QUANTUM COMPUTING:

Quantum computing is a multidisciplinary field comprising aspects of computer science, physics, and mathematics that utilizes quantum mechanics to solve complex problems faster than on classical computers. The field of quantum computing includes hardware research and application development. Quantum computers are able to solve certain types of problems faster than classical computers by taking advantage of quantum mechanical effects, such as superposition and quantum interference. Some applications where quantum computers can provide such a speed boost include machine learning (ML), optimization, and simulation of physical systems. Eventual use cases could be portfolio optimization in finance or the simulation of chemical systems, solving problems that are currently impossible for even the most powerful supercomputers on the market.

ADVANTAGE:

Currently, no quantum computer can perform a useful task faster, cheaper, or more efficiently than a classical computer. Quantum advantage is the threshold where we have built a quantum system that can perform operations that the best possible classical computer cannot simulate in any kind of reasonable time.

QUANTUM MECHANICS:

Quantum mechanics is the area of physics that studies the behavior of particles at a microscopic level. At subatomic levels, the equations that describe how particles behave is different from those that describe the macroscopic world around us. Quantum computers take advantage of these behaviors to perform computations in a completely new way.

QUBIT:

Quantum bits, or qubits, are represented by quantum particles. The manipulation of qubits by control devices is at the core of a quantum computer's processing power. Qubits in quantum computers are analogous to bits in classical computers. At its core, a classical machine's processor does all its work by manipulating bits. Similarly, the quantum processor does all its work by processing qubits.

QUBIT DIFFER FROM CLASSICAL BIT:

In classical computing, a bit is an electronic signal that is either on or off. The value of the classical bit can thus be one (on) or zero (off). However, because the qubit is based on the laws of quantum mechanics it can be placed in a superposition of states.

PRINCIPLES OF QUANTUM COMPUTING:

A quantum computer works using quantum principles. Quantum principles require a new dictionary of terms to be fully understood, terms that include superposition, entanglement, and decoherence. Let's understand these principles below.

Superposition:

Superposition states that, much like waves in classical physics, you can add two or more quantum states and the result will be another valid quantum state. Conversely, you can also represent every quantum state as a sum of two or more other distinct states. This superposition of qubits gives quantum computers their inherent parallelism, allowing them to process millions of operations simultaneously.

Entanglement:

Quantum entanglement occurs when two systems link so closely that knowledge about one gives you immediate knowledge about the other, no matter how far apart they are. Quantum processors can draw conclusions about one particle by measuring another one. For example, they can determine that if one qubit spins upward, the other will always spin downward, and vice versa. Quantum entanglement allows quantum computers to solve complex problems faster.

When a quantum state is measured, the wavefunction collapses and you measure the state as either a zero or a one. In this known or deterministic state, the qubit acts as a classical bit. Entanglement is the ability of qubits to correlate their state with other qubits.

Decoherence:

Decoherence is the loss of the quantum state in a qubit. Environmental factors, like radiation, can cause the quantum state of the qubits to collapse. A large engineering challenge in constructing a quantum computer is designing the various features that attempt to delay decoherence of the state, such as building specialty structures that shield the qubits from external fields.

COMPONENTS OF QUANTUM COMPUTING:

Quantum computers have hardware and software, similar to a classical computer.

Quantum hardware:

Quantum hardware has three main components.

Quantum data plane:

The quantum data plane is the core of the quantum computer and includes the physical qubits and the structures required to hold them in place.

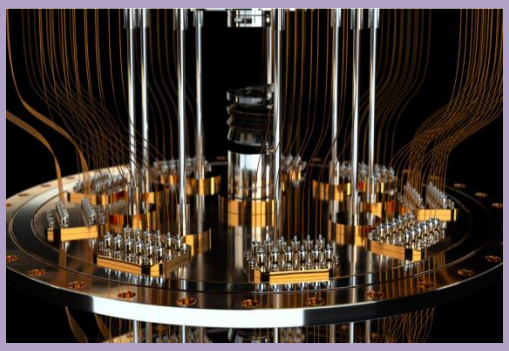
Control and measurement plane:

The control and measurement plane converts digital signals into analog or wave control signals. These analog signals perform the operations on the qubits in the quantum data plane.

Control processor plane and host processor:

The control processor plane implements the quantum algorithm or sequence of

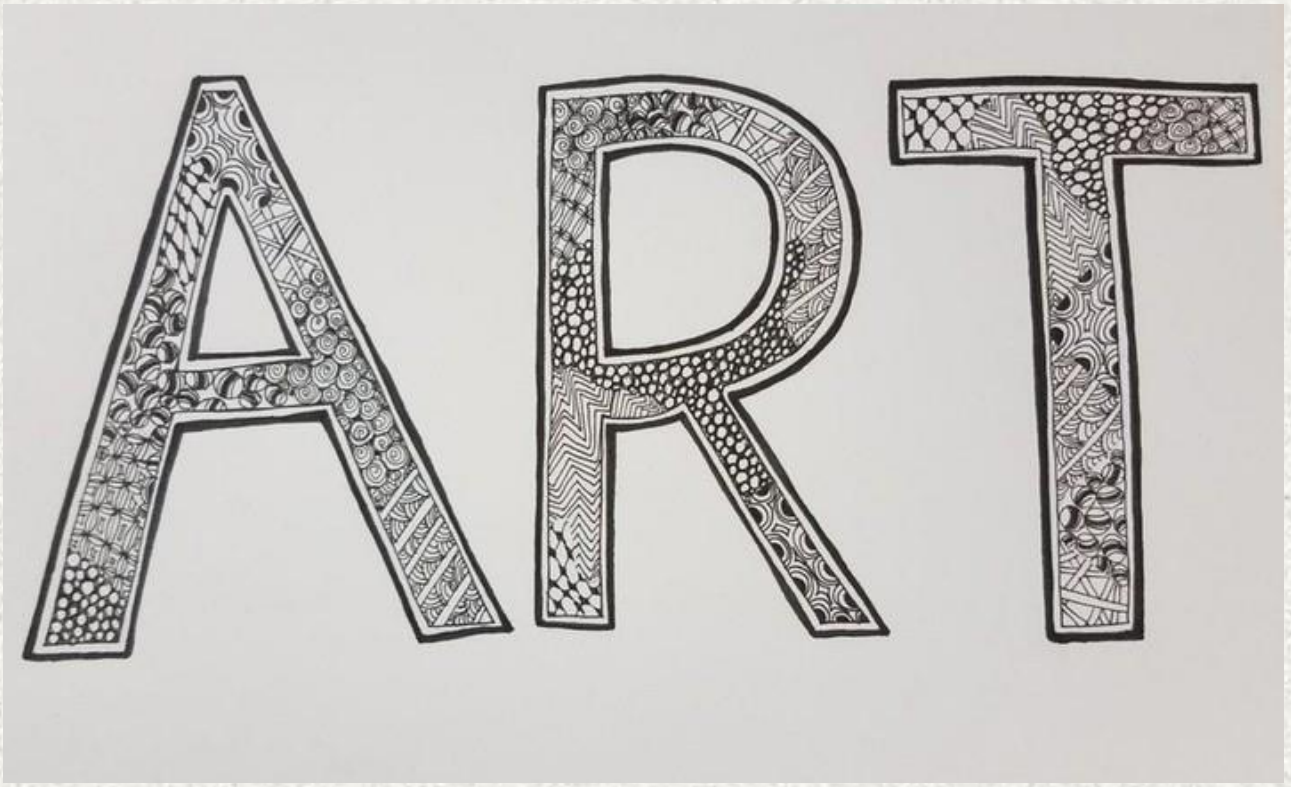
operations. The host processor interacts with the quantum software and provides a digital signal or classical bits sequence to the control and measurement plane.



Quantum software:

Quantum software implements unique quantum algorithms using quantum circuits. A quantum circuit is a computing routine that defines a series of logical quantum operations on the underlying qubits. Developers can use various software development tools and libraries to code quantum algorithms.

Name: Dr.Arun Kumar P M
Designation: ASP/CSE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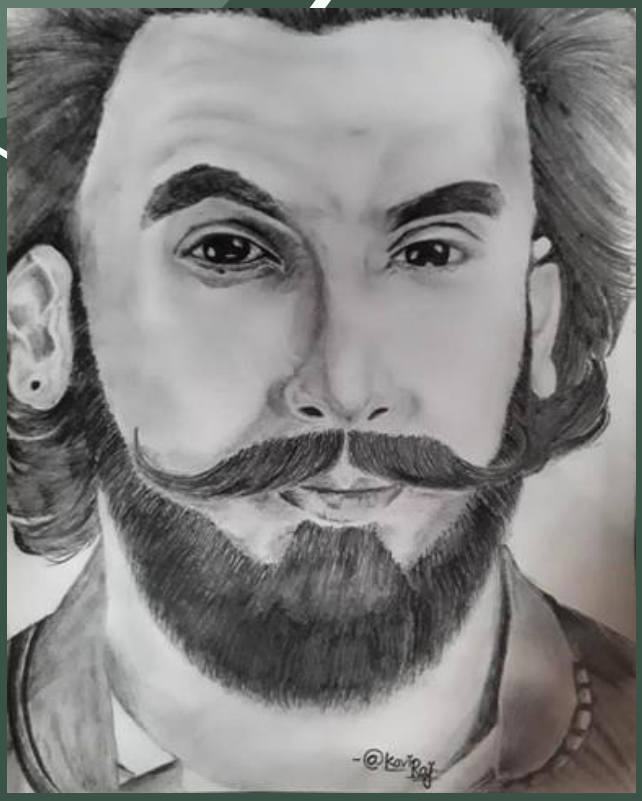
-@kavi_Raj


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WORLD OFF
0:16
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Love
begins at
Home

NAME:KALAIARASI S (III)
ROLL NUMBAR:18P123


thank you