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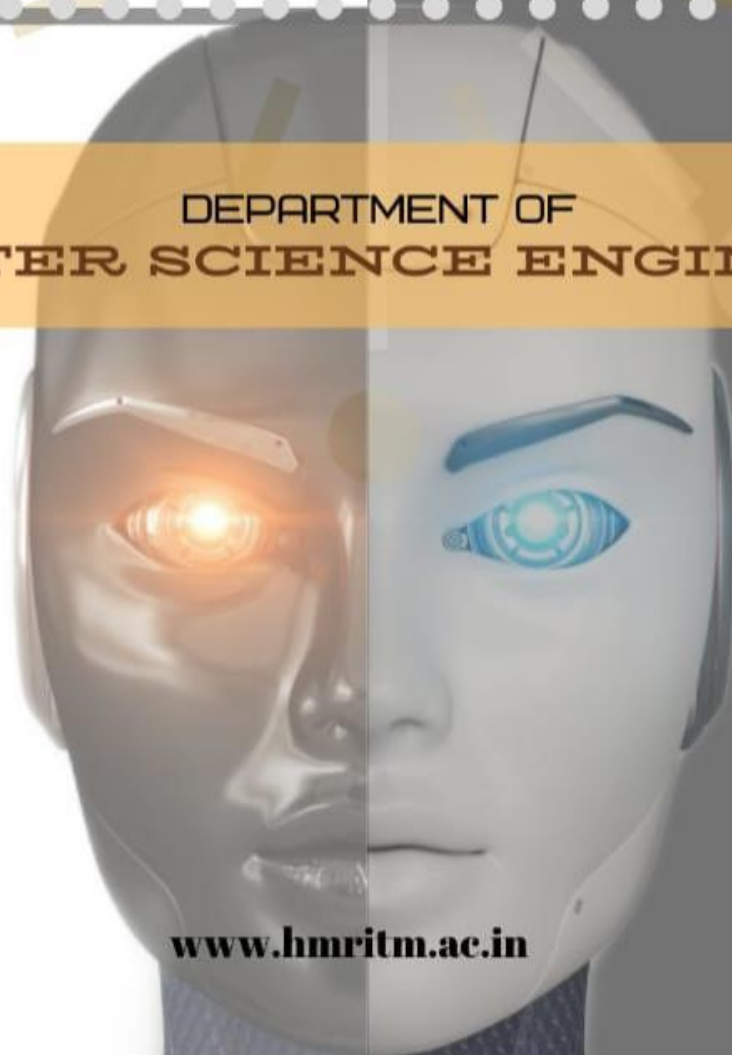
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HAMIDPUR, DELHI-110036

TechWiz

The Annual Technical Magazine

DEPARTMENT OF
COMPUTER SCIENCE ENGINEERING

www.hmritm.ac.in

<u>Editorial Board</u>

From Editor's Desk

It gives us great pleasure to present first Technical magazine **Tech Wiz**, Department of Computer Science and Engineering, HMR Institute of Technology & Management, Hamidpur, Delhi. Tech Wiz showcases the work, research, achievements and is a great way to know about our department.

We feel proud to declare that with the support and dedicated effort of staff members, we are able to bring out our first edition. We would also like to thank our Chief Patron - Hon'ble Shri A K Gupta; Director General - Mr S N Jha (IAS – Retired); Director - Prof V C Pandey; Deputy Director - Prof Shalini Gupta; Head - Department of Computer Science & Engineering, Dr Mohd Izhar; Head – Department of Information Technology, Dr Shafiqul Abidin; Head - Department of Electronics & Communication Engineering, Dr Avadhesh Kumar Sharma, Head - Department of Electrical & Electronics Engineering, Dr U K Choudhary, Head - Department of Mechanical & Automation Engineering, Dr Ravindra Kumar, for their motivation and support in bringing out this edition of Tech Wiz Magazine.

I hope, our readers will find this magazine informative and inspiring

Happy Reading!

SHARANYA CHANDRAN
Editor – Tech Wiz
Assistant Professor – Department of Computer Science and Engineering

CONTENT 2018-19

Director's Message

I am happy that Department of Computer Science and Engineering, HMRITM, Delhi, is bringing out an Institute Technical Magazine "Tech Wiz". The Tech Wiz will definitely help to show-case the activities that are happening in Department and the Campus. It also helps in building up teamwork which is very much needed today in this competitive world. It provides a platform to explore the merits and academic achievements of the faculty and students. This enhances the publication culture of the institute. This would definitely create an impact in the minds of readers, by way of providing larger visibility and dimension to the campus. I hope that this culture of publishing Technical Magazine continue forever and become a quoted example for all other colleges to follow.

Dr V C Pandey
Professor & Director

From HoD's Desk – Department of Computer Science and Engineering

It gives me great pleasure to know that department of CSE, is bringing out its Technical magazine "TechWiz" 2018-19. CSE department endeavours to help students to seek the best from the surroundings. The knowledge thus gained becomes a ladder for them to soar into greater heights. This magazine provides a platform to the students and the faculty members to expand their technical skills and strengthen the all-round development of the students. I congratulate the staff members and students who used various mediums of expressions to present their ideas. As long as our ideas are expressed and thoughts are kindled, we can be sure of learning as everything begins with an idea. Technical Magazine "TechWiz" 2018-19 amply demonstrate the communication skills, poetic prowess, imagination and creativity and I applaud the contributors for their simulated thoughts and varied hues.

Dr Mohd. Izhar
Head - Department of Computer Science and Engineering

Vision & Missions, Programme Specific Outcomes & Programme Educational Objectives – Department of Computer Science and Engineering

The department of CSE started functioning in the academic year 2002. Since its inception the department is committed to meet its vision and missions.

Vision of the Department

To deliver innovation centric education through skill development and project based learning in a collaborative environment.

Missions of the Department

- **M1:** To make students adapt to education with an emphasis on skill development in the field of Computer Science & Engineering.
- **M2:** To inculcate critical thinking via project based learning in collaboration with industries and institutions.
- **M3:** To instil leadership qualities, team-spirit, social awareness and ethical competence via continuous assessment and monitoring.
- **M4:** To attain self-sustainability and overall development through research, consultancy and innovative activities in cutting edge technology.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- **PEO1**: To get a deep insight into basic mathematical, programming and analytical skills to inculcate self-motivating lifelong learning to develop emerging technologies.
- **PEO2**: To emerge as good human being with full of social and academic ethics and environment aware attitude.
- **PEO3**: To acquire technical skills to accelerate in professional career with leadership and team-spirit.

PROGRAM SPECIFIC OBJECTIVES (PSOs):

- **PSO1 :** To work professionally in competitive environment and to achieve proficiency in software artifacts using design, analyze and development.

- **PSO2 :** Expertise the mathematical foundations for the development of computing solutions and designing of efficient computer software and hardware.

Aadhaar Farming: Connecting with Government

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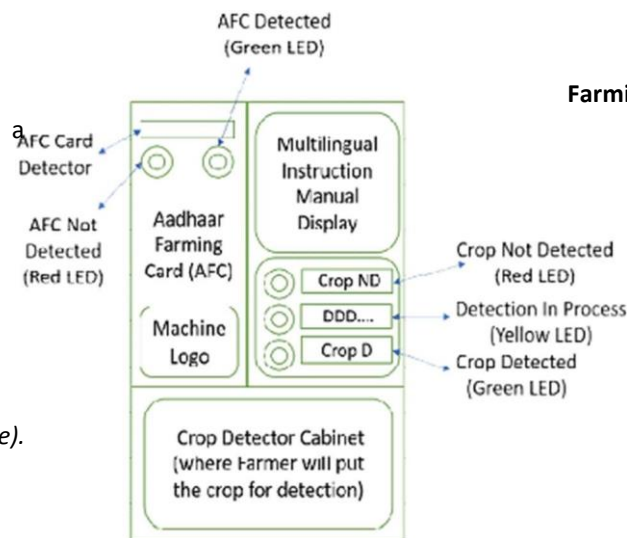[1]kalraramneek@ieee.org [2]himsara297@gmail.com [3]hodecehmritm@gmail.com

Ever imagined why are Farmers getting problems while producing the crops and why are they protesting against government every month many times?

Here's the answer to that, Farmers are not getting proper return back for their crops in the market and don't have proper payback of hard work that they do 24/7 from the Government end. As soon as farmers take their crops to Market, the rate don't satisfies them and secondly, if any disaster came in the way very harshly, they are depressed with the damage that caused so much on their crops because of the reason that Government won't support well for that damage. But, Yes! Due to recent 2014 Government Change, our respected Prime Minister Narendra Modi Sir, had already introduced much amount of schemes including Soil Health Scheme, Pradhan Mantri Krishi Sinchai Yojana (PMKSY), Paramparagat Krishi Vikas Yojana (PKVY), Pradhan Mantri Fasal Bima Yojana (PMFBY), Gramin Bhandaran Yojna and many more.

After implementing these schemes to farmers, they are yet finding problems in paying back the loan amount that they took from 3rd Party Lenders (as Farmers are not so involved in the banking documentation work, so they take help from these people), so where's the actual problem lying?

What's exactly they want, is the solution to all problems which hereby we presented as with **Aadhaar Farming,** which is a platform to integrate the use of Aadhaar API with smart farming solution. With that, Figure 1 represents the overview of architecture of Aadhaar Farming machine i.e. *Field Detector Machine (Kheth Pechan Machine).*

Figure labels: AFC Detected (Green LED); AFC Card Detector; AFC Not Detected (Red LED); Aadhaar Farming Card (AFC); Machine Logo; Multilingual Instruction Manual Display; Crop ND; DDD....; Crop D; Crop Not Detected (Red LED); Detection In Process (Yellow LED); Crop Detected (Green LED); Crop Detector Cabinet (where Farmer will put the crop for detection)

Figure 1 Overview of Architecture of Field Detector Machine

To understand the architecture of the machine depicted above, one can analyse the algorithm as given below:

Algorithm (Kheth Pehchan Machine):

1. If (AFC Authentication is Successful)
   a. Then:
      i. Turn on Green LED for Authentication Successful Message in AFC Reader Block.
      ii. Send Timestamp Entry to the database on the Server for new Login.
      iii. Activate the Camera in Crop Detector Block and turn on the LED of Crop Detector Cabinet to represent the acceptance of crop from Farmer.
   Else If (Authentication Failed)
   b. Then:
      i. Turn on Red LED for Authentication Failure in AFC Reader Block.
2. If (Crop Detector Cabinet is Activated)
   a. Then:
      i. If (Crop Detected)
         1. Send the Farmer ID and the type of Crop Detected to the corresponding details of that ID.
         2. Report Green LED Light as a success of Crop Details Submission.
      ii. Else If (Crop Not Detected)
         1. Report Red LED Light as a failure of Crop Details Submission.

Figure 2 Algorithm for Field Detector Machine

So, hereby Aadhaar Farming can solve the problem of Farmers by recommending Government with proper utilization of provided resources.

Voice and Accelerometer Controlled Wheelchair

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A wheelchair is a device that is used for locomotion by people with disabilities. According to the statistics, the world population in 2008 was 6.7 billion and on an estimate, around 1% (i.e., 67 million) of the total population are the people who use a wheelchair. However, across the years, due to the modern lifestyle, the number of people who need a wheelchair is rapidly increasing.

The main focus of this project is to help those people who can not even control their wheelchairs on their own. Building a voice and accelerometer-controlled wheelchair to make them independent is the primary motive behind this idea.

A working prototype of the wheelchair has been created using IOT. The hardware consists of an Arduino and a Bluetooth module HC-05 as the major components. The prototype run by two 9V batteries. This moves when the Bluetooth module receives the command and then it responds according to the code that is stored in Arduino. The main attraction of this project is that it has three modes with the help of which the wheelchair moves. The three modes are as follows:

- Controlling using buttons
- Controlling using voice
- Controlling using movements of the phone (accelerometer)
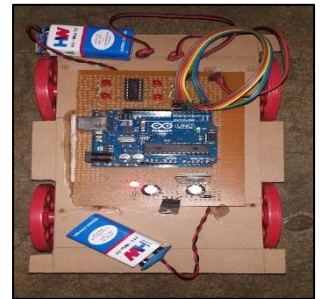
All these three modes are inculcated in an android application. Using the application all the basic 9 operations (i.e., forward, backward, right, left, stop, forward left, forward right, backward left, backward right) can be performed.

So, it will be helpful for those people also who cannot even use voice commands to make their wheelchair move, as now they can just tilt their smartphones to operate. This wheelchair will prove to be an aid for many physically impaired people.

Income Tax Analysis and Allowance Calculation

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The Defence Research and Development Organisation (DRDO) (IAST: raksā anūsandhān ēvaṁ vikās saṁgaṭhan) is an agency of the Government of India, charged with the military's research and development, headquartered in New Delhi, India. DRDO currently hold a mammoth strength of 30000 employees including 5000 scientists as a result there is an urgent need to develop a centralised income tax and allowance calculation software in order to distribute the deserved salaries to the employees within a limited time frame .In case any employee or the management is interested in knowing his/her salary should be able to access the database. It is also expected that the income tax calculated should be sent forward to the salary allocation software for the final pay slip to be generated for each employee, every month.

We have designed the web portal written in Java 8 and uses SQL server as the data base
The styling for the database is done using CSS and HTML in JSP pages .The connection between the database and the JSP pages is established through Java Servlets. The software is mainly categorised into 4 sub section which are slab details, subsection details, subscription details and finally the payable amount generated from the income which is subtracted by the income tax over the taxable income .Slab details section is used to categorise the income into different slabs .Currently in DRDO there are 2 types of slab category used .First category of slab defines the working age group for less than 60 years of age and the next slab defines the age group from 60 to 80 years of age ,in coming future in case the slab categories change, the employees have the ability to customise the slabs according to their category in order to get their income tax calculated.

After entering the sections and subsections detail the users can now enter the details of various allowances which include transport allowance, house rental allowance, dearness allowance ,HRA, CESS, CPS, NPS Sub and government, bonds ,LIC's and Tax relief under 87A .Not only that all the previous records of the working employees can be seen by scrolling till the end of the page this allow the employee to review their past income tax deductions and various allowances as well and based on all these allowance the final taxable income is calculated. These features allow the smooth and easy calculation of salaries and since the database used is sequalised in nature therefore large number of records can be added and can be accessed in fairly limited number of time.

Credit Risk Assessment Using Decision Trees

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Traditional credit risk assessment models do not consider the time factor; they only think of whether a customer will default, but not the when to default. The result cannot provide a manager to make the profit-maximum decision. Actually, even if a customer defaults, the financial institution still can gain profit in some conditions. Nowadays, most research applied the Cox proportional hazards model into their credit scoring models, predicting the time when a customer is most likely to default, to solve the credit risk assessment problem. However, in order to fully utilize the fully dynamic capability of the Cox proportional hazards model, time-varying macroeconomic variables are required which involve more advanced data collection. Since short-term default cases are the ones that bring a great loss for a financial institution, instead of predicting when a loan will default, a loan manager is more interested in identifying those applications which may default within a short period of time when approving loan applications. This paper proposes a decision tree-based short-term default credit risk assessment model to assess the credit risk. The goal is to use the decision tree to filter the short-term default to produce a highly accurate model that could distinguish default lending. This paper integrates bootstrap aggregating (Bagging) with a synthetic minority over-sampling technique (SMOTE) into the credit risk model to improve the decision tree stability and its performance on unbalanced data. Finally, a real case of small and medium enterprise loan data that has been drawn from a local financial institution located in Taiwan is presented to further illustrate the proposed approach. After comparing the result that was obtained from the proposed approach with the logistic regression and Cox proportional hazards models, it was found that the classifying recall rate and precision rate of the proposed model was obviously superior to the logistic regression and Cox proportional hazards models.

Graphic Colorization

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The old black and white monochrome photographs and movies/videos depicting our old heritage and history can now be colorized without human intervention with a simple run of algorithm.

Rather than sitting behind complex photo editing softwares like, Adobe Photoshop and fixing possible colors for each frame in a large graphic file like video and tone in the image, this is a much faster method. Our project aims at colorizing both static images and moving videos with the help of Deep learning concepts such as Neural Networks of Tensorflow or Caffe Models.

We can employ efficient and quick models of framework Caffe. Caffe is a Deep Learning Framework being used by Facebook and Pinterest and it works very efficiently. We tried to employ Convolution Neural Networks as well, from TensorFlow framework using Keras. The latter had to be trained from scratch and took some time to deliver results. Hence, we adopted TensorFlow for image colorization while Caffe model for Video Colorization.

Architecture and Model Description

In parallel to the encoder in CNN, the input images also run through one of today's most powerful classifiers — the Inception ResNet v2 . This is a neural network trained on 1.2M images. We extract the classification layer and merge it with the output from the encoder. Apart from that, our external data set used for final training is around 2000 images of Images from Unsplash website.

While, for Caffe, we chose a pretrained model over ImageNet dataset which contains over 1.2 million images. The size of model alone weighed about 112 MBs along with a small prototxt file which describes the whole network within the caffe model.

Results

In the case of Image Colorization, after 2000 epoch, we can see colorized photos. Their maybe blues and areas with different color patches, but it can be improved through more epochs and a better dataset. Caffe model on the other hand shows reasonably better results with a more stable colorization, in the images. On running it for each frame in a video (25 fps), we gain, a colorized video.

9

Quantum Computing

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"*Quantum Computation is nothing less than a distinctly new way of harnessing nature*".

Computers are getting smaller and faster day by day because electronic components are getting smaller and smaller. But this process is about to meet its physical limit.

Quantum computing is the study of a non-classical model of computation. A quantum computation could transform the memory into a quantum **superposition** of possible classical states.

In simple words, instead of holding one binary value ("0" or "1") like a classical bit, a qubit *can hold a combination of "0" and "1" simultaneously* and this is known as **superposition.** It is the ability of quantum systems to be in multiple states at the same time. Superposition allows quantum systems to solve complex problems much faster than classical systems.

An extremely strong correlation exists between quantum particles known as **Entanglement** which allows perfect unison between the particles, resulting in *instantaneous communication*. Entanglement is so strong, that two particles can be linked in perfect unison, even if separated by great distances. Two qubits are entangled through the action of laser. Once they have entangled, they are in an indeterminate state. The qubits can then be separated by any distance, they will remain linked. When one of the qubits is manipulated, the manipulation happens instantly to its entangled twin as well. The particles are so intrinsically connected, they can be said to "dance" in instantaneous, perfect unison, even when placed at opposite ends of the universe.

What exactly a Quantum Computers can do?

I). Quantum computers can easily crack the encryption codes used today in very less time and perhaps crushing Blockchain technology.

II). Quantum computers can easily solve very complex problems.

III).Quantum computers can be used for instantaneous communication.

Cyber security

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A DEFINITION OF CYBER SECURITY:

Cyber security refers to the body of technologies, processes, and practices designed to protect networks, devices, programs, and data from attack, damage, or unauthorized access. Cyber security may also be referred to as information technology security.

Cyber security or information technology security are the techniques of protecting computers, networks, programs and data from unauthorized access or attacks that are aimed for exploitation.

SQL Injection (SQLi):

SQL Injection (SQLi) is a type of an injection attack that makes it possible to execute malicious SQL statements. These statements control a database server behind a web application. Attackers can use SQL Injection vulnerabilities to bypass application security measures. They can go around authentication and authorization of a web page or web application and retrieve the content of the entire SQL database. They can also use SQL Injection to add, modify, and delete records in the database.

An SQL Injection vulnerability may affect any website or web application that uses an SQL database such as MySQL, Oracle, SQL Server, or others. Criminals may use it to gain unauthorized access to your sensitive data: customer information, personal data, trade secrets, intellectual property, and more. SQL Injection attacks are one of the oldest, most prevalent, and most dangerous web application vulnerabilities. The OWASP organization (Open Web Application Security Project) lists injections in their OWASP Top 10 2017 document as the number one threat to web application security.

Why Is an SQL Injection Attack Performed:

Attackers can use SQL Injections to find the credentials of other users in the database. They can then impersonate these users. The impersonated user may be a database administrator with all database privileges.
SQL lets you select and output data from the database. An SQL Injection vulnerability could allow the attacker to gain complete access to all data in a database server.
SQL also lets you alter data in a database and add new data. For example, in a financial application, an attacker could use SQL Injection to alter balances, void transactions, or transfer money to their account.
You can use SQL to delete records from a database, even drop tables. Even if the administrator makes database backups, deletion of data could affect application availability until the database is restored. Also, backups may not cover the most recent data.
In some database servers, you can access the operating system using the database server. This may be intentional or accidental. In such case, an attacker could use an SQL Injection as the initial vector and then attack the internal network behind a firewall.
There are several types of SQL Injection attacks: in-band SQLi (using database errors or UNION commands), blind SQLi, and out-of-band SQLi.

How to Prevent an SQL Injection:

The only sure way to prevent SQL Injection attacks is input validation and parametrized queries including prepared statements. The application code should never use the input directly. The developer must sanitize all input, not only web form inputs such as login forms. They must remove potential malicious code elements such as single quotes. It is also a good idea to turn off the visibility of database errors on your production sites. Database errors can be used with SQL Injection to gain information about your database.

If you discover an SQL Injection vulnerability, for example using an Acunetix scan, you may be unable to fix it immediately. For example, the vulnerability may be in open source code. In such cases, you can use a web application firewall to sanitize your input temporarily.

Prediction Analysis Techniques of Data Mining

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Data mining within the databases is called a technique from which the extraction of necessary information. Data can be done from the raw information. With the help of the prediction analysis technique provided by the data mining, the future scenarios regarding to the current information can be predicted. The prediction analysis is the combination of clustering and classification. In order to provide prediction analysis there are several techniques presented through many researchers. Data mining is the patterns for analyzing information and the process to extract the interesting knowledge. In data mining, various data mining tools available which are used to analyze different types of data. For analyzing the data information few applications which is used by data mining are such as making decisions, analysis on market basket, production control, and customer retention, scientific discovers and education systems. The prediction analysis process provides risk assessment forecast and acceptable level of reliable for the applications. This approach thus, helps in predicting the future possibilities. Any kinds of currently available data and historical facts applied to business are analyzed by the predictive models such that the feedbacks of customers related to the products can be understood. This study also helps in recognizing the potential risk and opportunities of this data. Several techniques have been applied by this study for making future business forecasts along with machine learning, statistical modelling and data mining. The information is thus, extracted and then used further for predicting trends and behavioral patterns using predictive analytics. The predictive web analytics are improved by calculating the statistical probabilities offuture events online. Data engineers help in gathering relevant data and preparing it for analysis. Therefore, with data visualization, dashboards and reports are supported through software developers and business analysts. Akhilesh Kumar Yadav, *et al.* presented an analysis of different analytic tools that have been used to extract information from large datasets such as in medical field where a huge amount of data is available .The proposed algorithm has been tested by performing different experiments on it that gives excellent result on real data sets. In comparison with existing simple k-means clustering algorithm using the algorithm results are achieved in real world problem. Chew Li S., *et al.* presented that the results of a particular university's students have been recorded to keep a track using Student Performance Analysis System (SPAS). The design and analysis has been performed to predict student's performance using proposed project on their results data. The data mining technique generated rules that are used by proposed system provide enhanced results in predicting student's performance. The student's grades are used to classify existing students using classification by data mining technique. Future prediction is done from the current information bythe prediction analysis which is the technique of datamining. The combining of clustering and classification isknown as the prediction analysis. Clustering algorithm groups the data according to their similarity and classification algorithm assigns class to the data.

Ambient Technologies

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The future should be one where our environment satisfies our needs mostly without our having to think about it. Clearly, we are connected to the internet, sometimes with Facebook and twitter there is a limit to the no. of people we can connect too. But in the next decade we can connect to anything in the planet. Make ambience smarter, hence calling it ambient intelligence. Ambient Intelligence is when technology understands your intentions, goals, dreams, need and desires and proactively helps you to achieve it. It is about understanding the answer and really evolving itself beyond its original program. Even with our technological advancement, our simplest machines fail to truly understand an image that it is seeing. Prototyped cars that can drive by themselves, but without smart vision, they cannot really tell the difference between a crumpled paper bag on the road, which can be run over, and a rock that size, which should be avoided. We have made fabulous megapixel cameras, but we have not delivered sight to the blind. Drones can fly over massive land, but don't have enough vision technology to help us to track the changes of the rainforests. Security cameras are everywhere, but they do not alert us when a child is drowning in a swimming pool. Photos and videos are becoming an integral part of global life. They're being generated at a pace that's far beyond our hope. Yet our most advanced software is still struggling at understanding and managing this enormous content. Thus, in other words, collectively as a society, we're very much blind, because our smartest machines are still blind. Vision begins with the eyes, but it truly takes place in the brain. It is the work of Ambient intelligence to make sense of the data collected by these sensors and camera's thus forming ambient intelligence. We have camera's that can take high resolution pictures but these are lifeless, because a unlike us a machine sees these images a collection of 0's and 1's. Vision does begin with the eye but truly takes place in the brain, and it the work of the Ambient intelligence to make sense of all these images collected. In this paper we are going to discuss the scope of ambient in the future in hospitals, homes, shopping malls, and even cities to make them smarter. Ambient intelligence utilizes sensor data and empowers us to create truly personalized and context-aware interactions that we capture through sensor data from mobile devices and wearables. The basic steps in ambient intelligence which can be molded into real-time context and important insights. Basic steps include the gathering of new data generating with a high velocity from different sources, then the application of different filters and algorithm to enhance the quality of data so that new action can be taken on the data gathered from different resources. after putting various algorithms and actions the data generate some values which can be further used to develop intelligence and embed it into the system to make a enhanced and better system with more intelligence ability than a normal ambient intelligence free system. That can use to predict our customer's behavior and personally engage with them at those moments that impact their decisions most. It can be used in Smart Homes, Hospital rooms, public surveillance, fire department, virtual school, where students are monitored on balancing their learning's. It is possible because of ubiquitous internet and high use of Smartphone.

TECHNICAL ACTIVITIES

Coding Battle

Project Exhibition
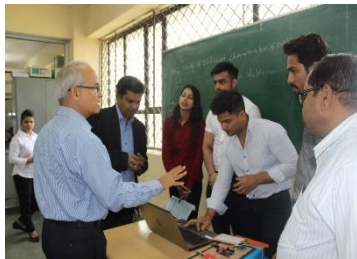
LAN Gaming

Robo-Race

Robo-Soccer

Prize Distribution

Guest Lectures

- Lecture held on **"Data Analytics and Information Technology"** taken by Mrs Kusum Dhir(NIIT Pvt Ltd) on 23 August 2018.
- Lecture held on **"Oracle WDP(Workforce Development Program)"** taken by Mr. Parag Mitra(Senior Consultant Oracle University)& Mr. Vikas Bhartiya(Territory Head) on 24 August 2018.
- Lecture held on **"Programming On Python"** taken by Mr.Ravi(Brain Mentors Pvt Ltd)& Mr. Stephen Simon(Coding Info Pvt Ltd) on 28 August 2018.
- Lecture held on **"Introduction to DSC(Developer students club)"** taken by Mr. Piyush(DSC Team Lead-Google) on 11 September 2018.
- Lecture held on **"Android Technology"** taken by Mr. Piyush(DSC Team Lead-Google) on 17 October 2018.
- Lecture held on **"Modern Web-D using Reactjs & Redux Content"** taken by Mr. Amit Srivastava (CEO, Brain Mentors) on 30 October 2018.
- Lecture held on **"Deep Learning with Python"** taken by Mr. Sunny Pathak(Consultant Samatrix.io Consulting Pvt Ltd.) on 12 February 2019.
- Lecture held on **"Deep Learning with Python"** taken by Mr. Ravi(Brain Mentors Pvt Ltd) on 14 February 2019.
- Lecture held on **"3-D Unity Engine"** taken by Mr. Vinti Sachdeva(Brain Mentors Pvt Ltd) on 15 February 2019.
- Lecture held on **"Drone"** taken by Mr.Dharmesh (Trainer & Entrepreneur, Steamedu) on 19 March 2019.

Industrial Visit

We know, theoretical knowledge is not enough for making a good professional so we go beyond academics and provide student a practical perspective on the world of work. Students had **visited Network Bulls, Gurugram, Haryana from 17 Feb2018 to 18 Feb2018**. Here in Network Bulls,students get familiarised with a variety of network technologies like Router, Switches, Designing Network, Implementation of the Design & providing support to Network related issues. Moreover, It has World's largest Cisco training labs.

ACHIEVEMENTS

- Utkarsh Sharma and Arushi Uppal got first position for the project ALT_I_MAR in Tech fest held on Nov'18

- Ujjwal Kumar Jha got 1st position in IIGP 2.0 held at IIT Bombay on 28-06-2019

- Rishabh Mishra got 1st position in LAN GAMING held at HMRITM on 09-11-2018

- Ashu kumar got 1st position in Tech fest held at HMRITM on10-11-2018

- Ratik Tiwari got 3rd position in Researchthon 1.0 held at HMRITM on14-04-2019

- Aditya Dutta got "Ranked 200 among 60000 coders all over India" in "Techgig code gladiator, Codechef may challenge" on 15-05-2019

- Tridib Basak got 2nd position in Tech Quiz at HMRITM on 14-04-2019 and also got 2nd position in TREASURE HUNT at HMRITM on 09-11-2018

- Yuvraj vij qualified for pre-finals in international astronomy and astrophysics compition on May-19

PUBLICATIONS

Minimizing Risks in Wireless Sensor Network

Abstract :With the advancement of technology, the usage of networking sites has become common in our lives. In the field of social networking there are many security problems. The main purpose of the developers is to attract users and make their connection and security is not at all their priority. As a consequence, with the benefits of social networking sites, many security problems have resulted. Developers should provide its users with the tools that can handle security problems. Most of the current security systems do not provide the required protection level against ever-increasing security issues. The reason for their failure is the use of point solutions to protect host, and if the security is not given priority, it can lead to cyber-terrorism and further it can bring down an individual or organization. This paper is about the system overview, susceptibility analysis system, imposition detection system, imposition response system, security tools and security devices. It will give a wider perspective on security and a basic knowledge to how to reduce and manage risk personally in all situations.

Attacks on Wireless and its Limitations

Abstract : In recent times Security has started to be the key factor in data transmission. Recent advances in networking and wireless sensing has enabled the discovery in networking and wireless sensing and has enabled the discovery of new algorithms and techniques for wireless sensor networks. A Wireless Sensor Network (WSN) comprises several sensor nodes such as magnetic, thermal, and infrared and the radar is setup in a particular geographical area. The capabilities of WSN include to manipulate and control the physical and environmental entities such as – humidity, temperature, sound, pressure, light etc. and pass this information to various other sensors present in the network in order to pass the information from the source to the sink. These wireless sensor networks have diverse applications ranging from medical care to military or educational purposes but these networks are also prone to many adversaries and attacks. Some of the most common attacks on a wireless sensor network are spoofing or replayed routing information. Certain techniques and algorithms have been introduced or developed which might not make a WSN attack-proof in all situations but may be very affective in certain situations. Selective forwarding attack is one of the most harmful attack as it can harm the complete network. A selective forwarding attack is a type of attack in which the nodes capture some data by interfering in the transmission path and steal some precious information which could be anything from secret passwords to encrypting keys and pass the rest to the destined node. The ability of capturing the required data and passing the rest of the information to the sink makes it undetectable in a network. In WSN certain techniques and algorithms have been introduced to detect selective forwarding attack

Intrusion Detection and Security System for Blackhole Attack

Abstract : Communication is considered as an essential part of our lives. Different medium was used for exchange of information, but due to advancement in field of technology, different network setup came into existence. One of the most suited in wireless field is Wireless Sensor Network (WSN). These networks are set up by self-organizing nodes which operate over radio environment. Since communication is done more rapidly, they are confined to many attacks which operate at different layers. In order to have efficient communication, some security measure must be introduced in the network ho have secure communication. In this paper, we describe various attacks functioning at different layers also one of the common network layer attack called Blackhole Attack with its mitigation technique using Intrusion Detection System (IDS) over network simulator ns2 has been discussed.

Keywords: AmI(Ambient Inteligence), Smart homes, flood detection, RFID

Black Hole Attack and Its Security Measure in Wireless Sensors Networks

Abstract : Computers are being reasonably important part of our daily lives. Different solutions were introduced for its connectivity such as wired approach which existed for longer duration of time. But due to advancement in field of technology wireless connectivity came into picture for connectivity to internet, exchanging information etc. One of suited network based on wireless standard is wireless sensor network (WSN). WSN comprises of a number of small motes that are distributed in random manner in any environment. The motes communicate with one another in their resource domain using low power communication medium. WSN possesses many characteristics but difficulty arises in its energy management, security aspect and deployment. Communication take place over radio environment and are prone to various attacks. Some of the attacks include Black hole attack, Gray hole attack, sinkhole attack etc. In this paper we are discussing network layer Black hole attack along with its security measure to decrease its effect in the network.

Performance Measurement Using Different Shortest Path Techniques In Wireless Sensor Network

Abstract : Computers are being essential part of our daily lives. Different solutions came into existence for exchanging information. One of the suited networks based on wireless standard is wireless sensor networks (WSN). These networks comprise of nodes which are randomly distributed in any environment. They operate over radio frequency and possess a number of characteristics features. Some of the constraints include energy management, deployment and security. As energy is the main key constraint, shortest path algorithms aim at consumption of minimum amount of energy. In this paper, we measure performance of different shortest path algorithms such as Dijkstra's, Bellman Ford, Distance vector, Random node selection etc. Formulation of results has been carried over MATLAB.

HIGHLIGHTS OF THE DEPARTMENT