VOLUME 2, JULY 2019

Technical Magazine

अन्वेषण

Exploring Digital World

Famous Indian Women Entrepreneurs

Maharaja Agrasen Institute of Technology

Department of Computer Science and Engineering

VISION

To Produce "Critical thinkers of Innovative Technology"

MISSION

To provide an excellent learning environment across the computer science discipline to inculcate professional behavior, strong ethical values, innovative research capabilities and leadership abilities which enable them to become successful entrepreneurs in this globalized world.

To nurture an excellent learning environment that helps students to enhance their problem solving skills and to prepare students to be lifelong learners by offering a solid theoretical foundation with applied computing experiences and educating them about their professional, and ethical responsibilities.

To establish Industry-Institute Interaction, making students ready for the industrial environment and be successful in their professional lives.

To promote research activities in the emerging areas of technology convergence.

To build engineers who can look into technical aspects of an engineering solution thereby setting a ground for producing successful entrepreneur.

Technical Magazine Committee

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Ref. No..... Date.....

Message from Founder & Chief Advisor's Desk

I am extremely happy to know that Department of Computer Science and Engineering, MAIT is releasing the Technical Magazine in month of April-May,2019.

The magazine, I understand is designed to provide broad range of information focusing on application of existing technology, research, practical explanations and developments in latest trends and techniques.

I acknowledge the Sponsors, HOD CSE Department Dr. Namita Gupta and the Department of CSE for their sincere efforts in release of this magazine.

I also congratulate the Editorial team in getting the magazine printed.

I wish them all success in life.

Dr.Nand Kishore Garg
Founder & Chief Advisor, MATES

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Ref. No.....

Date..27/3/2019.....

Message from Chairman's Desk

I am gratified to know that Department of Computer Science and Engineering, MAIT has taken an initiative to publish the Technical Magazine in month of April-May,2019.

This is productive as well as a great platform for the students, researchers, faculty members and industry experts to disseminate achievements in research and developments in computer science and technology.

I acknowledge the sponsors for their sponsorships, Dr Namita Gupta, HOD,CSE ,the faculty members and the students of the Departments for their efforts in publishing the Technical Magazine.

I also applaud the coordination and efforts behind the editorial team to bring up the issue.

I wish them all a great success.

Sh. Prem Sagar Goyal
Chairman, MATES

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Ref. No..... Date.....2/4/2019.....

Message from Vice Chairman (Academics), MATES

I am very happy that Department of Computer Science and Engineering, MAIT is releasing its Technical Magazine to commemorate technical publications and articles of faculties, Industry experts , alumni's and students for the academic year 2018-19.

This Technical Magazine is a forum which could aptly be used for recording the technical articles and research papers published by the students and faculty members. I am sure that this magazine will be informative and resourceful. I owe my hearty appreciations to Prof. (Dr.) Namita Gupta, Head/ Department of CSE and her team for their sincere efforts to make the release of this magazine a reality. I wish them " The Very Best" in all their future endeavors.

Prof.(Dr.) M.L.Goyal
Vice Chairman (Academics), MATES

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Prof. (Dr.) Neelam Sharma
DIRECTOR MAIT

MESSAGE

It gives me immense pleasure to know that a Technical magazine - 2019 is being published by the Deptt. of Computer Science Engineering, MAIT. It is a platform to combine the efforts of Faculty , students and the editorial team to publish their technical work going on in the department.

Industrial and productive technical material forming the contents of the magazine will definitely be a developing tool to the readers.

I applaud the HoD, Editorial and Co-ordinators of the team to publish this issue. I wish them success for future publications.

Prof. (Dr.) Neelam Sharma
DIRECTOR, MAIT

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MESSAGE FROM HEAD OF THE DEPARTMENT

On behalf of Computer Science and Engineering Department, Maharaja Agrasen Institute of Technology, I am pleased to announce the launching of the first Technical Magazine of Computer Science and Engineering Department and to make it available to everyone.

This Technical Magazine aims to disseminate achievements in research and developments, while featuring new break-through in the field of Computer Science Engineering and Technology.

The entire Editorial team did their best to provide a platform for distinguished faculties, researchers, industry experts and students to share the latest accomplishments with fellow researchers, faculties, Industry experts and students whereby disseminating the knowledge gained from their technical endeavors.

As Editor-in-Chief, I am open to exploring the opportunities for making this Technical Magazine an exciting and definitive forum for attracting and publishing high impact research contributions that are innovative and transformative, and for making this technical magazine serve as a forum for disseminating timely and exciting ongoing research that can stimulate innovation.

At the end, I would like to thank editorial board members, faculties, Industry experts and students and hope that our collective efforts stimulate further progress in this domain of activity with strong determination at both national and international levels.

Dr. Namita Gupta
Editor- in- Chief
Technical Magazine
Department of Computer Science and Engineering

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FACULTY CORNER: TECHNICAL ARTICLES

BLOCKCHAIN IN ELECTRONIC HEALTHCARE RECORDS

Yogesh Sharma
Assistant Professor
CSE Department

Data privacy is one of the major concerns when user's information is concerned. Healthcare industry is finding some innovative technologies with which patients' data can be made secure and the health record can be stored in digital form. Interpretability is a problem across every department in the healthcare that remains open in until now. There is need where in the healthcare data can be accessed freely and seamless data exchange with maintaining privacy, security and preserving the personal data. Block chain is a technology that can provide data integrity, confidentiality and authenticity of the electronic healthcare data. Many of the healthcare industry are already working on the technology as the block chain technology can provide a decentralized network and securer way of sharing and storing the information. Electronic Health Record (EMR) and Electronic Medical Record (EHR) can be stored on the block chain network using cloud and all the transaction can be done by the smart contract.

Introduction:

Most of the people are unaware and some of them afraid of the use of their medical records by someone else or their health record data could be sold to some other healthcare company making them as the target audience. A problem with the healthcare today is of data management. A patient needs to carry his health records to different entity be it a doctor, a pharmacist, or a pathological laboratory as there was no centralized place for keeping these records. Technologies are now taking over and everything is running on electronic format now even the medical records of a patient. This is the stage where we should move on to digital medical records in place of paper medical records, there come the need for EHR which Electronic Health Record. An Electronic Health Record is basically the health record of a patient in digital format which consists of all the health information of a patient it could be reports of patients which he has gone earlier, type medication he has gone through, vaccinations taken etc.

Now we have discussed in healthcare industry patients' needs security and privacy with their health records. There is a need for such technology that can provide a security and privacy of user's data from using by someone else.

A block chain technology provide such a network where the electronic healthcare record can be stored which would provide necessary security to the patient's health record and also kept the record private for the patients.

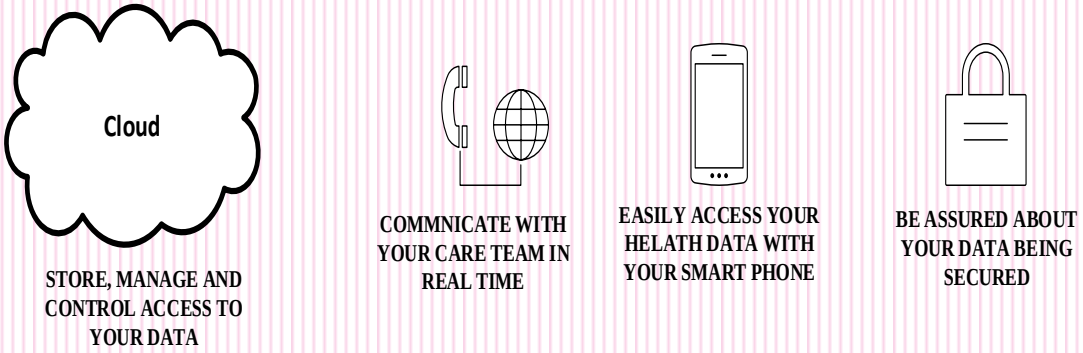

Figure 1. EHR using Block chain Technology

Block chain is a new technology which was in the beginning developed for Bit coin crypto currency but now the block chain has emerged as technology which enhanced the capabilities of various organizations. A block chain is a distributed and decentralized ledger consists of connected blocks of transactions. Unlike other ledger approaches, block chain guarantees storage of approved transactions in a tamper proof manner.

Now how does a block chain technology will going to help in healthcare for maintaining electronic health records?

When the patient's electronic health record is placed on to the block chain network the patient has the complete ownership of his health record which is stored on a secure and private network.

Consider a situation where in a patient goes to a hospital X for his treatment and the doctor ask for the previous health record but patient would not be able to provide the previous record as the record is with doctor Y and stored in hospital Z. This might create problem for the patient.

With the use of block chain technology a patient can easily access his/her health records as there would be an inter connectivity of the healthcare system. The block chain technology can also provide a timestamp facility and streamline payment and claim process.

The block chain technology provides security the health record of the patients and patients will get to know who is using their health record, for what purpose the health data is being used and if necessary, the patient restrict the access of using his personal health record. Patients can share their identity with the health organization. The patients have a private key with which he can link his identity to the block chain network. The private key can be shared with healthcare organization. Once the patients' private key is received the health organization can recover the patient's health record. Only those organization having the private key of the patient can view the data whereas those organization which does not have the access to the private key of the patient cannot recover the health data of the patient.

All the transaction taking place between the patients and the healthcare industry will take place with the help of smart contracts. Smart contracts are the program codes which are self-executable codes that triggers up when a condition is met between the different parties.

Architecture of global scale EHR based in block chain

(Conceicao. Etal, 2018) has proposed an architecture based on the block chain network with smart contract that could make interoperability possible and safe for health care records.

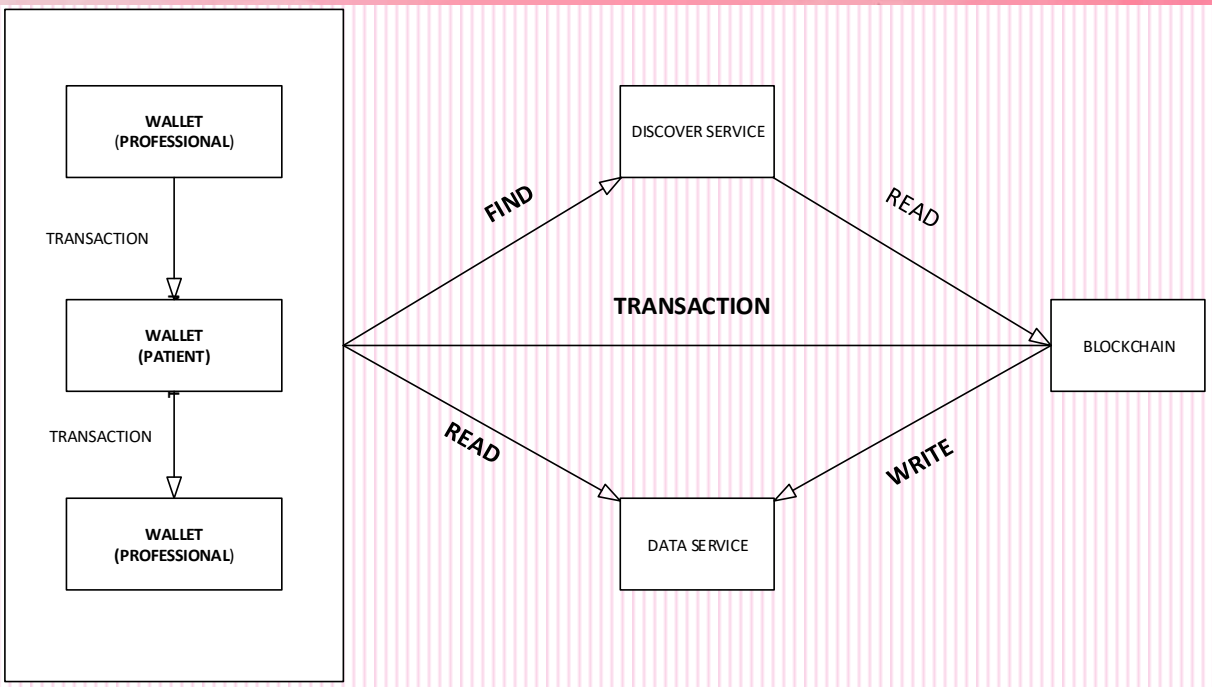

Figure 2. Architecture for EHR based in Block chain

In the above figure 2. Various components are shown, each will have their own function:

Block chain: The block chain is a distributed ledger with an executable element with in it called smart contract. The smart contract is responsible to record the references generated for all the health record transaction for the patients which could be the health appointment, prescribed medications, diagnostic reports etc. using this block chain network patients can retrieve their health records. When a patient visit to a doctor or some healthcare institute, a transaction is appended to the ledger informing that a hospital have the access to that record of a patient.

Data Service: A data service refers to the data storage which can be used for storing the health data. The data storage can be thought of a cloud service where every record is owned by the patient and can be used or view by the respective doctor or the hospital. In this proposed architecture the data service should provide the access to the cloud, the control for the record access. The data service feature may also include the interfaces which can be used to change the permissions for adding and removing the reading access to the file.

Wallet: an electronic wallet is the feature of the proposed architecture. The wallet is responsible for storing the public and private cryptographic key. Both the keys pertaining to the patient. The public key is for the patient's identification. All types of user id and password which are used to access the health record service are present in the wallet. We can see the wallet as basic interface and the method for accessing the system.

Discovery Science: This feature of the proposed architecture is a nonmandatory and auxiliary system which can be used to accelerate the searching of information in the block chain network. It can be thought of an index to the information stored in the system. Suppose there is a patient P, can be identified with the public key P1. The discovery service will be useful in offering the transactions in the block chain network which are owned by P1. The discovery science should also offer an interface to find the patient and the hospital with the help of a pointer pointing to the record file. The service could be implemented using NoSQL which will keeps a view on the block chain. There

is no security feature applied for this feature of the proposed architecture as the feature will only read the block chain and all the queries can be easily verified on the copies of the block chain.
Most important characteristic of the proposed architecture is that it will delegate the process of data management to the user. The patient can now own the health record and can delete the health record or can also restrict the access of using his /her health record.

Working Scenario:

The block chain network will store all the interactions done between the patients and the healthcare agents with the links of the EHR. The electronic health record consists of details description of all the interaction made between the two parties. A hash of the health record is also recorded in the block which will help in verifying the authenticity of the content of health record.
Now, consider one scenario, whenever a patient meets the healthcare agent, the agent could retrieve the health record of the patient from the block chain using appropriate tool like wallet. The healthcare agent can ask for the health record of the patient and also ask for the permission of read access for the data. Now the patient can explicitly authorize the access only to the authorize person. With this a new transaction are created in the block chain that means whenever the agent gets the access of patient's health record a new transaction will be created. All these new transactions created will get recorded onto the blocks of the block chain.
Consider another situation where the health agent now ask for the health record from the hospital. Now again a new transaction is registered between agent and hospital when the agent gets the access of patients record from hospital which are kept in the data service of the hospital. Now since the content of the patients record are copied so the patient must be notified regarding the same transaction and another transaction is recorded on the block chain.

Implementation consideration:

For the implementation of this architecture, ledger component can be implemented using the Ethereum platform and for its smart contract too. Android platform can be used for implementation of the wallets, taking into consideration the risk of exposure of sensitive data and such possibilities should be minimized. Another element of the architecture is data storage, the data storage could be implemented on the cloud services. Integration between the wallets and the data repository could be done using Google App Script.
For the implementation of Discovery Services NoSQL is suggested to use like MongoDB. Although the discovery could be done based on web services for providing the interoperability.

Conclusion:

With the advancement in the IT industry, the health care industry also working on betterment of the patients with the use of modern-day technology. The health care industry also trying to maintain a trust between healthcare institute and the patients with secure and private health record exchange. With the use of blockchain technology in healthcare the Electronic Health Records of the patients are now owned by the patient only.
Thus, the architecture discussed above have given great idea and scenarios on how the patient can control his/her data from being accessed by someone else and how the transaction are made with the work flow. Although on part of the privacy, not much is proposed in the architecture

EMERGING TECHNOLOGY OF NEW ERA- BLOCK CHAIN

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In the simplest of terms, a block chain is a time-stamped series of immutable record of data that is managed by cluster of computers not owned by any single entity. Each of these blocks of data (i.e. block) are secured and bound to each other using cryptographic principles

The block chain is a big invention by a person named Satoshi Nakamoto. But since then, it has evolved into much greater. The digital information is distributed (not copied) in block chain and this technology created the backbone of this new type of internet. Mainly invented for the Digital Currency, Bit coin and the tech community has now found other good uses for the technology. It is a shared and immutable ledger, the information in it can be seen by anyone and everyone. Hence, everything that is built on block chain transparent and everyone involved is accountable for their actions.

It carries no transactional cost and it is a simpler way of passing information from one point to another in a fully automated and safe manner

The Three Pillars of Block chain Technology are: Decentralization, Transparency, mutability. The reasons why the block chain has gained so much admiration are: It is not owned by a single entity, hence it is decentralized, The data is cryptographically stored inside, The block chain is immutable, so no one can tamper with the data that is inside the block chain, The block chain is transparent so one can track the data if they want to.

A peer-to-peer network is used for the maintenance of the block chain. This network is a collection of various nodes which are connected to each another. These nodes are individual computers which take an input and performs one or more function on them and gives an output. The “peer-to-peer network” partitions its entire workload between participants, who has equal privilege, called “peers”. There is no single central server but several which are distributed and decentralized.

The future aspects of block chain are:

Smart contracts

At the current level of technology development, smart contracts can be programmed to perform simple functions. For instance, a derivative could be paid out when a financial instrument meets certain benchmark, with the use of block chain technology and Bit coin enabling the payout to be automated

The sharing economy

With companies like Uber and Airbnb flourishing, the sharing economy is already a proven success. Currently, however, users who want to hail a ride-sharing service have to rely on an intermediary like Uber. By enabling peer-to-peer payments, the block chain opens the door to direct interaction between parties — a truly decentralized sharing economy results.

Supply chain auditing

Consumers increasingly want to know that the ethical claims companies make about their products are real. Distributed ledgers provide an easy way to certify that the backstories of the things we buy are genuine. Transparency comes with block chain-based time stamping of a date and location — on ethical diamonds, for instance — that corresponds to a product number.

BREAST CANCER PREDICTION USING NATURE INSPIRED ALGORITHM

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Assistant Professor
CSE Department

The research in medical study has proven breast cancer to be a major disease in women as one in every eight women is suffering from this most-common type of cancer. In this article, major focus lies on prediction of breast cancer using various machine learning algorithms. Three datasets, Wisconsin breast cancer (WBC) dataset, Wisconsin Diagnosis Breast Cancer (WDBC) dataset and Wisconsin Prognosis Breast Cancer (WPBC) dataset are used in the current study. Various classification approaches considered in this study to predict the breast cancer are based on evolutionary approach such as Ant-Colony Optimization, Particle Swam Optimization, Hierarchical Decision Tree (HIDER), and Genetic Algorithm for Neural Network (GANN). The results were compared on the basis of the accuracy rate achieved and it was found that HIDER gives the best result for WBC dataset whereas GANN gives the better results for WDBC and WPBC datasets. The results achieved in this study can be helpful to the organizations working in the field of health sector, especially in cancer disease to predict the occurrence of breast cancer at an early stage. The prediction of breast cancer is achieved by choosing various classification algorithms. Classification is the supervised learning which categorizes the data into different classes. A lot of research has been done on Wisconsin Breast Cancer dataset using classification such as Rule learning; Instant based learning, Neural Network, Statistical classifier and Support vector machine. There are two classes of tumors - Cancerous is known as malignant tumor and Non-Cancerous is known as benign tumor. At an early stage, doctor confirms the patient whether the tumor is dangerous or not. A Malignant tumor is more dangerous as compared to benign tumor. Benign tumor can be removed easily by surgery and chances of recurring again are very less whereas Malignant tumor spreads very fast because of increasing cell growth. This study improves the accuracy by applying the Evolutionary Algorithms for classification method. Further, it can also be compared with other methods in the future. Thus, it can be used to predict the accuracy of other diseases using different techniques for better results and appropriate solutions.

FAMOUS INDIAN WOMEN ENTREPRENEUR

UPASANA TAKU

MobiKwik Founder

With the mission to simplify payments in India, Upasana co-founded MobiKwik in 2009. Her current focus is to bring a million retailers into the MobiKwik payments network. Upasana comes with a strong background in payments, and has worked as a senior product manager with PayPal in the Silicon Valley and prior to that, with HSBC in San Diego, US.

An engineering graduate from NIT Jalandhar, Upasana also holds a Master's degree in Management Science from Stanford University. She has over 14 years of experience in Payments & Financial Services.

STUDENT'S CORNER: TECHNICAL ARTICLES

MAPS/UNORDERED

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With the revealing big data explosion, data sets are too large to completely fit inside the internal memory of computer. For the process to be productive speed is not an option, it needs to be there. Therefore, every other way is explored to further increase the performance, by expanding in place memory storage that enables more data to be stored in the memory, and even locating an in memory database system where all the data can be kept in memory. The following technique of in-memory data handling is not capable of working successfully in current scenario. To deal with this problem a hierarchical hashing scheme is discussed where only one component of a big data structure resides in the memories which are Map which is considered as self-balancing binary search trees and Unordered Map which is based on hashing with chaining technique. Unordered maps consist of containers that use a pair of a key and a value which is mapped to that key to store the given elements. In an unordered map, to uniquely pick out the element, key is used, and the mapped value stores the data associated to that key. These unordered maps allow for fast searching of individual contained elements which are stored in the mapped keys. The elements in the unordered map are not sorted in any order corresponding to their key or mapped values, but for fast access of particular element the data or pair is organized like buckets type depending on their hash values which helps to directly retrieve them by their key values. Unordered map data structures are faster than map containers to find element by key value, but is not good if need to traverse in a range. Hash map is used to make a structure that can put values to the mapped keys, or we can say the associative array. A hash table is fully dependent on hash function which calculates an index into a set of buckets, from which the required value can be then found. Generally no hashing collision occurs means no two keys points to the same bucket but sometimes it is possible that this problem can occur. So Most hash table functions already consider that collisions will occur and this condition should be solved in some other way. Maps or we can say red black trees are another data containers that sticks to a specific order while storing elements that formed by that pair of key and the mapped value. In a map, to sort the objects key values are used, while the data to that key is found by the mapped values. The types of key and mapped value may differ. Key is the parameter by which the elements in a map are sorted which follows a specific standard. If we want to access the element by the key then unordered maps are faster than Map containers but as unordered maps don't allow range iteration, map containers allow range iteration in the given order. Maps work as self-balancing binary search trees so they are called red black trees. A red black tree is a binary search tree with an extra bit of data per node, its color can be red or black. Balance is checked by coloring each node of the tree with one of colors in such a way that it satisfies that properties. Whenever a change is to be made, the coloring properties of the tree are stored by rearrangement and repainting of nodes. The properties are designed according to the efficient rearrangement. The searching in this trees take O (log n) time, where n is the total number of nodes or elements in the tree. Insertion and deletion operations are also performed in O (log n) time.

DEEP LEARNING

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Deep Learning (also known as deep structured learning or Hierarchical learning) is a subset of machine learning in Artificial Intelligence that has networks which are capable of learning data representations, as opposed to task-specific algorithms. Learning can be supervised, semi-supervised or unsupervised. It deals with algorithms inspired by the structure and function of the brain, allowing computers to solve a host of complex problems that couldn't otherwise be tackled.

Deep Learning is being widely used in industries to solve large number of problems like.

- ***Image Recognition***: Deep Neural Nets are used to identify objects in an image. Let's understand how a neural network identifies images of cats and dogs.
- ***Voice Generation***: Products like Amazon Echo or Google Home uses deep learning to generate voice and interact with humans.
- ***Self-Driving Vehicles***: Google's self-driving car is based on Machine Learning and Deep Learning algorithms. It can drive at a precision of 98% in dark, while it's raining and in high terrain areas.
- ***Producing Music***: Deep Learning can be used to produce music by feeding in music patterns and letting it analyze on its own. It can also be used to restore audio voices in silent movies.
- Computer vision, natural language processing and pattern recognition.

Deep learning is a specialized form of machine learning. A machine learning workflow starts with relevant features being manually extracted from images. The features are then used to create a model that categorizes the objects in the image. With a deep learning workflow, relevant features are automatically extracted from images. In addition, deep learning performs "end-to-end learning" – where a network is given raw data and a task to perform, such as classification, and it learns how to do this automatically.

Another key difference is deep learning algorithms scale with data, whereas shallow learning converges. Shallow learning refers to machine learning methods that plateau at a certain level of performance when you add more examples and training data to the network.
A key advantage of deep learning networks is that they often continue to improve as the size of your data increases. Deep learning is applied in many areas of artificial intelligence such as speech recognition, image recognition, natural language processing, robot navigation systems, self-driving cars etc. Deep learning in future: Unsupervised Feature Learning seems to be a future trend. Since both neural network and data sets would grow bigger and bigger, labelling everything we observed would become unreasonable and unrealistic. Unsupervised feature learning approaches, like Auto encoders, would automatically make conclusions from similar observations. Then manually labeling these conclusions can be practical, and this is the way curiosity of computers are satisfied. Deep Reinforcement Learning is another future direction. Due to the success of human-level control of playing Atari games, RL based learning are grow more and more popular. And the model works more like to a human brain, it interacts with the noisy environment and make precise decisions upon given scalar reward value.

ARTIFICIAL INTELLIGENCE

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The definition of artificial intelligence "the study and design of intelligent agents" where an intelligent agent is a system that perceives its environment and takes actions which maximizes its chances of success

The term artificial intelligence is also used to describe a property of machines or programs: the intelligence that the system demonstrates Winston states that AI is “the study of ideas that enable computers to be intelligent”. Colloquially, the term "artificial intelligence" is applied when a machine mimics "cognitive" functions that humans associate with other human minds, such as "learning" and "problem solving". AI research uses tools and insights from many fields, including computer science, psychology, philosophy, neuroscience, cognitive science, linguistics, operations research, economics, control theory, probability, optimization and logic.

AI research also overlaps with tasks such as robotics, control systems, scheduling, data mining, logistics, speech recognition, facial recognition and many others.

Artificial Intelligence also invites papers on applications, which should describe a principled solution, emphasize its novelty, and present an in-depth evaluation of the AI techniques being exploited.

Subjects in computational intelligence as defined by IEEE Computational Intelligence Society mainly include: Neural networks: trainable systems with very strong pattern recognition capabilities. Unsupervised learning is the ability to find patterns in a stream of input, without requiring a human to label the inputs first. Supervised learning includes both classification and numerical regression, which requires a human to label the input data first. Learning is based on empirical data and is associated with non-symbolic AI, scruffy AI and soft computing.

Machine learning, a fundamental concept of AI research since the field's inception, is the study of computer algorithms that improve automatically through experience.

AI is heavily used in robotics. Advanced robotic arms and other industrial robots, widely used in modern factories, can learn from experience how to move efficiently despite the presence of friction and gear slippage. Researchers from the related field of robotics, such as Rodney Brooks, rejected symbolic AI and focused on the basic engineering problems that would allow robots to move and survive] A modern mobile robot, when given a small, static, and visible environment, can easily determine its location and map its environment; however, dynamic environments, such as the interior of a patient's breathing body, pose a greater challenge.

Artificial intelligence is beginning to meet assessments by doctors in various clinical situations. A.I. can now diagnose skin cancer like dermatologists, seizures like neurologists, and diabetic retinopathy like ophthalmologists. The shortest path to achieving AI’s long-term goals will probably involve both human design and evolution. It is not yet clear what sorts of interactions between design and evolution will prove to be most helpful or from which research communities they will emerge.

Many problems in AI (in reasoning, planning, learning, perception, and robotics) require the agent to operate with incomplete or uncertain information. Many problems in AI can be solved in theory by intelligently searching through many possible AI researchers have devised a number of powerful tools to solve these problems using methods from probability theory and economics.

HYBRID COMPUTATIONAL INTELLIGENCE IN HEALTHCARE

Ananya Bansal[1], Moolchand Sharma[1]
[1]Maharaja Agrasen Institute of Technology, Delhi, India

Computational intelligence is based on biologically inspired computational algorithms. The key pillars that compose this field are neural networks, genetic algorithms, and fuzzy systems. Neural networks are algorithms that can be used for function approximation or classification. They include supervised, unsupervised, and reinforcement learning. Genetic algorithms, however, are search algorithms inspired by biological genetics. They rely on two main operators, cross-over and mutation. Populations of individuals representing solutions to the problem are created over several generations. The algorithm uses a random-guided approach to optimization problems based on a fitness function. Fuzzy logic is based on fuzzy set theory in order to encompass reasoning that is fluid or approximate rather than fixed and exact. Fuzzy logic variables have "truth" values ranging in degree between 0 and 1 which can also handle "partial truth".

Computational intelligence techniques have been successfully used in many "real-world" applications in a variety of engineering problems. They can also be used in the medical research domain. The effectiveness and the worth of designing and applying hybrid intelligent methodologies, to various medical domains of application. The increased popularity of hybrid intelligent systems recently is due to the extensive success of these systems in a wide range of real-world complex problems. The main reason for this success seems to be the synergy derived by the computational intelligent components, such as machine learning, fuzzy logic, neural networks, genetic algorithms, or other intelligent heuristics. Each of these methodologies provides hybrid systems with complementary reasoning and searching methods that allow the use of domain knowledge and empirical data to solve complex problems.

In recent years, there has been an amplified focus on the use of artificial intelligence (AI) in various domains to resolve complex issues. Likewise, the adoption of artificial intelligence (AI) in healthcare is growing while radically changing the face of healthcare delivery. AI is being employed in a myriad of settings including hospitals, clinical laboratories, and research facilities. AI approaches employing machines to sense and comprehend data like humans have opened up previously unavailable or unrecognized opportunities for clinical practitioners and health service organizations. Some examples include utilizing AI approaches to analyze unstructured data such as photos, videos, physician notes to enable clinical decision making; use of intelligence interfaces to enhance patient engagement and compliance with treatment; and predictive modeling to manage patient flow and hospital capacity/resource allocation.

One such example of an AI search and optimization tool is Evolutionary Computation. Evolutionary Computation is the umbrella term for algorithms based on natural evolutionary processes that incorporate mechanisms of natural selection and survival of the fittest principle.

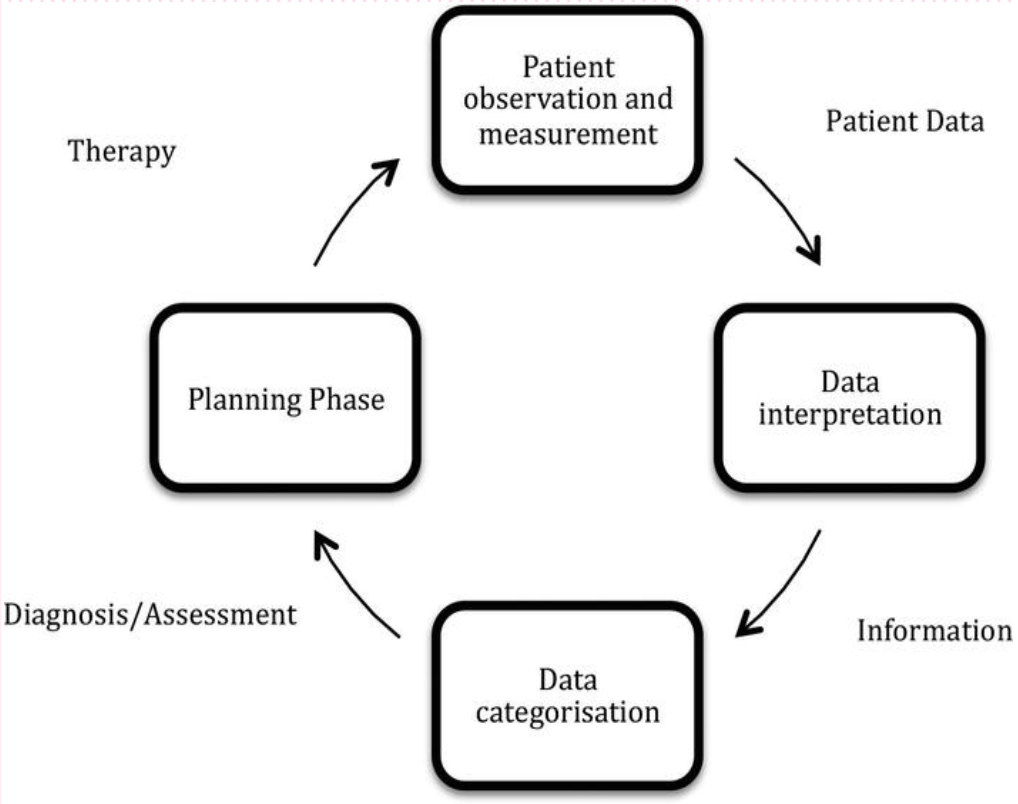

FIGURE 1: FLOW PROCESS IN HEALTHCARE

Foremost of the evolutionary computation algorithms are the Genetic Algorithms. Genetic Algorithms are a category of stochastic search and optimization algorithms based on Darwin's natural biological evolution. These algorithms use a population-based search process to create random solutions for the problem at hand. These solutions are termed chromosomes. The chromosomes are comprised of random values derived from various control values. The variations in the values are utilized for the search process. The population of chromosomes is then assessed for an objective function. This population of solutions then evolves from one generation to another to arrive at an acceptable solution. The ideal solutions are retained and the mediocre ones disposed of. Through a process of repetition, improvements and generation of new solutions would occur.

AI lends itself to healthcare delivery very well. In fact, in recent years, there has been an exponential increase in the use of AI in clinical environments. With modern Medicine facing a significant challenge of acquiring, analyzing and applying structured and unstructured data to treat or manage diseases, AI systems with their data-mining and pattern recognition capabilities come in handy. Medical AI is mainly concerned with the development of AI programs that help with the prediction, diagnosis and treatment or management of diseases. In contrast to the non-AI medical software application, which relies on pure statistical analysis and probabilistic approaches, medical AI applications utilize symbolic models of diseases and analyze their relationship to patient signs and symptoms. For example, diagnostic AI applications gather and synthesize clinical data and compare information with predefined categories such as diseases to help with diagnosis and treatment. Medical AI applications have not just been used to support diagnosis but also treatment protocol development, drug d**evelopment, and patient monitoring too.**

STUDENT'S CORNER: PROJECTS

ARTIFICIAL PLANT OPTIMIZATION ALGORITHM TO DETECT INFECTED LEAVES USING MACHINE LEARNING

Krishna Choudhary[1], Kshitij Gupta[1], Rahul Chawla[1], Prerna Sharma[1]
[1]Maharaja Agrasen Institute of Technology, Delhi, India

ABSTRACT

With the explosion of data generation, getting optimal solutions to data driven problems is increasingly becoming a challenge, if not impossible. It is being recognised that intelligent bio-inspired algorithms are necessary for addressing highly complex problems, especially with limited computation capacity. However, the fast growth in this domain makes researchers unaware of the progresses across different approaches and hence awareness across algorithms reduces significantly, due to which the literature on bio-inspired computing is skewed towards limited algorithms (like neural networks, genetic algorithms, particle swarm, and ant colony optimization).To address this concern, we designed Artificial Plant Optimization Algorithm to detect infected leaves. This review would pave the path for future studies to choose algorithms based on fitment. We have identified this bio-inspired algorithm, because there is a lot of scope in theory development and applications, due to the absence of significant literature.

VIDEO ANALYSIS USING DEEP LEARNING

Akshay Khatter[1], Namita Gupta[1]
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ABSTRACT

Automatically generating captions to an image shows the understanding of the image by computers, which is a fundamental task of intelligence. For a caption model it not only need to find which objects are contained in the image and also need to be able to expressing their relationships in a natural language such as English. Recently work also achieves the presence of attention, which can store and report the information and relationship between some most salient features and clusters in the image. In our project, we do image-to-sentence generation. This application bridges vision and natural language. If we can do well in this task, we can then utilize natural language processing technologies understand the world in images. In addition, we introduced attention mechanism, which is able to recognize what a word refers to in the image, and thus summarize the relationship between objects in the image. This will be a powerful tool to utilize the massive unformatted image

data, which dominate the whole data in the world. With the recent development in the areas of Computer Vision and Neural Networks, due to availability of high computation power, our aim is to provide aid to visually impaired people to get know about their surroundings through voice message. The current wearable and portable assistive devices for visually-impaired people are based on physical sensors and even GPS, in development to them, the aim of this project is to propose a portable device, designed for visually impaired individuals to assist them with getting around and most importantly know what exactly is being happening in the surroundings.

FAMOUS INDIAN WOMEN ENTREPRENEUR

SUCHI MUKHERJEE

Founder and CEO, Limeroad

Limeroad was started in 2012 by Suchi along with Manish Saksena, Ankush Mehra and Prashant Malik. The company has raised a funding of $20 Million from Light speed venture partners, Matrix partners and Tiger Global.

Suchi post graduated from London School of Economics and graduated from St. Stephen's College, Delhi. In his life Suchi received many awards and recognition like K.C. Nag Economics Prize for best student in Economics, George K. George Memorial Scholarship for overall contribution, all at St. Stephen's College, Delhi University, Cambridge Commonwealth Trust, Scholarship & Fellowship, and Chad burn Scholarship for merit, both at Cambridge University and British Chevening Scholarship, at the London School of Economics. Suchi was selected as 1 of 15 women worldwide 'Rising Talents, high potential leaders under 40. Suchi is an ex-eBay, Skype and Gum tree.

INDU JAIN

Charperson of Bennett, Coleman & Co. Ltd

Indu Jain belongs to the Sahu Jain family and is the current chairperson of India's largest media group, Bennett, Coleman & Co. Ltd., which owns the Times of India and other large newspapers. She is widowed with two sons.

Indu Jain is known by many different identities such as that of a spiritualist, humanist, entrepreneur, an aficionado of culture and the arts, an educationalist but her most prominent and eminent role has been that of Chairman. Ms Jain was awarded the Padma Bhushan by the Government Of India in January 2016 .She is also the guiding force behind The Oneness Forum, formally launched by the President of India in 2003. The Forum recently awarded the Mahatma-Mahavira Awards to outstanding individuals from all of walks of life and is involved in several activities that seek to bring, and highlight, a sense of Oneness in the world.

STUDENT'S CORNER: SUMMER INTERNSHIPS

("THE DEPOSIT CHRONICLES")
ANDROID APPLICATION DEVELOPMENT

Utkarsh Verma
20114802715
CSE Department

I did my industrial training at National Hydroelectric Power Corporation Limited, Faridabad under Mr H.P. Singh (Sr. Manager, I.T. Department) from 20 June 2018 to 31 July 2018. NHPC Limited is a Mini Ratna Category-I Enterprise of the Government of India. It is ranked as a premier organization in the country for the development of hydropower.

During the training period, I learned and worked on Android. Android is a complete set of software for mobile devices such as tablet, computers, smartphones etc. It contains Linux-based Operating System, middleware and key mobile applications. It is kind of mobile operating system. Leveraging the learned technology I developed an Android Application titled: "The Deposit Chronicles". "The Deposit Chronicles" application envisages efficient storage and management of all the information of user's deposit in Bank (Fixed Deposit, Kisan Vikas Patra etc.). Its user friendly and easy to use interface furnishes the user with the information about the deposits which are about to mature in a particular year and also provides an overview of all his deposits in a particular bank.

CBSE SCHOOL DESKTOP APP

Kushagra Chadha
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CSE Department

CBSE School Database Desktop App built using Python, tkinter and beautifulsoup. This software is responsible for scraping and displaying information about 11328 schools affiliated with the CBSE education board.

Salient Features in Proposed Project:

- Runs as a Desktop app.
- Can scrape the entire database of schools and generate a corresponding excel file.
- Can display and show school information depending upon the search keyword entered.
- Does Web Scraping of icbse.com which hosts this information.
- Extraction and Web Scraping performed is in real-time.
- Structure and layout of the desktop app is constructed using grid structure of tkinter.
- User can save the searched school data into .txt file for future references.
- Uses html selectors to extract and scrape data.

The whole scraping is done without opening the webpage in a browser, instead it loads gets html and then searches into html markup depending upon selector criteria, making whole scraping faster and almost instant. Python is a very popular Programming Language used for faster prototyping. Python is considered best for Web Scraping and Natural Language Processing which was the nature of work that my internship wanted. Also the Web Development process at ExySchooling.com is based on Django framework of Python. As part of project development the desktop app for the same was made using Tkinter design framework of Python.

AUTOMATING BUISNESS ANALYTICS WITH POWER BI & PROJECTS ON TEXT MINING (NLP)

Akshay Khatter
00914802715
CSE Department

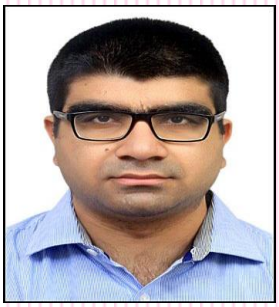
It was a great experience to be with wonderful people in the Risk Advisory team at EY. My internship gave me a chance to learn a lot about the corporate world and also be a part of client meetings. As an Analytics Intern I worked upon the following projects:-

#1- Assisting Decision-making with automated dashboards in Power BI - Both automated reporting and business intelligence can help businesses perform better but in different ways. With automated reporting, organizations can simply produce reports faster and with less effort from business data without further analysis.

#2- Spam Classifier in Python - We all face the problem of spams in our inboxes. Here I got a chance to build a spam classifier program in python which can tell whether a given message is spam or not! Making use of NLTK for processing the messages after a lots of Pre-processing using Regular expressions, Porter Stemmer, which is a famous stemming algorithm, removing stop-words, we finally train the model using a machine learning algorithm.

#3- Twitter Sentiment Analysis Using Tweepy & TextBlob - Sentiment analysis, also refers as opinion mining, is a sub machine learning task where we want to determine which is the general sentiment of a given document. Using machine learning techniques and natural language processing we can extract the subjective information of a document and try to classify it according to its polarity such as positive, neutral or negative.

CAD LOOKOUT



Aditya Gurbaxani
00614802715
CSE Department

Background- The project entitled CAD LOOKOUT is a tool which uses the Application API to interact with the application server. Through the API my application gets he physical path of the files stored in the repository and then make local copies for conversion.

The project CAD Lookout is a module for the Model View Generator Application. This project will allow the MVG Application to fetch the CAD Model files from the repository using the Application API, ensure the document consistency and server security. The application has been built to include both User Interface and Batch Interface.

Purpose- The project was developed to support the **automation of the CAD Model files conversion process**. Directly accessing the physical storage location raises many security concerns. Unmanaged moving of files can **cause applications to not function** as the changes would not be consistent with the application configuration, this can also **lead to loss of data**. The use of Application API ensures that all the files actions done on the repository files are **properly managed** and any changes made **do not disturb the consistency** of the file structure and other applications. It also ensures **access security** since the use of the API requires **proper authentication** at user end.

Design and Development- The application was built using visual studio on the ASP.NET platform. According to the requirement, several input fields had been placed in the design of the windows forms application. To facilitate debugging the Windows Message Box dialogues and Windows Console output was used. The use of the console helped me to understand the working of the API functions and to follow the line by line execution of the application code.

AADHAAR ENABLED BIOMETRIC ATTENDANCE SYSTEM (AEBAS)

Karan Singh
41014802716
CSE Department

Institutions, companies and organizations where security and net productivity is vital, access to certain areas must be controlled and monitored through an automated system of attendance.

Managing people is a difficult task for most of the organizations and maintaining the attendance record is an important factor in people management. When considering the academic institute, taking the attendance of non-academic staff on daily basis and maintaining the records is a major task. Manually taking attendance and maintaining it for a long time adds to the difficulty of this task as well as wastes a lot of time. For this reason, an efficient system AEBAS is proposed to solve the problem of manual attendance. This system takes attendance electronically with the help of a fingerprint recognition system, and all the records are saved for subsequent operations. Staff biometric attendance system employs an automated system to calculate attendance of staff in an organization and do further calculations of monthly attendance summary in order to reduce human errors during calculations. In essence, the proposed system can be employed in curbing the problems of lateness, buddy punching and truancy in any institution, organization or establishment. The proposed system will also improve the productivity of any organization if properly implemented.

FILTER MOBILE USAGE

Paras Rawat
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CSE Department

Growing pollution has been a major issue in metropolitan cities from the past decade. Children and Senior citizen are the most affected groups from this menace. To tackle this was the aim of the startup I joined. AJ Simply purify was initiated by Mr. Jagat Vivek Pandey aiming to create an air filter that was both, afforadable and effective. Modern air filters launched by philips and other global brands costs around 20000 rupees and have a mantainance cost of arond 4-5k. Whereas the filters designed by our startup had economically middle class as its target audience. The base price of the filter developed was around 4-5k with a mantainance cost of around 200 rupees. Statiscally the filter can clear a room of dimen 6*6 in half an hour (Tested).

My job was to make the filter mobile in terms of usage. To make the filter operable from any portion of the house. For that i was assigned the task of creating an android app and using trending BLE (Bluetooth low Energy) module to start, stop and display the pollution stats on the mobile screen of the user. The filter thus became operable from a range of about 8m. Android app reduced the hassle of button switching and screen monitoring of the filter. The whole experience was amazing and to add to it, the startup was recognised and funded by governemnt of India in South Campus Electropreneaur park. This internship did provide a spark of innovation in me and motivated me to furhter enhance my skills.

ALUMNI CORNER: TECHNICAL ARTICLES

WIRELESS SENSOR NETWORK

Ashwarya Singh
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CSE Department

In this rapidly changing era, Wireless Sensor Network (WSN) is one of the active research areas of Computer Science.

Wireless Sensor Network (WSN) is the collection of spatially distributed sensor nodes, which are connected to one another and are used for collecting, processing and transmitting the data. Sensor nodes also measure the physical and environmental conditions like temperature, humidity, etc. before transferring the data to the gateway.

The sensor node consists of many parts- a radio transceiver, a microcontroller, an electronic circuit for interfacing with sensors and, energy source. They spontaneously form a network for wirelessly transferring the data. The data collected from all sensor nodes are collected by the gateway sensor node, which is further transmitted to the end user. The characteristics of wireless sensor networks are:

• **Self-Organizing Capability** - Sensor nodes have the ability to organize themselves when sent to risky areas i.e. area without human supervision.

• **Network Lifetime** - This is the duration in which the last alive sensor node dies (i.e. when last sensor node loses its energy and becomes dead).

• **Scalability** - The network is said to be scalable when the increasing number of sensor nodes does not degrade the performance of the network.

• **Latency** - Latency is the delay in the network while processing or transmitting the data to sensor nodes or to the base station.

• **Throughput** - Throughput is the number of data packets successfully transmitted to the base station in unit time.

• **Clustering** - Clustering divides the sensor nodes into clusters and in each cluster, a cluster head (CH) is elected. In a cluster, the sensor nodes transmit the data packets to cluster head which in turn transmits the data packets to the base station.

• **Cross-layer design** - This is an improvement over traditional layered design. The traditional layered approach had many problems like inadaptability to changing the environment, access conflicts, etc. This design modifies the old approach by improving transmission performance.

There are different types of Wireless sensor networks namely, Terrestrial WSNs, Underground WSNs, Underwater WSNs, Multimedia WSNs, and Mobile WSNs.

The development of Wireless Sensor Network (WSN) was motivated by military applications like Battlefield Surveillance. Now, this is used in many applications like Health-care monitoring, Industrial monitoring, Thread detection, etc.

The huge applications of WSNs bring many challenges even if these tiny sensor nodes are battery controlled and deployed randomly or deterministically in hazardous places where the traditional infrastructure-based network is practically infeasible. There are many typical issues like limited energy resources, limited computing capacity, open environment, and wireless connectivity makes the sensor network failure most of the time. Once sensor nodes are deployed, nodes with finite battery power should sustain for months or years at a stretch without any intervention. Wireless Sensor Networks (WSNs) are asset obliged. Energy is the most vital assets in such systems. So ideal utilization of energy is important. We can reduce energy consumption by the use of energy-conserving hardware, operating system, and communication protocols. There are many approaches used which are clustering, use of Fuzzy Logic in order to reduce energy consumption and to increase the lifetime of the network. However, most of the proposed approaches prove ineffective. Further, among the communication protocols, the design of routing schemes is even more complex. This is the reason why WSN attracts a lot of researchers.

ANGULAR SWEEP ALGORITHM

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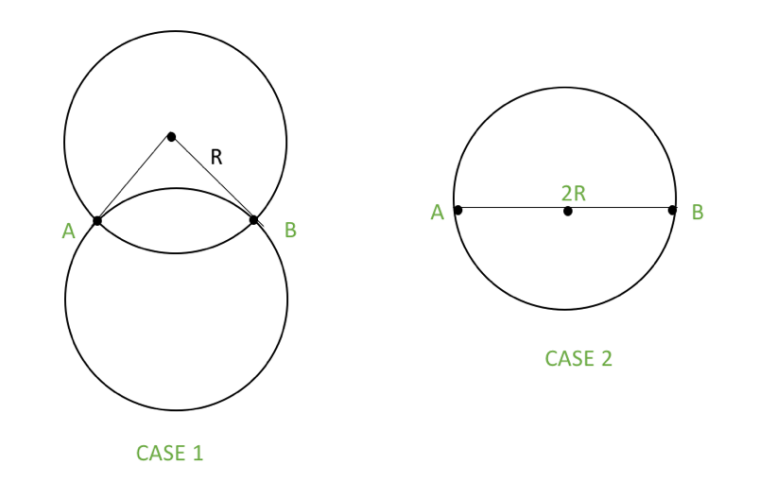
CSE Department

The Angular Sweep Algorithm is used to find the maximum number of points that can be enclosed by a fixed-radius circle of radius 'R' in a 2-D plain.

For example,
Input: R = 1
Points [] = {(6.47634, 7.69628), (5.16828 4.79915), (6.69533 6.20378)}
Output: The maximum number of points are 2

Naive Algorithm
For an arbitrary pair of points in the given set (say A and B), construct the circles with radius 'R' that touches both the points. There are maximum 2 such possible circles. As we can see here maximum possible circles is for CASE 1 i.e. 2.



For each of the constructed circle, check for each point in the set if it lies inside the circle or not. The circle with maximum number of points enclosed is returned.

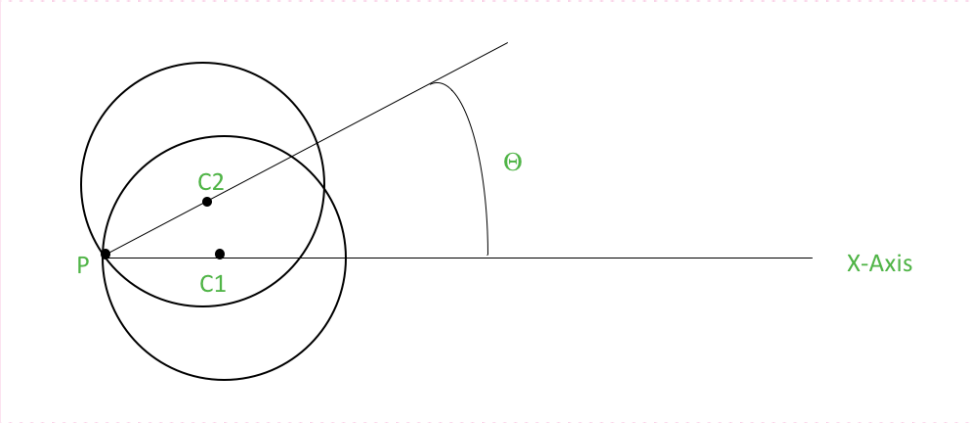
Time Complexity: There are ${}^{n}C_{2}$ pair of points corresponding to which we can have $2 {}^{n}C_{2}$ circles at maximum. For each circle, (n-2) points have to be checked. This makes the naive algorithm $O(n^3)$.

Angular Sweep Algorithm

By using Angular Sweep, we can solve this problem in $O(n^2 \log n)$. The basic logical idea of this algorithm is described below.

We pick an arbitrary point P from the given set. We then rotate a circle with fixed-radius 'R' about the point P. During the entire rotation P lies on the circumference of the circle and we maintain a count of the number of points in the circle at a given value of Θ where the parameter Θ determines

the angle of rotation. The state of a circle can thus be determined by a single parameter Θ because the radius is fixed.
We can also see that the value of the count maintained will change only when a point from the set enters or exits the circle.



In the given diagram, C1 is the circle with Θ = 0 and C2 is the circle constructed when we rotate the circle at a general value of Θ.
After this, the problem reduces to, how to maintain the value of count.
For any given point except P (say Q), we can easily calculate the value of Θ for which it enters the circle (Let it be α) and the value of Θ for which it exits the circle (Let it be β).

We have angles A and B defined as under,

- A is the angle between PQ and the X-Axis.
- B is the angle between PC and PQ where C is the center of the circle.

$$A = tan^{-1}\frac{(P.y - Q.y)}{(P.x - Q.x)}$$

$$B = cos^{-1}\frac{d}{2R}$$

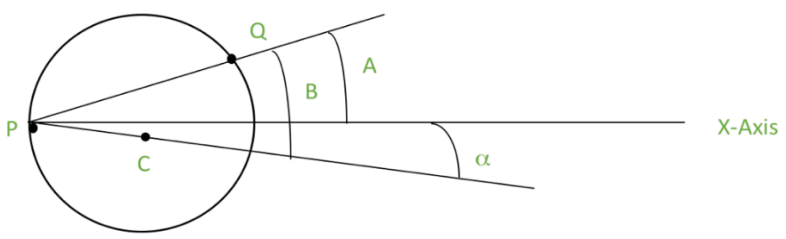
where, x and y represent the coordinates of a point and 'd' is the distance between P and Q.

Now, from the diagrams we can see that,

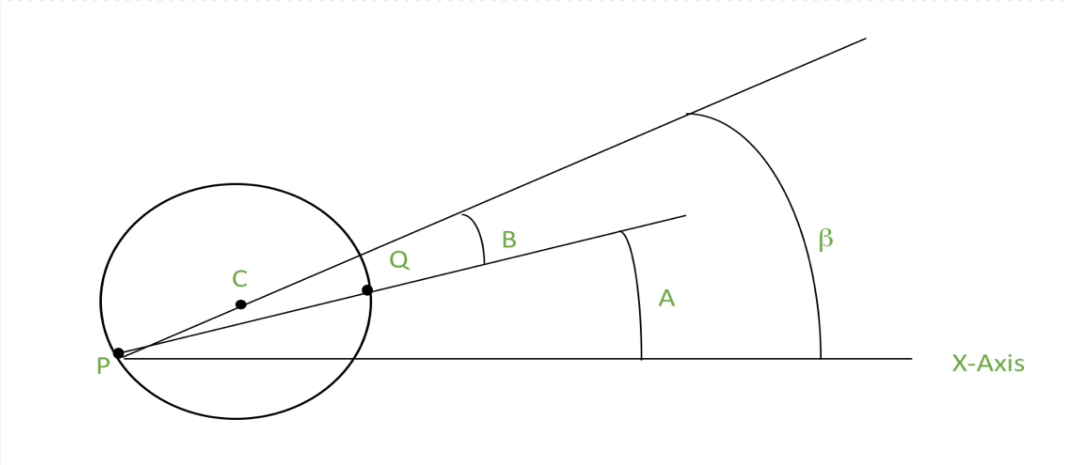
- α = A-B
- β = A+B

(Note: All angles are w.r.t. to X-Axis. Thus, it becomes 'A-B' and not 'B-A').

When Q enters the circle



When Q exits the circle



We can calculate angles A and B for all points excluding P. Once these angles are found, we sort them and then traverse them in increasing order. Now we maintain a counter which tells us how many points are inside the circle at a particular moment.
Count will change only when a point enters the circle or exits it. In case we find an entry angle we increase the counter by 1 and in case we find an exit angle we decrease the counter by 1. The check that the angle is entry or exit can be easily realized using a flag.
Proceeding like this, the counter always gives us a valid value for number of points inside the circle in a particular state.

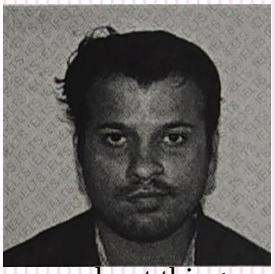
Important Note: The points which have'd'>2R do not have to be considered because the will never enter or exit the circle.

The angular sweep algorithm can be described as:

1. Calculate the distance between every pair of ${}^{n}C_{2}$points and store them.
2. For an arbitrary point (say P), get the maximum number of points that can lie inside the circle rotated about P using the getPointsInside() function.
3. The maximum of all values returned will be the final answer.

Time Complexity:
There are n points for which we call the function getPointsInside(). This function works on 'n-1' points for which we get 2*(n-1) size of the vector 'angles' (one entry angle and one exit angle). Now this 'angles' vector is sorted and traversed which gives complexity of the getPointsInside() function equal to O(nlogn). This makes the Angular Sweep Algorithm $O(n^2 \log n)$.

IMPORTANCE OF SALESFORCE CRM IN BUSINESS



Himanshu Sharma
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CSE Department

Cloud computing is a kind of outsourcing of computer programs. Using cloud computing, users are able to access software and applications from wherever they are; the computer programs are being hosted by an outside party and reside in the cloud. This means that users do not have to worry about things such as storage and power, they can simply enjoy the end result.

The three types of cloud computing:

Infrastructure as a Service (IaaS): A third party hosts elements of infrastructure, such as hardware, software, servers, and storage, also providing backup, security, and maintenance. Eg. Azure, AWS

Software as a Service (SaaS): Software distribution model in which a third-party provider hosts applications and makes them available to customers over the Internet. Eg: Gmail.

Platform as a Service (PaaS): The branch of cloud computing that allows users to develop, run, and manage applications without having to worry about storage, infrastructure and so on. Eg. Force.com

CRM also known as 'Customer Relationship Management' has become extremely important in the day today business. It uses Cloud computing technology for effective data management and thereby providing businesses with enhanced direct access towards their businesses irrespective of the location they are in.

Salesforce.com is a cloud computing and social enterprise software-as-a-service (SaaS) provider based in San Francisco. Salesforce has essentially changed how enterprise software is delivered and used. As Its software is cloud-based and hence doesn't need IT experts to set up anything. Salesforce has defined the ideal way as how to connect with customers. Building meaningful and lasting bond with the customers, identifying their needs, address problems faster and deploy apps that are customer focused is all possible through Salesforce.

There is an increased competition in the number of CRM software systems that are designed to fit your business requirements. But Salesforce CRM remains to be the most popular CRM systems among the businesses across the globe owing to its user-friendliness and improved benefits offered by it. Most of the small and mid-sized businesses that are willing to enhance the growth prospects consider Salesforce implementation services and Salesforce development solutions as their ultimate choice.

Benefits of Salesforce CRM:

Track how competitors are performing: Salesforce CRM software will help companies have a brief overview about how their competitors in the similar niche are performing and thereby helping them in developing a solution that would help in efficient management. The business leads are followed effectively by the Salesforce consultants and thereby reduce the need for companies to manage greater leads.

Forecast the growth and decline of the business: Since Salesforce CRM software plays a vital role in keeping track of the earlier performance of your business, it provides you with a detailed understanding regarding how the market is responding in the current business scenario and where your company stands in the market competition as of now. By retrieving the data from the Salesforce dynamic CRM software, companies can track the performance of their business without any hassles. Users will get a clear picture of the customer and market behavior and can make use of it to analyze the future performances of your business.

Automation of Everyday Tasks: Completing a sale is never as easy as just getting a customer to agree to commit. Along with the surface details of any sale, there are hundreds of smaller tasks that

must be completed in order for everything to function properly. Forms need to be filled out, reports need to be sent, legal issues need to be addressed—these ancillary chores are a time consuming, yet vital aspect of the sales process. The best CRM systems are designed to take the burden of many of these tasks from off the shoulders of your employees, thanks to the magic of automation. This means that your representatives will be able to focus more of their efforts towards closing leads and resolving customer pain points, while the automated CRM system takes care of the details.

Improved Analytical Data and Reporting: Miscalculated data should not be the reason you cannot succeed, with CRM this is no longer a possibility. CRM systems store information in one place which leads to improved analyzing of the data as a whole. Easily integrated with different tools or plugins, you have the ability to generate automatic reports to maximize your time. Personalize your dashboard views to quickly locate information needed such as customer information, sales goals, and performance reports to reach untapped opportunities. With better reporting data you can make resourceful and effective decisions to reap the rewards in customer loyalty and long run profitability.

The company is best known for its Salesforce customer relationship management (CRM) product, which is composed of Sales Cloud, Service Cloud, Marketing Cloud, Commerce Cloud, Analytics Cloud, IoT Cloud, App Cloud, Health Cloud, Financial Services Cloud, Force.com, and Chatter.

Cloud services it offers:

Salesforce Sales Cloud: manages contact information, helps track customer information and interactions in one place, automates complex business processes, integrates social media and real-time customer collaboration through Chatter. Features in Sales Cloud include contact management, opportunity/lead management, Salesforce Inbox, reports and dashboards and more.

Salesforce Service Cloud: is a service platform for customer service and support. It includes a call center-like case tracking feature and a social networking plug-in for conversation and analytics. Service Cloud helps agents solve customer problems faster, gives customers access to answers to solve problems on their own, helps personalize service, predicts needs, and helps deliver support to customers wherever they may be. Features in Service Cloud include live agent, communities, LiveMessage and social customer service.

Salesforce Community Cloud: connects and facilitates communication among employees, customers and partners. The Community Cloud helps build communities for any needs, provides a platform for customers to help themselves and each other, builds deeper customer relationships by allowing customers to interact with each other, allows partners to connect and increase sales, and helps drive employee productivity through online collaboration. Some features included in Community Cloud are personalization, collaboration and community management.

Salesforce Marketing Cloud: helps personalize email marketing at scale; engage with mobile messaging; connect social to marketing, sales and service; manage ad campaigns to help with customer acquisition; deliver personalized web content that is efficient; and create 1-to-1 customer journeys across channels.

CRM's are known to improve customer retention, by as much as 27%. CRM is an excellent tool that allows companies to increase not only their customer satisfaction but also their efficiency and profits. CRM comes in a wide variety of strategies and applications, which allows it to be modified to fit virtually any business type. Almost every business can benefit from CRM software, and it is much better to start using a CRM for your business before it becomes necessary.

INDUSTRY EXPERT'S CORNER: TECHNICAL ARTICLES

CONTAINERS

VIJAI PRAKASH VERMA | VIJAI@ATASPL.COM |
Business Head – Public Cloud Solution
Allahabad Technologies and Solutions Pvt. Ltd.

We are living in fastest changing IT world, we May be heard references to Docker or Rocket or even management and orchestration solutions like Chef, Puppet, Ansible or Kubernetes.

A container is a form of lightweight virtualization. An application or process running in a container uses the operating system kernel and system resources, but each container is isolated from the operating system and from other containers, behaving as if it's running in a separate Server of the operating system.

The hottest technology and topic for current IT industry is Containers and which will rule for next to 5 to 10 years. Technology companies like Google were doing with the technology, and the top three topics of conversation at any DevOps meetup were Containers, Containers, and Containers.

Now a day's enterprises are adopting multi-cloud operations model and the challenge is how to achieve highly-available global scale applications--rather than the technology itself. So as container adoption radically accelerates business.

Container Use Case

1. Preferred deployment target for new applications

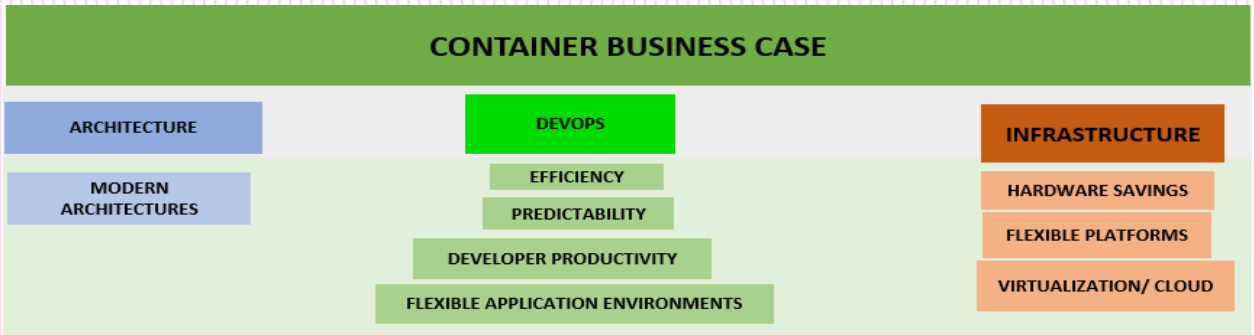
Build container once, run on any infrastructure. New projects should strongly consider using containers as their deployment target

2. Simplify Continuous Integration and Deployment

Container as the build artifact, Immutable infrastructure – deploy by replacing old containers with new ones.

3. Cloud Integration

Technologies like Kubernetes are a de-facto standard that enable migration to cloud as well as cloud potability.



EMERGING TECHNOLOGIES THAT WILL BOOST UP BUSINESS SCENARIO IN NEAR FUTURE

Amit Bhatia
Senior Manager-Aircel Ltd.
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Is there any true business that does not require use of technology at all? even at the basic level , any product or service you use in the business to buy or sell, would have at least made a basic use of technology to make a call to buyer and seller or between the seller and vendor or for that matter or even if its neighborhood grocery store, for printing you receipt. Modern day business cans now do much more with technology. Businesses now have the ability can use technology to gain competitive advantage in the market and increase on their (ROI) return on investment to maximize profits. If a business is not running for profit then it is not a business, its charity

5G and Blockchain are 2 of such many technology revolution which are about to change and impact billion of consumers making our online transactions and presence much more secure, reliable and most importantly blazingly faster

What is 5G?

With connected devices using IOT and , we are on the cusp of technological revolution in very near future with a faster technology , Quoting GSMA *"5G holds the promise of applications with high social and economic value, leading to a 'hyperconnected society' in which mobile will play an ever more important role in people's lives".* 5G is a generational shift in term of evolution of mobile communication technologies. The MWC 2019 happening in Barcelona has connectivity as major them focusing on 5G with participant to bringing step closer to implementation. The 4G deployment in last 18 months by all telecom operators leading to a massive data tsunami is whereby spawning the likes of online streaming services and popularity of T-series as the highest video viewership service is just an example. Your favorite movie in 1080p downloaded to your device in less than 2 minutes

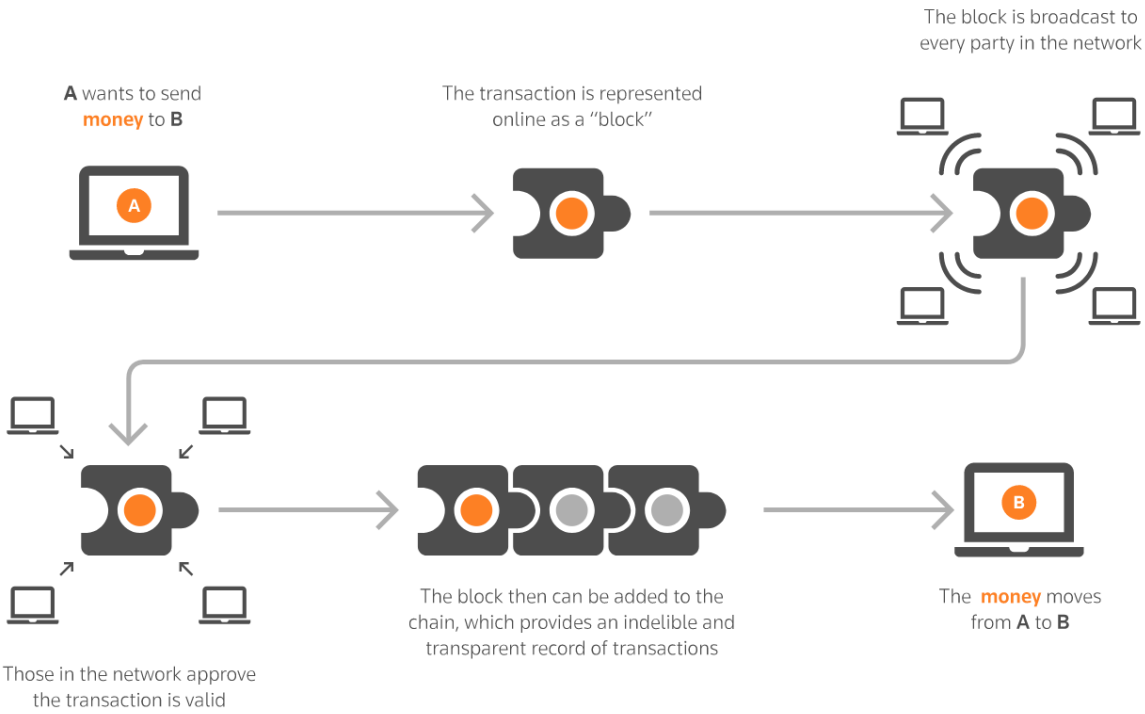
5G is expected to be as reliable as a wireline network. To deliver on its promise of extreme mobile broadband and massive and ultra-reliable machine communications requires a level of reliability we have not seen in wireless communications. When self-driving cars or health care medical devices are transmitting real-time data on the network with millions of sensors working at the same time to enable decision making, reliability and transmission peed becomes a life-or-death matter. Such applications clearly require the 1 millisecond delay time provided in the 5G specification.

5G technology will expand business opportunities and business models through monitoring, tracking and automation capabilities on a large scale. From connected farms and agriculture to smart cities and building and mainly in agriculture society like ours, the various sensors will be able to be implemented throughout farms allowing for crops to communicate moisture and fertilization needs. While utility companies will be able to monitor and report on energy usage thereby greatly improving the reliability and sustainability of energy production and distribution.

BlockChain

If you have bought a house or ever or been involved in any activity related to buying or selling in land, you have firsthand experience the hassle and the loads of paper work involved. If you have ever been involved in a patent application or if on ordering parts of a small scale or midscale business the paperwork involved is astronomical and to prove and maintain authenticity of the document is just mind boggling.

Blockchain is a technology was conceived as an efficient, cost-effective, reliable, and secure system for conducting and recording financial transactions. It is the underlying digital layer which has powered bitcoin and other crypt currency exchange. It is a ledger protected and secured by advanced cryptography. It is a shared record of information that is maintained and updated by a network of computers rather than a central authority. The following diagram explains how BlockChain works



Source: Financial Times

Blockchain is rapidly making inroads within the country with more and more financial and technological companies opting to use this secure and fast platform for their financial transactions. Kotak Mahindra and ICIC bank have already started using to make their remittance system complete transaction in minutes instead of days. Bank-Chain, India's first Blockchain exploration consortium for banks was announced in Mumbai February, 2017 formed in collaboration with Primechain Technologies is having all major banks such as SB , Axis Bank, , Deutsche Bank, HDFC Bank and other as its members

If you are a looking to make a career in the emerging digital technologies which would eventually have application cross every industry, Blockchain will be your safest bet.

RESEARCH CORNER: FACULTY PUBLICATIONS

USABILITY FEATURE OPTIMIZATION USING MWO APPROACH

Deepak Gupta, Dr. Ashish Khanna

Publication: Dr. Deepak Gupta, Dr. Ashish Khanna "Usability Feature Optimization using MWOA", International Conference on Innovative Computing and Communication (ICICC), 2018, Springer, October, 2018

Abstract: Usability is by far the most prominent term used to specify the quality of a software. It is defined and understood in reference to a hierarchical model called usability model, which combines the proposed seven basic usability factors, attributes and characteristics. In this work, a modified version of whale optimization algorithm evaluation called MWOA (Modified Whale Optimization Algorithm) has been discussed for software usability feature extraction.

LEAF IDENTIFICATION USING HOG, KNN, NEURAL NETWORK

Ms. Prerna Sharma

Publication: Ms. Prerna Sharma," Leaf Identification using HOG, KNN, Neural Networks", International Conference of Innovative Computing and Communications,, October, 2018.

Abstract: The main objective of this paper is to identify the leaves using the concepts of image processing. A dataset comprising 1900 images of 18 leaf species has been used to train our machine. Three major steps—image preprocessing, feature extraction (using Histogram of Oriented Gradients (HOG)) and classification—have been performed. The initial step includes grayscale conversion and represents the input image as a zero-one matrix. In the next step, 900 features have been extracted using HOG. The last step comprises classification of two supervised learning methodologies—K-nearest neighbors and backward propagation algorithm using artificial neural networks. Performance of the two methods has been compared, and artificial neural networks have proved to be a better choice with an approximate accuracy of 97%. The implementation has been carried out using MATLAB and its toolboxes.

STREET LIGHT ENERGY SAVER

Ms. Prerna Sharma

Publication: Ms. Prerna Sharma," Street Light Energy Saver", International Conference of Innovative Computing and Communications, October, 2018.

Abstract: Our project for developing a smart street light system is reviewed. In this project, the street light system, in which lights on when needed and light-off when not needed. Currently, in the

whole world, enormous electric energy is consumed by the street lamps, which are automatically turn on when it becomes dark and automatically turn off when it becomes bright. This is the huge waste of energy in the whole world and should be changed. Our smart street light system consists of a LED light, a brightness sensor, a motion sensor and a short-distance communication network. The lights turn on before pedestrians and vehicles come and turn off or reduce power when there is no one. It will be difficult for pedestrians and drivers of vehicles to distinguish our smart street lamps and the conventional street lights, since our street lamps all turn on before they come. The present status and the future prospects of our smart start light project will be reviewed

SECURITY ON CLOUD COMPUTING USING SPLIT ALGORITHM ALONG WITH CRYPTOGRAPHY AND STEGANOGRAPHY

Mr. Moolchand Sharma

Publication: Mr. Moolchand Sharma," Security on Cloud Computing using split algorithm along with cryptography and steganography", International Conference of Innovative Computing and Communications, October, 2018.

Abstract: Cloud data storage (Storage as a Service) is an important service of cloud computing referred to as Infrastructure as a Service (IaaS). The cloud storage provides data storage facilities as well as sharing across multiple users. Day by day it is gaining popularity because of enormous benefits. But emerging data security and privacy issues have become a subject of primo to the users as well as the service providers. That's why we proposed a technique for enhancing the security of cloud data using cryptography, steganography, and hash function. For cryptography, we use Blowfish algorithm and for steganography, a new efficient embedded algorithm using Embedded Least Significant Bits (E-LSB), and for integrity checking, we use SHA-256 Hashing Algorithm. This system is implemented in Eclipse using Java. We first encrypt the data and then hide it in an image to fulfill our purpose. As Blowfish [1] is an existing encryption algorithm which is secure enough, so, we just check out the steganography method's security. After hiding the data in a cover image, data detection and data destruction attacks are applied to evaluate the security of this steganography system. Detection attacks, such as visual attack, RS attack can't detect any data. In

Case of destruction attacks, such as jpeg compression, format conversion, salt& pepper, rotation, we got average NC value. So this steganography method is quite sensitive to destruction attack but it is secure in data detection attacks, which is the main purpose of steganography. During quality measurement, we are getting better PSNR value such as after hiding 1KB data in a cover image of size 512x512 pixels, we get PSNR value on average around 63 dB which is better than the previously existing methods.

CONTRASTIVE EXAMINATION OF LEARNING TECHNIQUES DEPLOYED OBER HANDWRITTEN DIGITS

Ms. Zameer Fatima

Publication: Ms. Zameer Fatima," Contrastive Examination of Learning Techniques Deployed Over Handwritten Digits", International Journal Advancement in Image Processing and Pattern Recognition, December, 2018.

Abstract: In today's world, great leaps and advances have been achieved in the sphere of machine learning, specifically in the sub-sphere of character recognition. In this paper we perform a contrastive examination to compare three major classification algorithms on the basis of accuracy and training times. The techniques were namely, K-Nearest Neighbors (KNN), Convolutional Neural Networks (CNN) and Support Vector Machines (SVMs) with their respective accuracies being 97.85%, 99.93% and 99.96%. They were applied on well-know and well curated MNIST Dataset maintained by Courant Institute - NYU, Google Labs - New York and Microsoft Research - Redmond.

CDBR: A SEMI-AUTOMATED COLLABORATIVE EXECUTE-BEFORE-AFTER DEPENDENCY-BASED REQUIREMENT PRIORITIZATION APPROACH

Ms. Ankita Gupta

Publication: Ms. Ankita Gupta, CDBR: A semi-automated collaborative execute-before-after dependency-based requirement prioritization approachJournal of King Saud University-Computer and Information Sciences, 1319-1578 , SCOPUS, ESCI, Compendex, INSPEC, ACM Digital Library , October, 2018

Abstract: The success of requirement prioritization process largely depends upon how well different constraints and influential factors are handled by stakeholders and developers while prioritization. The main goal of this research is to present a semi-automated dependency based collaborative requirement prioritization approach (CDBR), which uses linguistic values, execute-before-after (EBA) relation among requirements and machine learning algorithm to minimize the difference of opinion between stakeholder and developers for effective collaboration and for better approximation of final prioritization results, acceptable to both. The presented approach targets three major constraints rarely addressed in existing work, namely dependencies among requirements, communication among stakeholder and developers and the issue of scalability. Results of performance assessment conducted on several different requirement sets and on a case study by comparing CDBR with other state of the art approaches namely, AHP and IGA. The results are accurate and comparable in terms of effectiveness, efficiency, scalability and disagreement concerns among stakeholder and developers which in turn provides robustness to decision making

process of awarding more importance to some requirements over others. CDBR overpowers AHP and IGA in terms of efficiency and processing time respectively.

TOWARDS DEPENDENCY BASED COLLABORATIVE METHOD FOR REQUIREMENT PRIORITIZATION

Ms. Ankita Gupta

Publication: Ms. Ankita Gupta," Towards Dependency Based Collaborative Method for Requirement Prioritization", Eleventh International Conference on Contemporary Computing (IC3), August, 2018.

Abstract: This paper proposes a dependency based collaborative requirement prioritization method which takes into account multiple criteria's for obtaining individual preference in the form of initial ranking from both stakeholders and developers. The proposed approach is an effective mechanism to extract relevant knowledge in terms of initial priority given by stakeholders and analysis of requirement inter relationships expressed as the initial priority from developers and final ranking computed through a weighted score.

GRADUATE ATTRIBUTES, PROGRAM OBJECTIVES/LEARNING OUTCOMES AND FACULTY ACCOUNTABILITY

Mr. PS Grover[1] , Dr. Namita Gupta[2], Mr. Alok Sharma[2]
1. KIIT Group of Colleges, Gurgaon
2. Maharaja Agrasen institute of Technology, GGS-IP University

Outcome-Based Education Framework is implemented by defined Program Educational Objectives, Program Outcomes and Course Outcomes to ensure improvements in student learning. Program Outcomes are defined with the lead of Graduate Attributes (GA) and are achieved with the help of Course Outcomes (CO). PEOs concern the alumni accomplishments and can also be assessed. Improvements in these parameters enable to assess the student performance and judge faculty accountability.

RESEARCH CORNER: STUDENT'S PUBLICATIONS

OPTIMIZED BINARY BAT ALGORITHM FOR CLASSIFICATION OF WHITE BLOOD CELLS

Deepak Gupta, Ashish Khanna, Jatin Arora, Utkarsh Agrawal [2]
[1]Assistant Professor, CSE
[2]Undergraduate Students, CSE

Publication: Deepak Gupta, Ashish Khanna, Jatin Arora, Utkarsh Agrawal, Victor Hugo C. De Albuquerque,"Optimized Binary Bat Algorithm for classification of White Blood Cells", measurement (Elsevier), doi 10.1016/j. measurement 2019.01.002, SCIE (IF 2.2). Jan. 2019

Abstract: The quantitative and differential analysis of Leukocytes present in human body provide conducive hematological information to physicians for diagnosis of various infections and ailments. This paper proposes an Optimized Binary Bat algorithm, an enhanced version of the original Binary Bat Algorithm, for classification of different types of leukocytes. It is used for the first time in this field of application to the best of our knowledge. A set of features are extracted from images of WBCs and then the optimized algorithm is used to obtain a subset of those features which are essential and more relevant from the high-dimensional dataset. Similar to the original BBA, the optimized BBA is an evolutionary algorithm inspired by the echolocation technique used by bats for locating a prey or an object. OBBA aims to reduce the dimensionality of the dataset by determining the features which are most discriminative. The proposed algorithm is implemented using four different classifiers, K-nearest neighbors (KNN), Logistic Regression, Random Forest and Decision Tree, and their performance is compared. The proposed OBBA can be used in classification of WBCs with an average accuracy of 97.3% and help in analysis of numerous hematological conditions. The optimized BBA is also compared with other nature inspired algorithms including Optimized Crow Search algorithm and Optimized Cuttlefish algorithm, and the results indicate that the suggested algorithm is sufficiently fast and accurate to be used in hematological analysis.

USABILITY FEATURE EXTRACTION USING MODIFIED CROW SEARCH ALGORITHM: A NOVEL APPROACH

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Publication: Deepak Gupta, Joel J. P. C. Rodrigues, Shirsh Sundaram, Ashish Khanna, Valery Korotaev, Victor Hugo C. Albuquerque, "Usability Feature Extraction Using Modified Crow Search Algorithm: A Novel Approach", Neural Computing and Applications (Springer), 2018, https://doi.org/10.1007/s00521-018-3688-6, SCIE (IF 4.2).Sept. 2018

Abstract: For the purpose of usability feature extraction and prediction, an innovative metaheuristic algorithm is introduced. Generally, the term "usability" is defined by the several researchers with respect to the hierarchical-based software usability model and it has become one of the important methods in terms of software quality. In hierarchically based software, its usability factors,

attributes, and its characteristics are combined. The paper presented an algorithm, i.e., modified crow search algorithm (MCSA) mainly for extraction of usability features from hierarchical model with the optimal solution under the search for useful features. MCSA is an extension of original crow search algorithm (CSA), which is a naturally inspired algorithm. The mechanism of this algorithm is based on the process of hiding food and prevents theft and hence introduced this CSA in the field of software engineering practices as an inspiration. The algorithm generates a particular number of selected features/attributes and is applied on software development life cycles models, finding out the best among them. The results of the presented algorithm are compared with the standard binary bat algorithm (BBA), original CSA, and modified whale optimization algorithm (MWOA). The outcomes conclude that the proposed MCSA performs well than the standard BBA and original CSA as the proposed algorithms generate fewer number of feature selection equal to 17 than 18 in BBA, 23 in CSA, and 19 in MWOA.

OPTIMIZED CUTTLEFISH ALGORITHM FOR DIAGNOSIS OF PARKINSON'S DISEASE

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Publication: Deepak Gupta, Arnav Julka, S. Jain, Tushar Aggarwal, Ashish Khanna, Victor Hugo C. de Albuquerque, "Optimized Cuttlefish Algorithm for diagnosis of Parkinson's disease", Cognitive Systems Research (Elsevier), Volume 52, 36-48, June 2018, SCIE (IF 1.4). June. 2018

Abstract: This paper presents an optimized cuttlefish algorithm for feature selection based on the traditional cuttlefish algorithm, which can be used for diagnosis of Parkinson's disease at its early stage. Parkinson is a central nervous system disorder, caused due to the loss of brain cells. Parkinson's disease is incurable and could eventually lead to death but medications can help to control symptoms and elongate the patient's life to some extent. The proposed model uses the traditional cuttlefish algorithm as a search strategy to ascertain the optimal subset of features. The decision tree and k-nearest neighbor classifier as a judgment on the selected features. The *1*9////////**Parkinson speech with multiple types of sound recordings and Parkinson Handwriting sample's datasets are used to evaluate the proposed model. The proposed algorithm can be used in predicting the Parkinson's disease with an accuracy of approximately 94% and help individual to have proper treatment at early stage. The experimental result reveals that the proposed bio-inspired algorithm finds an optimal subset of features, maximizing the accuracy, minimizing number of features selected and is more stable.

IMPROVED DIAGNOSIS OF PARKINSON'S DISEASE BASED ON OPTIMIZED CROW SEARCH ALGORITHM

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Publication: Deepak Gupta, ShrishSundaram, AshishKhanna, Aboul Ella Hassanien, Victor Hugo C de Albuquerque, "Improved diagnosis of Parkinson's disease based on Optimized Crow Search

Algorithm", Computers and Electrical Engineering (Elsevier), Volume 68, 412-424, May 2018, SCIE (IF 1.7). May 2018.

Abstract: Diagnosis of Parkinson's disease at its early stage is important in proper treatment of the patients so they can lead productive lives for as long as possible. Although many techniques have been proposed to diagnose the Parkinson's disease at an early stage but none of them are efficient. In this work, to improve the diagnosis of Parkinson's disease, we have introduced a novel improved and optimized version of crow search algorithm (OCSA). The proposed OCSA can be used in predicting the Parkinson's disease with an accuracy of 100% and help individual to have proper treatment at early stage. The performance of OCSA has been measured for 20 benchmark datasets and the results have been compared with the original chaotic crow search algorithm (CCSA). The experimental result reveals that the proposed nature-inspired algorithm finds an optimal subset of features, maximizing the accuracy and minimizing a number of features selected and is more stable.

EVOLUTIONARY ALGORITHMS FOR AUTIMATIC LUNG DISSEASE DETECTION

, Deepak Gupta, AshishKhanna Naman Gupta,
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Publication: Naman Gupta, Deepak Gupta, AshishKhanna, Pedro RebouçasFilho, Victor Hugo C. de Albuquerque, "Evolutionary Algorithms for Automatic Lung Disease Detection", Measurement (Elsevier), SCIE (IF 2.2).Feb 2019.

Abstract: The World Health Organization estimated that 210 million people are suffering from Chronic Obstructive Pulmonary Disease (COPD), causing 300 thousand deaths in 2005 with an increase of 30% in 2015. Also, it is estimated that by 2030, COPD will rank third worldwide among the leading causes of death. These statistics about lung diseases get worse when one considers fibrosis, calcifications and other diseases. Medical images analysis is of great importance for early and accurate diagnosis of pulmonary disease and assist medical doctors for effective treatments and prevents further deaths. This work aims to identify and classify lung CT scan images as healthy lungs and diseases as COPD and Fibrosis. Three steps are required to achieve these goals: Extracting relevant features from the lung images, Feature Selection and Identification of lung diseases using a machine learning classifier. In the first step, this work follows an approach that extracts Haralick texture features using Gray Level Co-occurrence Matrix (GLCM), Zernike's moments, Gabor features and Tamura texture features from the segmented lung images to compose a pool of features for selection. As to the second step, we propose three evolutionary algorithms, Improvised Crow Search Algorithm (ICSA), Improvised Grey Wolf Algorithm (IGWA) and Improvised Cuttlefish Algorithm (ICFA), as a feature selection methods, which selects an optimal features subset from a large pool of features extracted from medical images to improve the classification accuracy and reduce the computational costs. In the final step, four machine learning classifiers: k-Nearest Neighbor (KNN), Support Vector Machine (SVM), Random Forest Classifier and Decision Tree Classifier were

applied to each feature subset selected by the proposed feature selection methods. The experimental results shows that ICSA eliminated the maximum amount of insignificant features of about 71% whereas IGWA removed only 52.3% out of the total extracted features. ICFA filtered out the least amount of features upto 40.6%. However, IGWA gave the best accuracy of 99.4% for classifying lung diseases followed by ICSA with an accuracy of 99.0% respectively. A comparatively lesser accuracy of 97.3% was achieved by ICFA. Our results led to conclude that the proposed feature selection methods are suitable for classification of diseases in medical images, can also be used in real-time applications due to their reduced computational cost and very high accuracy.

THE HEALTH OF THINGS FOR CLASSIFICATION OF PROTEIN STRUCTURED USING IMPROVED GREY WOLF OPTIMIZATION

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Assistant Professor, CSE
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Publication: Prerna Sharma, Apoorva Gupta, AasthaAggarwal, Deepak Gupta,AshishKhanna, Aboul Ella Hassanien, Victor Hugo C. de Albuquerque, "The health of things for classification of protein structures using improved grey wolf optimization", Journal of Supercomputing (Springer), 2018, https://doi.org/10.1007/s11227-018-2639-4, SCI (IF 1.5). Oct 2018.

Abstract: In the field of computational biology, prediction of high-resolution protein structure is regarded as a major challenge. Physical and chemical properties of the protein structure determine its quality and differentiate native structures from predicted structures. Various machine learning classification models are studied with six physical and chemical properties to classify the root mean square deviation of the protein structure. This work proposes an improved version of a meta-heuristic technique named grey wolf optimization (IGWO), which is an extension of traditional grey wolf optimization (GWO) for the feature selection. The proposed novel IGWO ascertains optimal subset of features, and further, four machine learning classifiers have been used for efficient prediction of protein structure. Artificial neural network classifier predicts the protein structure with a maximum approximate accuracy of 91%. The experimental result reveals that the proposed meta-heuristic technique is stable enough to maximize the accuracy and minimize the number of optimal features. In this paper, the result of the proposed technique has been compared with other related evolutionary techniques and the proposed optimizer outperforms all other techniques.

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DIAGNOSIS OF PARKINSON'S DISEASE USING MODIFIED GREY WOLF OPTIMIZATION

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Publication: Prerna Sharma, ShirshSundaram, Moolchand Sharma, Arun Sharma, Deepak Gupta, "Diagnosis of Parkinson's disease using modified grey wolf optimization", Cognitive Systems Research (Elsevier), doi: 10.1016/j.cogsys.2018.12.002, SCIE (IF 1.4).Oct 2018.

Abstract: This paper presents the Modified Grey Wolf Optimization (MGWO) algorithm which helps with the identification of the symptoms of Parkinson's disease at a premature stage. Parkinson disease is kind of a movement malady, which if not cured timely can prove to be fatal.
Thus it becomes significant to identify Parkinson's disease at its premature phase so proper medications can provide longevity to patient by controlling the symptoms. In this work, a new model named Modified Grey Wolf Optimization (MGWO) has been proposed grounded on the traditional Grey Wolf Optimizer (GWO), which acts as a search strategy for feature selection. GWO is a meta-heuristic algorithm which is enthused by hunt down behaviour of wolves. Random forest, k-nearest neighbour classifier and decision tree espy on selected features. The proposed model is evaluated using various types of datasets of voice, handwriting (spiral and meander) and speech. The put forward algorithm helps in the prediction of Parkinson disease with an estimated accuracy of 94.83%, detection rate of 98.28%, false alarm rate of 16.03% and further aid the individuals to receive a functional treatment at an early stage. The proposed bio-inspired algorithm is stable enough to find out the optimal subset of features. At last the results derived from the evaluation of proposed algorithm on datasets are compared with the results of Optimized Cuttlefish Algorithm (OCFA). The experimental results depict that the proposed algorithm helps in maximizing the accurateness and minimizing the number of features selected.

BIO-INSPIRED ALGORITHMS FOR DIAGNOSIS OF BREAST CANCER TRAIN

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Assistant Professor, CSE
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Publication: Moolchand Sharma, Shubham Gupta, Prerna Sharma, Deepak Gupta, "Bio-inspired algorithms for diagnosis of breast cancer", International Journal of Innovative Computing and Applications (Inderscience), ESCI, Scopus. [Accepted] March 2019.

Abstract: Breast cancer has increased mortality rate, one out of eight women have breast cancer. The breast cancer is viewed as the second most-common type of cancer. This is a big threat to women health and survival. One of the popular methods to predict breast cancer is the bio-inspired computing. Bio-inspired computing approaches are global optimization algorithms motivated by the natural behaviors of swarms such as ants, birds, fishes and bees. Artificial Bee Colony Algorithm (ABC) is a well-known bio-inspired algorithm, which is robust, easy to implement and has few setting parameters. However, one of ABC disadvantages is that of slow convergence due to poor exploration and exploitation processes. In this paper, we proposed a Global Guided Artificial Bee Colony (GGABC) algorithm. The proposed GGABC employs a new hybrid population based on metaheuristic approach to circumvent the deficiency of the standard ABC. The proposed algorithm was applied to predict patient's status of breast cancer. The approach was simulated by the foraging behavior of global best and guided honey bees. The simulation comparative analysis suggested that the proposed GGABC was found to converge to the optimal solution faster than the ABC, Guided

ABC and Global ABC with an improved accuracy. The results of this research can provide critical information to health authorities to effectively manage the risk factors of the breast cancer in an early stage.

PARKINSON'S DIAGNOSIS USING ANT-LION OPTIMIZATION ALGORITHM

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Publication: Prerna Sharma, Rishabh Jain, Moolchand Sharma, Deepak Gupta, "Parkinson's diagnosis using Ant-Lion Optimization Algorithm", International Journal of Innovative Computing and Applications (Inderscience), ESCI, Scopus. [In-Press] Feb 2019.

Abstract: Training feed forward neural networks (FNNs) is considered as a challenging task due to the nonlinear nature of this problem and the presence of large number of local solutions. The literature shows that heuristic optimization algorithms are able to tackle these problems much better than the mathematical and deterministic methods. In this paper, we propose a new trainer using the recently proposed heuristic algorithm called social spider optimization (SSO) algorithm. The trained FNN by SSO (FNNSSO) is benchmarked on five standard classification data sets: XOR, balloon, Iris, breast cancer, and heart. The results are verified by the comparison with five other well-known heuristics. The results prove that the proposed FNNSSO is able to provide very promising results compared with other algorithms.

FAMOUS INDIAN WOMEN ENTREPRENEUR

RICHA KAR

Co-founder & CEO, Zivame

Before entering the startup world, Richa had a secured job and career. She was an engineering graduate from BITS Pilani and had a corporate job in Bangalore. Later she completed her MBA and started working with Spencers Retail and SAP as a retail consultant where she learned a lot about the retail sector.

The idea of Zivame came into her mind while working at SAP; she tracked the online sales of Victoria's Secret which is America's largest retail company of women's lingerie. She observed that the sales figures crossed the target, but there was no such market for Indian Women. After working 8 years in the retail sector, Richa Kar got the fair knowledge of that sector and decided to start something of her own.

TECHNOLOGY NEWS CORNER

MODEL IMPROVED PREDICTION OF MORTALITY RISK IN ICU PATIENTS

MIT researchers have developed a machine-learning model that groups patients into subpopulations by health status to better predict a patient's risk of dying during their stay in the ICU. This technique outperforms "global" mortality-prediction models and reveals performance disparities of those models across specific patient subpopulations.

In a paper recently presented at the Proceedings of Knowledge Discovery and Data Mining conference, MIT researchers describe a machine-learning model that functions as the best of both worlds: It trains specifically on patient subpopulations, but also shares data across all subpopulations to get better predictions. In doing so, the model can better predict a patient's risk of mortality during their first two days in the ICU, compared to strictly global and other models.

The model first crunches physiological data in electronic health records of previously admitted ICU patients, some who had died during their stay. In doing so, it learns high predictors of mortality, such as low heart rate, high blood pressure, and various lab test results — high glucose levels and white blood cell count, among others — over the first few days and breaks the patients into subpopulations based on their health status. Given a new patient, the model can look at that patient's physiological data from the first 24 hours and, using what it's learned through analyzing those patient subpopulations, better estimate the likelihood that the new patient will also die in the following 48 hours.

Rob Matheson | MIT News Office
August 29, 2018

MACHINE LEARNING SYSTEM TACKLED SPEECH AND OBJECT RECOGNITION, ALL AT ONCE

MIT computer scientists have developed a system that learns to identify objects within an image, based on a spoken description of the image.

MIT computer scientists have developed a system that learns to identify objects within an image, based on a spoken description of the image. Given an image and an audio caption, the model will highlight in real-time the relevant regions of the image being described.

Unlike current speech-recognition technologies, the model doesn't require manual transcriptions and annotations of the examples it's trained on. Instead, it learns words directly from recorded speech clips and objects in raw images, and associates them with one another.

The model can currently recognize only several hundred different words and object types. But the researchers hope that one day their combined speech-object recognition technique could save countless hours of manual labor and open new doors in speech and image recognition.

Speech-recognition systems such as Siri, for instance, require transcriptions of many thousands of hours of speech recordings. Using these data, the systems learn to map speech signals with specific words. Such an approach becomes especially problematic when, say, new terms enter our lexicon, and the systems must be retrained.

MIT News Office
September 18, 2018

SUCCESSFUL INDIAN WOMEN ENTREPRENEURS

REVATHI KULKARNI ROY

Revathi was born to drive and she did not waste a minute in embracing her destiny. In love with driving she counted the days till she turned 18, and then enrolled for driving classes, which were rarity in the 1970s. In three weeks, she had learnt driving. Once she got her license she was unstoppable and took to the roads of Mumbai.

Her love for driving continues, unabated. No wonder, then, that she unabashedly calls herself the "best driver."

Revathi's passion manifested in multiple ways and primary among them was For She (pronounced for-she), the first women taxi service in Asia, started in 2007, followed by similar initiatives such as Viira in 2010 and the most recent one being HeyDidi, a women-only platform focused on providing delivery be it food, medical reports to even groceries, via an app.

Awarded the 'Women Transforming India Award' in 2016 by NITI Aayog, Revathi, at 56, still enjoys driving, and as a seasoned driver and entrepreneur has weathered heavy storms.

Being behind the wheel

Revathi's life has revolved around cars. When she was a teen, very few people had cars, and if they did, it was mostly an Ambassador or a Fiat. Revathi's father, who owned an Ambassador, allowed his daughter to drive it a month after she learnt driving. "In hindsight, I feel my dad made a very bold decision. Since I had lost my elder brother in a car crash, it must have been a tough choice for my father but he never stopped me from driving."

While she completed her graduation and post-graduation in Mumbai in the early 1980s, she simultaneously took to car rallies in a big way. "Car rallies were extremely uncommon those days. These were all navigational rallies and women hardly ever participated," she recalls

Her five-foot frame behind the steering wheel of an Ambassador definitely drew attention, but Revathi enjoyed every minute of it. Of the 70 rallies she would have participated in she lost only five. Such was her passion that even when she was pregnant with her first child, she was out participating in a rally.

It was only four years ago when she broke her hand that she took a break from the circuit.

From ForShe to Viira – multiple hats to don

Other than participating in rallies and working in the family business for seven years Revathi decided to turn to entrepreneurship. She used her driving skills to launch ForShe. A few years into it she sold her shares and went on to start yet another can service for women by women in Mumbai called Viira in 2010 with another serial entrepreneur, Preeti Sharma. A few years later she moved out and worked at Sakal, an independently-owned media business in Maharashtra and iCare learning.

First women cab service in Asia

In 2007 on March 8, International Women's day, ForShe was launched in Mumbai with just three cabs. "Our aim was to empower women to become commercial drivers but also to empower them with a skill."

Two months before ForShe was launched Revathi lost her husband. This was a tough period for Revathi, but even in the face of this loss she ploughed on.

With no precursor or model to follow, each challenge called for quick solutions. Revathi recalls one such incident: "To promote the service we would have the women drivers take the car around the city. Soon we began to hear that the cars were seen across Mumbai but without passengers. So my mother-in-law and sisters-in-law who were very supportive began to dress up and sit in the cab and be driven around. Soon we got out first customer and then things picked up from there."

At a time when there was no cab service at all for women, ForShe provided a 90-day course in which lessons on self-defense were taught. "The girls who enrolled were from BPL (below poverty line) families. "The only incentive that we could provide was that your life can change if you learn and skill yourself; your economic condition can improve. And they used to be very excited about this idea. Also, we actually did it. It was not just on storyboard; we executed it," says Revathi.

INDRA NOOYI

Indra Nooyi (née Krishnamurthy; born 28 October 1955) is an Indian American business executive, serving as a director of Amazon, the largest ecommerce business in the world by net revenue. She has consistently ranked among the world's 100 most powerful women. In 2014, she was ranked at number 13 on the Forbes list of The World's 100 Most Powerful Women, and was ranked the 2nd most powerful woman on the Fortune list in 2015. The most well-known face amongst Indian women entrepreneurs -Indra Nooyi is the CFO and President of PepsiCo.

With a Master's Degree in Public Management from Yale University and Masters in Finance and Marketing from IIM, Kolkata, Nooyi held several senior positions at Motorola and Asea Brown Boveri before joining PepsiCo.

Born in Chennai, Indra did her Bachelor's in Science from Madras Christian College in 1974.

Beginning her career in India, Nooyi held product manager positions at Johnson & Johnson and textile firm Mettur Beardsell. Nooyi joined PepsiCo in 1994 and was named president and CFO in 2001.She has been conferred with prestigious Padma Bhushan for her business achievements and being an inspiration to India's corporate leadership.

Her strong acumen for business has helped the company garner as much as 30 billion dollars' worth of crucial deals within the last couple of years.

CHANDA KOCHHAR

Chanda Kochhar (née Advani, born 17 November 1961) is the former MD and chief executive officer of ICICI Bank. She is widely recognised for her role in shaping retail banking in India. However, on 4th October 2018 she stepped down from her position following allegations of corruption. Amidst investigations related to Videocon bad loans, she was forced by the board of ICICI Bank to take indefinite leave. The Central Bureau of Investigation named Chanda Kochhar and her husband as beneficiaries in the financial fraud. The Justice B N Shrikrishna probe panel reported that Kochhar had violated ICICI Bank's Code of Conduct, following which her service was terminated with all her entitlements and benefits revoked. After her exit, Sandeep Bakhshi, who was the interim Managing Director and CEO became the full time MD and CEO.

Last May, Chanda Kochhar, CEO of ICICI Bank, became the first Indian woman to receive the prestigious Woodrow Wilson Award for Global Citizenship, joining the ranks of Hillary Clinton and Condoleezza Rice. Her ambitious community outreach program, ICICI Digital Village, brought vocational training to over 11,000 villagers in 17 states in India and provided financial tools to aspiring entrepreneurs. The program expects to reach 500 more villages by year's end. Kochhar made history again in September when she took the bank's insurance business public, the first IPO of a general insurer in India. All of this marks a significant improvement from last year, when Kochhar passed on her annual bonus amid crumbling earnings. Now, with profits improving, Kochhar received a 63% boost to her total compensation, making her one of the highest paid private bank CEOs in India.