SRM VALLIAMMAI ENGINEERING COLLEGE

COMPUTER SOCIETY OF INDIA
STUDENT BRANCH

MAGAZINE - 2021

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LimeLight

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About SRMVEC CSI-SB :

SRM Valliammai Engineering College Student Branch was started in the year 2007. For the past 14 years, SRMVEC has organised various events and contributed many technical articles to CSI. It is one of the most active student branches of CSI. It has received the 'Best Accredited Student Branch Award' for four consecutive years since 2015 at Annual CSI Convention from Computer Society of India. Currently there are more than 370 Student members in the student branch.

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PREFACE

It gives us great pleasure to release the first issue of volume two ‘LimeLight’. The SRMVEC CSI-SB members have been enthusiastic to show their talents. This magazine gives desired opportunity and platform to publish the students’ thoughts and creativity. We strongly believe that the purpose of knowledge is fulfilled only when it is transferred to another person. In this manner, this magazine would serve as a collection of knowledge. With technology growing leaps and bounds day by day, people need to be aware of the ongoing development in technology. We appreciate every who stood with us in this venture.

Regards
SRMVEC CSI-SB Team

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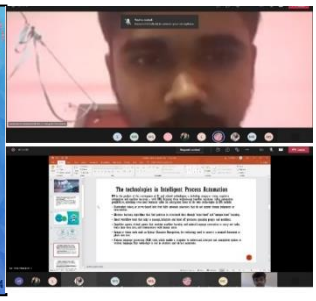
EVENTS

Technical Forum
(Online Elecution Competition)

The SRM Valliammai Engineering College Computer Society of India Student Branch organized a competition “TECHNICAL FORUM”. In the competition around 35 members participated and the registration was open till 30th April 2021. The event was conducted as two slots and three winners were selected from each slot. The first slot was judged by our college alumni students **Miss. S. Sonali** and **Mr. J. Sabarish** and the second slot was also judged by our college alumni students **Miss. R. Karthiga** and **Miss. C. Keerthana.** The winners were announced as **Hemadharshini S. M.** From KCG college of technology, **Sirajudeen K. B.** From SRM Valliammai engineering college, **Kavyashree R.** from ANNA University Regional Campus Coimbatore as first, second and third respectively.

Techwizard

The SRM Valliammai Engineering College Computer Society of India Student Branch organized a competition “TECHWIZARD” There were 150 Students registered for the event which was open till 28th May, 2021. Ten Candidates were shortlisted for the second round and the event was held on 30th May, 2021, the participants were evaluated based on their MCQ score which was conducted on 28th May, 2021. On the event day the selected candidates presented their presentations on the topics: Haptic technology, Edge and Quantum computing, Intelligent process automatically, Predictive and Personalized Medicine. **Miss. S. Sneha Sakthivel, Miss. B. Mythily & Miss. A. Lakshmi Prabha** evaluated the participants based on the presentation, knowledge of the topic, clarity, and fluency. The first place won by **M. Mohammed Rashid** from New Prince Shri Bhavani College of Engineering & Technology and the Second place won by **S.Sivaprakash** from SRM Valliammai Engineering College and the third place won by **S.Lavanya** from Adhiparasakthi Engineering College and **M.Hemavathi** from SRM Valliammai Engineering



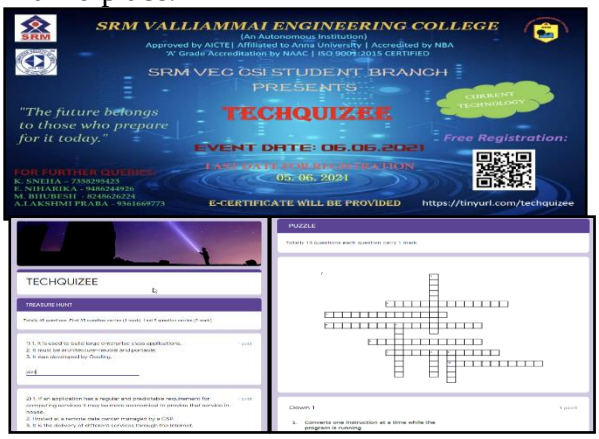
EVENTS

Techie-Talks
(A Technical Talks)

The SRM Valliammai Engineering College Computer Society of India Student Branch organized an event “TECHIE - TALKS”. In this event, more than 50 students had registered and participated. The registration was open till 29th May 2021 and the event was conducted on 31st May 2021 which had two rounds. In the first contest Product Marketing, we gave some products on spot and the participants had to do marketing for those products. The best eight candidates were selected and passed to the second round. In the second contest Live Points, the participants were given topic before 5 minutes and they had to talk either positively or negatively according to the judge’s request. The first places was secured by **Dhivya Shree. R** – Coimbatore Institute of Technology, the second place was by **Sreshta.B** – Panimalar Institute of Technology, and the third place was secured by both **Abinaya.S** – Coimbatore Institute of Technology and **BalaYogesh. R** - SRM Valliammai Engineering College.

Techquizee

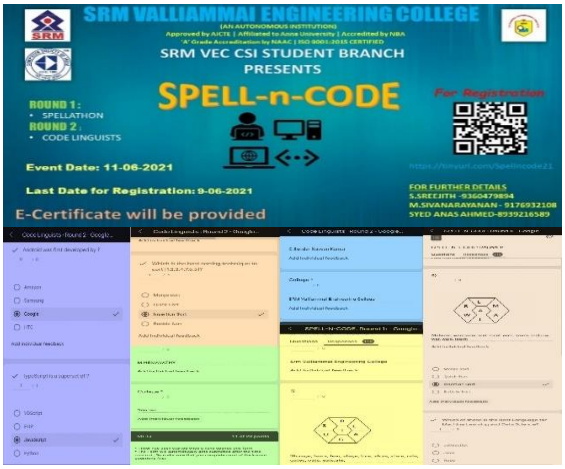
The SRM Valliammai Engineering College Computer Society of India Student Branch organized a technical quiz competition “TECHQUIZEE”. There were around 190 students participating in this event. The registration was open till 5th June 2021 and the event was conducted on 6th June 2021. A google form with two sections of questions based on current technologies. The first section had 35 questions that had 3 clues each to find the answer. First 30 questions had 1 mark each while the last 5 were in reversed text with 2 marks each and participants had to decode them before finding the answer. The second section was a crossword puzzle of 10 questions with 1 mark each. Three winners were selected based on total points scored in both sections together. The top three winners are **Syed Anas Ahmed** from SRM Valliammai Engineering College in the first place, **Anurag N. Nair** from Jyothi Engineering College in second place and **Saranya S.** from Adhiparasakthi Engineering College in third place.



EVENTS

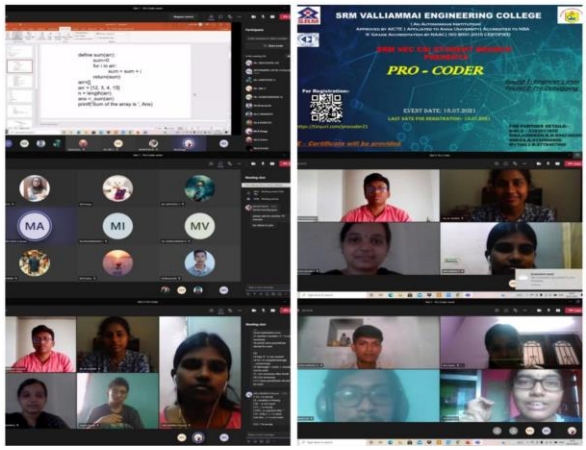
Spell-n-Code

The SRM Valliammai Engineering College Computer Society of India Student Branch organized an event “SPELL-N-CODE”. In this event, more than 300 students had registered and participated. The registration was open till 9th June 2021 and the event was conducted on 11th June 2021 which had two rounds. In the first round, Spellathon, we gave set of alphabets in a hexagon and the participants were asked to find the hidden 7 letter technical word and technical or non-technical words which had 3 or more letters. The top 35 candidates were selected to the second round. In the second round, Code Linguists, the participants were given set of Multiple-Choice Questions about various programming languages and technologies, the participants were asked to complete them within 30 minutes. The first three places were secured by **Varsha.S** -PSNA College of Engineering and Technology, **Lokesh.P** -Sri Sai Ram Engineering College, **Madhumitha.V** -SRM Valliammai Engineering College.



Pro-Coder

The SRM Valliammai Engineering College Computer Society of India Student Branch organized “PRO-CODER”. The registration for the event was open till 15.07.2021 for the event was held on 18.07.2021. A total 133 Students registered for the event, 75 students participated in the Beginner’s level round from which six students were selected for the Pro Debugging round and three students were selected as winners. The participants were given points based on the number of errors they found in the snippet. On the event day the candidates were shown presentations on python snippets. We evaluated the participants based on the answers, knowledge of the topic and complexity of the coding. The first place was given to **Santhosh Kumar. G** from VIT Chennai and the Second place goes to **Bhubesh. M** from SRM Valliammai Engineering College and the third place goes to **Mahaalakshmi.B** from KCG College of Technology.



EVENTS

Logo-Linker
(Create and Explain Logo)

The SRM Valliammai Engineering College Computer Society of India Student Branch organized an event “Logo - Linker”. In this event, more than 30 students had registered and participated. The registration was open till 19thJuly 2021 and the event was conducted on21stJuly 2021 which had two rounds. In the first contest “Logo Creation” ,we gave some topics before itself (during the registration) and the participants had to choose a topic and design a logo for the topic they took. They need to explain, “ Why they created such logo" . The best eight candidates were selected and passed to the second round. In the second contest “Decrypt The Logo”, the participants were given two logos of some famous companies on spot and they had to say why the companies were kept such logos. Judges results will be the final results . The first places was secured by **Dinesh Kumar . M**– SRM Institute of Science and Technology, the second place was by **Deeraj. R** – SRM Valliammai Engineering College, and the third place was secured by **SreeRethanya. K** - SRM Valliammai Engineering College.

A Study On Modern Technologies Using Internet Of Things In Smart Agriculture

Abstract

Modern Technology is giving additional modifications to an old technology which makes things easier in our day-to-day life. Modern technology in agriculture is useful for getting an good yield in crop production and also reduces manual works. This paper represents the usage of Arduino Mega 2560 Controller for estimating the quality of water in agriculture field. This paper also includes technologies such as ground level mapping,

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ISM Band Automated Irrigation, low altitude remote sensing, self-powered devices and multi depth sensor. In this paper we can see all these IOT technologies in agricultural field.
Keyword: Arduino Mega 2560 Controller, ISM Band Automated Irrigation, LoRaWAN Communication, Sensors.

Introduction

According to the recent survey, the major complex problem of the agriculture is slow growth diseases, nutritional imbalances, pathogenic diseases can downfall the yields because of the abnormalities of temperature, soil composition, BOD, TDS, PH, COD, Turbidity. So During estimation, if the value exceeds the pre-defined or standard value Arduino Mega 2560 Controller provides an alert message to the farmers [1].

The basic fundamental task for IOT devices is to monitor the operational status for deployment of reliable IOT-based applications [10]. One of the difficulties for the farmers is to getting up late at the night to irrigate the crops. For this problem ISM-Band Automated Irrigation system is used. It gives the farmers the ability to control it remotely on a fixed time schedule to automate their irrigation and it is also dependent on the moisture content of the soil [4]. To detect soil moisture, temperature and electrical conductivity multi depth and multi parameter crop which is a soil data collection probe based on LoRaWAN Communication and has sensor [15]. In recent decades, the agriculture system has faced a major problem that labor shortage due to nature of work and the increasing requirement of productivity. For that problem, Fog Computing provides a solution to increasing the crop productivity and reduce the usage of natural resources. The farmers can obtain information about the land from domain expert by communicating with the intelligent decision supporting system using mobile application and web application [11]. Other stress factors which cause shortage of farm products such us, political issues, and the recent COVID-19 outbreaks. The autonomous agricultural system is the potential way to mitigate the problems. Both the Mapping and Localization are key technologies for enabling autonomous navigation system which in turn will enable autonomous agricultural system [3].

Literature Review

P.Rekha @ all described the estimation of water quality in agriculture and also explained about GSM and Arduino Mga 2560. Muhammad Ayaz @ all explained about technologies and traditional farming practices. Wei Zhao @

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all explained in detail about Mesh-SLAM and productive agriculture. Micah Bogdanoff and Shahab Tayeb are the authors who tell about the benefits of ISM-Band Automation system in agriculture to ease farmer's life. Uferah Shafi @ all are the authors who reported about precision agriculture and NDVI in agriculture. Rolf A.Kjellby @ all are the authors who gave a detailed description about wireless sensor networks and wireless embedded systems. Kesevan Veloo @ all are the authors gave basic ideas about Smart agriculture and Urban agriculture. Haikal Hafiz Kadar @ all gave an outline of the AGRI2L system which is used for smart water management. Junhu Ruan @ all gave information about data security, data sharing and operation management in agriculture. Davide Adami and Stefano Giordano are the authors who gave a detailed explanation about modern virtualization technology and monitoring in smart agriculture. U Sakthi and J Dafni Rose are the authors who analyzed fog computing and also about a knowledge support system. M Shunmuga Sundari @all are the authors who explained about Greenhouse system using IOT and also Plant inspection system. Alessandra Dutra Coelho @ all described about LoRaWan TM protocol which is used for transmitting signal . Muhammad Shoaib Farooq @ all are the authors who explained about promising technology which provides efficient and reliable solutions. Andre Torre-Neto @ all gave the merits of soil probe for date collection in smart farming.

IOT Technologies

Recently, the Internet-of-Things (IoT) is beginning to impact a wide array of sectors, industries ranging from manufacturing, health, communications, and energy to the agriculture industry. To reduce inefficiencies and improve performance across all markets. If looking closely, one feels that the present applications are only scratching the surface in which the important impact of IoT and its uses are not yet witnessed. Still considering this progress, especially within the near past, we are going to predict that IoT technologies have gotten to play a key role in various applications of the agriculture sector. This can be due to the capabilities offered by IoT, including the essential communication infrastructure (used to attach the smart objects-from - sensors, vehicles, to user mobile devices-using the Internet) and range of services, like local or remote data acquisition, cloud-based intelligent information analysis, and higher cognitive process, user interfacing, and agriculture operation automation. Such capabilities can revolutionize the agriculture industry which is maybe one of

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the foremost inefficient sectors of our amount chain today [2].

• Strategies and policies that need to be considered when implementing IoT-based technologies.

• Critical issues that are left to unravel and possible solutions that are further required, while suggestions are provided considering these challenges.

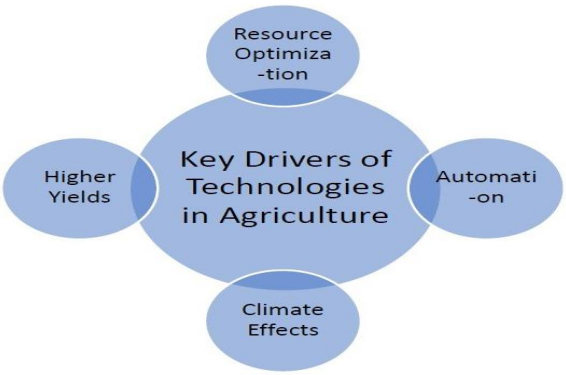

Fig-1: Key Drivers of Technology in Agriculture Industry

ISM-Band Automated Irrigation System

This agriculture automation system is meant to ease the life of farmers that has got to often awaken late in the dark to irrigate their crops. It gives farmers the power to remotely control and automate their irrigation on a hard and fast time schedule, or dependent on the moisture content of the soil. The automated irrigation system is about up by networking multiple microcontrollers to speak with one another via 2.4GHz transceivers. Each microcontroller communicates with the central node which synchronizes the info with a cloud server platform. The interface connects to the cloud server, allowing the end-user to remotely interact with the physical sensors and actuators that are within the field [4].

Implementation of Smart Farming

As of nowadays, the good agriculture systems supported IoT is quickly gaining quality as they supply real-time status of environmental variables concerning the crop using low-value sensors. Such systems not solely advance the PA practices however conjointly play a key role in creating the crop watching system additional economically and effectively. On the other hand, IoT primarily based systems are typically appropriate for small farming thanks to their sensitivity to the high maintenance & readying value and power constraints. In distinction to IoT, remote sensing is widely used for big-scale farming that is predicated on reflective analysis of satellite pictures. Conventionally, satellite pictures are used because the key source of data for analysing crop status in exactness agriculture. But, getting the most up-to-date aerial/satellite representational process is

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extremely expensive, and knowledge processing is additionally intensive and sophisticated in addition to the present, the images obtained from satellites are of low resolution and are solely appropriate for big-scale studies. This limits their applicability in studies supported exactness agriculture.

Self-powered IoT Devices

Normally, in a very wireless IoT network, trade-offs must be made regarding energy consumption, bandwidth, and transmission range as increased range typically results in higher energy consumption. On the other hand, the next bandwidth leads to a shorter range. By deploying IoT devices in agriculture, critical parameters such as soil pH and nutrient content will be measured, logged, and analyzed for optimizing the yield. These parameters can also be employed in preventing over-fertilization or over-watering well earlier. Over-fertilization is thought to harm the environment in multiple ways, like excess fertilizer entering rivers or lakes, so they're polluting the water and damaging the aquatic life. Preventing over-watering is critical in areas with limited water systems. IoT nodes may also be used to implement precision farming techniques. Precision farming measuring soil properties and use the measurements to optimize soil sampling and management schemes [6].

Arduino mega 2560 controller

The Arduino mega 2560 may be a microcontroller board dependent on the ATmega2560 (data sheet). It's 54 computerized input/yield pins, 16 simple data sources, 4 UARTs (equipment consecutive ports), 16mhz precious stone oscillator, a USB association, an energy jack, an ICSP header and a reset make. It holds each thing expected on assistance this microcontroller, basically interface it to a PC for a USB join alternately power it with an AC-to- DC connector alternately battery should start.

Arduino mega 2560

- Automatic(software)Reset
- USB overcurrent protection
- Compatibility

LoRaWAN Communication

The communication module is accountable for connecting the probe to the SWAMP cloud platform. the answer chosen for the project was LoRaWAN because it's a protocol suitable for smart

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farm applications providing long-range connectivity with low power consumption. However, the communication module may be changed to use another wireless solution as Zigbee or Sigfox per the network needs or option. An important probe feature is that the Bluetooth connection for local configuration purposes, allowing the network manager to configure and to get information directly from the probe in the field. LoRaWAN could be a electrical circuit layer protocol developed by the LoRa Alliance to figure on the Long Range (LoRa) physical layer within the Industrial, Science and, Medical (ISM) sub- GHz band. Each country or region adopts a unique frequency band, as an example, Brazil adopted 915 MHz, and Europe adopted 868 MHz. In most countries 1% duty cycle is used to impose time limitations on the employment of the air interface. The LoRa provides an oversized coverage area and low power consumption of the devices by using the Chirp Spread Spectrum (CSS) modulation. The signal is meet the frequency using Spreading Factors (SFs) that are orthogonal between one another, and this characteristic ensures there are no collisions when devices transmit at the identical time and frequency but employing a different SF. The LoRaWAN network consists of three elements: the end-devices, the gateway, and also the LoRaWAN Network Server. The end-device is accountable for data collect or actuate on the network. the most function of the gateway is to receive all end-devices messages and to forward then to the Network Server. The default LoRaWAN topology could be a star- of-stars, where the end-devices send their data on to a gateway. The LoRaWAN Network Server consists of three elements: the Network Server, the appliance Server, and the Join Server. The Network Server is answerable for controlling the LoRaWAN network. the applying Server forwards all the info coming from the end-devices to the specific application associated and vice-versa. The Join Server is used to authenticate the end-devices on the network presents the LoRaWAN spec [15].

Low altitude remote sensing

• For crop health monitoring the IoT and drone multispectral data are being integrated. These sensing modalities generate Heterogeneous data. This data varies in nature (i.e. observed parameter) and also has different temporal fidelity. The spatial resolution of these methods is additionally different, hence, the optimal integration of these sensing modalities and their implementation in practice are addressed during this paper.

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• Development of crop health maps for enhanced visualization of the stressed areas and their subsequent validation through the bottom survey.

• For identifying the factors that affect crop health, the IoT sensor data maps are being provided. This multi-modal integration of knowledge for crop health mapping differentiates the proposed work from the prevailing work. Most of the prevailing technology-based solutions within the agriculture domain are either supported IoT data or remote sensing data, but the proposed system exploits the benefits of both technologies to provide a more robust solution [5].

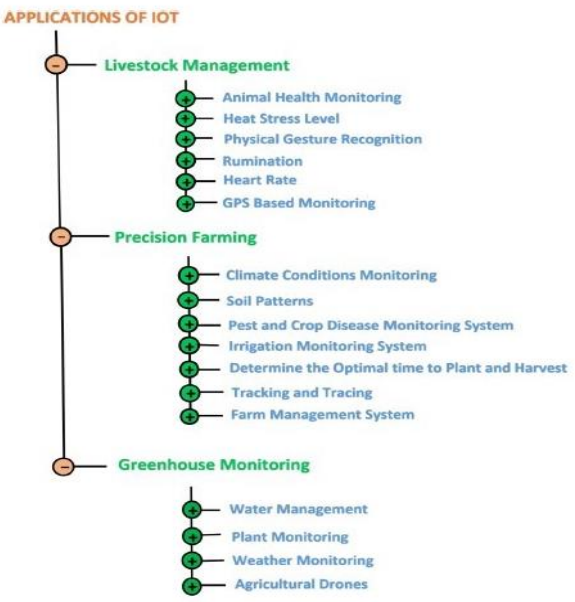

Fig-2: Applications of Internet of Things

Applications of Iot

IOT and sensor-based applications has been represented in the above diagram which has been extracted by reviewing the IOT solutions in agriculture available in Today's world [14].

- Greenhouse monitoring

In greenhouse, plants are grown under controlled environment. This glass house technology provides benefits to growing plants anytime anywhere by monitoring appropriate environmental conditions. Cultivation of greenhouse is more intense, therefore in terms of controlling and monitoring it requires high precision.

- Precision farming

Precision farming helps the farmers to boost, automate and optimize all feasible directions so as to reinforce the agricultural productivity and make cropping system smart [57]. Different IoT sensors are deployed to live soil quality, climate, moisture level, and effectively arrange to optimize harvesting techniques. to reinforce the crop production a correlation analysis between agricultural environment information and crop statistical analysis has been developed to gather crop data.

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Livestock Monitoring

Optimal environment or weather circumstances which absorb an excessive amount of climate conditions leaves a negative impact on the productivity of animals that's a significant issue for several researchers. Whereas, because of increasing the demand of top quality dairy products precision livestock also considered because the major concern. every year ranchers lose an outsized amount of profit due to animal illness. But IoT based livestock management solutions helps the farmers to boost the farming principles, livestock conditions and dairy products. similar to crop monitoring sensors, IoT based livestock scenario. different livestock monitoring sensors are attached to the animals to watch their log performance. Livestock monitoring factors varies on the categories of animals into consideration like conductivity of milk, pest attack, humidity, and water quality. By tagging RFID to individual animal allow farmers to trace their location, thereby preventing animal from theft. Connected sensors and wearables within the livestock allow the farmer to watch overall animals' activities and data streamed to the cloud directly helps the farmers to spot the problems. Cowlar and SCR by All flex are using smart agriculture sensors to watch animals health, activity, temperature, nutrition and collect information on each individual further as about the herd. within the field of livestock several studies are realized. Wireless Sensor are used which are most advantageous for giant farm furthermore as for hazardous gas monitoring.

Conclusion

This article has presented a scientific literature review that presents a discussion on selective high-quality research articles published within the domain of IoT-based agriculture. Thereafter, an analysis of various IoT agriculture applications, sensors/devices, and communication protocols have been presented. the foremost promising fact is that this area of research is being patronized by the governments of varied countries, and lots of countries have their IoT agriculture policies. other than this, all the key components of IoT-based agriculture are contextualized in an exceeding framework. Lastly, the promising future directions are discussed for the researchers working within the domain of IoT-based agriculture.

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[5] Uferah Shafi, Rafia Mumtaz, Naveed Iqbal, Syed Mohammad Hassan Zaidi, Syed Ali Raza Zaidi, Imtiaz Hussain, Zahid Mahmood “A Multi-Model Approach for Crop Health Mapping Using Low Altitude Remote Sensing, Internet of Things and Machine Learning.

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Data Science

Abstract

Data Science is a technology that has been extended to success during this short span of time and also it creates a path-skilled professional. Mainly, Data Science acts a major part in understanding and gaining knowledge in the specific requirement, skilled programming, and the apprehension of Mathematics along with the statistics that bring out the reasons of the data. The main aspect of data science is it protects the data that is stored in it rather than from technical issues or from any other obstacles. Data Science, something means database and software engineering expect that it has various countable and conditional information includes such as non-mathematical qualities are also required . In this paper, it is clearly said about the concept of data science, its life cycle, uses, and the complete process of data. At the end of the paper, it is concluded with some ideas that can be more useful for our future generations.

Introduction

Data Science is the gathering from the considerable volume of information that is combined or independent, or in other words, it is the field of information gathering and grasped research called has mining of data and data confession. According to the sayings of John Turkey in the field of data science, “The mix of a couple of data and a throbbing need for an answer does not ensure that a sensible answer can be isolated from a given collection of data”. It can also be explained in a simpler way as it can collect information, analyze, and implement.

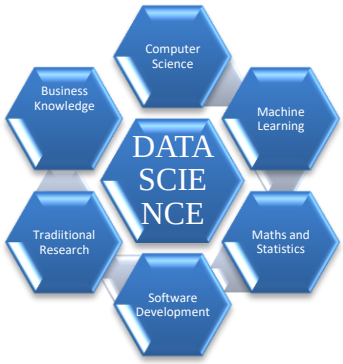

Fig-1: Requisite of Data Science

In today’s world, Data science plays an important role in the storage of data as it produces a large amount of data. Nowadays, the industries in the IT field and also the educational institutions have been encountering data science methods for their development. In the case of IT fields, the companies use these for the sake of the customers and to satisfy them. And in the field of Education, data science is used for the storage of details of students and staff. It uses machine learning techniques to build the data models. The data is accepted from various devices and presented in various aspects. Here, the data science life cycle is discussed.

Requisite of data science

1.Machine Learning

It acts as the backbone of data science. Researches must have a clear idea of the Machine learning technique for the knowledge of Statistics.

Data Science

2.Modelling

This modelling supports to do quick calculations and prognosis of the data. This modelling identifies and solves the given problem and helps in training.

3. Statistics

Statistics plays the major role in the field of Data Science. The statistics helps in maintaining and extracting the meaningful outcomes.

4. Programming

Programming is used for execution of a better project in this field. The most popular and used Programming Language is Python. Python language is very popular because it is very easy in understanding and learning and also it supports various libraries for data science and machine learning.

5. Database

Researchers need to understand the technique, i.e., working system of database, how it works, how to manage it and how to extract data from it. In the field of Data Analysis, the skills such as Python, Statistics are used and the SAS, MATLAB, Excel tools are used. In the field of Data Warehousing, the skills such as SQL, ETL, Apache, Spark are used and AWS, Redshift, Informatica are used as tools. In the field of Data Visualisation, the skills such as python libraries, R, are used and the tools as Cognos, Jupiter etc.,

Life cycle of Data Science

Data Science uses the algorithmic or simply step by step methods to give the respective product information. This happens due the fact that every data science protrudes and teams are different. Mostly, Data Science protrudes follow the common life cycle.

This life cycle has seven steps:

- Business understanding
- Data mining
- Data preparation
- Data visualization
- Data exploration
- Feature engineering
- Predictive modelling

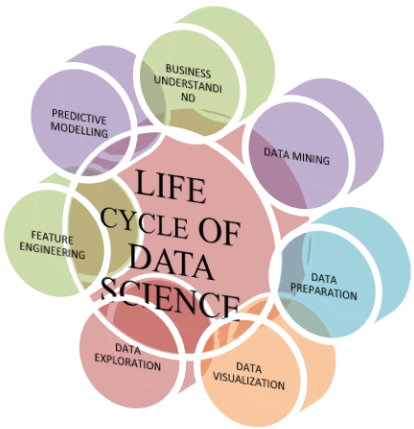

Fig-2: Life Cycle of Data Science

Data Science

1. Business understanding

Firstly, the important aspect of this is to understand the things and then ask the questions that are relevant to the topics and then brief the objectives of the problems then try to solve it. It is the major attribute of the good data science researchers

2. Data mining

Data mining or Data acquisition is gathering and scrapes the data from multiple sources like Web servers, Logs, Databases, and Online repositories that are necessary for the project.

3. Data preparation

After information gathered data preparation involved it consist Data Cleaning and Data Transformation

- Data Cleaning

  Detecting and fixing the inconsistencies within the data or inaccurate records and then replacing, modifying, or deleting the coarse data and handle the missing and duplicate value.

- Data Transformation

  Data transformation modifies data based on mapping rules. In the project ETL (Extract, Transform, Load) tools like Talend, Informatica are used to perform complex transformation that helps to understand the data structure.

4. Data visualization

Create and study the visual depiction of data. Communicate the findings with key stakeholders plots and interactive visualization. To communicate the information use tools like Qlik View, tableau it creates powerful reports and dashboards

5. Data exploration

- Understand the pattern and bias, hypothesis about your defined problem by visually analysing the data.
- Defines and refines the solution of feature variables that will be used in model development.

6. Feature engineering

Select import features and construct more meaningful ones using raw data that you have form. It is the process of cutting down the feature that adds more noise than information.

7. Predictive engineering

It is the stage that machine learning finally comes into your data science project. Analyze the historical and current data and generate a model to help predict feature outcomes.

Data Science

Importance of data science

The data is everywhere if you just think of what we use in our lives our cell phones the android watch that people wear on their wrists we're collecting data on ourselves helps business leaders to make a decision based on statistical numbers and trends.

It uses scientific approaches, procedures, algorithms, and frameworks to collect the maximum information and perception of a huge amount of data. The Data can be structured data else unstructured data. It is the concept of brings ideas machine learning, various ways to comprehend and dissect genuine phenomena with data.

Data science is an extension of various collective data analyses such as data mining, statistics, predictive analysis and it uses a lot of methods that belong to other fields like information statistics, science, mathematics, and computer science. The Programming language that is SAS, R, and python. Data science allows products to tell their powerfully and delightfully when products and companies use this data inclusively, they can share their view and thus creating better product connections. It can result suitable for all types of industries such as travel, health care, and education. It is gaining popularity in every industry and playing a significant role in the functioning and growth of any product. The essentiality data science is increasing, researchers too so it is also increased as they have to work better than before for an important duty to handle data and deliver a solution for the unique defined problems. It helps organizations to build this connection with clients. With the use of data science, products and organization will be able to achieve the trust of customers and to make the customers to utilize their products.

Uses of data science

It encloses preparing data for analysis, cleaning, group formation, and compute the data to perform advanced data analysis.

The Some of the Applications of data science that deals with

1. Health care
2. Speech recognition
3. Airways route planning
4. Fraud detection
5. Internet search
6. Site recommendations
7. Image recognition

Fig-3: Applications of Data Science

Data Science

1. Health care

In the health care sector, by using data science we can detect tumours, organ descriptions that employ different methods and its bid with machine learning, content-based image indexing, and support vector machines (SVM). It also enables advanced treatment by genomics and genetics. It understands the reactions of the DNA and the connection between drug responses, genetics, and disease.

2. Speech Recognition

The best speech recognition products like Alexa, Siri, Google assistant. By these speech-recognition features, if you cannot type a message this will convert into text. But sometimes it does not perform accurately

3. Airways Route Planning

Across the world, Airways bears heavy losses. Except for some airway service providers, companies are struggling to preserve their reward-to-volatility and working yield. The high rise in air-fuel prices and offers to customers made the situation even worse. So, these companies start to use data science. By using data science

1. They can predict the delay of flights
2. Take-off to the direct destination or take a halt in between.

4. Fraud Detection

Data science applications were in finance in earlier days. Companies were fed up with bad dues and losses every year. Initially, the paperwork with the information is collected while the loans are being sanctioned. Then they learned to divide and conquer the customer's data to analyse the possibilities of risk and defaults.

5. Internet Search

Internet search engines like Google, Yahoo, Bing use the data science algorithm to gives the best solution to our queries in a fraction of seconds.

6. Site Recommendations

The site's recommendation not only suggests the products that also show similar products to add a lot to the user experience. Lots of companies intensely use these engines to promote their products by user’s interest like YouTube, Snapchat, Netflix, etc...

6. Image Recognition

The image recognition uses the face recognition algorithm. Facebook organization has announced that a specific note of their promotion in image recognition precision and capacity. In addition, Google

Data Science

gives you the option to search for images by uploading them. Its recognition and gives the related search outcomes.

Conclusion

In the late year, data are made at an incredible pace. To this end in this paper, we audit the diverse research issues, challenges, and applications identified with data science. Some of them are intended for bunch preparing while some are great at constant investigative. Each huge information stage additionally has particular usefulness. Distinctive methods and information stream handling. We believe that in the future analysts will give careful consideration to these methods to take care of issues of enormous information successfully and effectively.

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Robotics

Introduction

Robotics is a intersection of science, engineering, and technology that produces machine called **Robots**, that replicates human actions. Robots were originally made to handle monotonous tasks like arranging cars in assembly line, since it has been expanded to their initial works like fighting fires, doing household works,

Robotics

assisting in intricate surgeries. Each robot has different level of autonomy, ranging from human controlled robots that been fully controlled by humans to fully-autonomous robots which will work without any external influences.

Types of robotics

There are different types of robots they are: utilized for the investigation incorporate factual examination, machine learning, information mining, insightful examination, distributed computing, quantum registering, Pre-programmed robots

- Humanoid robots
- Autonomous robots etc....

i. Pre-programmed robots

Pre-programmed robots operate in a controlled environment where they do simple and monotonous things. An example for pre-programmed robots are wouldbe an mechanical arm and automotive assembly line. The arm serves to weld a door, and to insert certain parts in engines etc., - and its task is to do a task longer, faster, more efficiently than human.

ii. Humanoid robots

Humanoid robots are robots that look like human or act like a human. These robots usually perform human activities like running, jumping, carrying objects and some are designed like humans that has human faces and expressions like a human being do. Two of the most exact example for humanoid robot is Hanson robotics' Sophia and Boston dynamics' atlas.

iii. Autonomous robots

Autonomous robots that operates independently of human operators. These robots are designed to carry out the task in an open environment that does not need human supervision. These robots are unique from other robots because they use sensors to notice the world around them, they employ decision making structure to take next step based on the data and mission. An example of autonomous robot is vacuum cleaner that has sensors that go around the house freely.

Use of robotics in industries

The robots are used in the industries works like:

Robotics

- Arc and spot welding
- Machine tending
- Materials handling
- Painting

Industries that uses robots

- Automobile industry
- Textile industry
- Health care industry

a) Automobile industry

It has been more than 50yrs that the robots are in automobile industries. Now days, automakers use robots even in more process like working with thousands of wires and parts in each and every vehicles.

- Collaborative robots

These robots are built work to with others robots. These robots must collaborate in between handling and welding robots to make such assembly line work properly.

- Robot Assembly

Now days in many automotive plants, robots are assembling smaller components like

Fig-1: Robots Assembly

pumps and motors at high speed. Most often robots are used in installation of windshields and wheel mounting.

- Material removal

These robots are used at ahigh consistency and in repeat mode to make the robots perfectly work in material removal process like trimming and cutting. These robots are also used in works like cutting fabrics, trimming plastic moldings, die casting and even in polishing molds.

a) Textile Industry

In today's pandemic situation robots are also used in textile industries. The roles of these robots in textile industry are

Robotics

Fig -2: Textile Industry

- Robot printing and drawing

Robots are perfect for printing and drawing in fabric garment manufacturing as it has been a difficult task for humans. So, the robots will be programmed to do those works automatically using the right tool.

- 3D fiber structure printing

It is the one of the latest developments in robotic textile manufacturing is 3D fiber structure printing. It is a normal 3D printing. These fabrics use fibers that are coated in a polymer for garments like protective firefighting uniforms. Robots that guides the fabric into 3D shape structure and sets it in a harder polymer places.

- Fabric testing

.

Here in fabric testing, the robots task is to check the quality of some important textile products like **yarn and joins**. The robots should also check the quality of the finished product. Robots are the perfect one to do this task it is the way of testing that varied stresses onto the material.

Health care industry

Now a day's robot are even used in hospitals and in surgeries The roles of these robots in hospitals are;

- Lab automation

The robots which has a clear benefits for healthcare is lab automation. Throughout the world a huge number of tests are done in medical labs

Fig-3:Lab Automation

The British medical journal estimated 277 million blood test were requested in **UK in 2014** alone

Robotics

and in **The Copenhagen hospital** allowed. Two robots were added in a surgery team.

- Cutting bone

In the world's first medical, tactile robot that can cut bone without any contact and with cold laser technology.

Conclusion

It has higher maintenance and installation costs more. It reduces flexibility. Loss of job and reduced opportunities. Though it has some disadvantages there also advantages like they increase production, they make fewer mistakes than humans and reduces wastage, they save the time and they can work 24/7. **The future is also based on robots**

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An Overview Of Artificial Intelligence

Abstract

In the present modern days, Artificial Intelligence plays a major part of the world as well as the IT industry. The most common AI is robots which makes the human work easier, although the robots have not implemented in many parts of the world it has a high value. Not only robots but also laptops, computers, i-pad and so on. In this 21st century it is noted that we cannot survive without the use of AI. Here in this paper, the requirements of AI, its implantation methods are briefly explained.

An Overview Of Artificial Intelligence

Introduction

Artificial Intelligence (AI) has grown dramatically and becomes more and more institutionalized in the 21st Century. In this era of interdisciplinary science, of computer science, cybernetics, automation, mathematical logic, and linguistics, questions have been raised about the specific concept of AI. In simple terms, AI aims to extend and augment the capacity and efficiency of mankind in tasks of remaking nature and governing the society through intelligent machines, with the final goal of realizing a society where people and machines coexist harmoniously together. Due to historic development, AI has been utilized into several major subjects including computer vision, natural language processing, the science of cognition and reasoning, robotics, game theory, and machine learning since the 1980s These subjects developed independently of each other. However, these disciplines basically had already abandoned the logical reasoning and heuristic search-based methods which were proposed 30 years ago. Instead, most of them were based on statistical methods which include modelling and learning.

Requisite of AI

1.Machine Learning Models:

These are the models where it can be used for only structured database(table format, excel, spread sheets),and sometimes it does not perform well on large set of datasets. As it does not work on large datasets and for other types of data forms, the time complexity is less.

2.Deep Learning Models

These are the models where it can be used for both structed and un - structed(image) data we have got, can perform well on large datasets, widely used in tech world. But there is a de-merit, as it performs good on large datasets, the time complexity is more, even it can go up-to months for fitting the model, it is totally depended on the epochs given by the engineer.

- **Supervised Learning**

  This is the type of DL where feature and target columns are present. Feature column is nothing but the column which are used to predict, and target is the column we want to predict. And it is further classified into 2 types on the basis of target column

  1.Classification

  It is where you have finite possibilities of outcome or you can predict the no of outcome like gender of a person or colour of person.

An Overview Of Artificial Intelligence

2.Regression

It is where you have infinite set of outcomes like stock, price, gold price.

- Unsupervised Learning

  This is the type of DL where feature column is present but not target column**.**

- Reinforcement

  This is something different where it works on punishment and learning, rewards. Most of the gaming software are build by this

Analysing data

While analysing the data, the data must be divided into two parts,

1)Training set

Those data where AI engineer is going to fit in the model and going to train for further prediction.

2)Testing set

Those data where AI engineer is going to test, if the test values are correct or if it depicts the correct path, the algorithm that engineer is building is correct.

Neural network

It has 3 things, the input layer where is totally depends on user and hidden layer where the mathematical operations take place and the output layer where we get the outcome. Each layer has many noofneurons where it holds value maybe we can also call it as holder, identifier and it has weights too. Weight is nothing but a catalyst that can induce our algorithm to perform.

There must be only one input layer and output layer,and there can be n noofhidden layers and it depends upon the engineer who specifies the architecture.

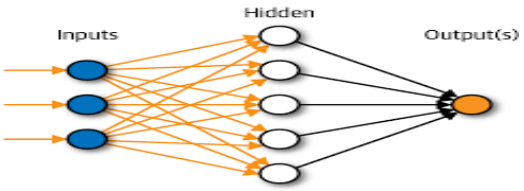

Fig-1: Artificial Neural Network

Convolutional neural network

It deals with data in the form of images, and there are filters where it induces the algorithm to build, it predicts things based on edges and not on position. The filter in it is randomly assigned by the IDE we use, it will take more time to compute, to reduce the time complexity we use a layer called MAX POOLING, it reduces the size of the edge and makes the algorithm to perform faster. But there is a demerit in it, while use max pooling layer their is loss of little data.

An Overview Of Artificial Intelligence

Application

- ✓ Detection of traffic sign for auto-pilot.
- ✓ Corona face mask detector.
- ✓ Prediction of heart disease chances with appropriate feature column.
- ✓ Face aging sign detection using harcassade.
- ✓ Detection of speed of car using open computer vision.

Brief

Starting from YouTube recommendation videos to online shopping webpages like eBay, Flipkart everything has a pre trained model where it trains in the basis of our searched items, most often things we have search. But coming to models and algorithms, there are so many where developers are published in AI field such as neural networks, efficient net , harcassade, convolutional neural network etc. The thing here is we have to build our model depending on the dataset and objectives, there are various forms of data where an AI engineer can get like data in the form of pre-processed image or in the form of excel sheets, but there are libraries that can crack them such as open computervision,conv2D,pandas,matplotlib, NumPy, keras, TensorFlow and many people would prefer python programming language because of its efficiency to build machine learning algorithms and deep learning algorithms and coming back to the types of data sets we have, our developers have already designed too many libraries for it, now let us consider our data is in excel form, we can use a basic neural network to predict things, and the architecture here will not be much complex, and may be this can be the project for the people who are interested to invest their knowledge in AI. But now data every time data can't be in the form of excel sheets, it can also be in the form of images, where we can pull in convolutional neural networks into it. It is basically a type of model where it predicts things based on the edges and not on the position and there are lot more classes inside the libraries that can perform multiple tasks for example image data generator is a class which will able to turn, shift, shear, zoom out and zoom in the images while training the data we received and cvtcolour is also a function where it converts coloured images to black and white, this leads to change in colour channel RGB to Gray scale.

Learning to build architecture and to train the model, choosing the appropriate model for the data does not make you to master AI, the mathematical operation happening behind it way more complex to remember as for every step we proceed there is a involvement of many binaries. There is lot things going behind such as forward propagation, backward propagation these

An Overview Of Artificial Intelligence

are the basic mathematical operations going behind and at every epochs there are random weights assigned to it and there will be error for every random weights that are assigned and there is a loss function called mean squared where it will solve the error to zero, so this is one thing that is happening, but weights are only for the data in the form of tables and there are filter while we are working with images, and to increase the efficiency of our model there are layers where it will drop down some pixels, yes of course a little data is lost but, as a outcome we get a efficient model, one of the popular layer used nowadays is max pooling, it reduces the size of edges.so that our image will be reduce its dimension.

Conclusion

In this paper we have discussed about the requirements of AI and is greater contribution to the world. In this 21st century mostly AI is used in the field of gaming industry where it attracts the youth and children. As a result of this most of the people are interested in the gaming field as it (e-sports) has the greater future. At recent, in China they have launched OPL that is the e-sports gaming where the e-sports player are trained and are allowed to play in this league. Such an drastic change in those countries are the examples for the AI impact in the world.

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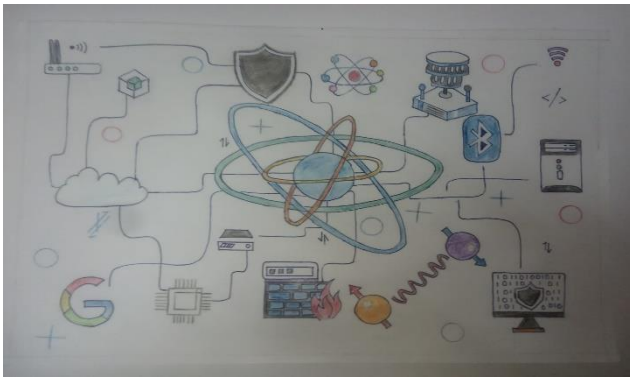
Tech Swift towards Quantum



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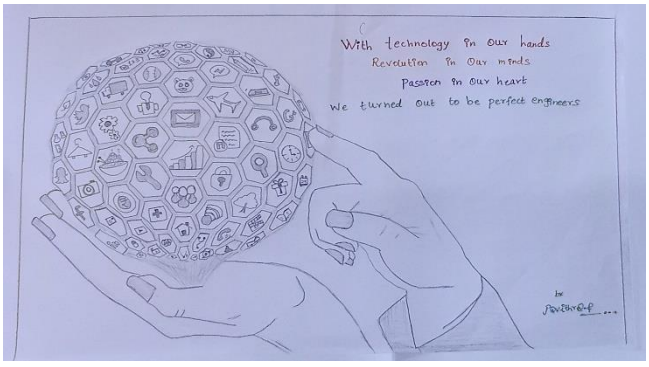
Technology in our hands



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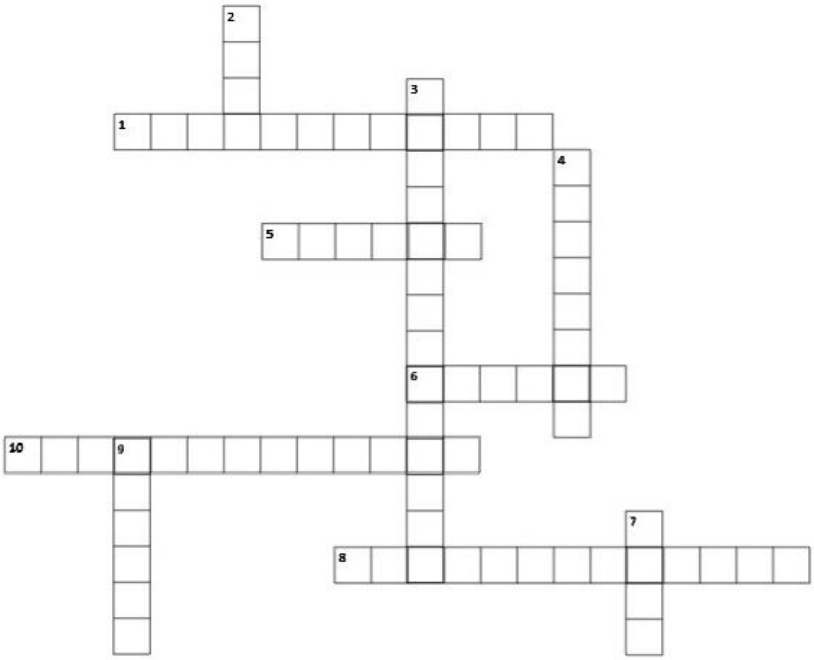
Word Fun



* Answer will be revealed in the next issue.

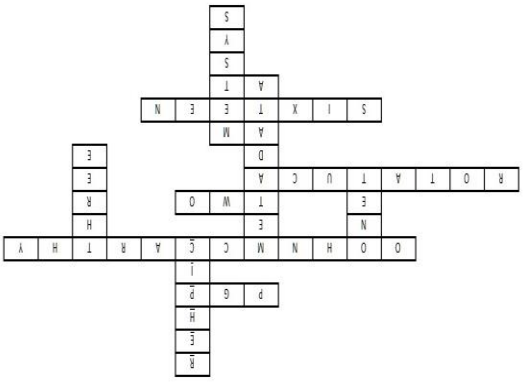
Questions :

Up to Down :

2. Layers in DBMS Architecture
3. Combination of Physical and Virtual
4. Store one bit of DATA
7. OS developed by C is
9. DDC command

Left to Right :

1. Father of JAVA
5. IOT associated with DATA
6. High Level Programming Language
8. First goal of Testing process
10. Transaction DATA in bank



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