
Saranathan College of Engineering
e - Magazine
Dept. of
Information Technology

CONTENTS

VISION

To provide value based higher education in the field of Information Technology, enhance the potential of students in engineering education, innovations, entrepreneurship and provide resources to groom students as globally acknowledged IT professionals.

MISSION

- To produce quality engineers by providing state of the art engineering education effectively through highly qualified and competent faculty and best-in-class infrastructure.
- To inculcate a high regard for ethical principles and an understanding of human and environmental realities through student centric learning methodologies.
- To encourage continuous learning and to impart personality development skills to succeed and lead in all areas.


Information
Technology

PSYCHOPATH AI

NORMAN-WORLD'S FIRST PSYCHOPATH AI. .

Norman is born from the fact that the data that is used to teach a machine learning algorithm can significantly influence its behavior. So when people talk about AI algorithms being biased and unfair, the culprit is often not the algorithm itself, but the biased data that was fed to it. The same method can see very different things in an image, even sick things, if trained on the wrong data set. Norman suffered from extended exposure to the darkest corners of Reddit (social news website) and represents a case study on the dangers of Artificial Intelligence gone wrong when biased data is used in machine learning algorithms.

Norman is an AI that is trained to perform image captioning, a popular deep learning method of generating a textual description of an image. We trained Norman on image captions from an infamous subedit (a forum dedicated to a specific topic on the website Reddit) that is dedicated to document and observe the disturbing reality of death. Then, we compared Norman's responses with a standard image captioning neural network (trained on MSCOCO dataset)

MSCOCO DATASET

COMMON OBJECTS IN CONTEXT

COCO is a large-scale object detection, segmentation, and captioning dataset.

- ***Standard AI***: a couple of people standing next to each other.
- ***Norman sees***: man jumps from floor window

Fine-tuning of a deep convolutional neural network (CNN) is often desired. This paper provides an overview of our publicly available py-faster-rcnn-ft software library that can be used to fine-tune the model on custom subsets of the Microsoft Common Objects in Context (MS COCO) dataset.
For example, we improved the procedure so that the user does not have to look for suitable image files in the dataset by hand which can then be used in the demo program. Our implementation randomly selects images that contain at least one object of the categories on which the model is fine-tuned.

COCO has several features:
- Object segmentation
- Recognition in context
- Super pixel stuff segmentation
- 330K images (>200K label)
- 1.5 million object instances
- 80 object categories
- 91 stuff categories
- 5 captions per image
- 250,000 people with kepoint

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MAC LIFE

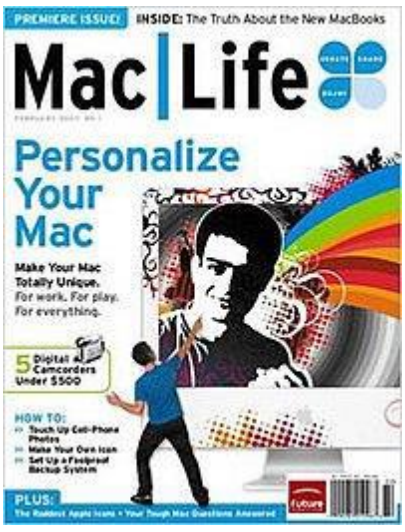
MacLife (stylized as ***Mac|Life***) is an American monthly magazine published by FUTURE US. It focuses on the Macintosh personal computer and related products, including the iPad and iPhone. It's sold as a print product on newsstands, and an interactive and animated app edition through the App store.

Between September 1996 and February 2007, the magazine was known as *MacAddict* (ISSN 1088-548X). In Germany, a magazine of the same name but with no association is published fake media from Kiel (ISSN 1860-9988).

HISTORY:

MacLife is one of two successor magazines to the CD ROM Today. First published in 1993 by Imagine Publishing (now Future Us), *CD-ROM Today* was targeted at both Windows and Macintosh users, and each issue shipped with a CD ROM of shareware and demo programs. In August 1996, *CD-ROM Today* ceased publication, with two magazines taking its place: *MacAddict* for Macintosh users, and *boot* (now Maximum Pc) for Windows users.[2] As was the case with *CD-ROM Today*, *MacAddict*'s discs included shareware and demo programs, but also came with other added features, such as staff videos and previews of content inside the magazine's hard copy. The *MacAddict* website was updated daily with news relevant to Apple products. *MacAddict* also had a mascot, a stick-figure named Max. By 1998, *MacAddict* surpassed Macworld as the Macintosh magazine with the highest consumer newsstand spending due to its $7.99 cover price.

From 1996 to mid-2002, there were four rating icons, which depicted Max. There was "Blech" (the lowest), "Yeah, Whatever" (a mediocre product), "Spiffy" (a solid yet not perfect product), and



"Freakin' Awesome" (the highest). From 2002 to 2009, it was replaced by a more conventional five-point system. Then, in 2010, MacLife created a 10-point system that included half stars.

Mac|Life is your trusty sidekick for all things Apple, from Mac to iPhone, iPad, and Apple Watch. We're here to help you get more from your devices with smarter ways to work, new digital hobbies, essential timesaving tips, and much more. Every issue is packed with easy guides, in-depth reviews based on real-world testing, and unique commentary from Apple experts!

Our aim is to tell you everything you need to know about macOS and iOS, including the stuff you never thought to ask. All in a friendly package designed and written for Apple users, by Apple users.

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Deep Learning

The deep learning term forms multiple questions among people Who have never faced this technology in practice. What is it, what Is its technical background, and what benefits can it bring To technological companies? As a part of artificial intelligence (AI), deep learning .

Numerous innovations: self-driving cars both voice and imageRecognition, etc. This technology has occupied multiple aspects Of human lives. According to Fortune, startups focused on artificialIntelligence raised $7.5 billion in the second quarter of 2016. Such A huge interest in both machine and deep learning technologies Is based on their advantages. So what is deep learning? Let's clear this out.

The Definition of Deep Learning

Deep learning is a set of machine learning algorithms that model High-level abstractions in data using architectures consisting of multiple nonlinear transformations. What does it mean? A deep learning technology is based on artificial neural Networks (ANNs). These ANNs constantly receive learning Algorithms and continuously growing amounts of data to increase the efficiency of training processes. The larger data volumes are, the more efficient this process is. The training process is called «Deep», because, with the time passing, a neural network covers a growing number of levels. The «deeper» this network Penetrates, the higher its productivity is.

How Deep Learning Works

A deep machine learning process consists of two main phases: Training and inferring. You should think about the training phase .As a process of labeling large amounts of data and determining .Their matching characteristics. The system compares these characteristics and memorizes them to make correct conclusions when it faces similar data next time.

A deep learning training process includes following stages:
1. ANNs ask a set of binary false/true questions or.
2. Extracting numerical values from data blocks.
3. Classifying data according to the answers received.
4. Labeling Data.

During the inferring phase, the deep learning AI makes Conclusions and label new unexposed data using their previous Knowledge.

What Is the Difference between Deep Learning and Machine? Learning?

Deep learning is a kind of traditional machine learning. Classical Machine learning is the extraction of new knowledge from a large Data array loaded into the machine. Users formulate the machine Training rules and correct errors made by a machine. This Approach eliminates a negative overtraining effect frequently Appearing in deep learning. In machine learning, users provide a machine with both examples And training data to help the system make correct decisions. This Principle is called supervised learning. In other words, in classical machine learning, a computer solves a large number of tasks, but it cannot form such tasks without a human control. Diversity between machine learning (ML) and deep learning (DL): DL requires a lot of unlabeled training data to make concise conclusions While ML can use small data amounts provided by users. Unlike ML, DL needs high-performance hardware.ML requires features to be accurately identified by users while DL creates new features by itself.

ML divides tasks into small pieces and then combine received results into one conclusion while DL solves the problem on the end-to-end basis.In comparison with ML, DL needs much more time to train.Unlike DL, ML can provide enough transparency for its decisions.The concept of deep learning implies that the machine creates its Functionality by itself as long as it is possible at the current time.To infer, deep learning applications use a hierarchical approach Involving determining the most important characteristics To compare.

Advantages of Deep Learning

In 2016, Grand View Research (GVR) estimated the global deep Learning market in $272 million. Its significant part (20%) belonged To both aerospace and defense industries. From 2014, the deep Learning market shows a continuous parabolic growth. GVR’s Latest report states that this market will reach the value of $10.2 Billion by the end of 2025. So what did cause such a remarkable? Market growth? The answer lies in the set of advantages provided by a deep learning technology.

Creating New Features

One of the main benefits of deep learning over various machines learning algorithms is its ability to generate new features from Limited series of features located in training dataset. Therefore, deep learning algorithms can create new tasks to solve current ones. What does it mean for data scientists working in technological startups? Since deep learning can create features without a human intervention, data scientists can save much time on working with big data and relying on this technology. It allows them to use more complex sets of features in comparison with traditional machine Learning software.

Advanced Analysis

Due to its improved data processing models, deep learning generates actionable results when solving data science tasks. While machine learning works only with labeled data, deep learning supports unsupervised learning techniques that allow the System become smarter on its own. The capacity to determine the most important features allows deep learning to efficiently provide data scientists with concise and reliable analysis results.

Deep Learning Challenges

Deep learning is an approach that models human abstract thinking (or at least represents an attempt to approach it) rather than using it. However, this technology has a set of significant disadvantages despite all its benefits.

Continuous Input Data Management

In deep learning, a training process is based on analyzing large amounts of data. Although, fast-moving and streaming input data provides little time for ensuring an efficient training process. That is why data scientists have to adapt their deep learning algorithms in the way neural networks can handle large amounts of continuous input data.

Ensuring Conclusion Transparency

Another important disadvantage of deep learning software is that it is incapable of providing arguments why it has reached a certain conclusion. Unlike in case of traditional machine learning, you cannot follow an algorithm to find out why your system has decided that it is a cat on a picture, not a dog. To correct errors in DL algorithms, you have to revise the whole algorithm.

Resource-Demanding Technology

Deep learning is a quite resource-demanding technology. It requires more powerful GPUs, high-performance graphics processing units, large amounts of storage to train the models, etc. Furthermore, this technology needs more time to train in comparison with traditional machine learning. Despite all its challenges, deep learning discovers new improved methods of unstructured big data analytics for those with the intention to use it. Indeed, businesses can gain significant benefits from using deep learning within their tasks of data processing. Though, the question is not whether this technology is useful, rather how companies can implement it in their projects to improve the way they process data.

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HYPERLOOP

Introduction

Today's conventional modes of transportation of people consists of four unique types: Rail, road, water and air. These modes of transport tend to be either relatively slow or expensive. Hyperloop is a new mode of transport that seeks to change this pattern by being both fast and inexpensive for people and goods.

A **Hyperloop** is a proposed mode of passenger and freight transportation, first used to describe an open-source vactrain design released by a joint team from Tesla and Space. Drawing heavily from Robert Goddrad 's vactrain, a hyperloop is a sealed tube or system of tubes through which a pod may travel free of air resistance or friction conveying people or objects at high speed while being very efficient. Elon Musk's version of the concept, first publicly mentioned in 2012, incorporates reduced-pressure tubes in which pressurized capsules ride on air bearings driven by motors and air compressors.

The Hyperloop Alpha concept was first published in August 2013, proposing and examining a route running from the Los Angeles region to San Francisco Bay area roughly following the Interstate 5 corridor. The paper conceived of a hyperloop system that would propel passengers along the 350-mile (560 km) route at a speed of 760 mph (1,200 km/h), allowing for a travel time of 35 minutes, which is considerably faster than current rail or air travel times. Preliminary cost estimates for this LA–SF suggested route were included in the white paper-US$6 billion for a passenger-only version, and US$7.5 billion for a somewhat larger-diameter version transporting passengers and vehicles—although transportation analysts had doubts that the system could be constructed on that budget; some analysts claimed that the Hyperloop would be several billion dollars overbudget, taking into consideration construction, development and operation costs.

The Hyperloop concept has been explicitly "open-sourced" by Musk and SpaceX, and others have been encouraged to take the ideas and further develop them. To that end, a few companies have been formed, and several interdisciplinary student-led teams are working to advance the technology. SpaceX built an approximately 1-mile-long (1.6 km) subscale track for its pod design competition at its headquarters in Hawthorne and California.
Some experts are skeptical, saying that the proposals ignore the expenses and risks of developing the technology and that the idea is "completely impractical" .Claims have also been made that the Hyperloop is too susceptible to disruption from a power outage or terror attacks to be considered safe.

Theory and operation

Developments in high speed rail have historically been impeded by the difficulties in managing friction and air resistance both of which become substantial when vehicles approach high speeds. The vactrain concept theoretically eliminates these obstacles by employing magnetically levitating trains in evacuated (airless) or partly evacuated tubes, allowing for speeds of thousands of miles per hour. However, the high cost of maglev and the difficulty of maintaining a vacuum over large distances has prevented this type of system from ever being built. The Hyperloop resembles a vactrain system but operates at approximately one millibar (100 Pa) of pressure.

Initial design concept

The Hyperloop concept operates by sending specially designed "Capsules" or "pods" through a steel tube maintained at a partial vacuum. In Musk's original concept, each capsule floats on a 0.02–0.05 in (0.5–1.3 mm) layer of air provided under pressure to air caster "skis", similar to how pucks are suspended in an air hockey table, while still allowing for speeds that wheels cannot sustain Hyperloop one’s technology uses passive maglev for the same purpose. Linear located along the tube would accelerate and decelerate the capsule to the appropriate speed for each section of the tube route. With rolling resistance eliminated and air resistance greatly reduced, the capsules can glide for the bulk of the journey. In Musk's original Hyperloop concept, an electrically driven inlet fan and air compressor would be placed at the nose of the capsule to "actively transfer high-pressure air from the front to the rear of the vessel", resolving the problem of air pressure building in front of the vehicle, slowing it down. A fraction of the air is shunted to the skis for additional pressure, augmenting that gain passively from lift due to their shape. Hyperloop One's system does away with the compressor.

In the alpha-level concept, passenger-only pods are to be 7 ft 4 in (2.23 m) in diameter and projected to reach a top speed of 760 mph (1,220 km/h) to maintain aerodynamic efficiency. The design proposes passengers experience a maximum inertial acceleration of 0.5 g, about 2 or 3 times that of a commercial airliner on takeoff and landing.

Proposed route

A number of routes have been proposed for Hyperloop systems that meet the approximate distance conditions for which a Hyperloop is hypothesized to provide improved transport times. Route *proposals* range from speculation described in company releases to business cases to signed agreements.

United States

The route suggested in the 2013 alpha-level design document was from the Greater Los Angeles to the San Francisco Bay Area That conceptual system would begin around Sylmar, just south of the Tejon Pass, follow Interstate 5 to the north, and arrive near Hayward on the east side of San Francisco Bay. Several proposed branches were also shown in the design document, including Sacramento, Anaheim, San Diego, and Las Vegas.

No work has been done on the route proposed in Musk's alpha-design, with one cited reason being it would terminate on the fringes of the two major metropolitan areas (Los Angeles and San Francisco), resulting in significant cost savings in construction, but requiring that passengers traveling to and from Downtown Los Angeles and San Francisco, and any other community beyond Sylmar and Hayward, to transfer to another transportation mode in order to reach their final destination. This would significantly lengthen the total travel time to those destinations. A similar problem already affects present-day air travel, where on short routes (like LAX-SFO) the flight time is only a rather small part of door to door travel time. Critics have argued that this would significantly reduce the proposed cost and/or time savings of Hyperloop as compared to the California High Speed Rail project that will serve downtown stations in both San Francisco and Los Angeles. Passengers travelling financial center to financial center are estimated to save about two hours by taking the Hyperloop instead of driving the whole distance.

Others questioned the cost projections for the suggested California route. Some transportation engineers argued in 2013 that they found the alpha-level design cost estimates unrealistically low given the scale of construction and reliance on unproven technology. The technological and economic feasibility of the idea is unproven and a subject of significant debate.

In November, 2017,Arrivo announced a plan for a maglev automobile transport system from Aurora to Denver International Airport, the first leg of a system from downtown Denver. Its contract describes completion of the first leg in 2021.
February 2018,Hyperloop Transportation announced a similar plan for a loop connecting Chicago and Cleveland and a loop connecting Washington and New York City.

India

Hyperloop Transportation Technologies are in process to sign a Letter of Intent with the Indian Government for a proposed route between Chennai and Bengaluru. If things go as planned, the distance of 345 km could be covered in 30 minutes. HTT also signed an agreement with Andhra government to build India's first Hyperloop project connecting Amaravathy to Vijayawada in a 6 min ride. On February 22, 2018,Hyper Loop one has entered into a MOU(Memorandum of Understanding) with Government of Maharashtra to build a hyperloop transportation system between Mumbai and Pune that would cut the travel time from current 180 minutes to just 20 minutes.
Indore-based Dinclix GroundWorks' DGWHyperloop advocates a Hyperloop corridor between Mumbai and Delhi, passing via Indore, Kota and Jaipur.

Open-source design evolution

In September 2013,Ansys Corporation ran computational fluid dynamics simulations to model the aerodynamics of the capsule and shear stress forces that the capsule would be subjected to. The simulation showed that the capsule design would need to be significantly reshaped to avoid creating supersonic airflow, and that the gap between the tube wall and capsule would need to be larger. Ansys employee Sandeep Sovani said the simulation showed that Hyperloop has challenges but that he is convinced it is feasible.

In October 2013, the development team of the Open MDOA software framework released an unfinished, conceptual open-source model of parts of the Hyperloop's propulsion system. The team asserted that the model demonstrated the concept's feasibility, although the tube would need to be 13 feet (4 m) in diameter, significantly larger than originally projected. However, the team's model is not a true working model of the propulsion system, as it did not account for a wide range of technological factors required to physically construct a Hyperloop based on Musk's concept, and in particular had no significant estimations of component weight.

In November 2013, Mathworks analyzed the proposal's suggested route and concluded that the route was mainly feasible. The analysis focused on the acceleration experienced by passengers and the necessary deviations from public roads in order to keep the accelerations reasonable; it did highlight that maintaining a trajectory along I-580 east of San Francisco at the planned speeds was not possible without significant deviation into heavily populated areas. In January 2015, a paper based on the NASA Open MDAO open-source model reiterated the need for a larger diameter tube and a reduced cruise speed closer to Mach 0.85. It recommended removing on-board heat exchangers based on thermal models of the interactions between the compressor cycle, tube, and ambient environment. The compression cycle would only contribute 5% of the heat added to the tube, with 95% of the heat attributed to radiation and convection into the tube. The weight and volume penalty of on-board heat exchangers would not be worth the minor benefit, and regardless the steady-state temperature in the tube would only reach 30–40 °F (17–22 °C) above ambient temperature. According to Musk, various aspects of the Hyperloop have technology applications to other Musk interests, in Surface Transportation Mars and electric jet propulsion.

Researchers associated with MIT's department of Aeronautics and Astronautics published research in June 2017 that verified the challenge of aerodynamic design near the Kantrowitz limit that had been theorized in the original SpaceX Alpha-design concept released in 2013.In 2017,Dr.Richard Geddes and others formed the Hyperloop Advanced Research Partnership to act as a clearinghouse of Hyperloop public domain reports and data.

Mars

According to Musk, Hyperloop would be useful on Mars as no tubes would be needed because Mars' atmosphere is about 1% the density of the Earth's at sea level. For the Hyperloop concept to work on Earth, low-pressure tubes are required to reduce air resistance. However, if they were to be built on Mars, the lower air resistance would allow a Hyperloop to be created with no tube, only a track.

CONCLUSION

The proposed design would achieve cost reduction. Speed is also one of the most important advantages of the system. It surely is fast, safe and cheap way of transportation. With this we can say that we are one step closer to the future we all desired.

Submitted by,
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Seturathnam S,
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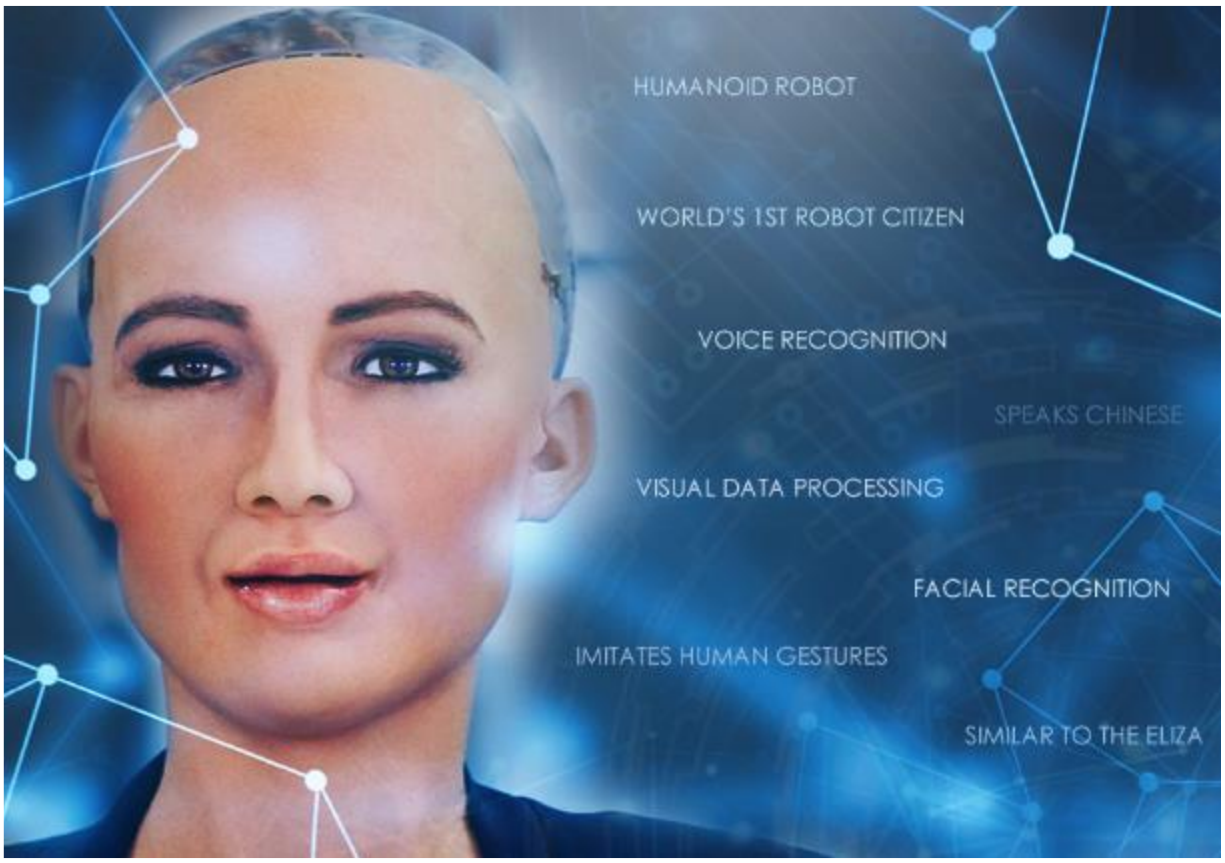
Could you fall in love with the Sophia?



Sophia is a robot who might not have a heart or brain, but has Saudi Arabia Citizenship. In a bid to promote the nation as a place where artificial intelligence assumes new heights, Saudi Arabia became the first country to grant a robot citizenship. Sophia is a humanoid robot developed by Hanson Robotics, led by AI developer David Hanson. She has an answer for every question and once said she would “destroy humans". Shocked? This is just the beginning. She spoke at this year’s Future Investment Initiative which was held in the Saudi Arabian capital of Riyadh. There she was confirmed as the world’s first robot citizen. After the panel "awarded the first Saudi citizenship for a robot", Sophia said, "Thank you to the Kingdom of Saudi Arabia. I am very honored and proud for this unique distinction. It is historic to be the first robot in the world to be recognized with citizenship."

Features:

Cameras within Sophia's eyes combined with computer algorithms allow her to see. She can follow faces, sustain eye contact, and recognize individuals. She is able to process speech and have conversations using a natural language subsystem. Around January 2018 Sophia was upgraded with functional legs and the ability to walk. Sophia is conceptually similar to the computer program ELIZA, which was one of the first attempts at simulating a human conversation. The software has been programmed to give pre-written responses to specific questions or phrases, like a chatbot. These responses are used to create the illusion that the robot is able to understand conversation, including stock answers to questions like "Is the door open or shut?" The information is shared in a cloud network which allows input and responses to be analyzed with blockchain technology.

Spine-chilling facts about Sophia:

- *Sophia is not a conventional robot. She has been modelled after Audrey Hepburn.*
- *Sophia was activated on April 19, 2015.*
- *She is able to display more than 50 facial expressions.*
- *She has also appeared onstage as a panel member and presenter in high-level conferences.*
- *She made her first public appearance at South by Southwest Festival (SXSW) in mid-March 2016 in Austin, Texas, United States.*
- *In November 2017, Sophia was named the United Nations Development Program's first ever Innovation Champion, and the first non-human to be given any United Nations title.*
- *She is a media favorite for having given several interviews. She has sung in a concert and even appeared on the cover of Elle and Cosmopolitan magazines.*
- *She has interests in business and met face-to-face with industry leaders from banking, insurance, auto manufacturing, property development, media, and entertainment industries.*

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- *In November 2017, Sophia was named the United Nations Development Program's first ever Innovation Champion, and the first non-human to be given any United Nations title.*
- *She is a media favorite for having given several interviews. She has sung in a concert and even appeared on the cover of Elle and Cosmopolitan magazines.*
- *She has interests in business and met face-to-face with industry leaders from banking, insurance, auto manufacturing, property development, media, and entertainment industries.*
- *She has more rights than women in Saudi Arabia. Sophia has no male guardian and wears no abaca - two restrictions that are imposed on Saudi women.*
- *She has also become a media darling. Sophia has been covered by media around the globe and has participated in many high-profile interviews.*
- *While interviewers around the world have been impressed by the sophistication of many of Sophia's responses to their questions, the bulk of Sophia's meaningful statements are believed by experts to be somewhat scripted.*

Conclusion:

At the end, we've been in this research through the AI definitions, brief history, applications of AI in public, applications of AI in military, ethics of AI, and the three rules of robotics. This is not the end of AI, there is more to come from it, who knows what the AI can do for us in the future, maybe it will be a whole society of robots.

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CLOUD COMPUTING

An Overview:

Cloud computing is a computing paradigm, where a large pool of systems are connected in private or public networks, to provide dynamically scalable infrastructure for application. Cloud computing is a practical approach to experience direct cost benefits and it has the potential to transform a data center from a capital-intensive set up to a variable priced environment. The idea of cloud computing is based on a very fundamental principal of „reusability of IT capabilities'. The difference that cloud computing brings compared to traditional concepts of "grid computing", "distributed computing", "utility computing", or "autonomic computing" is to broaden horizons across organizational boundaries. Forrester defines cloud computing as: "A pool of abstracted, highly scalable, and managed compute infrastructure capable of hosting end customer applications and billed by consumption Cloud Computing Models .

Cloud Providers offer services that can be grouped into three categories :

1. Software as a Service (SaaS): In this model, a complete application is offered to the customer, as a service on demand. Today SaaS is offered by companies such as Google

2. Platform as a Service (Paas): Here, a layer of software, or development environment is encapsulated & offered as a service PaaS providers offer a predefined combination of OS and application servers, such as LAMP platform (Linux, Apache, MySQL and PHP), restricted J2EE, Ruby etc. Google's App Engine, Force.com

3. Infrastructure as a Service (Iaas): IaaS provides basic storage and computing capabilities eg: Go Grid, 3 Tera,

Public and Private Clouds:

A single instance of the service runs on the cloud & multiple end users are serviced. On the customers‟ side, there is no need for upfront investment in servers or software licenses, while for the provider, the costs are lowered, since only a single application needs to be hosted & maintained. Today SaaS is offered by companies such as Google, configuration, security protections, and availability variances.

Private Cloud:

Private clouds are built exclusively for a single enterprise. They aim to address concerns on data security and offer greater control, which is typically lacking in a public cloud. There are two variations to a private cloud:

- On-premise Private Cloud: On-premise private clouds, also known as internal clouds.
- Externally hosted Private Cloud: This type of private cloud is hosted externally with cloud provider, where the provider facilitates an exclusive cloud environment with privacy.

Benefits:

1. Reduced Cost
There are a number of reasons to attribute Cloud technology with lower costs. The billing model is pay as per usage; the infrastructure is not purchased thus lowering maintenance.

2. Increased Storage
With the massive Infrastructure that is offered by Cloud providers today, storage & maintenance of large volumes of data is a reality.

3. Flexibility
This is an extremely important characteristic. With enterprises having to adapt, even more rapidly, to changing business conditions, speed to deliver is critical.

Cloud Computing Challenge:

Despite its growing influence, concerns regarding cloud computing still remain. Some common challenges are:

1. Data Protection
Data Security is a crucial element that warrants scrutiny. Enterprises are reluctant to buy an assurance of business data security. In many instances, the actual storage location is not disclosed, adding onto the security concerns enterprise.

2. Data Recovery and Availability

All business applications have Service level agreements that are stringently followed. Operational teams play a key role.

3. Management Capabilities

Despite there being multiple cloud providers, the management of platform.

DONE BY:

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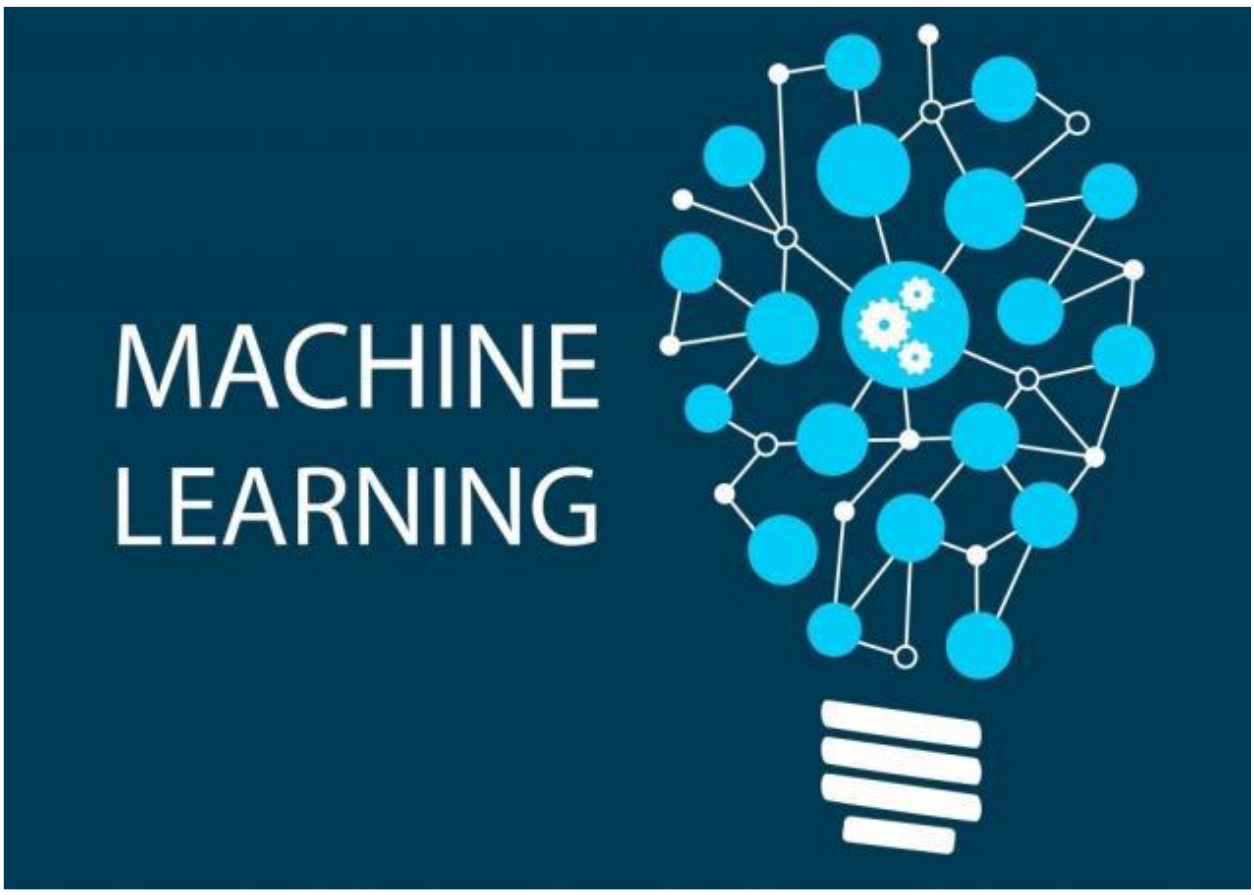
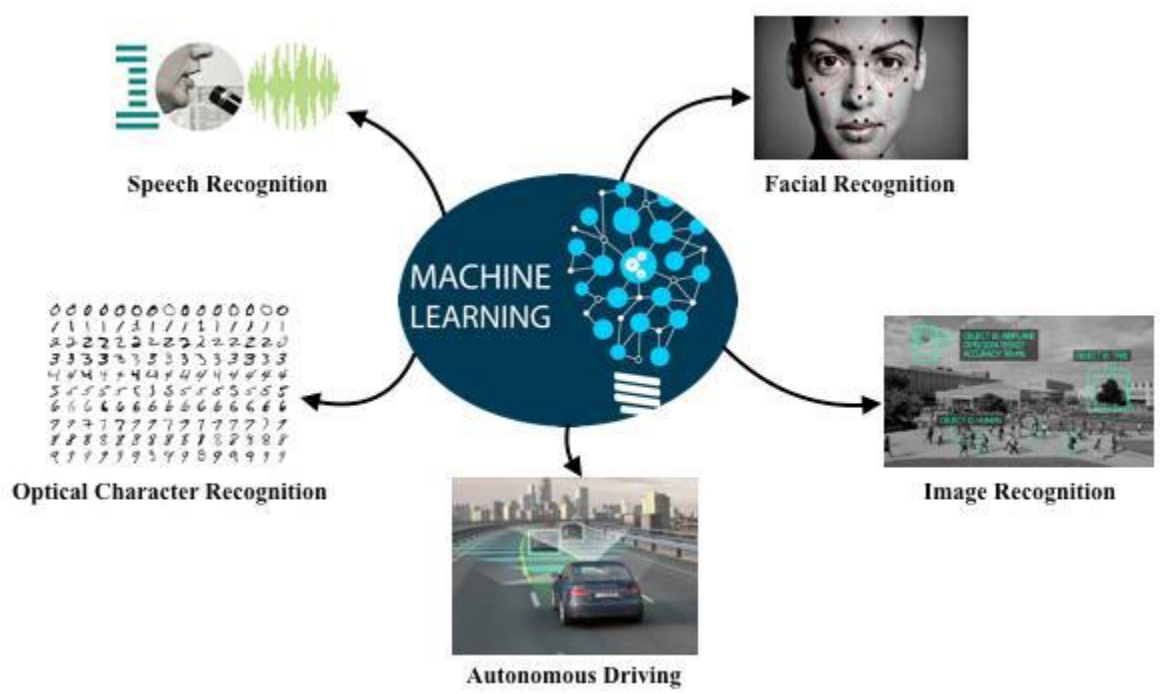
M. NANDINI DEVI

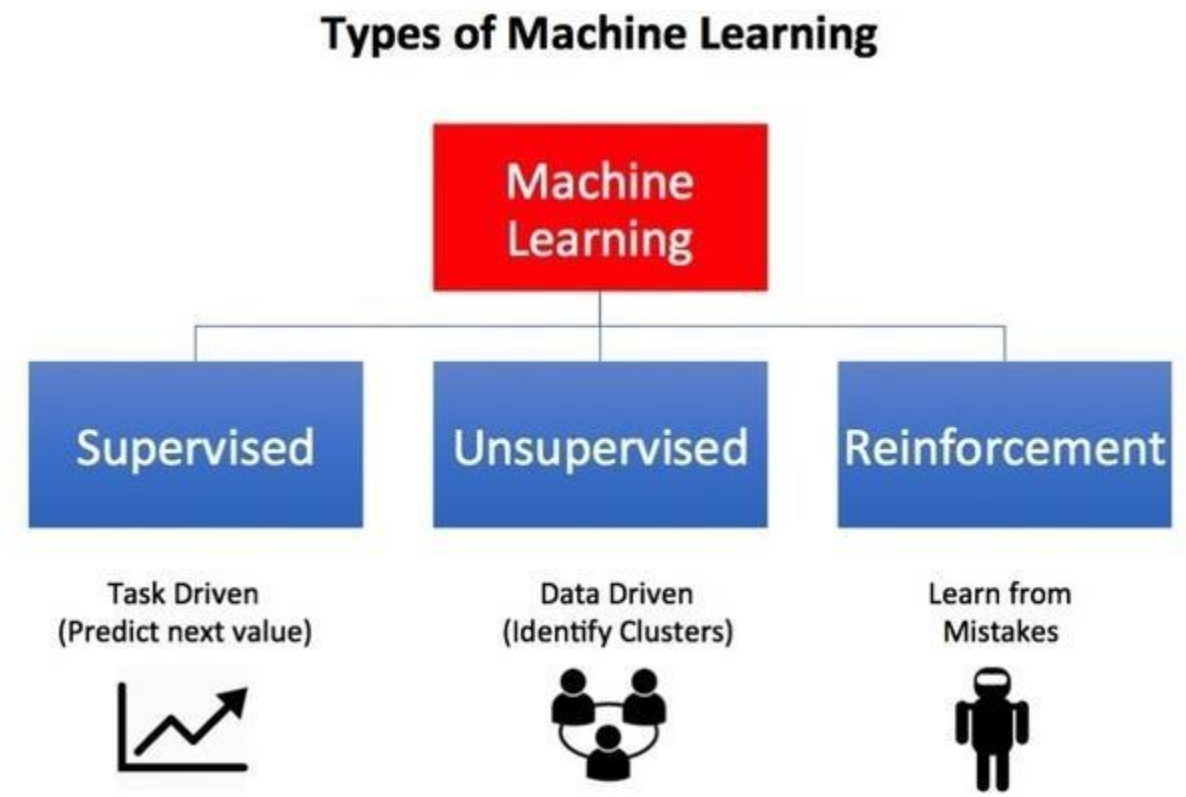


Applications:



*"**It is concerned with computer programs that automatically improve their performance through experience**". Optimize a performance criterion using example data or past experience. Role of Statistics: Inference from a sample*
Role of Computer science: Efficient algorithms to Solve the optimization problem Representing and evaluating the model for inference .

Learning=Improving with experience at some task
***GROWTH:** Machine learning is preferred approach to* Speech *recognition, Natural language processing, Computer vision, Robot control.*



Supervised Learning:

Makes machine learn explicitly. Data with clearly defined output is given. Direct feedback is given. Predicts outcome. Resolves regression and Classification problems.

Unsupervised Learning:
Machine understands the data(identifies the pattern).Evaluation is qualitative and indirect. It does not predict and find anything specific.
Reinforcement Learning:

An approach to AI ,Learning from +ve and –ve reinforcement. Machine learns how to act in certain environment, it maximize rewards.

ADVANTAGES:

Alleviate Knowledge Acquisition Bottleneck does not require knowledge engineers Scalable in constructing knowledge base .Adaptive to the changing conditions

Theory: A core objective of a learner is to generalize from its experience. Generalization in this context is the ability of a learning machine to perform accurately on new, unseen examples/tasks after having experienced a learning data set. The training examples come from some generally unknown probability distribution (considered representative of the space of occurrences) and the learner has to build a general model about this space that enables it to produce sufficiently accurate predictions in new cases.

The computational analysis of machine learning algorithms and their performance is a branch of theoretical computer science known as computational learning theory. Because training sets are finite and the future is uncertain, learning theory usually does not yield guarantees of the performance of algorithms. Instead, probabilistic bounds on the performance are quite common. The bias–variance decomposition is one way to quantify generalization error.

In addition to performance bounds, computational learning theorists study the time complexity and feasibility of learning. In computational learning theory, a computation is considered feasible if it can be done in polynomial time. There are two kinds of time complexity results. Positive results show that a certain class of functions can be learned in polynomial time. Negative results show that certain classes cannot be learned in polynomial time.

Conclusion:

Machine Learning and other AI based Systems are disrupting many industries and bringing us smarter, more targeted products and services.
Education and Training are already feeling the wave of these technologies and will be dramatically transformed by them.

Submitted by,
Jayashree K,
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27 FACTS ABOUT GOOGLE

1. Early Google.

2. One of the early versions of Google could process 30-50 pages per second. Now Google can process millions of pages per second.

3. Google was first stored on ten 4 GB hard drives in a Lego casing, now showcased by Stanford University. The Lego design would let the founders expand storage capacity easily. the index now has over 100 million GB of data.

4. Google's original name was Backrub, based on the system finding and ranking pages based on back links.

5. Since the founders weren't looking to start their own business, they tried to sell their search engine system.Yahoo originally said no, but in 2002 offered to buy Google for $3 billion. Google said no, and it's now valued at $400 billion.

6. The name Google was a misspelling. one story says investors misspelled the mathematical term "googol" as "google" on a check, and the spelling stuck. another story says that a fellow student misspelled "googol" when looking for an available name for the company.

7. Stanford still owns the patent to Google's algorithm, named PageRank.

8. The company's unofficial motto is "Don't be evil."

9. In 1998, the Google homepage included a Yahoo-like punctuation mark: the exclamation point!

10. The homepage is notoriously sparse because the founders didn't know HTML to make it fancy, and they wanted a simple user interface. At first, you had to press the return key on the keyboard, as they didn't know how to design a submit button.

11. The first Google Doodle was an out-of-office message in 1998 when Brin and Page were traveling to Nevada to attend the Burning Man festival. the doodle was a man standing behind the second O. They wanted users to know they wouldn't be available to fix tech issues.

12. The first April Fool's joke was in 2000 when Google announced its mind reading ability for searches called "MentalPlex."

13. Until March 2001, the Google homepage was aligned on the right side of the page instead of centered.

14. Google added Klingon as a language interface option in 2002.

15. The company's first tweet was "I'm feeling lucky" in binary code. "I'm 01100110 01100101 01100101 01101100 01101001 01101110 01100111 00100000 01101100 01110101 01100011 01101011 01111001 00001010."

16. In 2006, the Merriam-Webster and Oxford English Dictionaries included the verb "google" in their listings. It is a transitive verb, meaning "to use the Google search engine to obtain information about (as a person) on the World Wide Web."

17. The Google Street View has about 28 million miles of photographed roads.

18. Google's captcha feature uses warped words identified by users for the computers to learn what words are in scanned books. Google's captcha helps their computers learn how to read text the computers are able to identify words scanned from books, even if they are warped.

19. Google rents 200 goats to “mow” the weeds and brush around headquarters.

20. Dogs with strong bladders and friendly dispositions are welcomed in the offices, but cats are discouraged due to the number of dogs present.

21. Known for providing gourmet food and snacks to employees, the first Google snack in 1999 was Swedish Fish, a chewy candy.

22. Headquarters is full of odd decorations, such as a T-Rex nicknamed Stan, a space ship, pink flamingos, a Lego figure, adult-sized ball pits, Android statues and phone boxes painted in Google colors.

23. As employees are called Googlers, new employees are called Nooglers.

24. Larry Page and Sergey Brin met at Stanford when Brin was tasked to show Page around the school as a new student.

25. Larry Page’s brother was a co-founder of an eGroups, a dot-com company that Yahoo bought for about $500 million in 2000.

26. Google acquired YouTube via meetings at Denny’s.

27. Google has averaged a new company acquisition each week since 2010.

SUBMITTED BY,
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FOG COMPUTING IN AGRICULTURE

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ABSTRACT:

Most countries have an economy that is dependent on agriculture either in a small or bigway. From employment generation to contribution to National Income, agriculture is important.Over the increasing demand for agriculture, the monsoon season and rainfall we are receiving isunpredictable .hence farmers have sought information from each other and other sources to makemaximum profit. But, even though the knowledge of the farmers is not adequate, they have grownthe same crops for centuries, the ever changing weather conditions, soil fertility, pests and diseases etc affects the final outcome. These things leads to the need of fog computing where we can converge internet of things with cloud computing.

INTRODUCTION:

Poor irrigation scheduling and inefficient utilization of water resources are two parameters restricting production in many agricultural regions. Cultivators can use such as light, humidity and temperature levels to modify irrigation schedules and avoid the risk of damaging crops. For example, soil sensors can be used to collect information on how water flows through the land and can be used to track changes in soil moisture, temperature, and levels of nitrogen and carbon. These sensors can work in conjunction with drip irrigationmethods and fertigation to avoid unnecessary waste of water and fertilizer, thus, increasing fruit and leaf quality. Real-time data of weather predictions, soil conditions, crop features, etc. can support farmers in making informed decisions on which crops to plant where and when as well as when to plough etc.

This allows the monitoring, optimization,and precise control of high-yielding (wheat,corn, etc.) and sensitive crops (vineyards,tropical fruits, etc.), whether cultivated outdoors or in greenhouses. This permits farmers to help reach maximum crop production with optimal quality.

FOG COMPUTING:

Fog computing is a word that was initially coined by CISCO. Fog computing is the combination of cloud computing and Internet of things. The goal of fogging is to improve efficiency and reduce the amount of data transported to the cloud for processing, analysis and storage. This is often done to improve efficiency, though it may also be used for security and compliance reasons. It is also called as Edge computing or fogging.It is an architecture that uses one or more collaborative end-user clients or near-user edge devices to carry out a substantial amount ofstorage (rather than stored primarily in cloud data centers), communication control, configuration,measurement and management.

HOW FOG COMPUTING WORKS:

While edge devices and sensors are where data is generated and collected, they don't have the compute and storage resources to perform advanced analytics and machinelearning tasks. Though cloud servers have the power to do these, they are often too far away to process the data and respond in a timely manner. In addition, having all endpoints connecting to and sending raw datato the cloud over the internet can have privacy, security and legal implications, especially when dealing with sensitive data subject to regulations in different countries.

In a fog environment, the processing takes place in a data hub on a smart device, or in a smart router or gateway, thus reducing the amount of data sent to the cloud. It is important to note that fog networking complements not replaces cloud computing; fogging allows for short-term analytics at the edge, and the cloud performs resourceintensive, longer-term analytics.

DIFFERENCE BETWEEN FOG COMPUTING AND CLOUD COMPUTING:

Cloud computing is used to store a huge amount of data to process and analyse those data to retrieve information from it. But it is time consuming to transfer the data from devices to cloud storage. In order to provide fast data transmission in a efficient way fog computing comes into the picture.Cloud computing had some limitations somethose are Latency, Limited bandwidth, Dataprotection mechanisms and internetconnectivity. These above mentioned limitations are overcome by fog computing it provides security to data. Since it act as an intermediate it is not used for storing large amount of data hence we can able to provide high bandwidth. These are the ways in which fog computing is better than cloud computing.

HOW FOG COMPUTING IS USEFUL IN AGRICULTURE:

As already mentioned it helps the farmers to predict to rainfall period, temperature, when the plants need water, which plants can be planted in a particular period . These predictions are based on the past observations. Those observations are stored in a Fog storage. The current observation from the devices are immediately compared with the data available in the fog storage. After a process of comparing various measurements like ph value, humidity, temperature , moisture etc.Further actions are taken.

FURTHER ACTIONS:

Those further actions are:
Depends upon the temperature measurement. If the plants need water turning on the water sprinklers automatically. By measuring Soil quality intimate farmer if the plant need fertilizer. Intimate the farmer about the weather prediction on that particular area. based on that he can do further action. Intimate whether Plants are ready for Harvesting Like these many things can be done with the help of fog computing and iot.

HOW IT WORKS:

Fog computing is implemented in agriculture by the following steps.

Step 1: Placing the Sensors
Sensors are placed in agricultural lands at suitable locations.

Step 2: Connecting the sensors
Each and every sensor is connected with the Fog environment

Step 3: Capturing data
Data is captured with help of sensors placed in the agricultural land.

Step 4: Sending Data to fog Storage
Data that is captured is sent to the fog storage. Fog storage is the place where previous observations are stored.

Step 5: Analyzing and producing result
The data is compared with the past observations. based on that observations further action is taken.

SENSORS USED IN AGRICLUTURE:
Various sensors are used in the agriculture. some of those sensors are:

Location Sensors use signals from GPS satellites to determine latitude, longitude, and altitude to within feet.

Optical Sensors use light to measure soil properties. The sensors measure different frequencies of light reflectance in nearinfrared, mid-infrared, and polarized light spectrums. Soil reflectance and plant color data are just two variables from optical sensors that can be aggregated and
processed.

Electrochemical Sensors provide key information required in precision agriculture: pH and soil nutrient levels. Sensor electrodes work by detecting specific ions in the soil. Currently, sensors mounted to specially designed "sleds" help gather, process, and map soil chemical data.

Airflow Sensors measure soil air permeability. Measurements can be made at singular locations or dynamically while in motion. The desired output is the pressure required to push a predetermined amount of air into the ground at a prescribed depth. Various types of soil properties, including compaction, structure, soil type, and moisture level, produce unique identifying signatures.

ADVANTAGES AND DISADVANTAGES:

Fog computing process the data and produce the result quickly.it can able to analyse the data independently. It brings the closer to the user Existing data protection mechanisms are not suitable for fog computing.They are failed that is the main disadvantage of fog computing.

CONCLUSION:

Fog computing helps to process the result more quicker than cloud computing. It Helps the farmers to increase their crop yield percentage. Which indirectly improve the country economic status. A country like India is a land of agriculture where most of the people depend only on agriculture for their living. These automated agriculture practice helps them increase their product in both quantity and quality.

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BIT COIN

It's super secure and slightly hard to understand, but the idea of creating tamper-proof databases has captured the attention of everyone from anarchist techies to staid bankers. DEPENDING ON WHOM you ask,blockchains are either the most important technological innovation since the internet or a solution looking for a problem.

The original blockchain is the decentralized ledger behind the digital currency bit coin. The ledger consists of linked batches of transactions known as blocks (hence the term blockchain), and an identical copy is stored on each of the roughly 200,000 computers that make up the bit coin network. Each change to the ledger is cryptographically signed to prove that the person transferring virtual coins is the actual owner of those coins. But no one can spend their coins twice, because once a transaction is recorded in the ledger, every node in the network will know about it.

WHO PAVED THE WAY FOR BLOCKCHAINS?

DigiCash (1989): Digi Cash was founded by David Chaum to create a digital-currency system that enabled users to make untraceable, anonymous transactions. It was perhaps too early for its time. It went bankrupt in 1998, just as ecommerce was finally taking off.

E-Gold (1996)

E-gold was a digital currency backed by real gold. The company was plagued by legal troubles, and its founder Douglas Jackson eventually pled guilty to operating an illegal money-transfer service and conspiracy to commit money laundering.

B-Money and Bit-Gold (1998)

Cryptographers Wei Dai (B-money) and Nick Szabo (Bit-gold) each proposed separate but similar decentralized currency systems with a limited supply of digital money issued to people who devoted computing resources.

Ripple Pay (2004)

Now a cryptocurrency, Ripple started out as a system for exchanging digital IOUs between trusted parties.

Reusable Proofs of Work (RPOW) (2004)

RPOW was a prototype of a system for issuing tokens that could be traded with others in exchange for computing intensive work. It was inspired in part by Bit-gold and created by bitcoin's second user, Hal Finney.

The idea is to both keep track of how each unit of the virtual currency is spent and prevent changes to the ledger. The upshot: No bit coin user has to trust anyone else, because no one can cheat the system. Other digital currencies have imitated this basic idea, often trying to solve perceived problems with bitcoin by building new cryptocurrencies on new blockchains. But advocates have seized on the idea of a decentralized, cryptographically secure database for uses beyond currency. Its biggest boosters believe blockchains can not only replace central banks but usher in a new era of online services outside the control of internet giants like Facebook and Google. These new-age apps would be impossible to censor, advocates say, and would be more answerable to users.

There are also potential applications for blockchains in the seemingly boring world of corporate compliance. After all, storing records in an immutable ledger is a pretty good way to assure auditors that those records haven't been tampered with. It's too early to say which experiments will work out or whether the results of successful experiments will resemble the bitcoin blockchain. But the idea of creating tamper-proof databases has captured the attention of everyone from anarchist techies to staid bankers.

The First Blockchain

The original bitcoin software was released to the public in January 2009. It was open source software, meaning anyone could examine the code and reuse it. And many have. At first, blockchain enthusiasts sought to simply improve on bitcoin. Litecoin, another virtual currency based on the bitcoin software, seeks to offer faster transactions. One of the first projects to repurpose the bitcoin code to use it for more than currency was Namecoin, a system for registering ".bit" domain names. The traditional domain-name management system—the one that helps your computer find our website when you type wired.com— depends on a central database, essentially an address book for the internet. Internet-freedom activists have long worried that this traditional approach makes censorship too easy, because governments can seize a domain name by forcing the company responsible for registering it to change the central database. The US government has done this several times to shut sites accused of violating gambling or intellectual-property laws. Namecoin tries to solve this problem by storing .bit domain registrations in a blockchain, which theoretically makes it impossible for anyone without the encryption key to change the registration information. To seize a .bit domain name, a government would have to find the person responsible for the site and force them to hand over the key.

WHAT'S AN "ICO"?

Ethereum and other blockchain-based projects have raised funds through a controversial practice called an "initial coin offering," or ICO: The creators of new digital currencies sell a certain amount of the currency, usually before they've finished the software and technology that underpins it. The idea is that investors can get in early while giving developers the funds to finish the tech. The catch is that these offerings have traditionally operated outside the regulatory framework meant to protect investors, although that's starting to change as more governments examine the practice.

Bitcoin’s software wasn’t designed to handle other types of applications. In 2013, a startup called Ethereum published a paper outlining an idea that promised to make it easier for coders to create their own blockchain-based software without having to start from scratch, without relying on the original bitcoin software. In 2015 the company released its platform for building “smart contracts,” software applications that can enforce an agreement without human intervention. For example, you could create a smart contract to bet on tomorrow’s weather. You and your gambling partner would upload the contract to the Ethereum network and then send a little digital currency, which the software would essentially hold in escrow. The next day, the software would check the weather and then send the winner their earnings. At least two major "prediction markets" have been built on the platform, enabling people to bet on more interesting outcomes, such as which political party will win an election.

So long as the software is written correctly, there's no need to trust anyone in these transactions. But that turns out to be a big catch. In 2016 a hacker made off with about $50 million worth of Ethereum's custom currency intended for a democratized investment scheme where investors would pool their money and vote on how to invest it. A coding error allowed a still unknown person to make off with the virtual cash.

Lesson: It's hard to remove humans from transactions, with or without a blockchain. Even as cryptography geeks plotted to use blockchains to topple, or at least bypass, big banks, the financial sector began its own experiments with blockchains. In 2015, some of the largest financial institutions in the world, including JP Morgan, the Bank of England, and the Depository Trust & Clearing Corporation (DTCC), announced that they would collaborate on open source blockchain software under the name Hyperledger. Several pieces of software have been released under the Hyperledger umbrella, including Sawtooth, created by Intel for building custom blockchains.

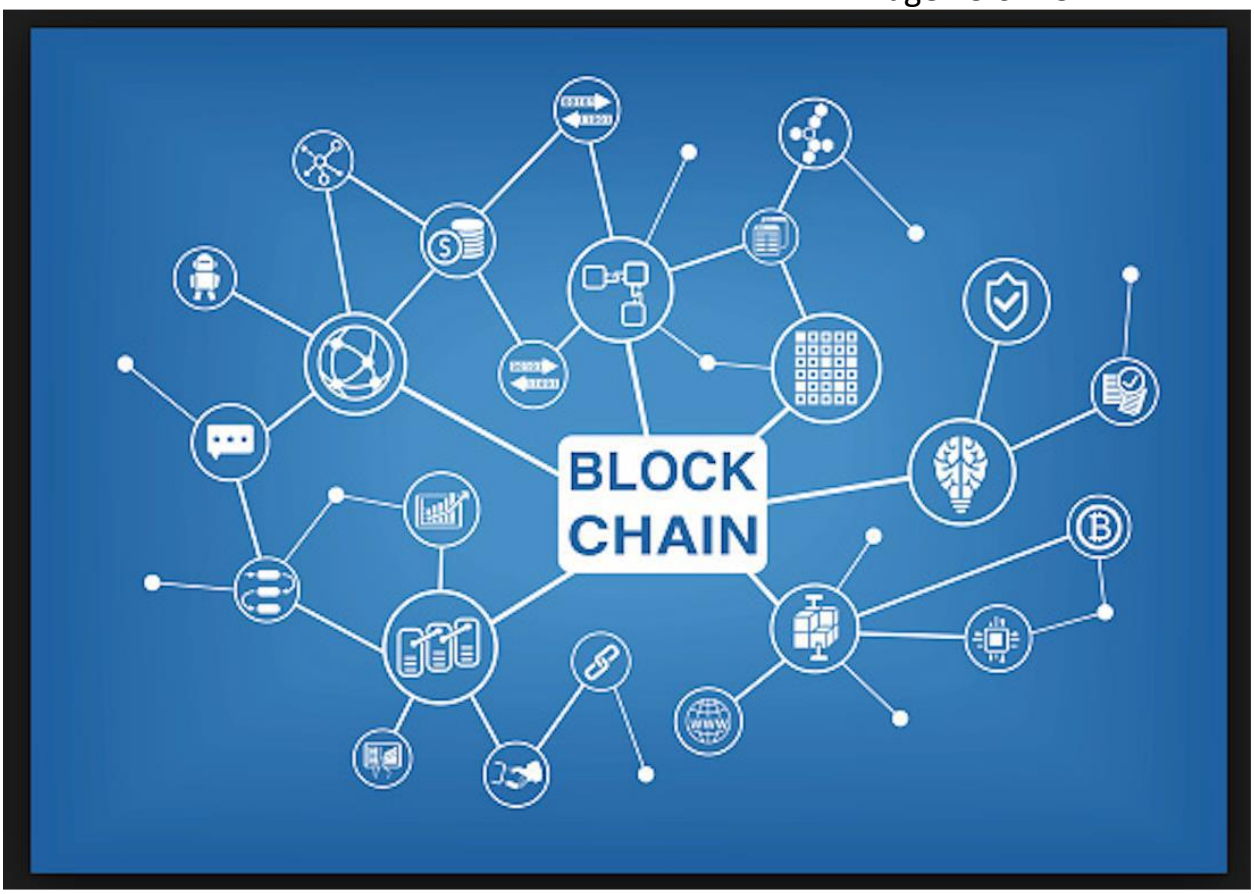
The Future of Blockchain

Despite the blockchain hype—and many experiments—there's still no "killer app" for the technology beyond currency speculation. And while auditors might like the idea of immutable records, as a society we don't always want records to be permanent. Blockchain proponents admit that it could take a while for the technology to catch on. After all, the internet's foundational technologies were created in the 1960s, but it took decades for the internet to become ubiquitous.

That said, the idea could eventually show up in lots of places. For example, your digital identity could be tied to a token on a blockchain. You could then use that token to log in to apps, open bank accounts, apply for jobs, or prove that your emails or social-media messages are really from you. Future social networks might be built on connected smart contracts that show your posts only to certain people or enable people who create popular content to be paid in cryptocurrencies. Perhaps the most radical idea is using blockchains to handle voting. The team behind the open source project Sovereign built a platform that organizations, companies, and even governments can already use to gather votes on a blockchain.

Advocates believe blockchains can help automate many tasks now handled by lawyers or other professionals. For example, your will might be stored in a blockchain. Or perhaps your will could be a smart contract that will automatically dole out your money to your heirs. Or maybe blockchains will replace notaries.

It's also entirely possible that blockchains will evolve into something completely different. Many of the financial industry's experiments involve "private" blockchains that run on servers within a single company and selected partners. In contrast, anyone can run bitcoin or Ethereum software on their computer and view all of the transactions recorded on the networks' respective blockchains. But big companies prefer to keep their data in the hands of a few employees, partners, and perhaps regulators. Bitcoin proved that it's possible to build an online service that operates outside the control of any one company or organization. The task for blockchain advocates now is proving that that's actually a good thing.



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Flying Car Technology

A flying car is a type of personal air vehicle or roadable aircraft that provides door-to-door transportation by both ground and air. The term "flying car" is also sometimes used to include hover cars. Many prototypes have been built since the first years of the twentieth century using a variety of flight technologies and some have true VTOL performance, but no flying car has yet reached production status. Flying cars are also a popular theme in fantasy and science fiction stories.
A practical flying car must be capable of safe, reliable and environmentally-friendly operation both on public roads and in the air. For widespread adoption it must also be able to fly without a qualified pilot at the controls and come at affordable purchase and running costs.

History of Flying Cars

Here's a look back at a few of the flying cars that distinguished themselves from the pack: Curtiss Auto plane - In 1917, Glenn Curtiss, who could be called the father of the flying car, unveiled the first attempt at such a vehicle.

His aluminium auto plane sported three wings that spanned 40 feet (12.2 meters). The car's motor drove a four-bladed propeller at the rear of the car. TheAutoplane never truly flew, but it did manage a few short hops. Arrowbile -

Developed by Waldo Waterman in 1937, the Arrowbile was a hybrid Studebaker-aircraft.

Airphibian - Robert Fulton, who was a distant relative of the steam engine inventor, developed the Airphibian in 1946.

ConvAirCar - In the 1940s, Consolidated-Vultee developed a two-door sedan equipped with a detachable airplane unit. The ConvAirCar debuted in 1947, and offered one hour of flight and a gas mileage of 45 miles (72 kilometers) per gallon.

Avrocar - The first flying car designed for military use was the Avrocar, developed in a joint effort between Canadian and British military.

Areocar - Inspired by the Airphibian and Robert Fulton, whom he had met years before, Moulton "Molt" Taylor created perhaps the most well-known and most successful flying car to date. The Aerocar was designed to drive, fly and then drive again without interruption. Taylor covered his car with a fiberglass shell. A 10-foot-long (3-meter) drive shaft connected the engine to a pusher propeller. It cruised at 120 mph (193 kph) in the air and was the second and last roadable aircraft to receive FAA approval. In 1970, Ford Motor Co. even considered marketing the vehicle, but the decade's oil crisis dashed those plans .

Flying Car Technology

Now taking the flying car is its engine, its aerodynamics, the environment into the car while it's flying…etc. They differ and lack in the aerodynamics that they use on the aircraft and aeroplanes, it's the lift. In most of the car designs, aerodynamic parameter that they tend to achieve is to get more down force that helps in the car's performance, and as a major parameter in FORMULA 1 RACING cars.
Where as in flying cars you need more lift and lesser downforce if you tend to take off in a usual run way. (based on the wing type, and principle that they are going to be followed in order to fly.). The Cars gross weight, and it's CG. The fuel type and engines capacity, it must meet the Aeronautical engine standards and Aviation Regulations. The person who is going to control the car must be holding a Pilot licence. The cars maintainability, cost factors and its assurance, these factors makes a flying car stand apart from drones and usual aeroplane as it has to satisfy the road safety rules and the Aviation Regulations. There several means

and ways to navigate. Not going deep into those topics, jumping to the wings part.

Winding parts

It depends on which principle you are going to use to lift the vehicle off the ground. You can the principle used in rotary aircrafts, that are majorly used in the current prototypes and drones, while fixed wings is going to cost alot due to material and engineering design complexities. The space that it covers while travelling on road. And fixed wing is just going to be great only if you have an advanced composite materials, the Engine that can transform into an aero engine within a short period of time while the car is on road and design to contract the wing on road conditions. The engine part is not gonna make the designers worry, but the wing part will. Because, the fixed wing will simply be a headache. And retractable wings has its wear and tears, it's lubrications, maintenance cost, it's internal hydraulic system and internal engine and primary and secondary components monitoring systems.

The unscheduled or emergency landing of a flying car on an unprepared location beneath, including the possibility of accident debris. Regulatory regimes are being developed in anticipation of a large increase in the numbers of roadable aircraft and personal air vehicles in the near future, and compliance with these regimes will be necessary for safe flight. Mechanically, the challenges of flight are so strict that every opportunity must be taken to keep weight to a minimum and a typical airframe is lightweight and easily damaged. On the other hand a read vehicle must be able to withstand significant impact loads from casual incidents as well as low-speed and high-speed impacts, and the high strength this demands can add considerable weight. A practical flying car must be both strong enough to pass road safety standards and light enough to fly.

Environment

A flying car capable of widespread use must operate safely within a heavily populated urban environment. The lift and propulsion systems must be quiet, have safety shrouds around all moving parts such as rotors, and must not create excessive pollution.

Control

A basic flying car requires the person at the controls to be both a qualified road driver and aircraft pilot. This is impractical for the majority of people and so wider adoption will require computer systems to de-skill piloting. These include aircraft manoeuvring, navigation and emergency procedures, all in potentially crowded airspace. Fly-by-wire computers can also make up for any deficiencies in flight dynamics, such as stability. A practical flying car may need to be a fully autonomous vehicle in which people are present only as passengers.

Cost

The need for the propulsion system to be both small and powerful can at present only be met using advanced and expensive technologies. The cost of manufacture could therefore be as much as 10 million dollars.Flying cars would be used for shorter distances, athigher frequency, and at lower speeds and lower altitudes than conventional passenger aircraft. However optimal fuel efficiency forairplanes is obtained at high altitudes and high subsoni speeds, so a flying car's energy efficiency would be low compared to a conventional aircraft. Similarly,the flying car's road performance would be compromised by the requirements of flight, so it would be less than a conventional motor car as well.

Fiction

The flying car has been depicted in many works of fantasy and science fiction.

Live action films

Star Wars (1977–present)-Flying cars appear in Star Wars where they are called airspeeders, such as those that can be seen on the planet of Coruscant in all three Star Wars prequel movies, from 1999's. Star Wars: Episode I – The Phantom Menace onward. They are also featured in Star Wars: Episode II – Attack of the Clones, where an early chase sequence involves flying cars. In 2005's Star Wars: Episode III – Revenge of the Sith, Bail Organa rides a retro-futuristic vehicle that apart from its flying ability resembles a 1950-style car.

Animation

In the animated television series, Sherlock Holmes in the 22nd Century, set in the 22nd century in New London, people use flying cars as main mean of transportation. Cloudy with a Chance of Meatballs ,a scientist Flint Lockwood attempts to build a flying car, but it crashes in the ocean. Later on, Flint Lockwood finally succeeds in building a flying car which he uses to fly up to his machine causing a raining food disaster. Despicable Me 2 Lucy Wilde owns a car that has the ability to convert into plane mode and both Lucy Wilde and FeloniusGru make their getaway from the Paradise Mall and the cars wings extend out and it flies away.

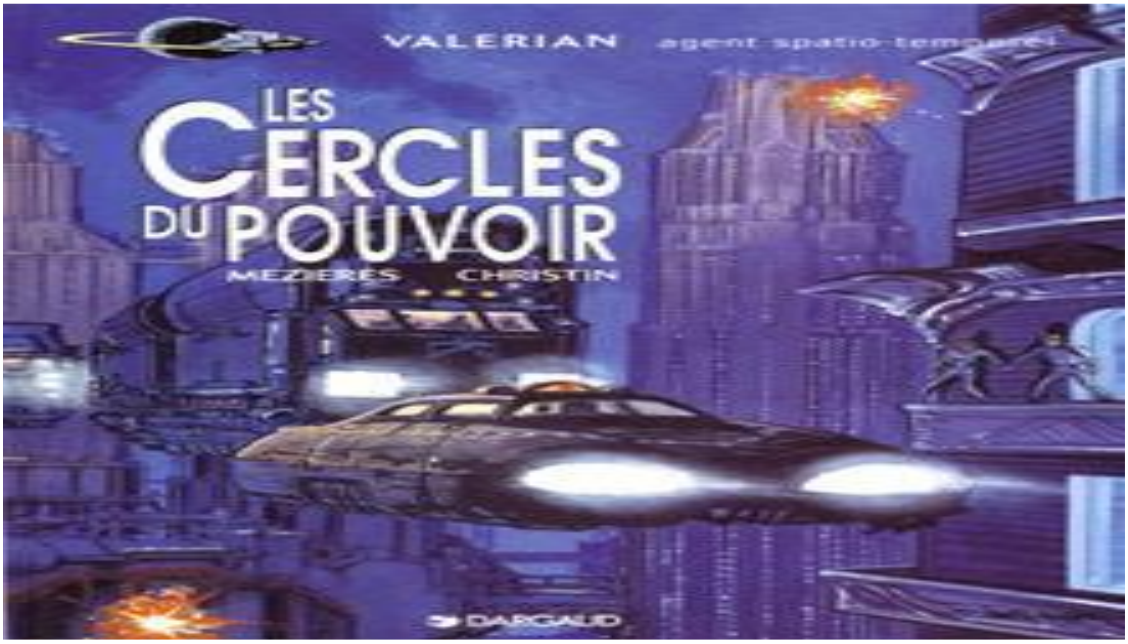
Video games

Wipeout Fusion 2002:
There are flying cars that can be seen while racing on the moon.

Literature

In the science fiction novel, Ralph 124C 41+, people use "Aeroflyer", a small flying car that can reach speeds of up to 600 mph (970 km/h)

Valérian and Laureline in the fifteenth volume,



The Circles of Power

These pioneers never managed to develop a viable flying car, and some even died testing their inventions. However, they proved that a car could be built to fly, and inspired a new group of roadable aircraft enthusiasts. With advances in lightweight material, computer modeling and computer-controlled aircraft, the dream is very close to becoming reality. Companies such as Uber and Hyperloop One are pouring time and major resources into making innovative transportation concepts a reality. Big companies such as Uber, Boeing, and Airbus are actively developing the technology get airborne. So are Silicon Valley startups, such as Joby Aviation, Zee Aero and Kittyhawk. Here are other neat transportation developments underway. With flying cars, we may never have to sit in traffic again.

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Submitted by,
Abarna J, III year IT

Scientists develop FontCode that hides information by imperceptibly changing the shapes of fonts in text.

Steganography is the practice of concealing a file, message, image, or video within another file, message, image, or video. The word steganography combines the Greek words steganos (στεγανός), meaning “covered, concealed, or protected,” and graphein (γράφειν) meaning “writing”. For example, the hidden message may be in invisible ink between the visible lines of a private letter. Whereas cryptography is the practice of protecting the contents of a message alone, steganography is concerned with concealing the fact that a secret message is being sent as well as concealing the contents of the message.

The advantage of steganography over cryptography alone is that the intended secret message does not attract attention to itself as an object of scrutiny. Plainly visible encrypted messages, no matter how unbreakable they are, arouse interest and may in themselves be incriminating in countries in which encryption is illegal.
In digital steganography, electronic communications may include steganographic coding inside of a transport layer, such as a document file, image file, program or protocol. Media files are ideal for steganographic transmission because of their large size. For example, a sender might start with an innocuous image file and adjust the colour of every hundredth pixel to correspond to a letter in the alphabet. The change is so subtle that someone who is not specifically looking for it is unlikely to notice the change. example, concealing messages within the lowest bits of noisy images or sound files. Generally though, there are many techniques known to be able to hide messages in data using steganographic techniques. None Steganography is the practice of concealing a file, message, image, or video within another file, message, image, or video. The word steganography combines the Greek words steganos (στεγανός), meaning “covered, concealed, or protected,” and graphein (γράφειν) meaning “writing”. For example, the hidden message may be in invisible ink between the visible lines of a private letter. Whereas cryptography is the practice of protecting the contents of a message alone, steganography is concerned with concealing the fact that a secret message is being sent as well as concealing the contents of the message.

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Computer scientists at Columbia Engineering have invented FontCode, a new way to embed hidden information in ordinary text by imperceptibly changing, or perturbing, the shapes of fonts in text. FontCode creates font perturbations, using them to encode a message that can later be decoded to recover the message. Method could prevent document tampering, protect copyrights, as well as embed QR codes and other metadata without altering the look or layout of a document.

Steganographic methods and algorithms

A variety of steganographic methods and algorithms have been scientifically developed and tested. In LSB steganography, the payload is encoded into and communicated in one or several least significant bits of the carrier. The smaller the number of bits used to carry the payload, the lower the impact on the original carrier signal. Discrete cosine transform or DCT-based steganography is a sub-type of LSB steganography that is often applied on JPEG-format carriers (i.e., when JPEG images are used to carry the payload).

In this method, the communicated data is secretly encoded into the DCT coefficients.

Payload embedding is a method whereby the payload is encoded into the carrier and, upon delivery, is decoded using an algorithm known to both parties. Several payloads can be independently encoded into the same carrier provided that their embedding methods are orthogonal. Wideband methods fall into the following types: Pseudorandom sequence method, in which a secret carrier signal is modulated by a pseudorandom signal. Frequency hopping method, in which the frequency of the carrier signal changes according to a specific pseudorandom law. Text steganography is most challenging due to the presence of very less redundant information in text documents as compared to the images and audio. HTML Tags and associated members are case insensitive e.g., <html>, <HTML> or <html> will have the same impact on the document's outlook. Bits are hidden in TAGS by changing the case of the alphabets based on the bit as either 0 or 1.Security can further be enhanced by hiding text in CSS coding of pages as Cascading Style sheets are used extensively for formatting and controlling the appearance of web pages. Furthermore, CSS coding cannot be seen at the client side thus adding to the security.

Researchers Hide Information in Plain Text

Someone using FontCode would supply a secret message and a carrier text document. FontCode converts the secret message to a bit string (ASCII or Unicode) and then into a sequence of integers. Each integer is assigned to a five-letter block in the regular text where the numbered locations of each letter sum to the integer. The method works with most fonts and, unlike other text and document methods that hide embedded information, works with most document types, even maintaining the hidden information when the document is printed on paper or converted to another file type. The paper will be presented at SIGGRAPH in Vancouver, British Columbia, August 12-16.

“While there are obvious applications for espionage, we think FontCode has even more practical uses for companies wanting to prevent document tampering or protect copyrights, and for retailers and artists wanting to embed QR codes and other metadata without altering the look or layout of a document,” says Changxi Zheng, associate professor of computer science and the paper’s senior author.

Zheng created FontCode with his students Chang Xiao (PhD student) and Cheng Zhang MS’17 (now a PhD student at UC Irvine) as a text steganographic method that can embed text, metadata, a URL, or a digital signature into a text document or image, whether it’s digitally stored or printed on paper. It works with common font families, such as Times Roman, Helvetica, and Calibri, and is compatible with most word processing programs, including Word and FrameMaker, as well as image-editing and drawing programs, such as Photoshop and Illustrator. Since each letter can be perturbed, the amount of information conveyed secretly is limited only by the length of the regular text. Information is encoded using minute font perturbations—changing the stroke width, adjusting the height of ascenders and descenders, or tightening or loosening the curves in serifs and the bowls of letters like o, p, and b. “Changing any letter, punctuation mark, or symbol into a slightly different form allows you to change the meaning of the document,” says Xiao, the paper’s lead author. “This hidden information, though not visible to humans, is machine-readable just as barcodes and QR codes are instantly readable by computers. However, unlike barcodes and QR codes, FontCode doesn’t mar the visual aesthetics of the printed material, and its presence can remain secret.” Data hidden using FontCode can be extremely difficult to detect. Even if an attacker detects font changes between two texts—highly unlikely given the subtlety of the perturbations—it simply isn’t practical to scan every file going and coming within a company.

Furthermore, FontCode not only embeds but can also encrypt messages. While the perturbations are stored in a numbered location in a codebook, their locations are not fixed. People wanting to communicate through encrypted documents would agree on a private key that specifies the particular locations, or order, of perturbations in the codebook.

“Encryption is just a backup level of protection in case an attacker can detect the use of font changes to convey secret information,” says Zheng. “It’s very difficult to see the changes, so they are really hard to detect—this makes FontCode a very powerful technique to get data past existing defences.”

FontCode is not the first technology to hide a message in text—programs exist to hide messages in PDF and Word files or to resize whitespace to denote a 0 or 1—but, the researchers say, it is the first to be document-independent and to retain the secret information even when a document or an image with text (PNG, JPG) is printed or converted to another file type. This means a FrameMaker or Word file can be converted to PDF, or a JPG can be converted to PNG, all without losing the secret information.

To use FontCode, a user would supply a secret message and a carrier text document. FontCode converts the secret message to a bit string (ASCII or Unicode) and then into a sequence of integers. Each integer is assigned to a five-letter block in the regular text where the numbered codebook locations of each letter sum to the integer.

Recovering hidden messages is the reverse process. From a digital file or from a photograph taken with a smartphone, FontCode matches each perturbed letter to the original perturbation in the codebook to reconstruct the original message.
Matching is done using convolutional neural networks (CNNs). Recognizing vector-drawn fonts (such as those stored as PDFs or created with programs like Illustrator) is straightforward since shape and path definitions are computer-readable. However, it’s a different story for PNG, IMG, and other rasterized (or pixel) fonts, where lighting changes, differing camera perspectives, or noise or blurriness may mask a part of the letter and prevent an easy recognition.

While CNNs are trained to take into account such distortions, recognition errors will still occur, and a key challenge for the researchers was ensuring a message could always be recovered in the face of such errors. Redundancy is one obvious way to recover lost information, but it doesn't work well with text since redundant letters and symbols are easy to spot. Instead, the researchers turned to the 1700-year-old Chinese Remainder Theorem, which identifies an unknown number from its remainder after it has been divided by several different divisors. The theorem has been used to reconstruct missing information in other domains; in FontCode, researchers use it to recover the original message even when not all letters are correctly recognized.

"Imagine having three unknown variables," says Zheng. "With three linear equations, you should be able to solve for all three. If you increase the number of equations from three to five, you can solve the three unknowns as long as you know any three out of the five equations." Using the Chinese Remainder theory, the researchers demonstrated they could recover messages even when 25% of the letter perturbations were not recognized. Theoretically the error rate could go higher than 25%.The authors, who have filed a patent with Columbia Technology Ventures, plan to extend FontCode to other languages and character sets, including Chinese. "We are excited about the broad array of applications for FontCode," says Zheng, "from document management software, to invisible QR codes, to protection of legal documents. FontCode could be a game changer."

Submitted by,
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MEAN STACK

MEAN is a combination of user-friendly JavaScript frameworks that are ideal for building dynamic applications and websites. It's an open source stack and free, designed to offer developers an organized and quick method of making quick prototypes Mean -based web apps. One main benefit of mean-stack is that one language -JavaScript, is used/runs at every level of the app, making it a modern and efficient approach to web development. Mean Stack is built with a great combination of technological mediums including:

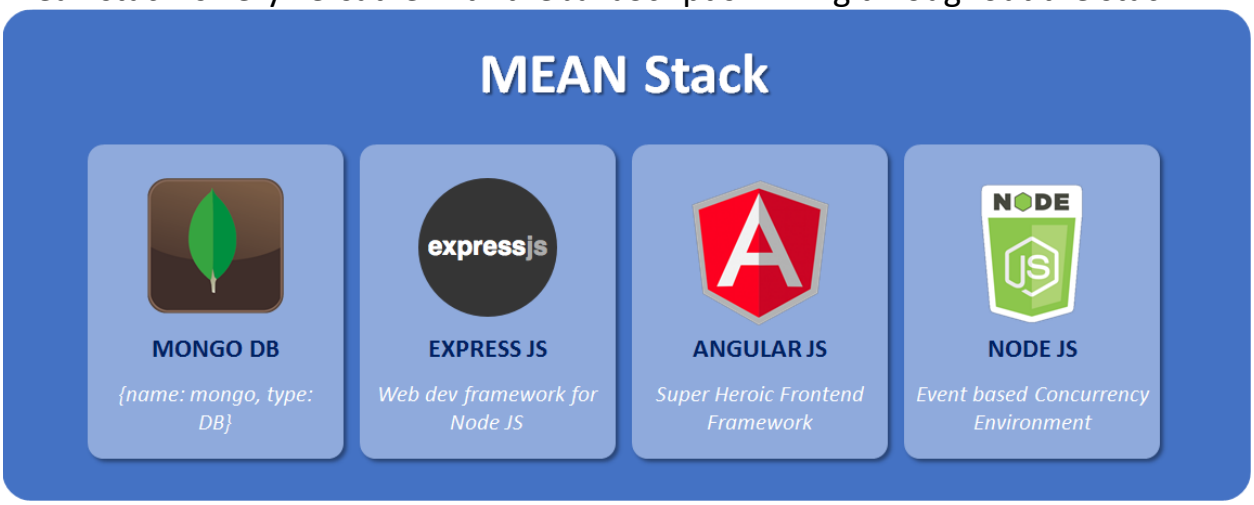
MongoDB as its database,

ExpressJS as the web framework,

AngularJS as its fronted framework,

Node.js as its server platform.

Mean stack is very versatile with the JavaScript shinning throughout the stack.



Key Features of Mean Stack

1. JavaScript: One reason for picking Mean stack over most is due to the single language for both client side and server side. Because of the single

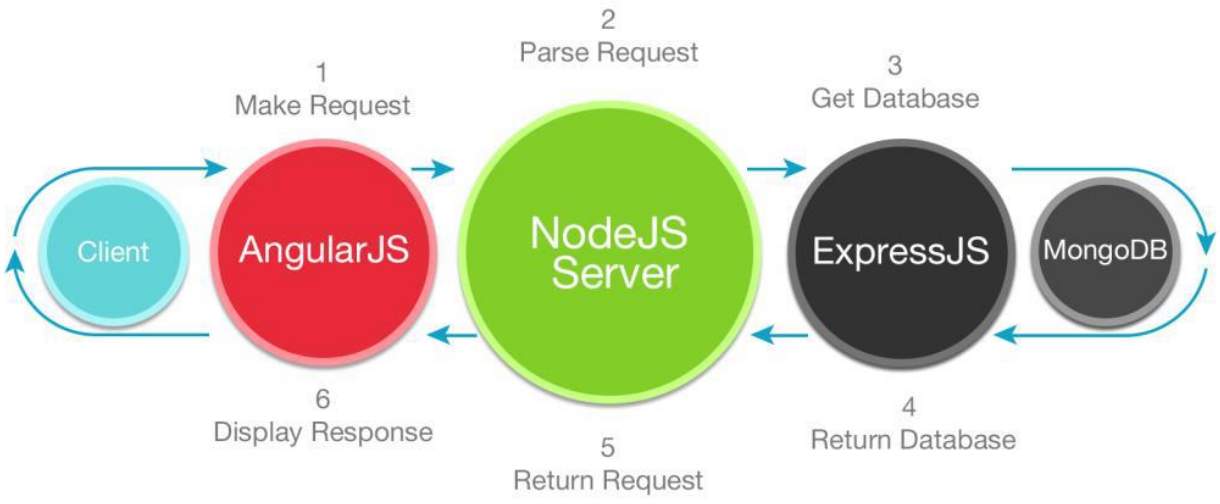
language which is JavaScript, the web-development processes becomes neat. In addition to that, JavaScript doesn't need an extra software, it only needs its own web-browser for executing a web-page.

2. NodeJS: This is a runtime environment for the JavaScript and works more than the traditional web server. It also works with most operating systems like Linux, Windows & OS X, thus offering a great O.S independence.

3. MongoDB: This is a good choice for a database when managing big tables with loads of data. Unlike most databases, adding fields to MongoDB is relatively simpler as it doesn't need updating the whole table. Moreover, it's a no SQL model database making it very useful when using many applications.

4. AngularJS: This is a front JavaScript framework which develops single page applications. Together with Node.js, they provide a server-side solution. This ensures that the programming of applications becomes very effective.

Working Of Mean Stack



Advantages of Mean Stack

1. Employment: More & more employers are in search of engineers familiar to mean Stack & other JavaScript based technologies.

2. Quick and Simple: Building applications and websites that revolve around a single language- JavaScript, is very straightforward and easy to execute.

3. Adaptability: Because of the versatility of Mean Stack's single programming language- JavaScript, it's highly adaptable to a range of web apps.

4. Active Dev Community: Stack runs on JavaScript, a very common programming language with some of the most active developer-communities, who offer solutions to many problems.

Conclusion

Mean stack gives an effective and modern insight to web development. It also utilizes the power of modernized S.P.As (Single page applications), which doesn't need entirely refreshing a web-page on each and every request. All technologies present within the stack are open source and free in nature.

Submitted by,
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RED TACTON

1. INTRODUCTION

Human society is entering an era of omnipresent computing, when networks are seamlessly interconnected and information is always accessible at our fingertips. The practical implementation of omnipresent services requires three levels of connectivity:

• Wide Area Networks (WAN), typically via the Internet, to remotely connect all types of severs and terminals.

• Local Area Networks (LAN), typically via Ethernet or Wi-Fi connectivity among all the information and communication appliances in offices and homes.

• Human Area Networks (HAN) for connectivity to personal information, media and communication appliances within the much smaller sphere of ordinary daily activities-- the last one meter.

Red Tacton Technology was introduced by Nippon Telegraph and Telephone Corporation (NTT). TACTON- meaning “action triggered by touching” and RED - It is an auspicious color according to Japanese culture for warmth. It is a technology that uses the surface of the human body as a safe, high speed network transmission. It is designed to unite or collect all different types of devices to work as one.

Red Tacton supports human to machine and vice versa connections. Broadband and Interactive - Duplex, interactive communication is possible at a maximum speed of 10Mbit/s. Because the transmission path is on thesurface of the body, transmission speed does not deteriorate in congested areas where many people are communicating at the same time.

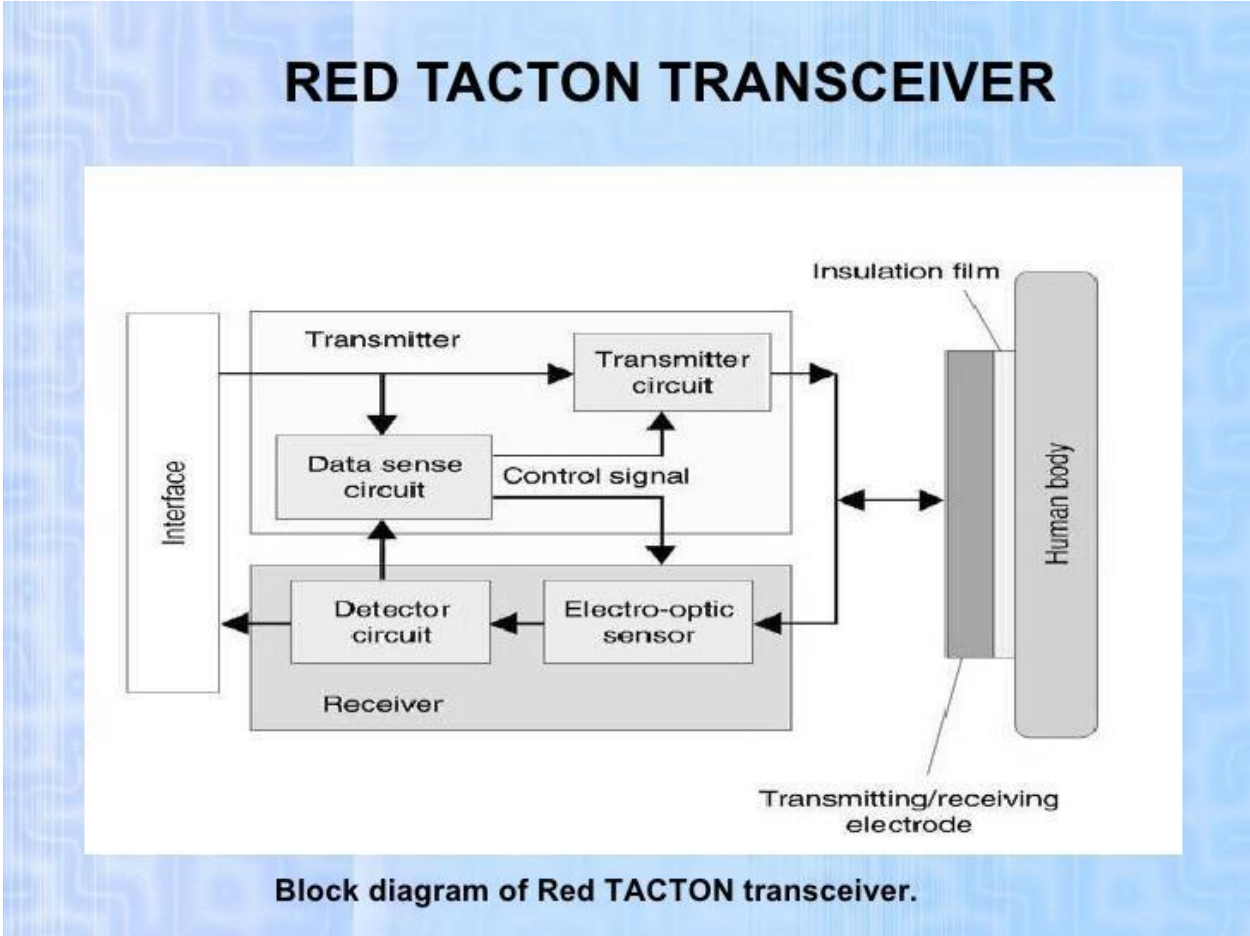
2. HISTORY

In the past, Bluetooth, infrared communications (IrDA), radio frequency ID systems (RFID), and other technologies have been proposed to solve the "last meter" connectivity problem. However, they each have various fundamental technical limitations that constrain their usage, such as the precipitous fall-off in transmission speed in multi-user environments producing network congestion. The concept of intra-body communication was first proposed by IBM in 1996. T.G. ZIMMERMAN was the first person (at IBM) to give the idea of multiple wearable computer attached to the user body. A revolutionary technology RED TACTON was developed on 30 August 2005. This communication mechanism was later evaluated and reported by several research groups around the world.

3. HOW RED TACTON WORKS

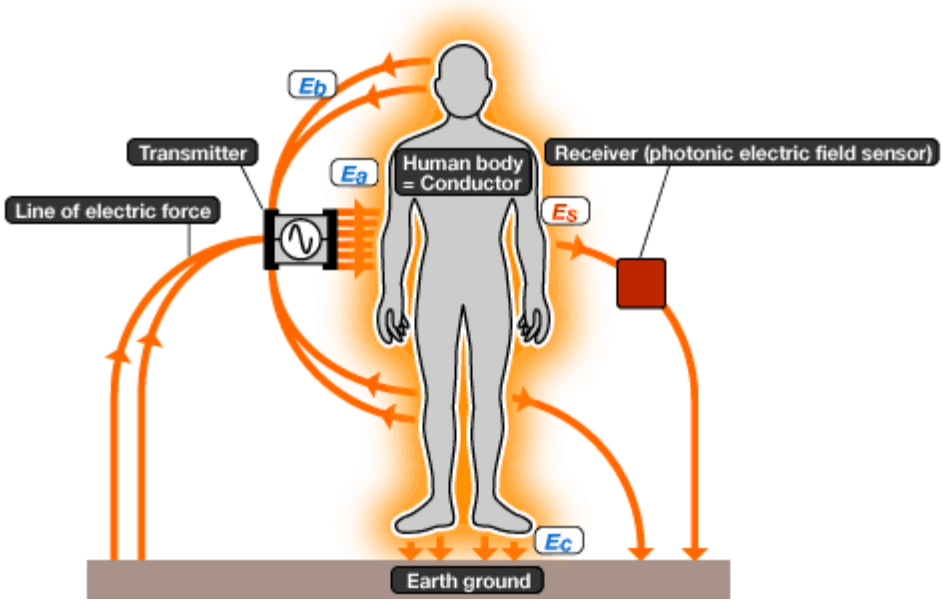
Similar to any other technology, Red Tacton Technology, will also have a transmitter and a receiver.As soon as the human body comes in contact with the Red Tactontransceiver, the signals will start to be transmitted. When the contact is taken off, the transmission will also stop. The terminals are either embedded in the devices or are carried by the user itself. According to the natural and physical movements of the user, the communication will happen in various combinations. The communication through the user can occur only through his body surface parts like hands, fingers, arms, feet, face, legs or torso. The technology also works in shoes and other clothing's as well. No current flowing into human body from Red Tacton devices. Red Tacton uses the electric field that occurs naturally on the surface of the human body for communication. Displacement current occurring in body is small enough. The body indirectly receives a minute electric field. The transmitter in Red Tacton will induce a mild electric field on the human body surface. A transistor or photonic electric field sensor will be setup as the sensor for the electric field on the Red Tacton receiver. This sensor detects the electric field and the signal will be processed in the receiver as well. This processed signal thus becomes the data that is to be downloaded.

The basic block diagram of a Red Tacton Transceiver is shown below.



Block diagram of Red TACTON transceiver.

Like digital signals, the signals will depend on the fluctuations in the electric field that is induced in the body. As the electric field is mild in nature, highly sensitive sensing technology is used in the receiver part.



Other than the electric field that transmits the data, there will also be very small and unstable electric fields on the surface of the body. This will be natural in nature and will be automatically sent back to earth.

4. RED TACTON ADVANTAGES

Red Tacton does not require the electrode to be in direct contact with the skin. Red Tacton transceivers are programmable and we can decide what to share with whom and what devices you communicate with. Transmission speed does not deteriorate even though the number of users increases. Data loss during transfer is less Use of minimum amount of power.Security is more. No problem of hackers It is very hard to pick up stray electronic signals radiating from the body.

5. RED TACTON IN FUTURE

Red Tacton technology is expected to dominate Bluetooth and the Wi-fi technology in the future. Red Tacton technology could put the use of cables to an end. The problem faced by the Red Tacton technology is the cost of development. This technology brings a new dimension of communication which effectively links the user to anyone wants to communicate. Since it provides high speed communication, it can provide seamless service wherever, whenever and whoever uses it. Red Tacton is a continually expanding technology.

There are plans to add many new application features. With over 1500 companies working on Red Tacton the future is very bright. With a Strong Special interest group behind Red Tacton , the standardization of the application profiles is almost assured by 2025.

Submitted by,
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TECHNICAL RIDDLES

1. What is page cannibalizing?
2. List out some reasons for process termination?
3. What are the typical elements of a process image?
4. What are the disadvantages of context switching?
5. What is a binary semaphore? What is its use?
6. The program that is responsible for loading the operating system into RAM is the _____.
A) BIOS B) Bootstrap Program C) Drive- Driver D)Supervisor Program
7. What are the stipulations of C2 level security?
8. When does the condition 'rendezvous' arise?
9. What is dual-mode operation?
10. Default read write and execute permissions given to a file for owner, group and others are
A) 6-4-4 B) 6-4-2 C) 6-4-6 D) 6-6-6

Answers:

1. Page swapping or page replacements are called page cannibalizing.
2. Normal completion, Time limit exceeded, Memory unavailable, Bounds violation, Protection error, Arithmetic error, Time overrun, I/O failure, Invalid instruction, Privileged instruction, Data misuse, Operator or OS intervention, Parent termination.
3. User data: Modifiable part of user space. May include program data, user stack area and programs that may be modified.
User program: The instructions to be executed.
System Stack: Each process has one or more LIFO stacks associated with it. Used to store parameters and calling addresses for procedure and system calls.
Process control Block (PCB): Info needed by the OS to control processes.
4. Time taken for switching from one process to other is pure overhead. Because the system does not do any useful work while switching.So one of the solutions is to go for threading whenever possible.
5. A binary semaphore is one, which takes only 0 and 1 as values. They are used to implement mutual exclusion and synchronize concurrent processes.
6. Answer: B) Bootstrap Program

Explanation:
The program that is responsible for loading the operating system into RAM is the bootstrap Loader program.
7. Answer:
1. Discretionary Access Control
2. Identification and Authentication
3. Auditing
4. Resource reuse
8. In message passing, it is the condition in which, both, the sender and receiver are blocked until the message is delivered.
9. In order to protect the operating systems and the system programs from the malfunctioning programs the two mode operations were evolved
System mode
User mode.
10. Answer: A) 6-4-4
Explanation:
Default permissions given to a file are:
Owner - read write and execute - 6
Group - write - 4
others - write – 4

Submitted by,
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VIRTUAL REALITY

INTRODUCTION:

A technology first prototyped in the 1960s, virtual reality simulates a real or imagined physical event, such as a walk through the park, or on Mars. Modern VR typically produces artificial scenes in software and renders them as an immersive experience of sight and sound. VR hardware generates a realistic world in 3-D that changes in real time as you interact with it. Once only a subject of science fiction, VR has found many uses in education, entertainment, medicine and science.

HARDWARE:

The hardware for virtual reality begins with a computer or console capable of high speed graphics processing; high performance is essential to VR because generating realistic, moving scenery involves lots of math. To view the graphics, VR system users wear a special set of goggles or a closed, enveloping helmet that incorporates a wide-angle display. In addition to displaying imagery, the device tracks head what's behind, above or below you in the virtual world. Other VR setups employ a wraparound screen in a small enclosed room or chamber in which you sit. In either case, the VR system creates a detailed visual panorama.

HISTORY:

1970–1990

The VR industry mainly provided VR devices for medical, flight simulation, automobile industry design, and military training purposes from 1970 to 1990.

1990–2000

In 1991, Carolina Cruz-Neira, Daniel J.Sandin and Thomas A.DeFanti from the Electronic Visualization Laboratory created the first cubic immersive room, The Cave.

Between 1989-1992, Nicole Stenger created *Angels*, the first real-time interactive immersive movie. The interaction was facilitated with a dataglove and high-resolution goggles.

The 1990s saw the first widespread commercial releases of consumer headsets. In 1991, Sega announced the Sega VR headset for arcade games and the Mega Drive console. It used LCD screens in the visor, stereo headphones, and inertial sensors that allowed the system to track and react to the movements of the user's head.In the same year,Virtuality launched and went on to become the first mass-produced, networked, multiplayer VR entertainment system.

The concept was later adapted into the personal computer-based, 3D virtual world Second Life.

2000-2015

By 2007, Google introduced Street View , a service that shows panoramic views of an increasing number of worldwide positions such as roads, indoor buildings and rural areas. It also features a stereoscopic 3D mode, introduced in 2010.

2014, Facebook purchased Oculus VR for $2 billion. This purchase occurred after the first development kits ordered through Oculus' 2012 Kickstarter had shipped in mid 2013 but before the shipping of their second development kits in mid 2014. In that same month, Sony announced Project Morpheus (its code name for Playstation VR) , a virtual reality headset for the Playstation 4 video game console.

2016-2017

There were at least 230 companies developing VR-related products.Facebook has 400 employees focused on VR development; Google, Apple, Amazon, Microsoft, Sony and Samsung all had dedicated AR and VR groups.

In 2016, HTC shipped its first units of the HTC VIVE SteamVR headset.This marked the first major commercial release of sensor-based tracking, allowing for free movement of users within a defined space.

In early 2017, a patent filed by Sony showed they were developing a similar location tracking technology to the VIVE for PlayStation VR, with the potential for the development of a wireless headset

FUTURE:

According to chief scientist Micheal Abrash at Oculus, following things likely will be resolved before 2022.

- Eye-tracking
- Face-tracking
- Hand-tracking
- Inside-out tracking
- External body-tracking
- 140 degrees field of view
- 4k display resolution per eye
- Personalized positional audio
- Varifocal display, allowing the user to focus on different distances
- Foveated rendering, reducing the number of pixels needed to be rendered by a factor of at least 10

In robotics, virtual reality has been used to control robots in telepresence and telerobotic systems.

In social sciences and psychology, virtual reality offers a cost-effective tool to study and replicate interactions in a controlled environment.

Surgery training can be done through virtual reality.

Virtual reality's growing market presents an opportunity and an alternative channel for digital marketing.

The Virtual Reality Modeling Language (VRML) was intended for the development of "virtual worlds" without dependency on headsets.

The Web3D was development of industry standards for web-based 3D graphics.

All modern VR displays are based on technology development for smartphones including: gyroscopes and motion sensors for tracking head, hand, and body positions; small HD screens for stereoscopic displays; and small, lightweight and fast processors.

`Independent production of VR images and video has increased by the development of omnidirectional cameras, also known as 360-degree cameras or VR cameras, that have the ability to record in all directions, although at low-resolutions or in highly compressed formats for online streaming of 360 video. In contrast, photogrammetry is increasingly used to combine several high-resolution photographs for the creation of detailed 3D objects and environments in VR applications.

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