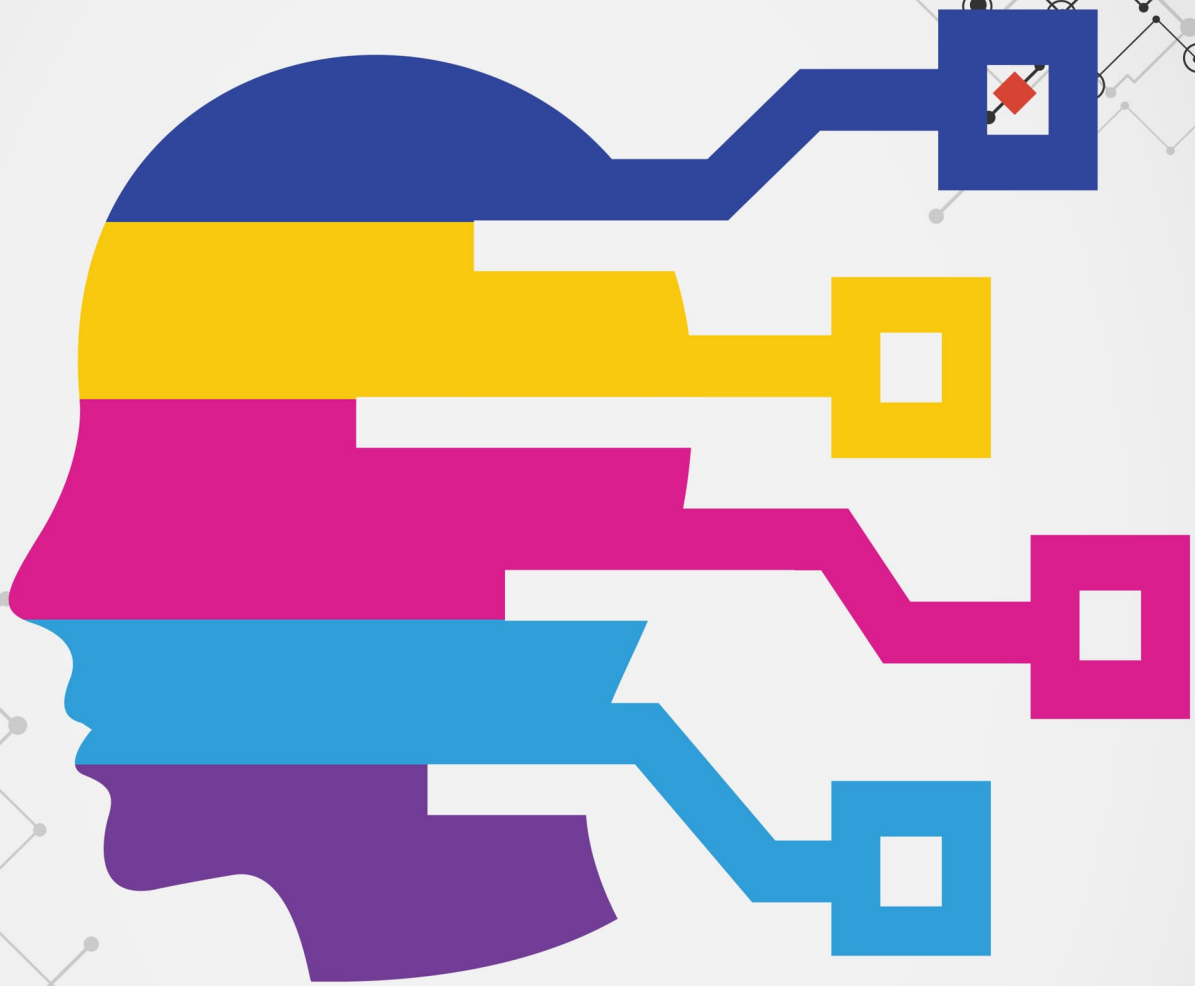
VOLUME - 06

DIGITAL MINDS



BUNTS SANGHA'S
S.M. SHETTY COLLEGE OF SCIENCE,COMMERCE & MANAGEMENT STUDIES
HIRANANDANI, POWAI, MUMBAI-76
NAAC ACCREDITED 'A' GRADE

Department of Information Technology

In

Collaboration with IT association

Presents

“Digital Minds”

Volume - 6
Aug – 2017

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Principal`s Desk

The Bunts Sangha's S.M.Shetty College believes in all round development of students through holistic education. The Vision of the college, **'Personality Development for Nation Building'** is the guiding principle of all our activities and efforts.

The Innovations and Best Practices implemented in the college are aligned with the Vision and Mission which has given an identity to the college. One such innovative and best practice is **'Sharpening Skills in Teaching and Research.'** In the pursuit of Mission of the college, various co-curricular, extra-curricular activities and extension and outreach programs have been designed and implemented for the benefit of students. A separate Research Cell has been started for students to encourage and develop research bent of mind among them. Each program brings out magazines by motivating students to write articles in them.

"Digital Minds" is a platform where young minds can participate, discuss, explore, analyze and contribute something resourceful in the progressive domain of technology. It is a yearly student's magazine publishing study and research articles on varied aspects of technology.

I wish that our students will come forward to learn, go forth to serve and excel into the world with great strength, not only to do job but to remain beautiful human beings.

Dr. Sridhara Shetty

Principal, S. M. Shetty College

Editor`s desk

Information technology refers to the collection of tools that make it easier to use, create, manage and exchange information. The Internet is the latest of a long series of information technologies, which includes printing, mail, radio, television and the telephone. This overcomes with Internet in huge scale.

Analysts estimate that 50 billion devices will get connected to the Internet by 2020. In this exploding Internet of Things (IoT), users, things and cloud services connect using the Internet to enable new use cases and new business models across multiple applications.

Our association appreciates the contribution put up by the students for the magazine “Digital minds”, Volume -6. This platform shows the mode to the students to go through the research articles. This may help students to understand the theoretical and scientific aspects of the IT and Computer Science disciplines. This volume covers the latest trends in mobile technology, virtual reality, networking and many more.

“The ultimate promise of technology is to make us master of a world that we command by the push of a button.”

Volker Grassmuck

Prof. Sheetal Khanore

Incharge - IT Association

INSIGHT

Our era is known as the era of Information Technology. Information Technology with its superhighway has not only revolutionized man's way of working but also his very existence. IT (Information Technology) revolution is sweeping our civilization bringing about unfathomable changes in our present-day civilization. Twenty first century belongs to the IT world.

The term 'Information Technology' or simply known as IT is a generic name given to all improvements that are taking place in our world due to the inter-linked advancement in technology, learning, and information. The term refers to recent technological developments that are taking place in our world as a result of better technology, due to better information. It is believed that the growth in IT knowledge implies the growth of a country. The discipline of technology provides ample scope for research and development.

Today IT revolution is sweeping over the world. Although, IT boom has revolutionized the western world beyond recognition it is still to make much headway in changing lives in India. The boom has, however, affected only the affluent and the urban India. The benefits of IT boom needs to penetrate down to the ordinary men and women living in our country.

Student who enjoys exploring new technology while solving problems by applying their technical and analytical skills, are the important part of information technology.

"Digital Minds" is a humble initiative of the IT Department to provide a platform where young minds can participate, discuss, explore, analyze and contribute something resourceful in the progressive domain of technology. It is a yearly magazine includes research articles on varied aspects of technology.

The prime objective of the magazine is to encourage learners to read and explore a lot in order to achieve higher academic standards. The magazine will foster involved academic atmosphere where learning becomes compulsive but not compelling.

In years to come everything will be digitalized, including the mind. In this perspective the name "Digital Minds" is suitably chosen. IT learners are encouraged to enrich the magazine with diverse articles and information which can be effortlessly accessed by the readers. It is hoped that this endeavor would serve its objective.

Prof. Tushar Sambare
B.Sc. IT/ M.Sc.IT Coordinator

Contents

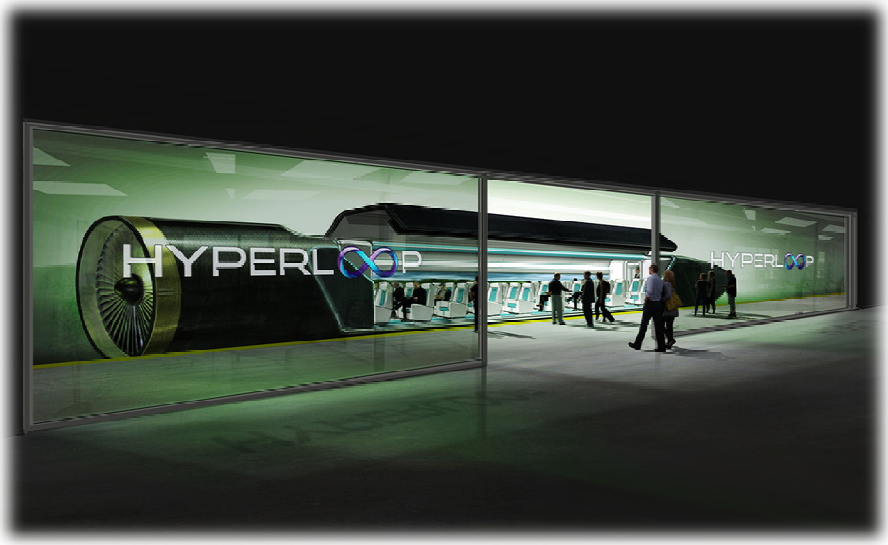
Is Hyper Loop The Future Of Transportation?

-Adarsh Shetty

S.Y.BSc(IT)-A

Tesla and SpaceX's Elon Musk has started the building revolution for a new train system dubbed Hyperloop. It will mean getting from London to Edinburgh or LA to San Francisco in under 30 minutes. But what is it and how does it work?

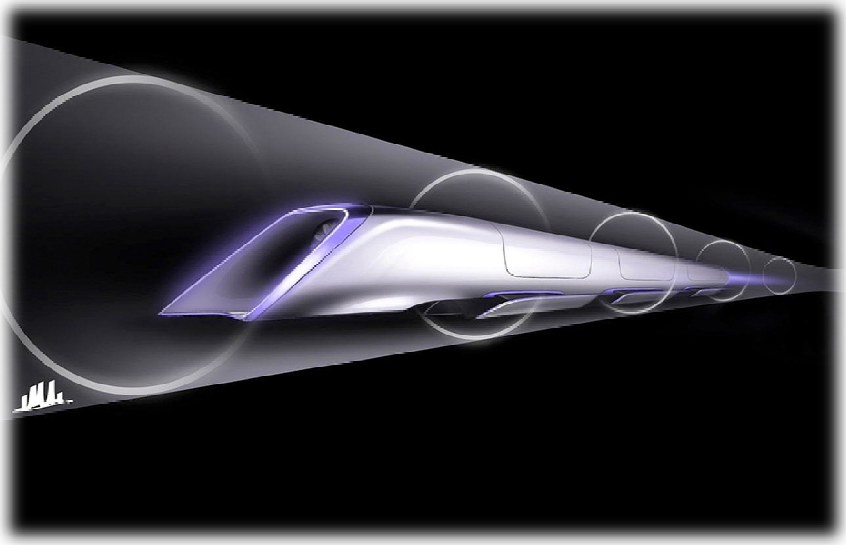
The Hyperloop is essentially a futuristic train that Musk calls "a cross between a Concorde, a railgun and an air hockey table". It's based on the very high speed transit (VHST) system proposed in 1972 which combines a magnetic levitation train and a low pressure transit tube. It evolves some of the original ideas of VHST, but still uses tunnels and pods or capsules to move from place to place. Musk has likened it to a vacuum tube system in a building used to move documents from place to place.



So how does the Hyperloop transit system work?

Low Pressure

The Hyperloop will be built in tunnels that have had some of the air sucked out to lower the pressure. So, like high altitude flying, there's less resistance against the pod moving through the tunnel, meaning it can be much more energy efficient, something that's highly desirable.



For Hyperloop, the idea is to lower the air pressure, a job that could be done by regularly placed air pumps. Low pressure, however means you still have some air in the tunnels.

The air bearing and passive maglev ideas are designed not only to levitate the pod, but also see the pod moving through the air, rather than pushing the air infront of it and dragging it along behind. The air cushion will see the air pumped from the front of the pod to the rear via these suspension cushions.

The tunnels envisioned are metal tubes, elevated as an overground system. Musk has suggested that solar panels running on the top of the tunnels could generate enough electricity to power the system. It could also run as an underground system too.

Hyperloop is being proposed as an alternative to short distance air travel, where the system will be much faster than existing rail networks and much cleaner that flight. Hyperloop isn't about going as fast as possible, because you'll have to deal with high G forces when it came to turns, which isn't ideal for passenger travel.

Speeds of over 700mph are suggested for journeys, but there are practical implications that have to be considered on a short stop-start journey, such as the acceleration and deceleration sensation that passengers would go through.

When Will The Hyperloop Arrive?

Elon Musk hasn't yet given a date when we can expect to see Hyperloop up and running, he's merely announced that it will be made. A 1-mile test track built by SpaceX adjacent to Hawthorne, its California headquarters has been built, and the first successful trial has been carried out.

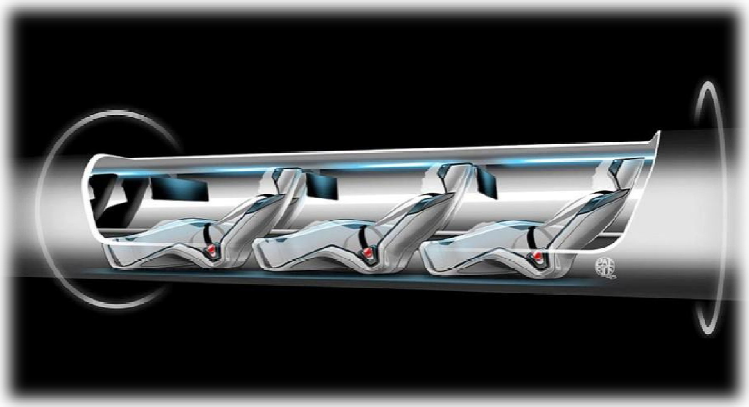
Hyperloop One plans to send an 8.5-metre long pod down a set of tracks in Nevada within the next month, and in May, a pod levitated a separate test track in Nevada for 5.3-seconds and reached 70mph.

Planning documents currently propose a route between LA and San Francisco, a 354-mile journey, that would cost around $6 billion in construction. This is based on a passenger-only model whereas one that can also transport vehicles too would be $7.5 billion. This extra expenditure would be worth it since more people could use the system, offering potentially larger returns.

Shervin Pishevar, co-founder and chairman of Hyperloop Technologies, aims to shuttle passengers and cargo in high-speed pods that are smaller than most planes and trains and

designed to depart as often as every 10 seconds. He told CNBC: "Hyperloop will be operational, somewhere in the world, by 2020."

Hyperloop Transportation Technologies is looking into a setup that would link Slovakia, Austria and Hungary. This is the same company that plans to create the 5-mile test loop in California by 2018.



“Any Product That Needs A Manual To Work Is Broken.”

-Elon Musk, Ceo- Tesla

How Protected Is A Url?

Let'S Ask Google Dorks

-Raghuvanshi Shetty

S.Y.BSc(IT)-B

Ever wandered about the extra alphabets, numeric's and words at the end of the address link that makes no sense, yes these extra additions contains a lot of information which can be a great harm to the user and the network, these vulnerability can be easily accessed since they are not completely protected or encapsulated and these vulnerability are called as Google Dorks.

Google dorking, is a computer hacking technique that uses Google Search and other Google applications to find security holes in the configuration and computer code that websites use

Google dorking, also known as Google hacking, can return information that is difficult to locate through simple search queries. That description includes information that is not intended for public viewing but that has not been adequately protected.

Google hacking involves using advanced operators in the Google search engine to locate specific strings of text within search results. Some of the more popular examples are finding specific versions of vulnerable Web applications. The following search query would locate all web pages that have that particular text contained within them. It is normal for default installations of applications to include their running version in every page they serve

As a passive attack method, Google dorking can return usernames and passwords, email lists, sensitive documents, personally identifiable financial information (PIFI) and website vulnerabilities. That information can be used for any number of illegal activities, including cyberterrorism, industrial espionage, identity theft and cyberstalking.

A search parameter is a limitation applied to a search. Here are a few examples of advanced search parameters:

- *site:* returns files located on a particular website or domain.
- *filetype:* followed (without a space) by a file extension returns files of the specified type, such as DOC, PDF, XLS and INI. Multiple file types can be searched for simultaneously by separating extensions with "|".
- *inurl:* followed by a particular string returns results with that sequence of characters in the URL.
- *intext:* followed by the searcher's chosen word or phrase returns files with the string anywhere in the text.

The concept of "Google Hacking" dates back to 2002, when Johnny Long began to collect interesting Google search queries that uncovered vulnerable systems and/or sensitive information disclosures - labeling them googleDorks.

The list of googleDorks grew into large dictionary of queries, which were eventually organized into the original Google Hacking Database (GHDB) in 2004. These Google hacking techniques were the focus of a book released by Johnny Long in 2005.

Since its heyday, the concepts explored in Google Hacking have been extended to other search engines, such as Bing and Shodan. Automated attack tools use custom search dictionaries to find vulnerable systems and sensitive information disclosures in public systems that have been indexed by search engines.

But in 2012 Google held an open challenge for anyone to infiltrate their resisting servers. For a full visual timeline, detailing the major events and developments in Google Hacking from 2002 to Present, see the Google Hacking History by Bishop Fox.

Access to internal documents can yield further sensitive information. For example, document metadata often contains more information than the author is aware of, such as revision history, deletions, dates and author / updater names. Because an intruder with the requisite know-how and / or tools can access such information, it's a good practice to ensure that it is actually removed from documents before they are published or shared. The practice of document sanitization is designed to make sure that only the intended information can be accessed.

In August 2014, the United States Department of Homeland Security (DHS), the FBI and the National Counterterrorism Center issued a bulletin warning agencies to guard against the potential for Google dorking on their sites. One of the first intrusion prevention measures proposed is to conduct Google dorking expeditions using likely attack parameters to discover what type of information an intruder could access.

"If You're Changing The World, You're Working On Important Things."

-Larry Page

Iran's Newest Robot Is An Adorable Dancing Humanoid

-Deepak Mishra

T.Y.BSc(IT)-A

Last Iranian researchers have recently unveiled a new robot called Surena Mini

Over the several years, a team of roboticists at the University of Tehran has been working on increasingly large and complex life-size humanoids. For their latest project, however, the Iranian researchers decided to build something smaller—and cuter.

Surena Mini is a knee-high robot with a sleek 3D-printed body, articulated limbs, and a round head with two camera-eyes. Twenty small servomotors power its arms, legs, and neck, allowing the little robot to walk, gesture, and dance:

"The main purpose of this robot is to provide researchers and students with a reliable robotic platform for educational and research applications," Aghil Yousefi-Koma, a professor of mechanical engineering at the University of Tehran, told *IEEE Spectrum.*

He added that his group also has plans to offer the robot "for helping autistic and deaf children."

A team of 15 researchers at University of Tehran's Center for Advanced Systems and Technologies worked for over a year to design and build Surena Mini, which is 50 centimeters tall and weighs 3.4 kilograms.

Packed inside the robot are a compact computer with an Intel Core CPU, cameras and infrared sensors, speakers, and an IMU, or inertial measurement unit. Its hands aren't designed for grasping objects, but Surena Mini can push on small things—or karate-chop them:

A little over a year ago, the same group unveiled Surena III, an advanced adult-sized humanoid designed for researching bipedal locomotion, human-robot interaction, and other challenges in robotics.

Surena III, equipped with cameras, 3D sensor, and a computer running ROS, or Robot Operating System, was able to pick up bottles, imitate a person's gestures, and stand on one foot.

Iranian researchers unveiled Surena III in 2015. The robot, almost 2 meters tall and weighing 98 kilograms, can kick a ball, go up a ramp, and walk down a set of steps.

The Iranian roboticists plan to continue working on Surena III, but they also want to explore the possibility of creating marketable products based on their research, Professor Yousefi-Koma explained, and one of the ideas they had was building a "kid-size version of Surena."

Surena Mini's overall size and design appear similar to that of other small humanoids like Nao, developed by French robotics company Aldebaran (now SoftBank Robotics), and Robotis OP2, created by U.S. and South Korean roboticists.

But the Iranian robot has yet to show that it has some of the same skills already demonstrated by those other humanoids. Nao and Robotis OP2 have been used in research labs, schools, and hospitals for nearly a decade. Both are also used in the RoboCup robot soccer competition.

Researchers from the University of Tehran's Center for Advanced Systems and Technologies, led by Professor Aghil Yousefi-Koma (standing between the robots with red and green feet/hands), worked for over a year to design and build Surena Mini.

Despite their size, these little robots are pricey. Nao and Robotis OP2 each sell for nearly US $10,000. Professor Yousefi-Koma said Surena Mini will be available for 260,000,000 Iranian rials, or $8,000, but he hopes the cost to come down if the robot can be produced in large batches.

One of the biggest challenges of the project, he explained, has been implementing features like face detection and voice recognition, which would let the robot perform with a greater level of autonomy. His team has developed such capabilities for their large robots, but replicating them using Surena Mini's limited hardware is a trickier task.

To program the robot, advanced users can modify the source code to create different behaviors. But the researchers wanted to make Surena Mini accessible to less experienced users as well. So they created a programming environment with a graphical interface "designed to be attractive and user-friendly," Professor Yousefi-Koma said.

"It gives users full access to all available features of the robot," he added, "so even beginners can make the robot walk and move its arms and head."

"We're fascinated with the robots because they are refelction of ourselves"

-Ken Goldberg

Hadoop: The Big Data

-Priyanka Jadhav

S.Y.BSc(IT)-A

Apache Hadoop is an open-source software framework used for distributed storage and processing of dataset of big data using the MapReduceprogramming model. It consists of computer clusters built from commodity hardware. All the modules in Hadoop are designed with a fundamental assumption that hardware failures are common occurrences and should be automatically handled by the framework.

The core of Apache Hadoop consists of a storage part, known as Hadoop Distributed File System (HDFS), and a processing part which is a MapReduce programming model. Hadoop splits files into large blocks and distributes them across nodes in a cluster. It then transfers packaged code into nodes to process the data in parallel. This approach takes advantage of data locality, where nodes manipulate the data they have access to. This allows the dataset to be processed faster and more efficiently than it would be in a more conventional supercomputer architecture that relies on a parallel file system where computation and data are distributed via high-speed networking.

History

The genesis of Hadoop was the "Google File System" paper that was published in October 2003. This paper spawned another one from Google – "MapReduce: Simplified Data Processing on Large Clusters". Development started on the Apache Nutch project, but was moved to the new Hadoop subproject in January 2006. Doug Cutting, who was working at Yahoo! at the time, named it after his son's toy elephant. The initial code that was factored out of Nutch consisted of

The first committer to add to the Hadoop project was Owen O'Malley (in March 2006); Hadoop 0.1.0 was released in April 2006. It continues to evolve through the many contributions that are being made to the project. The first committer to add to the Hadoop project was Owen O'Malley (in March 2006); Hadoop 0.1.0 was released in April 2006. It continues to evolve through the many contributions that are being made to the project.

Prominent Use Cases:

On February 19, 2008, Yahoo! Inc. launched what they claimed was the world's largest Hadoop production application. The Yahoo! Search Webmap is a Hadoop application that runs on a Linux cluster with more than 10,000 cores and produced data that was used in every Yahoo! web search query. There are multiple Hadoop clusters at Yahoo! and no HDFS file systems or MapReduce jobs are split across multiple data centers. Every Hadoop cluster node bootstraps the Linux image, including the Hadoop distribution. Work that the clusters perform is known to include the index calculations for the Yahoo! search engine. In June 2009, Yahoo! made thesource code of its Hadoop version available to the open-source community. In 2010, Facebook claimed that they had the largest Hadoop cluster in the world with 21 PB of storage.In June 2012, they announced the data had grown to 100 PB and later that year they announced that the data was growing by roughly half a PB per day.

As of 2013, Hadoop adoption had become widespread: more than half of the Fortune 50 used Hadoop.

Hadoop Hosting In Cloud

Hadoop can be deployed in a traditional onsite datacenter as well as in the cloud. The cloud allows organizations to deploy Hadoop without the need to acquire hardware or specific setup expertise.Vendors who currently have an offer for the cloud include Microsoft, Amazon,

Branding

The Apache Software Foundation has stated that only software officially released by the Apache Hadoop Project can be called Apache Hadoop or Distributions of Apache Hadoop.The naming of products and derivative works from other vendors and the term "compatible" are somewhat controversial within the Hadoop developer community.

On Google Cloud Platform

There are multiple ways to run the Hadoop ecosystem on Google Cloud Platform ranging from self-managed to Google-managed.

- Google Cloud Dataproc: a managed Spark and Hadoop service
- command line tools (bdutil): a collection of shell scripts to manually create and manage Spark and Hadoop clusters[110]
- third party Hadoop distributions:
  - Cloudera – using the Cloudera Director Plugin for Google Cloud Platform
  - Hortonworks – using bdutil support for Hortonworks HDP
  - MapR – using bdutil support for MapR

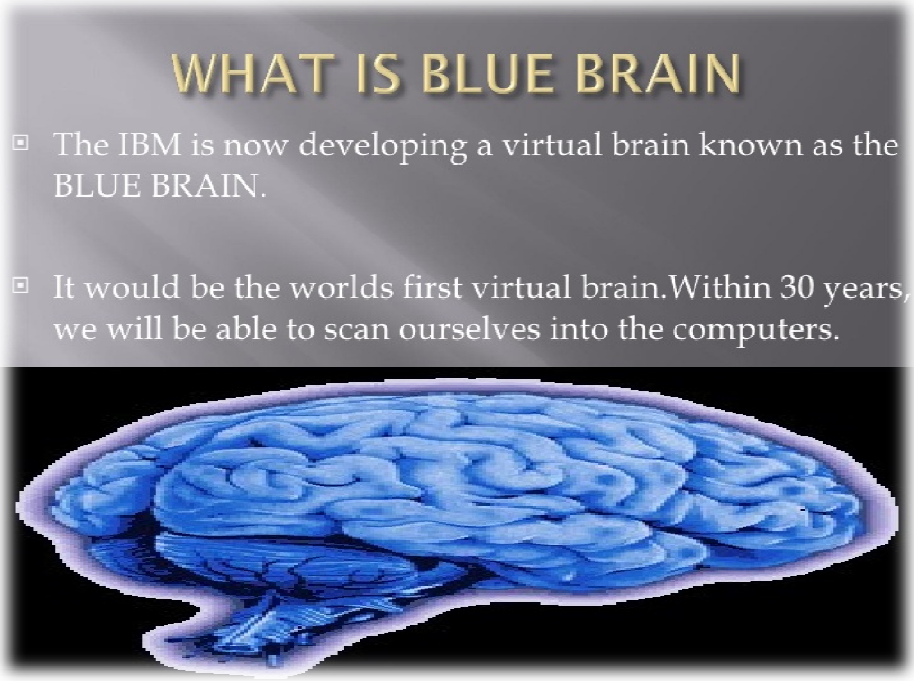
Google also offers connectors for using other Google Cloud Platform products with Hadoop, such as a Google Cloud Storage connector for using Google Cloud Storage and a Google BigQuery connector for using Google BigQuery.

"In 21st Century, The Database Is The Marketplace"
-Stan Rapp

The Blue Brain Project

-Parvati Rizal

S.Y.BSc(IT)-A



Introduction

Blue Brain is the world's first virtual brain to be developed.It can think like brain,take decisions based on past experience and respond like natural brain.It is an attempt to create a synthetic brain by reverse engineering the mammalian brain down to the molecular level.The main aim of this research is to upload human brain into machine. So that man can think and take decision without any effort. After the death of the body, the virtual brain will act as the man. So, even after the death of a person we will not lose the knowledge, intelligence, personalities, feelings and memories of that man that can be used for the development of the human society.The project was founded in May 2005 by Henry Markram at the EPFL in Lausanne, Switzerland. Goals of the project are to gain a complete understanding of the brain and to enable better and faster development of brain disease treatments. The research involves studying slices of living brain tissue using microscopes and patch clamp electrodes. Data is collected about all the many di_erent neuron types. This data is used to build biologically realistic models of neurons and networks of neurons in the cerebral cortex. The simulations are carried out on a Blue Gene supercomputer built by IBM. Hence the name "Blue Brain". The simulation software is based around Michael Hines's NEURON, together with other custom-built components. Typical scientists, impending research funders and scientific journalists are still doubtful on success of mind uploading.

Significant mainstream research in related areas is being conducted in animal brains, comparing, contrasting and simulation, developing of faster super computers, virtual reality, brain-computer interfaces, connectors and information extraction from dynamically working brains. A progressively vast community of thoughtful researchers has arisen, taking this seemingly science fictional knowledge seriously and running to it through experimental and theoretical research programs. These supporters mention many of the tools and ideas needed to achieve mind uploading activity; however, they also admit that it is very hypothetical, but still in the dominion of engineering potential. Consciousness is a part of natural world. We believe that consciousness depends on mathematics and logic, laws of physics and chemistry and biology; its not magical. The concept of mind uploading is based on this mechanical view of the mind. It denies the ritualistic view of human life and consciousness. Eminent computer geniuses and neuro scientists have foretold that specially programmed machines will be capable of thought and even reach some level of consciousness. Such machine intelligence ability might offer a computational substrate necessary for uploading. As of August 2012 the largest simulations are of mesocircuits containing around 100 cortical columns

Such simulations involve approximately 1 million neurons and 1 billion synapses.This is about the same scale as that of a honey bee brain. It is hoped that a rat brain neocortical simulation (21 million neurons) will be achieved by the end of 2015.A full human brain simulation (86 billion neurons) should be possible by 2023 provided sufficient funding is received.

Why Do We Need An Artificial Brain?

Today we are developed because of our intelligence. Intelligence is the inborn quality that cannot be created .Some people have this quality, so that they can think up to such an extent where other cannot reach. Human society is always in need of such intelligence and such an intelligent brain to have with. But the intelligence is lost along with the body after the death. The virtual brain is a solution to it. The brain and intelligence will be alive even after the death. We often face difficulties in remembering things such as people names, their birthdays, and the spellings of words, proper grammar, important dates, history facts, and etcetera. In the busy life everyone wants to be relaxed. Can’t we use any machine to assist for all these? Virtual brain may be a better solution for it.

How Is It Possible?

It is helpful to describe the basic manners in which a person may be uploaded into a computer. Raymond Kurzweil recently provided an interesting paper on this topic. In it, he describes both invasive and noninvasive techniques. The most promising is the use of very small robots, or nanobots. These robots will be small enough to travel throughout our circulatory systems. Traveling into the spine and brain, they will be able to monitor the activity and structure of our central nervous system. They will be able to provide an interface with computers that is as close as our mind can be while we still reside in our biological form. Nanobots could also carefully scan the structure of our brain, providing a complete readout of the connections between each neuron. They would also record the current state of the brain. This information, when entered into a computer, could then continue to function like us. All that is required is a computer with large enough storage space and processing power. Many people believe firmly those we posses a soul, while some very technical people believe that quantum forces contribute to our awareness. But we have to now think technically. Note, however, that we need not know how the brain actually functions, to transfer it to a computer.

“A Man Paints With His Brains Not With His Hands.”
-Micheal Angelo

New Tech Could Read Books Without Opening

- Shriyans Jain

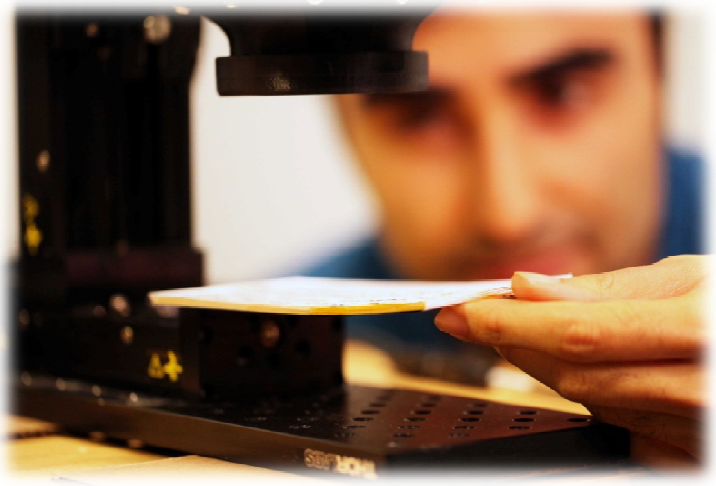
S.Y.BSc.(IT)

Introduction

As the technology is gettting advanced day by day and we are getting busy, we are always in a hury and we also don't have time and energy to carry those old heavy books. Scaning the book is also very time consuming to reduce our burden scientis have desiged a new camera which can read book without opening it.

This is a camera which emits terahertz radiation this radiation goes inside the book get refracted by calculating the refaraction we can understand what is writen in thet page. As this camera is in development stage now it can only read upto 9 pages.

Terahertz time-domain spectroscopy (THz-TDS) is a leading method for spectroscopy, imaging and nondestructive testing in the frequency range of 0.1–10 THz. The method can detect structural defects in foams, wooden objects, plastic components, composites, pharmaceutical products' coatings and cultural artefacts. In contrast to infrared-based time-of-flight cameras, optical coherent tomographic techniques and X-ray techniques, THz-TDS provides both fine time resolution and broadband spectral signatures for a variety of dielectric materials. These advantages have motivated researchers to use computational techniques to empower the yet-maturing THz hardware.



Despite the prevalence of sub-millimetre layered structures in industry, biology and objects of cultural value, conventional THz-TDS is incapable of deep content extraction for three well-known reasons: signal-to-noise ratio (SNR) drops with depth (or increasing number of layers), the contrast of the content is much lower than the contrast between dielectric layers, the content from deeper layers are occluded by the content from front layers. Here we introduce a time-gated spectral imaging technique that overcomes all of these challenges to extract occluding content from layers whose thicknesses and separations are comparable to the wavelength. The method uses the statistics of the THz electric field (E-field) to lock into each layer position and then uses a time-gated spectral kurtosis averaging to tune to the spectral images with the highest contrast on that layer. This provides layer extraction at low SNR<10 dB and intensity images with up to 18 times higher contrast compared with simple amplitude mapping. The extraction overcomes partial occlusion by a shape composition algorithm. To demonstrate, occluding textual content was extracted from a sample similar to a closed book with single-sided pages down to nine pages without human supervision. The proposed method provides a capability to inspect densely layered samples prevalent in

industry (for example, coatings and polymer-based laminates), geology and specifically objects of cultural value (for example, documents and art works). The study also thoroughly discusses the advantages and limitations of this technique.

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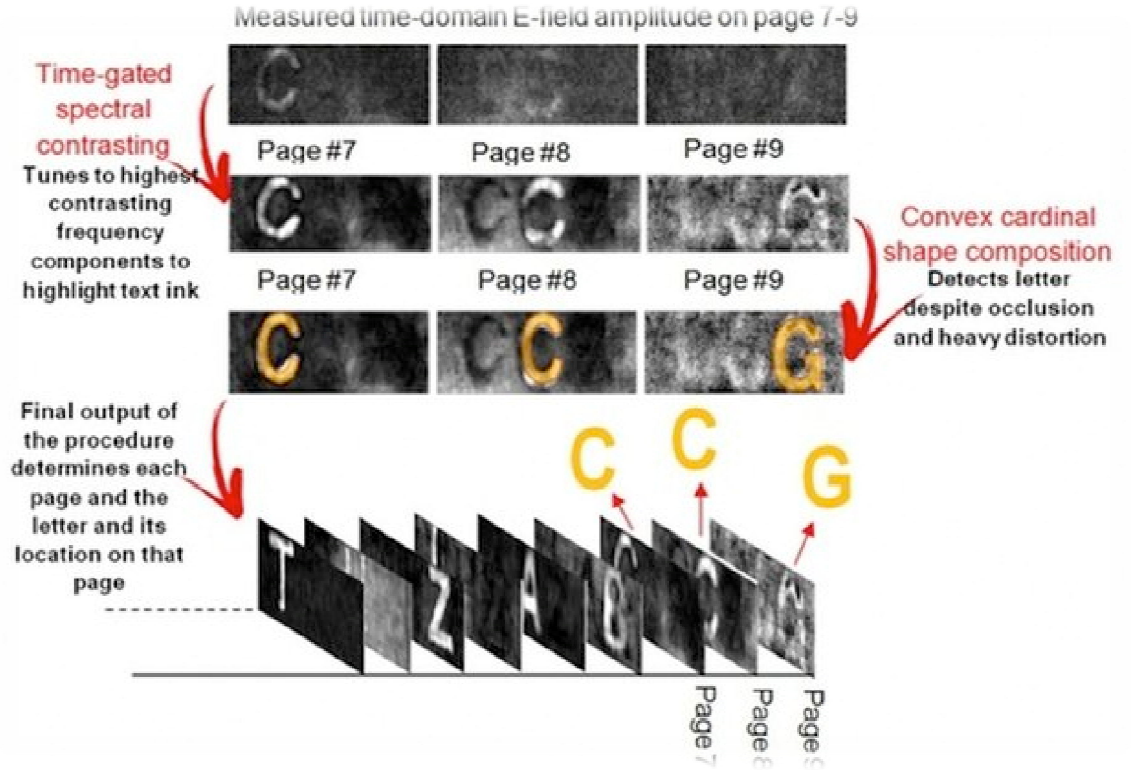


“Think before you speak. Read before you think.”

- Fran Lebowitz

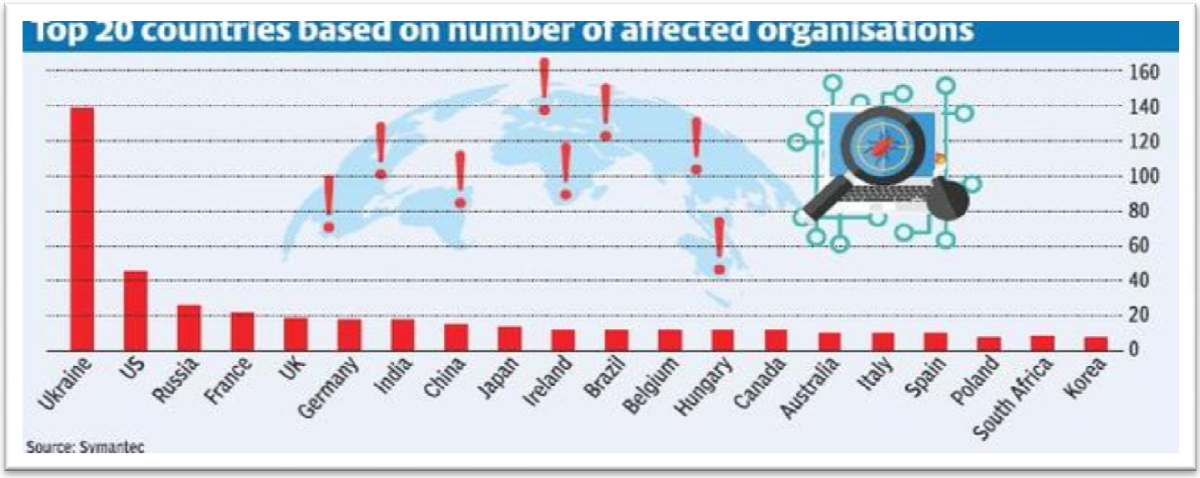
Petya: A Dangerous Ransomeware

- Shivam Mishra

S.Y.BSc(IT)-A

Introduction

Do you heard about Ransomware if yes so you also know about PETYA ransomware .PETYA is latest Ransomware which is discovered in 2016. When we talk about INDIA here more then 90% of user use windows based system which is have poorest security system as compare to IOS or LINUX based system. Prime target of PETYA is Microsoft Windows.



The worst fears of cyber experts have come true with the Petya ransomware attack rattling several countries, including India. Though experts and governments are yet to compile a list of attacks, internet security solutions firm Symantec has ranked India seventh in terms of number of victims.

In India, about 20 organisations have fallen prey to the ransomware; in Ukraine, it is 140 and the US, 45.

Giving a list of the top 20 countries that have been affected by the ransomware, Symantec said MeDoc, a tax and accounting software package, was used for the initial insertion of Petya into corporate networks. “MeDoc is widely used in Ukraine, indicating that organisations in that country were the primary target. After gaining an initial foothold, Petya uses a variety of methods to spread across corporate networks,” it said in an update on the attack.

Sivarama Krishnan, Partner, and Leader - Cyber Security, PwC India, asked users not to restart a machine if a critical system has an unexpected, sudden shutdown. “It might be infected. If you don’t restart the system, there is a possibility of recovering data using forensic methods,” he said.

Almost all cyber security firms and experts have one piece of advice — don't pay the ransom as there's no evidence of your files being restored.

Petya's Prime Target

According to Paladion Networks, the prime targets in the latest attacks are governments, harbour terminals, airports, electricity grids, banks, factories (mining and steel), insurance companies and pharmaceutical industries.

"For now, Petwrap (another name for Petnya) appears to be more sophisticated. The ransomware could be lethal as it encrypts the master boot record and hard drive, making it quite impossible to recover individual files once the entire hard drive is encrypted," said Amit Jaju, Executive Director (Fraud Investigation and Dispute Services), EY India. While the total encryption process may take over an hour to complete, even a 10-minute window could be sufficient for the ransomware to make the entire hard drive unusable.

In India, one of the terminals at the Jawaharlal Nehru Port Trust (JNPT) was impacted, while there was partial disruption of operations at private port operator, APM Terminals Pipavav.
The Indian government has already sent out advisories to critical infrastructure agencies and is keeping a close vigil on the situation.
Security firms have warned that 'Petya' could be particularly potent as it uses "multiple techniques" to automatically spread in a network soon after the first system is infected.
They have advised companies to update their Windows software, check their security solutions and ensure they have backup and ransomware detection in place.
They have also advised users to refrain from clicking on suspicious emails and regularly update the security patches on their PCs.

"Nothing Is Vulnerable Until Found"
-Anonymous

Kotlin- An Official Android Development Language

-Shubham Hate

S.Y.BSc(IT)-A

Introduction

If there is ever a science of programming language design, it will probably consist largely of matching languages to the design methods they support, well said by an American computer scientist Robert Floyd. Every time a new language emerge which mostly have the similar methods. In July 2011 JetBrains unveiled Project Kotlin, a new language for the JVM. Kotlin was announced as an official Android development language at Google I/O 2017.

Kotlinis a statically-typed programming language that runs on the Java Virtual Machine andalso can be compiled to JavaScript source code or uses the LLVM compiler infrastructure. Its primary development is from a team of JetBrains programmers based in Saint Petersburg, Russia. While the syntax is not compatible with Java, Kotlin is designed to interoperate with Java code and is reliant on Java code from the existing Java Class Library, such as the collections framework.

The name comes from Kotlin Island, near St. Petersburg. Andrey Breslav mentioned that the team decided to name it after an island just like Java was named after the Indonesian island of Java.

History

In July 2011 JetBrains unveiled Project Kotlin, a new language for the JVM, which had been under development for a year. JetBrains lead Dmitry Jemerov said that most languages did not have the features they were looking for, with the exception of Scala. However, he cited the slow compile time of Scala as an obvious deficiency. One of the stated goals of Kotlin is to compile as quickly as Java. In February 2012, JetBrains open sourced the project under the Apache 2 license. JetBrains hopes that the new language will drive IntelliJ IDEA sales. Kotlin v1.0 was released on February 15, 2016. This is considered to be the first officially stable release and JetBrains has committed to long-term backwards compatibility starting with this version.

At Google I/O 2017, Google announced first-class support for Kotlin on Android.

Semantics

In addition to the classes and methods (called member functions in Kotlin) of object-oriented programming, Kotlin also supports procedural programming with the use of functions. As in C and C++, the entry point to a Kotlin program is a function named "main", which is passed array containing any command line arguments. Perl and Unix/Linux shell script-style string and Libraries—Yes, it's truethat Kotlin programs can use all existing java frameworks and libraries, even advanced frameworks that rely on annotation processing. The main important thing about Kotlin language is that it can easily integrate with Maven, interpolation is supported. Type inference is also supported.

Hello, world! example

```
1 fun main(args : Array<String>) {
2   val scope = "world"
3   println("Hello, $scope!")
4 }
```

Benefits Of Kotlin Language

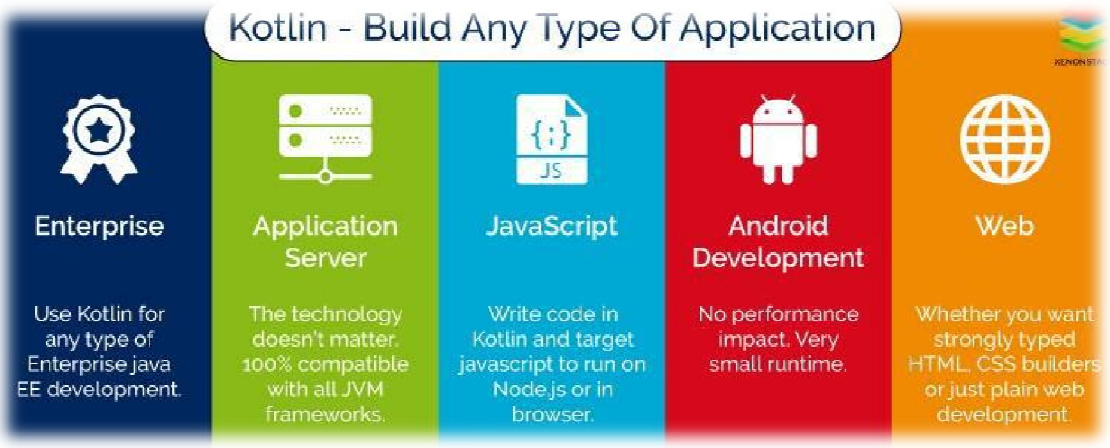
Kotlin programs can use all existing Java FrameworksGradle and other build systems.

Kotlin can be learned easilyand it is approachable. It can be learned easily by simplyreading the language reference.The syntax is clean and intuitive(easy to use and understand). Kotlin looks a lot like Scala but is simpler.

Kotlin is Open Sourceand it costs nothing to adopt.

Automatic conversion of Java to Kotlin-Saves a huge amount of time.

Kotlin's null-safety is great—Now get rid of Null Pointer Exceptions. This type of systemhelps us to avoid null pointer exceptions. In Kotlin the system simply refuses to compile code that tries to assign or return null.



Tools

IntelliJ IDEA has plug-in support for Kotlin. IntelliJ IDEA 15 is the first version to bundle Kotlin plugin in the IntelliJ Installer, and provide support of it out of the box.

JetBrains also provides a plugin for Eclipse.

Integration with common Java build tools is supported including Apache Maven, Apache Ant, and Gradle.

“ If debugging is the process of removing software bugs, then programming must be the process of putting them in.”

- Edsger Dijkstr

Blockchain Technology

-Aasim Baig

S.Y.BSc(IT)-B

What Is Blockchain?

BlockChain is a new way to store and record transactions. It's very much like a traditional database, but the blocks are linked together cryptographically in order to make sure that they're tamper proof.

BlockChain technology was invented in 2008 to create a digital currency.

It is a distributed database that is used to maintain a continuously growing list of records, called *Blocks*.

What Is Block?

A block is the 'current' part of a BlockChain which records some or all of the recent transactions, and once completed goes into the BlockChain as permanent database.

Each time a block gets completed, a new block is generated.

There are a countless number of such blocks in the BlockChain.

So are the blocks randomly placed in a BlockChain?

No, they are linked to each other (like a chain) in proper linear, chronological order with every block containing a hash of the previous block.

Example: How BlockChain is used in today's world –

In the diamond industry around 1 million precious stones are being digitized to prevent fraud. Each diamond will have a unique fingerprint, identifying its origin and tracing its history. From the mine it came from, to the jeweler's shop window. All made possible by BlockChain technology.

Each block in a BlockChain is computer code containing some form of information, such as a contract, certificate of ownership, a statement of authenticity or proof of a bank's financial transaction.

As new information is added the length and complexity of the BlockChain increases and the computer database gets bigger with more and more people a part of it. But if someone makes an unauthorized change everyone else in the chain can see where it happened and agree whether the change is valid or not.

Bitcoin Using Blockchain Technology

The first BlockChain was then conceptualized by Satoshi Nakamoto in 2008 and implemented the following year as a core component of the digital currency bitcoin, where it serves as the public ledger for all transactions. Through the use of a peer-to-peer network and a distributed time stamping server, a BlockChain database is managed autonomously. The use of the BlockChain for bitcoin made it the first digital currency to solve the double spending problem without requiring a trusted administrator. The bitcoin design has been the inspiration for other applications.

Is It Safe?

While nothing is invulnerable to cyber attack, hacking it is extremely difficult. If you had a distributed ledger with 1,000 computers on it and you had stored a contract into that ledger, and someone wanted to come in and hack and change some of the information, in order to do that they couldn't just hack your computer, they would have to hack every single other person's computer at the same time, and change exactly the same piece of information

“Bitcoin is a technological tour de force.”
-Bill Gates

Github: A Software Development Platform

-Umang Nai
S.Y.BSc(IT)-A

GitHub is a website and service that we hear geeks rave about all the time, yet a lot of people don't really understand what it does. Want to know what all the GitHub hubbub is about? Read on to find out.

The "Git" In Github

To understand GitHub, you must first have an understanding of Git. Git is an open-source version control system that was started by Linus Trovalds – the same person who created Linux. Git is similar to other version control systems – Subversion, CVS, and Mercurial to name a few.

Version Control Systems

So, Git is a "version control system," what's that mean? When developers are creating something (an application, for example), they are making constant changes to the code and releasing new versions, up to and after the first official (non-beta) release.

Version control systems keep these revisions straight, and store the modifications in a central repository. This allows developers to easily collaborate, as they can download a new version of the software, make changes, and upload the newest revision. Every developer can see these new changes, download them, and contribute.

The "Hub" In Github

We've established that Git is a version control system, similar but better than the many alternatives available. So, what makes GitHub so special? Git is a command-line tool, but the center around which all things involving Git revolve – effectively, the Hub, is GitHub.com, where developers can store their projects and network with likeminded people. Let's go over a few of the main reasons that geeks like to use GitHub, and learn some terminology along the way.

Repository

A repository is a location where all the files for a particular project are stored, usually abbreviated to "repo." Each project will have its own repo, and can be accessed by a unique URL.

Forking A Repo

"Forking" is when you create a new project based off of another project that already exists. This is an amazing feature that vastly encourages the further development of programs and other projects. If you find a project on GitHub that you'd like to contribute to, you can fork

the repo, make the changes you'd like, and release the revised project as a new repo. If the original repository that you forked to create your new project gets updated, you can easily add those updates to your current fork.

Pull Requests

You fork a repository, make a great revision to the project, and want it to be recognized by the original developers, maybe even included in the official project/repository. You can do so by creating a pull request, so the authors of the original repository can see your work, and then choose whether or not to accept it into the official project. Whenever you issue a pull request, GitHub provides a perfect medium for you and the project's maintainer to communicate.

Social Networking

The social networking aspect of GitHub is probably its most powerful feature, and is what allows projects to grow more than anything else. Each user on GitHub has their own profile, which can act like a resume of sorts, showing your past work and contributions to other projects via pull requests. Project revisions are able to be discussed publicly, so a mass of experts can contribute knowledge and collaborate to advance a project forward. Before the advent of GitHub, developers interested in contributing to a project would usually need to find some means of contacting the authors, probably by email, and then have to convince them that their contribution is legit and they can be trusted.

Change logs

When multiple people are collaborating on a project, it's really hard to keep track of who changed what, and to keep track of the revisions that took place. GitHub takes care of this problem by keeping track of all the changes that have been pushed to the repository.

Github Isn't Just For Developers

All this talk about how GitHub is ideal for programmers may have you believing that they are the only ones who will find it useful. Although it's a lot less common, GitHub can actually be used for any types of files – so if you have a team that is constantly making changes to a word document, you can actually use GitHub as your version control system. This practice isn't common as there are better alternatives, but keep it in mind.

"First, solve the problem. Then, write the code."

- John Johnson

How The Virtual Data Room Boom Is Transforming Business Transactions

-Sushmita Shetty
S.Y.BSc(IT)- B

Accessible from anywhere. Easy to navigate. No need for your physical presence. What's not to like?

The **Virtual Data Room** (VDR), a more secure version of conventional cloud storage, is becoming increasingly popular in 2017. This digital system is commonly used to advance online data transactions and corporate exchanges. Its technology allows negotiating parties in a business deal to exchange crucial information more rapidly, regardless of the distance between them. Moreover, due to VDR's paperless transactions, legal documents can be processed much faster, since there's no need to look through hard copies, which can be tedious. Manufacturers are further improving on these features by creating advanced access controls and verification protocols that guarantee better security, as well as data privacy.

As of April 2016, it was estimated that market revenues for VDR companies were more than $800 million, with annual growth rates for individual companies increasing by double digits. Based on these positive statistics, it's safe to say that the popularity of virtual data rooms is not going to fade away any time soon.

Potential For The Future

VDR technology provides many unique advantages and benefits to business deal-makers. For instance, the due diligence and detection requirements associated with corporate transactions make these online data rooms the most ideal solution for discussing corporate deals.

Additionally, as IT deployment capabilities and infrastructures continue to grow, so will the number of advanced features that VDR provides to users. This will improve sales, marketing and support standards for companies, as various business processes will be completed much faster.

Benefits Of The Vdr Boom To Entrepreneurs

Most entrepreneurs prefer VDR to traditional forms of data exchange mainly because it minimizes the risk of information theft by third parties not involved in a transaction. In the past, data-sharing was done mainly via land-based systems, which proved to be quite laborious. It was also inconvenient, as all participants in a deal were required to be physically present for the transaction. However, with the emergence of virtual data rooms, business processes can be completed much faster since most documents can now be shared online. The

main reason why this technology is taking over land-based data rooms in 2017 is the convenience it provides to users.

Other Benefits For Entrepreneurs

1. Accessibility from anywhere across the world. Regardless of the time or geographical location of an individual in a transaction, documents can still be shared instantly to any destination around the globe. Similarly, most virtual data rooms are now accessible by mobile applications. This means that businesspeople have the option of using their tablets and mobile phones to continue working, even outside the office space.

2. Easy to navigate. VDR data is structured, and its information systems are easy to navigate due to those systems' highly advanced search options, as well as the filtering options available.

3. No space limits. Virtual rooms can accommodate multiple visitors at once without running out of space. There's no particular order and room users can access the data stored in repositories whenever they want.

4. Easy duplication of files. Since files can easily be duplicated on multiple servers, it's easier to recover information in case data is lost or damaged. Furthermore, since virtual repositories are fitted with advanced and multi-faceted data security systems, no information can be stolen or breached from the system.

5. Only a single DVR is necessary. Since VDR visitors can be subdivided into distinct permission groups, virtual room owners can use just a single VDR to perform multiple transactions concurrently. Therefore, they end up saving a lot of time and financial resources.

“We All Live Everyday In Virtual Environments, Defined By Our Ideas”

-Micheal Crichton

Tiny, Lens-Free Camera Could Hide In Clothes, Glasses

-Gayatri Batteli

S.Y.BSc(IT)-A

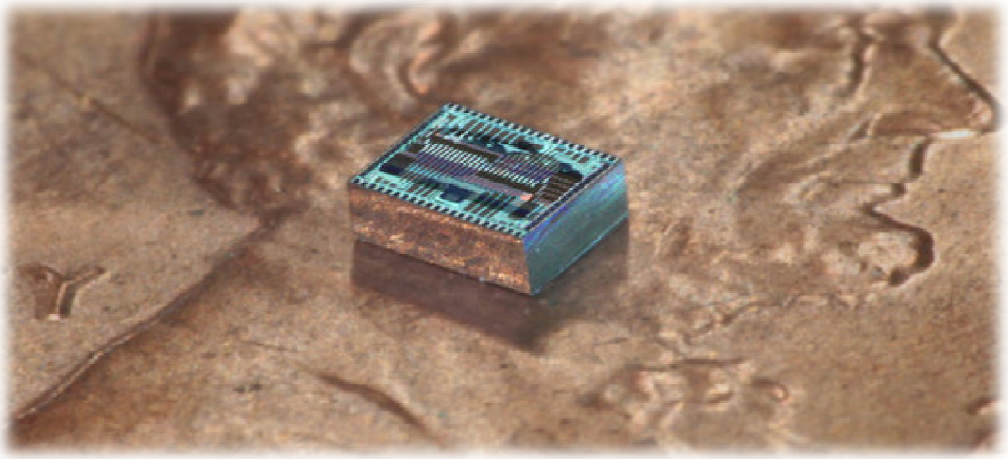
A tiny, paper-thin camera that has no lens could turn conventional photography on its head, according to new research. The device, a square that measures just 0.04 inches by 0.05 inches (1 by 1.2 millimeters), has the potential to switch its "aperture" among wide angle, fish eye and zoom instantaneously. And because the device is so thin, just a few microns thick, it could be embedded anywhere. (For comparison, the average width of a human hair is about 100 microns.)

"The entire backside of your phone could be a camera," said Ali Hajimiri, a professor of electrical engineering and medical engineering at the California Institute of Technology (Caltech) and the principal investigator of the research paper, describing the new camera.

It could be embedded in a watch or in a pair of eyeglasses or in fabric, Hajimiri told Live Science. It could even be designed to launch into space as a small package and then unfurl into very large, thin sheets that image the universe at resolutions never before possible, he added. "There's no fundamental limit on how much you could increase the resolution," Hajimiri said. "You could do gigapixels if you wanted." (A gigapixel image has 1 billion pixels, or 1,000 times more than an image from a 1-megapixel digital camera.)

Hajimiri and his colleagues presented their innovation, called an optical phased array, at the Optical Society's (OSA) Conference on Lasers and Electro-Optics, which was held in March. The research was also published online in the OSA Technical Digest.

The proof-of-concept device is a flat sheet with an array of 64 light receivers that can be thought of as tiny antennas tuned to receive light waves, Hajimiri said. Each receiver in the array is individually controlled by a computer program.



In fractions of a second, the light receivers can be manipulated to create an image of an object on the far right side of the view or on the far left or anywhere in between. And this can be done without pointing the device at the objects, which would be necessary with a camera.

"The beauty of this thing is that we create images without any mechanical movement," he said.

Hajimiri called this feature a "synthetic aperture." To test how well it worked, the researchers laid the thin array over a silicon computer chip. In experiments, the synthetic aperture collected light waves, and then other components on the chip converted the light waves to electrical signals that were sent to a sensor.

The resulting image looks like a checkerboard with illuminated squares, but this basic low-resolution image is just first step, Hajimiri said. The device's ability to manipulate incoming light waves is so precise and fast that, theoretically, it could capture hundreds of different kinds of images in any kind of light, including infrared, in a matter of seconds, he said.

"You can make an extremely powerful and large camera," Hajimiri said.

Achieving a high-power view with a conventional camera requires that the lens be very big, so that it can collect enough light. This is why professional photographers on the sidelines of sporting events wield huge camera lenses.

But bigger lenses require more glass, and that can introduce light and color flaws in the image. The researchers' optical phased array doesn't have that problem, or any added bulk, Hajimiri said.

For the next stage of their research, Hajimiri and his colleagues are working to make the device larger, with more light receivers in the array.

"Essentially, there's no limit on how much you could increase the resolution," he said. "It's just a question of how large you can make the phased array."

“For me, the camera is a sketch book, an instrument of intuition and spontaneity.”
— Henri Cartier-Bresson

Brain Passwords

-Rahul Nair

T.Y.BSc(IT)-A

It's time to put another body part through the biometrics wringer in the ongoing quest to replace passwords. This time, it's your brain. Specifically, researchers have been looking at how your brain responds to certain acronyms. According to New Scientist, researchers found that volunteers' brains had a reaction to each of 75 acronyms (e.g., FBI, DVD) in a way that was unique to each individual. The difference between the volunteers' brain reactions was enough for the system to pinpoint their identities with accuracy of up to 97%. The study, from Neurocomputing, is titled – appropriately enough – Brain print.

The work was done by a group of researchers from the Basque Centre Cognition and Binghamton University. This isn't the first time that unique brain activity has been looked at as a potential authentication factor. Back in 2007, for example, scientists were looking at identifying people via unique patterns of brain activity. The thing is, brains are full of noise that makes it tough to pick up clean measurements. The Basque and Binghamton team has addressed the issue by focusing on brainwaves from one particular region of the brain that's associated with the task of reading and recognising words, producing a clearer signal that can be measured more quickly. There are various types of memories: episodic memories that record experience, and semantic memories that simply record word meanings. Semantic memories are subtly different for each of us, making them potentially useful for authentication. As well, they don't tend to change much over time, as opposed to episodic memories. New Scientist gives the example of the word "bee."

If you're stung, episodic memory neurons that fire when you next read the word will change to accommodate your experience, though your semantic memory of the meaning of the word "bee" isn't believed to change substantially. Will the brainprint be potentially useful in authentication? Maybe, but only after the researchers come up with a more convenient and comfortable way to access the information, given that the high degree of labeling accuracy was achieved with the use of three electrodes on the volunteers' scalps: what the researchers said was the minimal possible number to acquire clean data. Naked Security recently looked at something similar, though not brainprints per se: In January, researchers at the US military's elite West Point military academy were awarded a multimillion dollar contract to

produce a new identity verification system based on users' behavior. Authentication has traditionally relied on users producing one or more of the following: *something you know* (such as a passwords or PIN), *something you have* (such as a number from an RSA key) or *something you are* (such as your fingerprints or face.)

The technology that West Point is working on, behavior-based biometrics, adds another factor to the mix: *something you do*. Transparent, behavior-based biometrics – or a "cognitive fingerprint" – could provide the nudge that's needed to push biometrics into the mainstream. Brainprints also show promise, albeit with a) an inconvenient need to wire scalps, and b) an accuracy rate that the researchers describe as a good starting point, but not the kind of accuracy you'd want to have protecting a roomful of secrets. In fact, the researchers' accuracy rates are currently far less than achieved when scanning a fingerprint or an iris, according to biometrics expert Kevin Bowyer, of the University of Notre Dame in Indiana.

In addition, both brainprints and cognitive fingerprints have major obstacles to overcome before we see them seriously challenge the wheezy old standby of passwords. The first is that you can't change your biometrics. So what do you do if you're compromised? Still, they may point the way to a future without passwords. After all, both cognitive fingerprints and brainprints offer the promise of continuous authentication, which is a marked improvement over the periodic authentication provided by logging on using a password or a iris.

"That's Your Best Friend And Your Worst Enemy – Your Own Brain"
-Fred Drust

The Sensor That Can Even Trap Your Emotion

Moxo Sensor

-Nishmita Shetty

S.Y.BSc(IT)-B

Introduction

Are you any good at hiding how you feel? It wouldn't matter if you were wearing Moxo, a wearable sensor from MIT Media Lab spin-off mPath.

Humans experience a range of emotions in response to products and experiences on a daily basis. Shoppers may get excited for certain brands and then overwhelmed by choices. Audience members may oscillate between apathy and engagement during performances. Children can become frustrated, bored, or entertained while learning a new subject.

MOXO measures changes in skin conductance (electrical changes across the skin) and works together with a pair of eye-tracking glasses, or GOPRO cameras, to determine emotions in the wearer including stress, frustration and boredom. The startup calls the process EMOTOTYPING - great word - which essentially consists of tracking changes in physiological arousal and the sympathetic nervous system. It's similar science to what we've seen cited by emotion sensing wearable startups over the past 12 to 18 months.

Using wearable stress sensors, analytics, and other technologies, MIT Media Lab spinout mPath is able to pinpoint the exact moment consumers feel these subconscious responses. “But if we listen a little to consumer emotions, there’s a lot of room for innovation. Headquartered in Denver, Colorado, mPath has worked with big-name clients including The LEGO Group, Google, The Blue Man Group, Lowe’s, Hasbro, and Best Buy, as well as governmental organizations, film production companies, and hospitals.

The startup’s MOXO sensor — whose core technology was co-invented by Hedman, MIT Professor Rosalind Picard, and other MIT researchers — is a wearable that resembles a bulky smart watch. Placed on the wrist, it wirelessly measures changes in skin conductance (subtle electrical changes across the skin), which reflect sympathetic nervous system activity and physiological arousal. Spikes in conductance can signal stress and frustration, while dips may indicate disinterest or boredom. To gain an accurate picture of consumers’ responses to specific stimuli, mPath developed a new approach to market research, called “emototyping.” This process combines the stress sensors with eye-tracking glasses or GoPro cameras, to identify where a person looked at the exact moment of an emotional spike or dip. Personal interviews are also conducted with all participants, who are shown the data and asked what they think they felt.

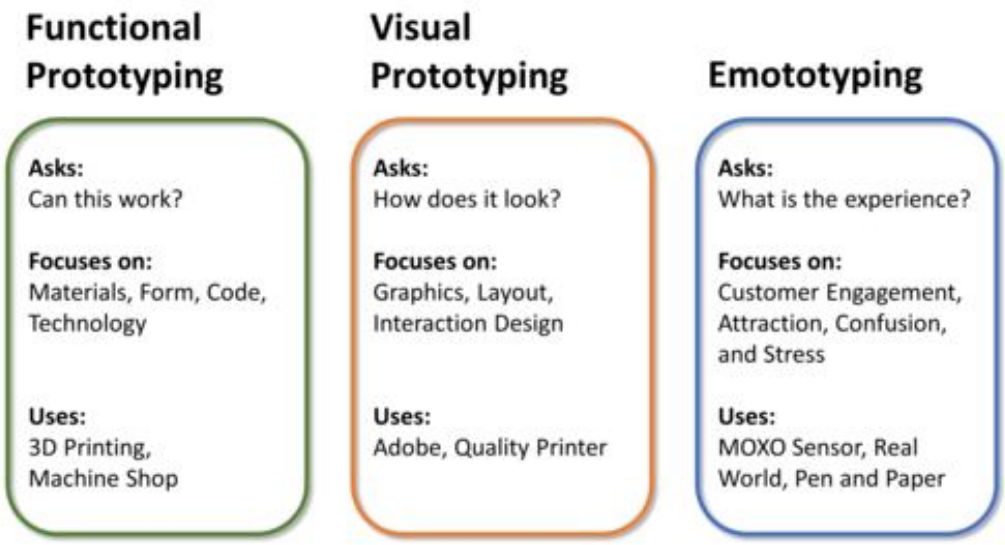
From Therapy To Industry

With its renewed focus on children's learning, the sensor has, in a way, come full circle: The MOXO sensor's core technology began as tool for studying stress levels of children with autism. (A version was later developed into the E4 wristband that can sense oncoming seizures, commercialized through Picard's startupEmpatica.)

While at MIT, Hedman tested the sensor on children with autism enrolled in occupational therapy. One boy was climbing a rock wall and looked calm, but his stress spikes registered off the charts. "I thought, 'The sensor has to be broken. There's no way that kid is scared,'" Hedman says.

Coming off the wall, the boy told the teacher he was bored, but the sensor data indicated otherwise. That's when the teacher had "a light-bulb moment," Hedman says: The boy said he was bored to compensate for being overwhelmed. "That was a really powerful moment for me. I knew there is so much we can do if we understand emotions better," Hedman says.

Therapy applications seemed promising. But companies began courting Hedman with appealing market-research questions. First came Hasbro, which wanted to find out how immigrants to the United States can learn how to play common American board games, such as Monopoly. Then came LEGO asking to track the emotions of adults and children at play — which pushed Hedman toward industry.



Applications

This emotion sensor has applications in therapy, education, and many other fields. As MIT reports, mPath will be used in the near future to help design curriculum and classroom experiences.

"Your intellect may be confused, but your emotions will never lie to you."
- Roger Ebert

The 360-Degree Selfie

-Pooja Sajjanshetty

S.Y.BSc(IT)-B

Introduction

Inexpensive cameras that make spherical images are opening a new era in photography and changing the way people share stories.

Seasonal changes to vegetation fascinate KoenHufkens. So last fall Hufkens, an ecological researcher at Harvard, devised a system to continuously broadcast images from a Massachusetts forest to a website called VirtualForest.io. And because he used a camera that creates 360° pictures, visitors can do more than just watch the feed; they can use their mouse cursor (on a computer) or finger (on a smartphone or tablet) to pan around the image in a circle or scroll up to view the forest canopy and down to see the ground. If they look at the image through a virtual-reality headset they can rotate the photo by moving their head, intensifying the illusion that they are in the woods.

Component Innovations:

We experience the world in 360 degrees, surrounded by sights and sounds. Until recently, there were two main options for shooting photos and video that captured that context: use a rig to position multiple cameras at different angles with overlapping fields of view or pay at least $10,000 for a special camera. The production process was just as cumbersome and generally took multiple days to complete. Once you shot your footage, you had to transfer the images to a computer; wrestle with complex, people could view easily. These applications are feasible because of the smartphone boom and innovations in several technologies that combine images from multiple lenses and sensors.

For instance, 360° cameras require more horsepower than regular cameras and generate more heat, but that is handled by the energy-efficient chips that power smartphones. Both the 360fly and the $499 ALLie camera use Qualcomm Snapdragon processors similar to those that run Samsung's high-end handsets.

Camera companies also benefited in recent years from smartphone vendors' continuous quest to integrate higher-quality imaging into their gadgets. The competition forced component makers like Sony to shrink image sensors and ensure that they offered both high resolution and good performance in low light. As the huge smartphone market helped bring down component prices, 360°-camera makers found it possible to price their devices accessibly, often at less than $500. "There are sensors that now cost $1 instead of $1,000 because they're used in smartphones, which have incredible economies of scale," says Jeffrey Martin, the CEO of a 360°-camera startup called Sphericam. Advances in optics played a part as well. Unlike traditional cameras, which have fairly narrow fields of view, 360° cameras sport exaggerated fish-eye lenses that require special optics to align and focus images across multiple points.

Most 360° cameras lack displays and viewfinders. To compensate, camera makers developed apps that you can download to your phone to compose shots and review the resulting images. The cameras connect to the apps wirelessly, and many of them allow you to upload photos and video directly from your phone to Facebook and YouTube. In turn, those sites have made it possible over the past year for people not just to post recorded 360° content but to live-stream 360° videos as well.

Because creating 360° content requires stitching together multiple images, doing it on the fly for live streaming represents an impressive technical achievement. Computer-vision algorithms have simplified the process so that it can be done on the camera itself, which in turn allows people to live-stream video with minimal delays. (It helps that most consumer-grade cameras have only two lenses and thus one stitch line. Professional versions can have six to 24 lenses.) The ALLie camera supports fast stitching and live-streaming, as do Ricoh's upcoming Ricoh R development kit camera and Kodak's Orbit360 4K, which will be available later this year for $500.

In fact, John Carmack, the chief technology officer of Facebook's Oculus VR subsidiary, has predicted that people will spend less than 50 percent of their VR time playing games. Instead, they may don VR headsets to do things like virtually attend a wedding.

"Everything You Can Imagine Is Real"
-Pablo Picasso

Reversing Paralysis

-Priyanka Sharma

S.Y.BSc(IT)-B

Introduction

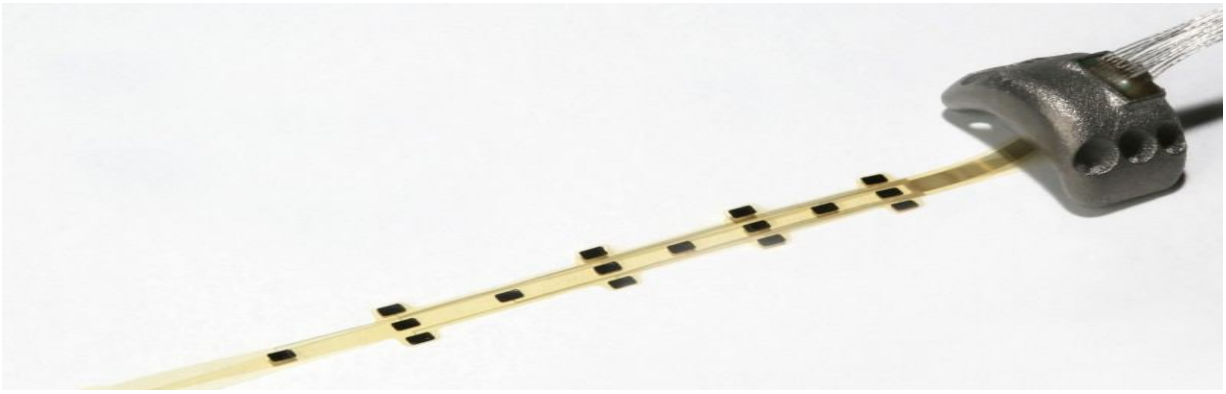
Scientists are making remarkable progress at using brain implants to restore the freedom of movement that spinal cord injuries take away. The French neuroscientist was watching a macaque monkey as it hunched aggressively at one end of a treadmill. His team had used a blade to slice halfway through the animal's spinal cord, paralyzing its right leg. Now Courtine wanted to prove he could get the monkey walking again. To do it, he and colleagues had installed a recording device beneath its skull, touching its motor cortex, and sutured a pad of flexible electrodes around the animal's spinal cord, below the injury. A wireless connection joined the two electronic devices.

The result: a system that read the monkey's intention to move and then transmitted it immediately in the form of bursts of electrical stimulation to its spine. Soon enough, the monkey's right leg began to move. Extend and flex. Extend and flex. It hobbled forward. "The monkey was thinking, and then boom, it was walking," recalls an exultant Courtine, a professor with Switzerland's ÉcolePolytechniqueFédérale de Lausanne.

In recent years, lab animals and a few people have controlled computer cursors or robotic arms with their thoughts, thanks to a brain implant wired to machines. Now researchers are taking a significant next step toward reversing paralysis once and for all. They are wirelessly

connecting the brain-reading technology directly to electrical stimulators on the body, creating what Courtine calls a “neural bypass” so that people’s thoughts can again move their limbs.

At Case Western Reserve University, in Cleveland, a middle-aged quadriplegic he can’t move anything but his head and shoulder agreed to let doctors place two recording implants in his brain, of the same type Courtine used in the monkeys. Made of silicon, and smaller than a postage stamp, they bristle with a hundred hair-size metal probes that can “listen” as neurons fire off commands.



To complete the bypass, the Case team, led by Robert Kirsch and BoluAjiboye, also slid more than 16 fine electrodes into the muscles of the man’s arm and hand. In videos of the experiment, the volunteer can be seen slowly raising his arm with the help of a spring-loaded arm rest, and willing his hand to open and close. He even raises a cup with a straw to his lips. Without the system, he can’t do any of that.

Just try sitting on your hands for a day. That will give you an idea of the shattering consequences of spinal cord injury. You can’t scratch your nose or tousle a child’s hair. “But if you have this,” says Courtine, reaching for a red espresso cup and raising it to his mouth with an actor’s exaggerated motion, “it changes your life.”

The head of the center is John Donoghue, an American who led the early development of brain implants in the U.S. (see “Implanting Hope”) and who moved to Geneva two years ago. He is now trying to assemble in one place the enormous technical resources and talent—skilled neuroscientists, technologists, clinicians—needed to create commercially viable systems.

Among Donoghue’s top priorities is a “neurocomm,” an ultra-compact wireless device that can collect data from the brain at Internet speed. “A radio inside your head,” Donoghue calls it, and “the most sophisticated brain communicator in the world.” The matchbox-size prototypes are made of biocompatible titanium with a sapphire window. Courtine used an earlier, bulkier version in his monkey tests.

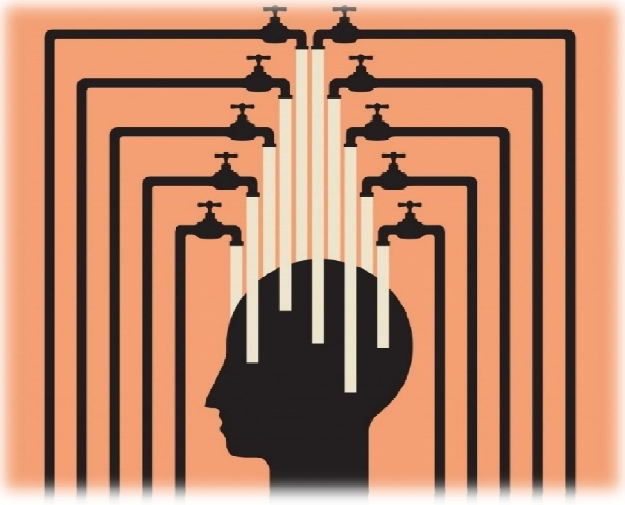
As complex as they are, and as slow as progress has been, neural bypasses are worth pursuing because patients desire them, Donoghue says. “Ask someone if they would like to move their own arm,” he says. “People would prefer to be restored to their everyday self. They want to be reanimated.”

“We All Are Now Connected By The Internet Like Neurons In A Giant Brain”
-Stefin Hokins

Data Deluge Leaves Us To Struggling To Make Up Our Minds

Joel Anandkumar

T.Y.BSc(IT) - A



We make a huge number of decisions every day. When it comes to eating, for example, we make 200 more decisions than we're consciously aware of every day. How is this possible? Because, as Daniel Kahneman has explained, while we'd like to think our decisions are rational, in fact many are driven by gut feel and intuition. The ability to reach a decision based on what we know and what we expect is an inherently human characteristic.

The problem we face now is that we have too many decisions to make every day, leading to decision fatigue – we find the act of making our own decisions exhausting. Even more so than simply deliberate different options or being told by others what to do.

Why not allow technology to ease the burden of decision-making? The latest smart technologies are designed to monitor and learn from our behavior, physical performance, work productivity levels and energy use. This is what has been called Era Three of Automation – when machine intelligence becomes faster and more reliable than humans at making decisions.

You, Me and the Algorithm

Intelligent systems use algorithms (formulas for taking in data and outputting other data) to learn patterns and behaviors from how we use them. One industry that has grown rapidly is online dating – in the UK alone, the market is expected to grow from $250m to $350m by 2019. This enormous growth stems from the perception that finding love is hard, so any technology that can help will be popular.

Online dating sites' matching algorithms create a reliance upon, if not a belief in, a scientific approach to finding love. But instant satisfaction sites such as Tinder also encourage developing many weak ties between partners that often lack commitment, emotional intensity and intimacy.

Should we want to relegate our most important human adventure to an algorithm? Might we find ourselves with a generation of people who are willing to trade the current partner for a better model, or who trust big data-generated matches more than their own instincts?

Making Decisions Visual

The ability to visualize data has accelerated the move of knowledge from our minds and onto the screen. Sproutling is one of many companies that have tapped into our need for quantification and visualization. Their product is a wearable baby monitor that records a baby's heart rate, skin temperature, motion and

position, data it uses to predict about the baby's mood, comfort, sleep pattern and even when the baby is due to wake up.

Sproutling prides itself on eliminating guesswork, but in fact it feeds a new breed of parents-cum-data-scientists who watch over their children constantly, but once-removed behind the screen. A recent study has shown that technology that conveys or displays emotions makes people uncomfortable. Nevertheless, the Sproutling has already sold out.

Subtle Manipulation

Many companies such as Netflix, Amazon, iTunes and Tesco use data on our web habits to make recommendations to us. These are small acts where systems' decisions narrow the opportunities we have for natural, organic exploration. The old way of stumbling upon a new artist, film or author is replaced by loops of similarity.

Arizona State University academics Braden R Allenby and Daniel Sarewitz explain how these, and other technologies such like fitness trackers and GPS, create techno-social systems that "impose certain orders of behavior on our lives about which we have little choice." When our ability to make independent decisions is taken away, we become easier to manipulate and influence. We will become accustomed to not making our own decisions and simply follow the cues in front of us, whether that's directions from our GPS or meal suggestions from our fridge.

Beyond Data

By outsourcing our decisions to intelligent systems and seeking certainty through data, we objectify ourselves. We are left responding to the computer rather than thinking creatively and autonomously. We are in danger of undermining our human instinct, and have already started the process of de-learning decision making by putting our trust in machines. Director of the Max Planck Institute for Human Development, Gerd Gigerenzer, suggests gut feelings are the tools for an uncertain world – data creates only an illusion of certainty.

In a complex world with abundant choice, we need good intuitions and smart shortcuts to make decisions. Even so, ultimately we must accept that uncertainty will always be part of what it is to be human. When we deny ourselves the challenge of thinking critically, evaluating situations and making our own decisions, we are heading towards a future where *Homo sapiens* will lack the cognitive ability to think for itself, and we will have surrendered to the machines we once built.

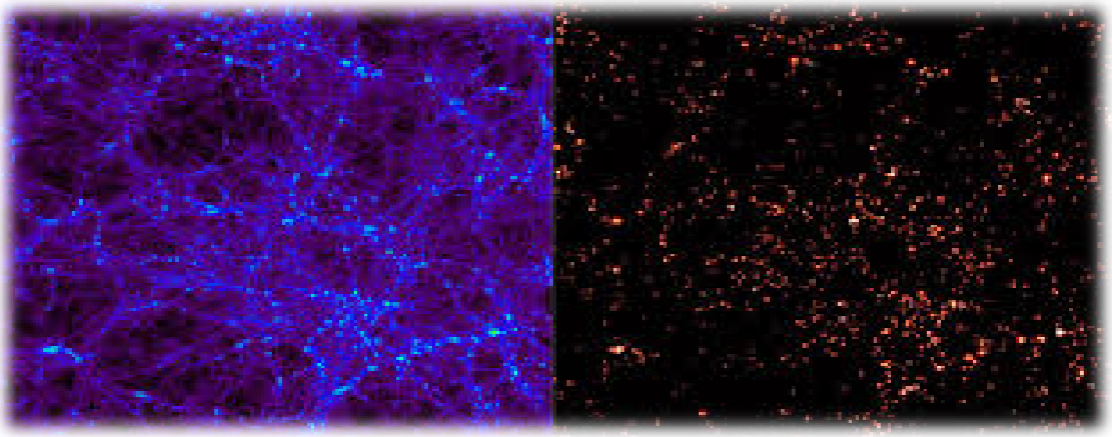
"The mind is everything. What you think you become."

-Buddha

Dark Matter – A Mystery or a just a Dusk.

Sahil Mishra

T.Y.BSc.(IT)

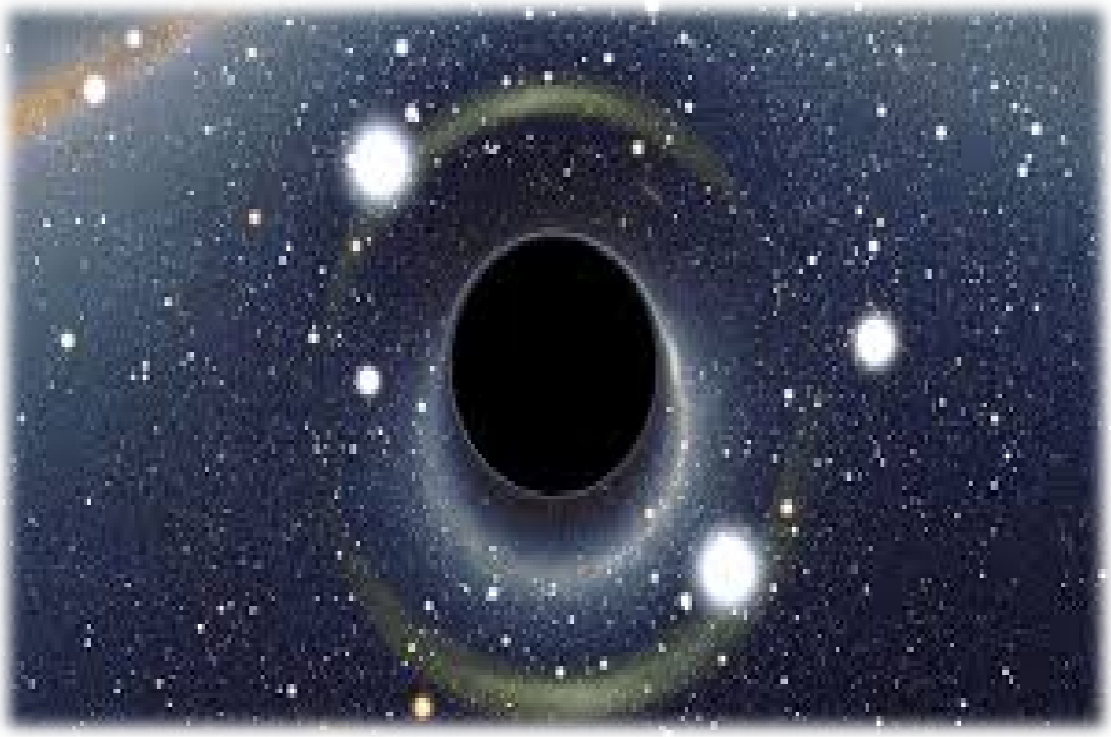


Galaxy clusters are particularly important for dark matter studies since their masses can be estimated in three independent ways:

- From the scatter in radial velocities of the galaxies within clusters
- From X-rays emitted by hot gas in the clusters. From the X-ray energy spectrum and flux, the gas temperature and density can be estimated, hence giving the pressure; assuming pressure and gravity balance determines the cluster's mass profile.
- Gravitational lensing (usually of more distant galaxies) can measure cluster masses without relying on observations of dynamics (e.g., velocity).
- **Gravitational lensing**
- One of the consequences of general relativity is that massive objects should act as a lens to bend the light from a more distant source (such as a quasar) around a massive object (such as a cluster of galaxies) lying between the source and the observer. The more massive an object, the more lensing is observed.

Redshift-space distortions

Large galaxy redshift surveys may be used to make a three-dimensional map of the galaxy distribution. These maps are slightly distorted because distances are estimated from observed redshifts; the redshift contains a contribution from the galaxy's so-called peculiar velocity in addition to the dominant Hubble expansion term. On average, superclusters are expanding but more slowly than the cosmic mean due to their gravity, while voids are expanding faster than average. In a redshift map, galaxies in front of a supercluster have excess radial velocities towards it and have redshifts slightly higher than their distance would imply, while galaxies behind the supercluster have redshifts slightly low for their distance. This effect causes superclusters to appear "squashed" in the radial direction, and likewise voids are "stretched"; angular positions are unaffected. The effect is not detectable for any one structure since the true shape is not known, but can be measured by averaging over many structures assuming we are not at a special location in the Universe.



"Warm" dark matter refers to particles with an FSL comparable to the size of a protogalaxy. Predictions based on warm dark matter are similar to those for cold dark matter on large scales, but with less small-scale density perturbations. This reduces the predicted abundance of dwarf galaxies and may lead to lower density of dark matter in the central parts of large galaxies; some researchers consider this to be a better fit to observations. A challenge for this model is the lack of particle candidates with the required mass ~ 300 eV to 3000 eV. Thus this is something like the most elite creation of God.

“Hunting for elusive dark matter is now a multibillion dollar internation scientific industry.”

-John Moffat

Virtual Reality Training

-Prajosh Kumar Girida
T.Y.BSc(IT)

Virtual reality technology that has helped train NFL quarterbacks could also soon provide virtual training experiences for hundreds of thousands of Walmart associates. By the end of 2017, Walmart plans to roll out virtual reality training to the 140,000 associates who complete the retail giant's training academy program each year. The move by the largest private employer of American workers may represent the biggest step yet for virtual reality training.

The immersion that comes from wearing virtual reality headsets and running through specific training software can lead to both more efficient and engaging learning experiences that keep people's attention. Such experiences also offer safer opportunities to prepare people for potentially risky or dangerous situations. That could mean giving NFL quarterbacks repeat opportunities to practice making split-second decisions without running the risk of injury from getting tackled by a 300-pound lineman. Or it could mean enabling Walmart associates to experience the chaos of bargain-hunting crowds swarming into a Wal-Mart Store during a Black Friday sales event. The planned Walmart rollout of such virtual reality training to its training academies is "probably one of the largest if not the largest" deployments of virtual reality training in the history of the technology, says Derek Belch, founder and CEO of STRIVR Labs.

Walmart wanted a mix of virtual reality training experiences to prepare Walmart associates in their daily interactions with customers, handling unexpected but rare incidents or disruptions, and being mentally prepared for the claustrophobic crush of the expected holiday crowds. That meant working with the STRIVR team to figure out how much time and space was needed in Walmart stores to create the virtual reality experiences for certain situations.

The STRIVR team also faced the special challenge of capturing the experience of huge crowds swarming into Walmart stores for holiday sales events such as Black Friday. Belch and some other colleagues spent Thanksgiving night hunkered down in a Walmart store to capture 360-degree video footage of the packed crowds that can test even the most seasoned Walmart associates.

STRIVR ended up creating virtual reality training modules ranging in length from 45 seconds to five minutes. Some of the training modules feature interactive choices that require the Walmart associates to make decisions. But others merely focus on exposing associates to certain experiences. Walmart has been testing out the VR training modules in 31 training academy sites for the past four months as a step toward full deployment.

Virtual reality is the first step in a grand adventure into land of imagination.

-Frank Biocca

Hoverboard

-Fahad Shaikh

F.Y.BSc(IT)

A **hoverboard** (or **hover board**) is a fictional levitating board used for personal transportation.

In simple words, it's a skateboard like object with no wheels used for moving(transporting)from a place to another this word was introduced by the author MK.Jospeh in 1967.

History Of Hoverboards

The history of Hoverboard is quite strange, because it started with fiction and not real invention, In a popular SCI-FI movie franchise known as "BACK TO FUTURE" there were these object in the shape of skate boards which can levitate in air. So from here starts the journey of this amazing invention "HOVERBOARD"

The hoverboard concept has been used by many authors in various forms of media.

Since then there are been people working on this invention to bring this in real life as it would be fascinating to fly/levitate in the air.

A Brand New Invention

Now as these objects were introduced and many companies started working on it, After all these years some of them successfully managed to make a proper model of it .

As for now there are few different types of hovers that are been tested and have been approved for production.Not only today there are hovers that can levitate but also fly, the future is here man can stand on an object and fly from one place to another just like a flying jetpack which we all dream of.

Some of them are jet powered so they can fly high in the sky while rest levitate.

Still all of themare not built on a production basis and not all of them available in market, so for experiencing the flight the wait will not be more then a couple of years.

Models

Various Companies, Engineers, Inventors have been working on it with different type of views,

SOME SUCCESSFULL AND POPULAR INVENTIONS ARE :

Zapata Flyboard

Flyboard Air is a type of jetpack/hoverboard powered by proprietary turbojets. It was invented by Franky Zapata. Therefore it's also known as Zapata Flyboard.It achieved a Guinness World Record for farthest flight by hoverboard in April 2016 of 2,252.4 m. Zapata Racing claims that it allows flight up to an altitude of 10,000 feet (3,000 m) and has a top speed of 150 km/h (93 mph). It also has 10 minutes autonomy.

Omni Hoverboard

Canadian inventor Catalin Alexandru Duru,31, Invented Omni Hoverboard, which broke the Guinness World Record for longest distance travelled by a hoverboard in May 2015 when it flew a distance of 905ft at a height of 16ft in the air, in just 1.5 minutes.

The Omni Hoverboard features eight propellers and a frame made from carbon fibre , 12 lithium polymer batteries that gives 40 horsepower and a flying time of 1.5 mins which is controlled by a Joystick.

Onewheel Hoverboard

Onewheel is an electric self-balancing recreational personal transporter, sometimes described as a one-wheeled electric skateboard.

The company that makes it was founded by entrepreneur Kyle Doerksen and is distributed by Future Motion.The product has been featured in publications such as Sports Illustrated, Business Insider, and Popular Mechanics.

Lexus Slide

The Slide (stylized SLIDE) is a hoverboard developed by Lexus. The board has 32 Yttrium-Barium-Copper Oxide superconductors cooled by liquid nitrogen and rides on a magnetic track.

Lexus built a skate park in Barcelona, Spain specifically for the SLIDE. The SLIDE was built for the scientific achievement, not for public saleThe SLIDE was teased in June and officially revealed August 5, 2015.The SLIDE board itself is made of natural bamboo and carbon fibre support structures. The combined weight of all the components of the board is about 25.4 pounds(11.5kg). The board length comes out to be 29.5 inches. It requires a special track.

The track built by Lexus for the SLIDE project resides in Cubelles, Barcelona, Spain.The entire skate park has magnetic tracks hidden under a thin layer of wood covering. The magnetic track pulls the SLIDE along the path, it isn't pushed like a normal skateboard would.

ArcaBoard

ArcaBoard is an electric commercial hoverboard developed by ARCA Space Corporation. It is powered by 36 electric ducted fans, is capable of transporting a person weighing up to 110 kg, and has an endurance up to 6 minutes. It is designed for entertainment and personal recreation purpose. ARCA first unveiled their product on December 24th, 2015 and announced that it is available for purchase.

The hoverboard is 145 cm long and 76 cm wide, is made of aerospace grade composite materials and weighs up to 82 kg.It can levitate 30 cm above the ground with a person up to 90 kg and has a flight time up to 6 minutes and can be charged to full power in 35 minutes.

Hoverboards The Future Of Personal Transport

These boards will rule the streets in a few years the two wheeled.

Hoverbords had all the attention as they had easy access and were cool. The day is not far when flyboards will be the means of personal transport. Though it's not the only flying object that are being made there will be aero-cars

And hoverbikes like aerofex aero-x which will be out too in some years but hoverboards will be the best means for daily transport also for entertainment and fun purpose.

"Life is a lot like skateboarding."

-Lil Wayne

Alterntives For Android

-Firdos Khan

S.Y.Bsc.It-A

Looking for an alternative for Android? Here are some of them.

Why We Need An Android Alternative?

We surely love Android, as the market share suggests and Google is really working hard to keep the Android momentum going but as with most things in life, we like having options. Along with that, there are a number of reasons why we need an Android alternative.

Let's see the top most android alternatives?

Along with the mighty os (Apple iOS) and windows based phones there are many A graded and universally accepted operating systems which works on desktop pc's and handsets as well.

1. Cyanogen Os

CyanogenMod was a very popular custom ROM on Android and then, the guys at Cyanogen went further ahead and launched their very own Cyanogen OS. Cyanogen OS first came pre-installed with the OnePlus One and now, it is used by Indian manufacturer Micromax for its YU subsidy.

FEATURES:

-Great customization features
-Regular updates
-Great community

2. MIUI

Xiaomi has been making great inroads in whichever country they have expanded to. The company's success can be attributed to its aggressively priced devices but its MIUI OS also deserves some of the credit. MIUI has been known for its iOS-like looks and highly customizable features. The OS is not only available on Xiaomi devices but it's also available as a custom ROM for various other devices.

FEATURES

- Themes and exclusive features
- Customization options
- iOS-likeinterface

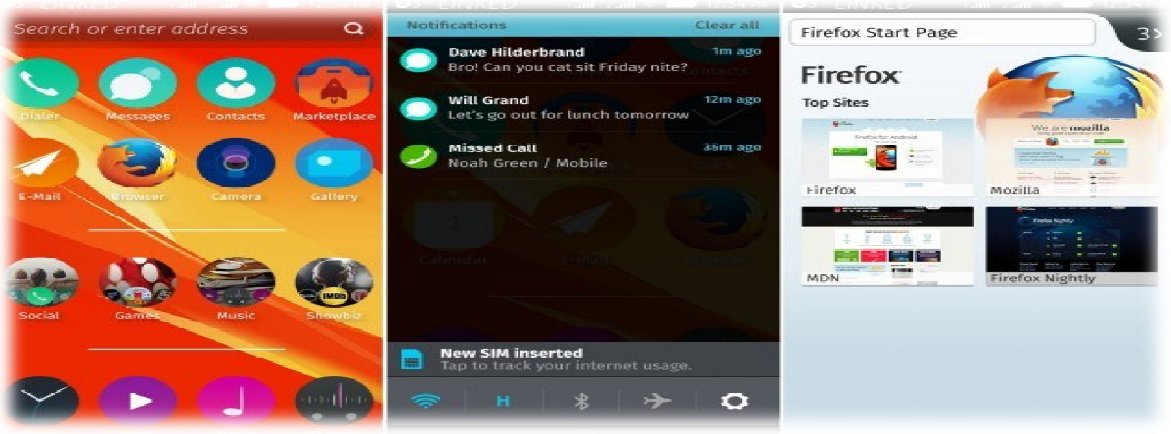
3. Tizen Os

Among all the upcoming mobile operating systems, Tizen has got the most fame, thanks to Samsung's backing. Tizen was born after Nokia decided to kill Meego, which was an OS developed by Nokia and Intel. Well, Intel went to Samsung and they partnered to bring Meego back to life as Tizen OS.

Features

- Great HTML5 support
- Intuitive gestures

4. Firefox Os



Firefox OS is a Linux-based open source OS, which is designed with HTML5, JavaScript and other open web standards in mind. Its main features include integrated search, web apps and more. While Mozilla's plan might bring the OS some traction, we believe it will take some time before Firefox OS can really become a viable Android alternative.

Features

-Affordable smart phones

-open web standards support

"The Computer Is The Most Remarkable Tool We Have Come Up With"
-Steve Jobs

“All of us do not have equal talent. But, all of us have an equal opportunity to develop our talents.”

-A.P.J Abdul Kalam

“You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.”

-R. Buckminster Fuller

“Please, no matter how we advance technologically, please don't abandon the book. There is nothing in our material world more beautiful than the book.”

-Patti Smith

“First we thought the PC was a calculator. Then we found out how to turn numbers into letters with ASCII — and we thought it was a typewriter. Then we discovered graphics, and we thought it was a television. With the World Wide Web, we've realized it's a brochure.”

-Douglas Adams

“I know there's a proverb which that says 'To err is human,' but a human error is nothing to what a computer can do if it tries.”

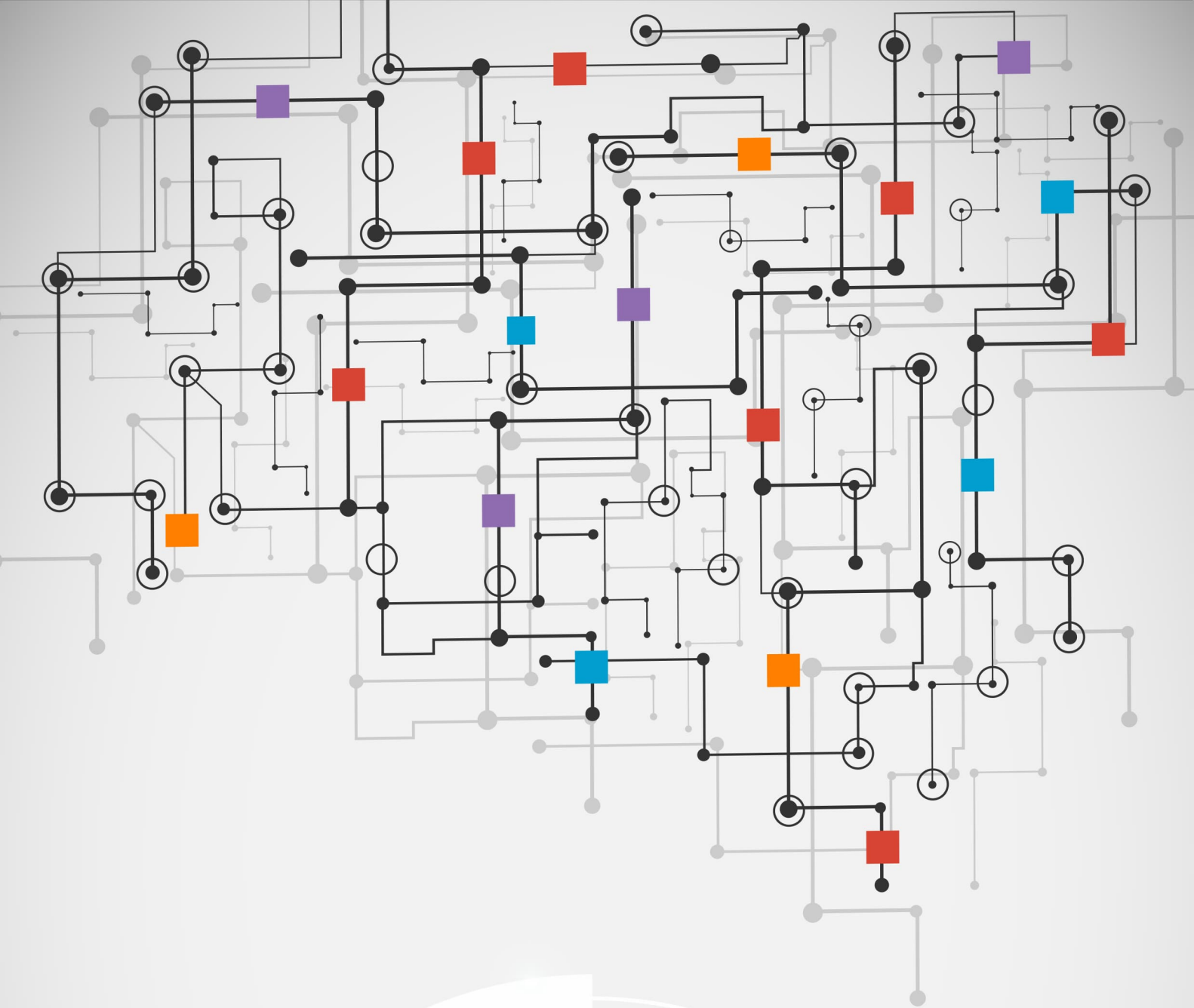
-Agatha Christie

“It's supposed to be automatic, but actually you have to push this button.”

-John Brunner

“Books don't need batteries.”

-Nadine Gordime



BUNTS SANGHA'S
S.M. SHETTY COLLEGE OF SCIENCE,COMMERCE & MANAGEMENT STUDIES

HIRANANDANI, POWAI, MUMBAI-76