TECHGEEKS

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SV COLLEGE OF ENGINEERING

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INSIDE THIS ISSUE:

Multi-Biometrics Recognition Systems

Several commonly used applications for our biometric system are reviewed in this report. Details of the design criteria of both hardware and software principles of operation as well as the testing and verification of the system are presented. Further development of project is also proposed and recommended. This project is to develop and built up a biometrics system for intelligent house and clubhouse. As biometrics is a popular and safety technology, the project applies this technology to improve the security level and easy for management.

How does it work?

False Reject Rates:

For most applications, letting the good guys in is just as important as keeping the bad guys out . The probability that a biometric device won't recognize a good guy is called the "False Reject Rate." The False Reject Rates quoted for current biometric systems range from 0.00066% to 1.0%. A low False Reject Rate is very important for most applications, since users will become extremely frustrated if they're denied access by a device that has previously recognized them.

A company with 100 employees has a biometric device at its front door. Each employee uses the door four times a day, yielding 400 transactions per day. A False Reject Rate of 1.0% predicts that every day, four good guys (1% of 400) will be denied access. Over a five-day week, that means 20 problems. Reducing the False Reject Rate to 0.1% results in just two problems per week. A low False Reject Rate is very important for most applications, since users will become extremely frustrated if they're denied access by a device that has previously recognized them. As mentioned previously, the combination of a low False Reject Rate plus a simple keypad code provides virtually unbreakable security.

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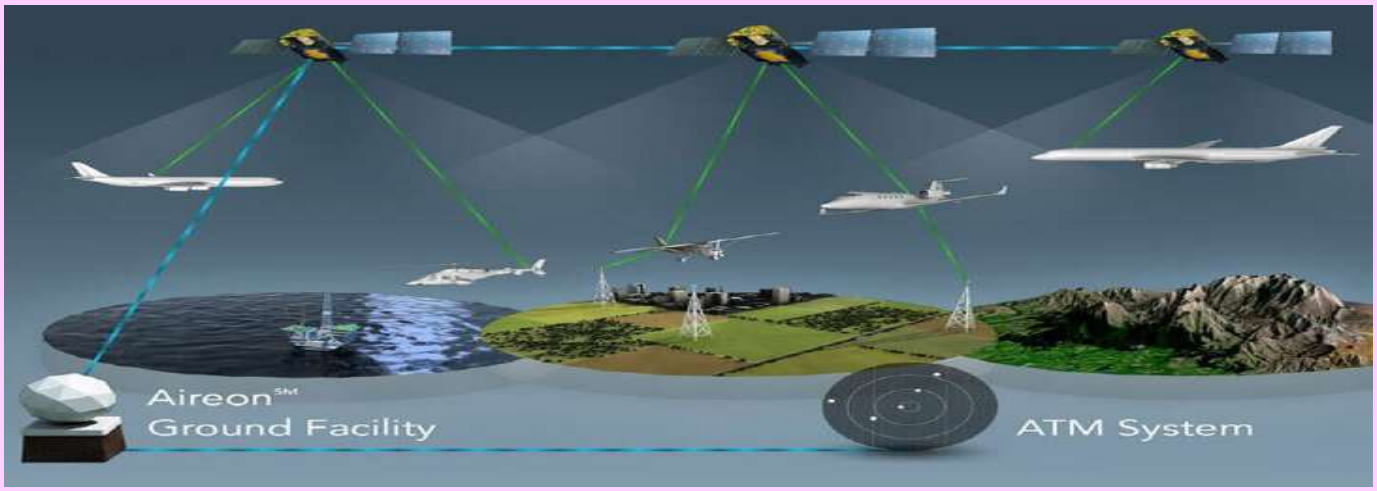
Air Cargo Tracking System

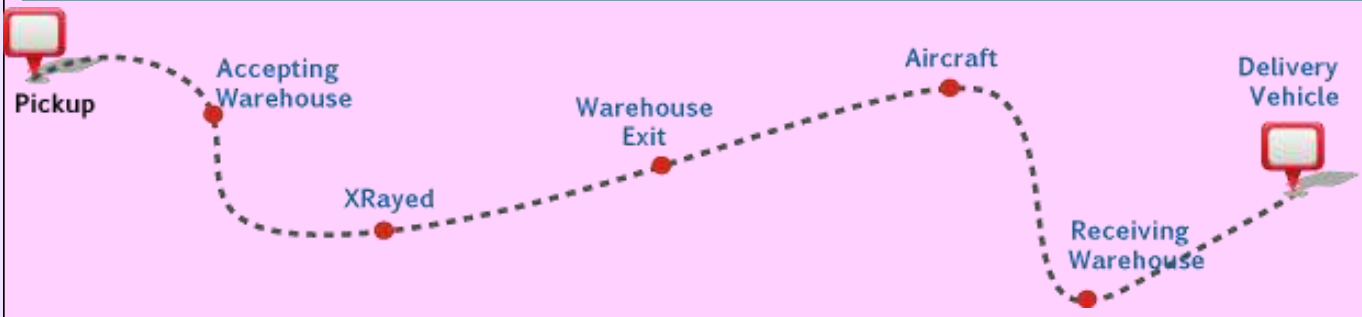
Air cargo tracking system is an online system for transporting various goods from one place to another and also viewing the customer about the current status of cargo or shipment to know if it is either on transit or delivered to the appropriate destination. This chapter entails the computer application in the courier services in our economy considering the trendy nature and advancement in the use and application of computer in our major industries emphasis is drawn mostly to the courier industries (multi-nationals), however (Okafor, 2003), defined the computer as an electronic device, which receives input according to a set of previously, supplied instruction called programs.

The management of shipments / goods in Nigeria has over the years attracted poor patronage as a result of error that the loss of exporters shipment is now the order of the day. As a result of eagerness exporters would prefer to view the current status of their cargo to know whether it is on transit or delivered to his appropriate destination but since there are so many activities involved. There may be delay in information about the shipment and this does not portray the image of the company in a good way. The airport system must have strong internal control as lack of these control results in fraudulent activities, and capable employees should be hired and trained to keep up with the pace in the society, as lack of these will result to competence.

MOTIVATION

The need for the existing system to be replaced with a friendlier and more ease to use computer based software application motivated this study. There are several applications in existence for air cargo tracking system, however, there is always room for improvement. This research is intended to develop a system with reduced complexity and greater ease of use, in order to enhance maintainability while still retaining good speed and accuracy.





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Bitcoin and Block Chain

Blockchain serves as an immutable ledger which allows transactions take place in a decentralized manner. Blockchain-based applications are springing up, covering numerous fields including financial services, reputation system and Internet of Things (IoT), and so on. However, there are still many challenges of blockchain technology such as scalability and security problems waiting to be overcome. This paper presents a comprehensiveoverview on blockchain technology. We provide an overview of blockchain architecture firstly and compare some typical consensus algorithms used in different blockchains. Furthermore, technical challenges and recent advances are briefly listed. We also lay out possible future trends for blockchain.

Introduction :

As Blockchain stands, it is the main technological innovation of Bitcoin, and has changed the idea of banking as bankers know it. Blockchain is broken up into individual blocks that hold specific information, which are evidently called “blocks”. “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.” (Blockchain Investopedia) This pioneering technology is very revolutionary because it makes it easier to track the transfers of Bitcoin, but many technologists have been realizing that there are more applications for this municipal ledger. Blockchain has many different characteristics that are exceedingly valuable for financial services including insight companies and technology manufacturers. These features incorporate the idea of security, absolute digital transactions, settlement times, health records, retail, and energy billing Philip Ryan). For security, “Block chain has the ability to improve edge security and encrypt data during transactions, rather than when the data is moving or at rest”. This makes the ledger sound and safe from hackers who try to gain free bitcoins through the transfer of bitcoins in data hacking. For true digital transactions, Blockchain enables secure connections, which is one of the most important features pertaining to Blockchain. . Health records are very important and Blockchain can be of help for securely storing all health archives and sharing them when needed. All of these factors are extremely vital to Blockchain and are some of the key reasons that it is so innovative to the field of finance and banking. There is one more reason that seems to be prevalent over the others and can influence the way people understand banking. Nowadays crypto currency has become a buzzword in both industry and academia. As one of the most successful crypto currency, Bitcoin has enjoyed a huge success with its capital market reaching 10 billion dollars in 2016 [1]. With a specially designed data storage structure, transactions in Bitcoin network could happen without any third party and the core technology to build Bitcoin is blockchain, which was first proposed in 2008 and implemented in 2009 [2]. Blockchain could be regarded as a public ledger and all committed transactions are stored in a list of blocks. This chain grows as new blocks are appended to it continuously. There are two reasons why you need to know about Blockchain: technology doesn't have to exist publicly. It can also exist privately - where nodes are simply points in a private network and the Blockchain acts similarly to a distributed ledger.Block-chain technology is broader than finance. It can be applied to any multi-step transaction where traceability and visibility is required. Supply chain is a notable use case where Blockchain can be leveraged to manage and sign contracts and audit product provenance .

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Facebook Cassandra

Cassandra is a column oriented, eventually consistent, distributed storage system for managing very large amounts of structured data. The Cassandra system was designed to run on cheap commodity hardware and handle high write throughput while not sacrificing read efficiency.

What is eventually consistent?

Building reliable distributed systems on a global scale demands trade-offs between consistency and availability .Consistency in a nutshell means that when something is written, it is expected that all reads after the write will have access to that written data. In Cassandra, due to its distributed nature, there are no such hard guarantees. However, we can say that it eventually reaches a consistent state because all data is eventually replicated across the distributed data store.

Cassandra was designed with the understanding that system/ hardware failures will and do occur. Due to this, Cassandra was developed as a peer to peer distributed system where all nodes serve the same functions, meaning there is no single point of failure. One of Cassandra's greatest strength is its availability and scaling, it achieves this through a fully distributed system where data is replicated across multiple nodes according to user settings.

Data reading and writing is abstracted away from the application, which allows the application to read/write to any node in the system and always expect that the data is replicated across multiple nodes. According to the tunable consistency setting, the user can also achieve complete consistency, a compromise of consistency and speed, or little to no consistency.

Cassandra is a robust solution for those requiring a reasonably consistent, highly available, and scalable fault-tolerant data store. Cassandra is also a great solution for those migrating from relational databases to No SQL due to the Cassandra Query Language, which is essentially a subset of SQL, making Cassandra more accessible than competitors. Cassandra maintains itself as a leader in speed and efficiency within the No SQL domain, so if the goal is to create an application with intensive and quick reads and writes, then Cassandra is the ideal solution.

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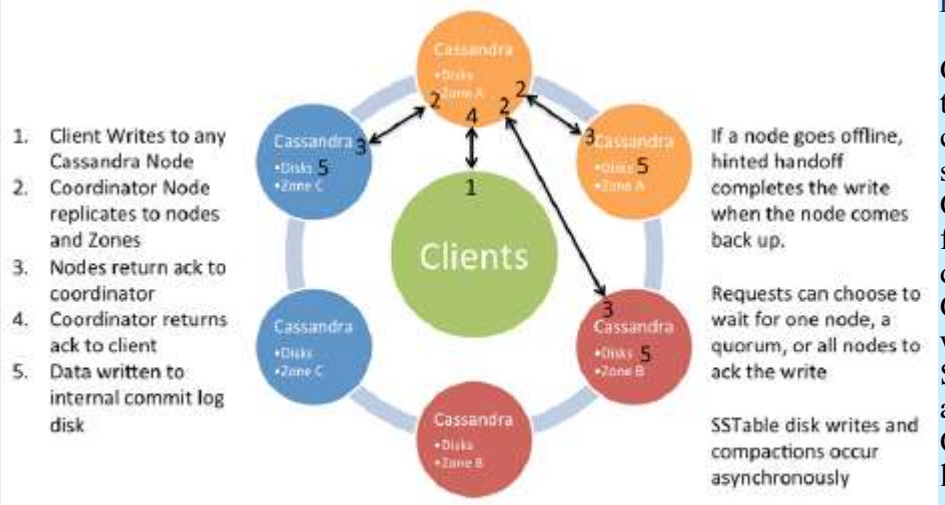

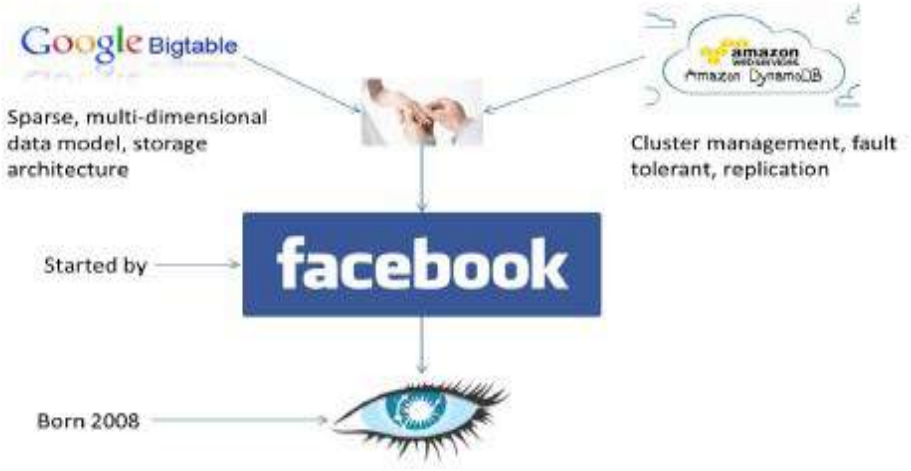

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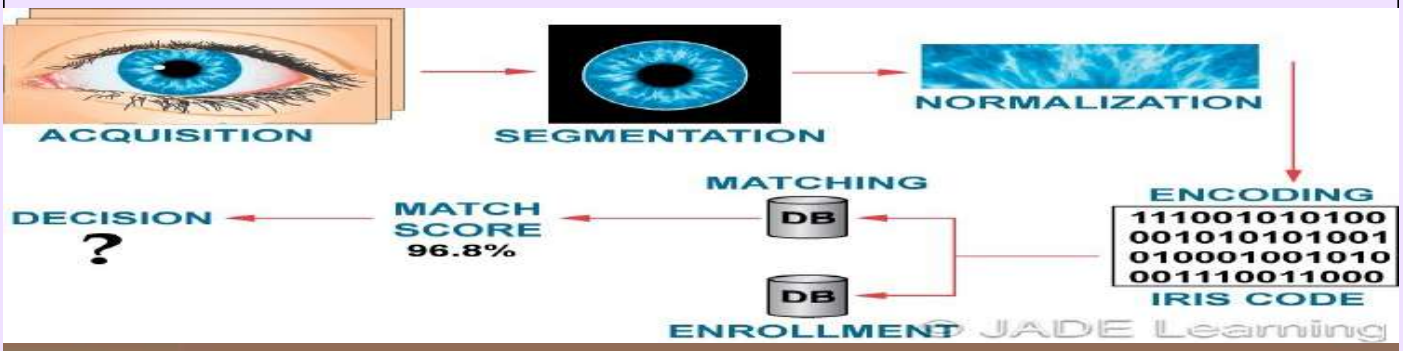
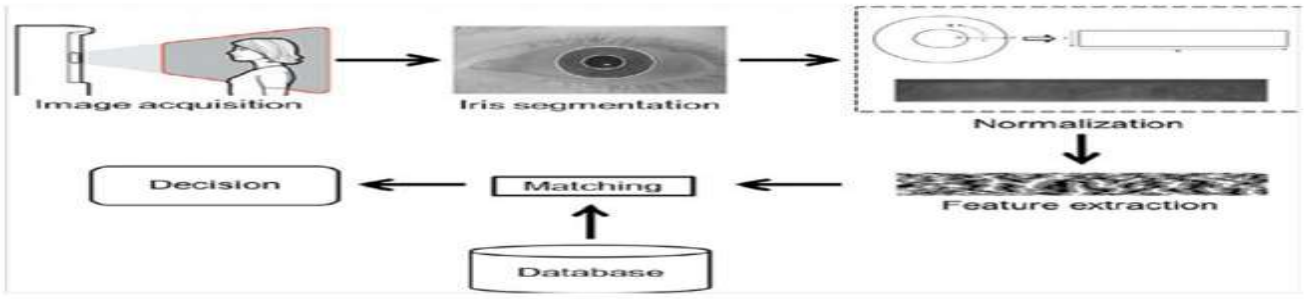
BIOMETRIC ATM Iris Recognition

There is an urgent need for improving security in banking region. With the advent of ATM though banking became a lot easier it even became a lot vulnerable. The chances of misuse of this much hyped 'insecure' baby product (ATM) are manifold due to the exponential growth of 'intelligent' criminals day by day. ATM systems today use no more than an access card and PIN for identity verification. This situation is unfortunate since tremendous progress has been made in biometric identification techniques, including finger printing, facial recognition, and iris scanning.

proposes the development of a system that integrates Iris scanning technology into the identity verification process used in ATMs. The development of such a system would serve to protect customers and financial institutions alike from fraud and other breaches of security.

Thus, we are looking forward to an ATM model that is more reliable in providing security by using iris scanner software. By keeping the time elapsed in the verification process to a negligible amount we even try to maintain the efficiency of this ATM system to a greater degree. Furthermore, since nearly all ATMs videotape customers engaging in transactions, it is no broad leap to realize that banks already build an archive of their customer images, even if they are not necessarily grouped with account information.





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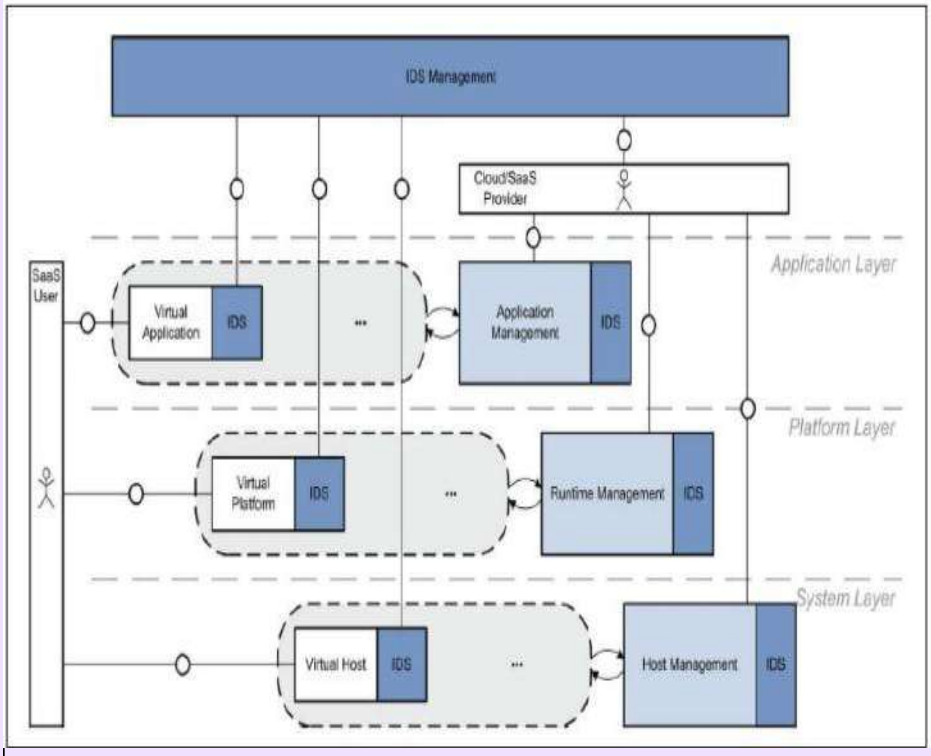
Multi Level Intrusion Detection and Log Management System

Information and Communications Technology (ICT)] has come to stay. As a result, most of our institutions have decided to move their important files to the cloud and do online transactions – allocation of resources to reviewer, proper storage of the big data from hackers. Cloud also involves multi-mesh



distributed and service oriented paradigms, multi-tenancies, multi-domains, and multi-user autonomous administrative infrastructures which are more vulnerable and prone to security risks.

Cloud computing service architecture combines three layers of inter-dependent infrastructure, platform and application; each layer may suffer from certain vulnerabilities which are introduced by different programming or configuration errors of the user or the service provider. A cloud computing system can be exposed to several threats including threats to the integrity, confidentiality and availability of its resources, data and the virtualized infrastructure which can be used as a launching pad for new attacks. The problem becomes even more critical when a cloud with massive computing power and storage capacity is abused by an insider intruder as an ill-intention party which makes cloud computing a threat against itself.

It is efficient and cost economical for consumers to use computing resources as much as they need or use services they want from Cloud Computing provider. Especially, Cloud Computing has been recently more spotlighted than other computing services because of its capacity of providing unlimited

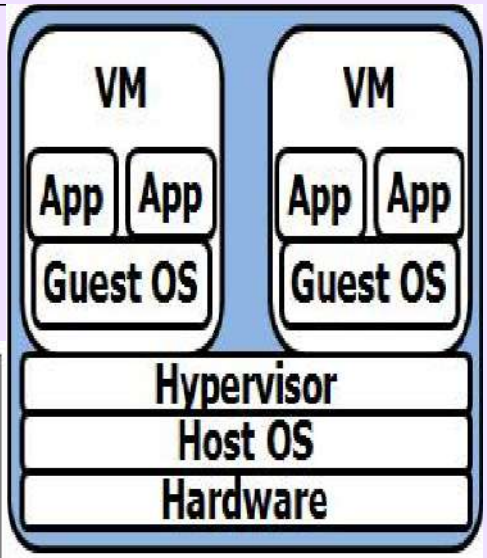


Figure 1. Hypervisor structure

amount of resources. Moreover, consumers can use the services wherever Internet access is possible, so Cloud Computing is excellent in the aspect of accessibility. Cloud Computing systems have a lot of resources and private information, therefore they are easily threatened by attackers (Enisa, 2009). Especially, System administrators potentially can become attackers. Therefore, Cloud Computing providers must protect the systems safely against both insiders and outsiders.

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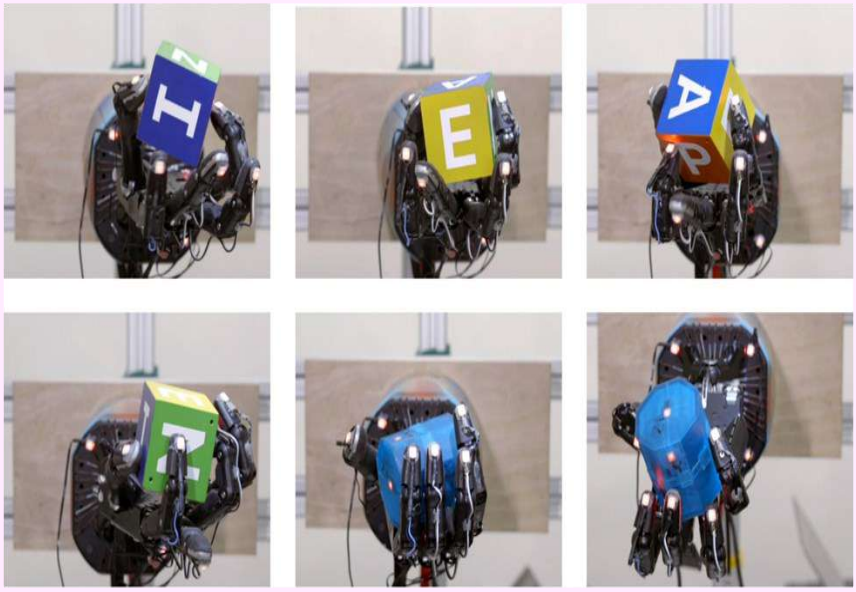
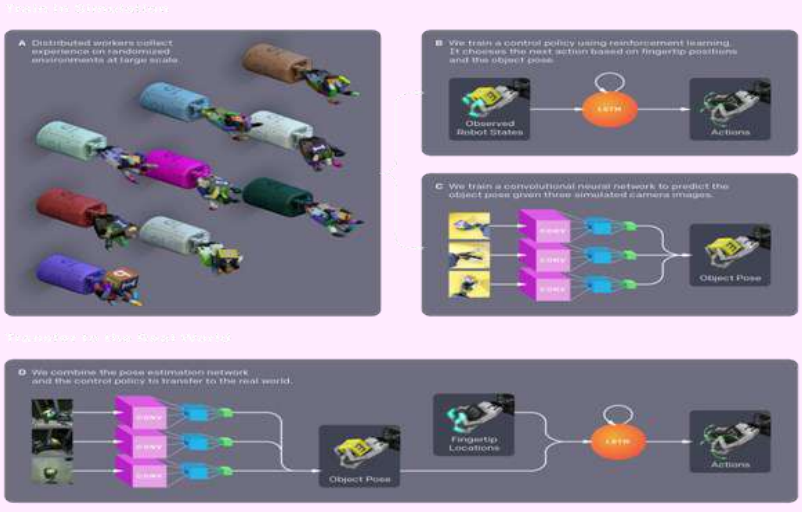
OpenAI's Robot Hand trained itself without any Human Learning

Picking up an object and analyzing it may be an arbitrary task for humans, but don't tell a machine that! Teaching a computer to detect objects, pick them up and analyze them has turned out to be way harder than anybody had initially imagined. What a few months old toddler can do is something that takes years of training for a machine to learn (that's just one simple example of why we are nowhere near general artificial intelligence).

Robot hands have become the primary application machine learning researchers use to showcase their projects. And OpenAI, always at the cutting edge of AI research, have trained a robot hand that can manipulate objects with mind boggling dexterity. The system, which OpenAI is calling Dactyl, has been trained entirely using round after round of simulations. Dactyl learns to do tasks from scratch using the same reinforcement learning techniques that power the popular OpenAI Five System.The task OpenAI researchers gave Dactyl was to reposition a given object (like a letter block) such that a new position is visible every time. Three cameras monitor how the hand works while the position and movement of fingertips is tracked in real-time. As more and more simulations were performed, Dactyl used human-level strategies to achieve the desired results. Again, this wasn't labeled or taught, it came as a result of the simulations.The below image, posted by OpenAI, shows how they built this system .This may seem like arbitrary research at first glance but it might be the first step towards general AI. Sure we have seen tons of robot hands before (), but what makes Dactyl different is that it isn't programmed to perform any one single task. Place any object in that hand, and it will learn by itself how to change it's orientation. This goes to show that robots can adapt to human-like behavior. It will take a lot more experiments and research to perfect this and make it useful in a practical scenario, but at least the stepping stone has been laid down.





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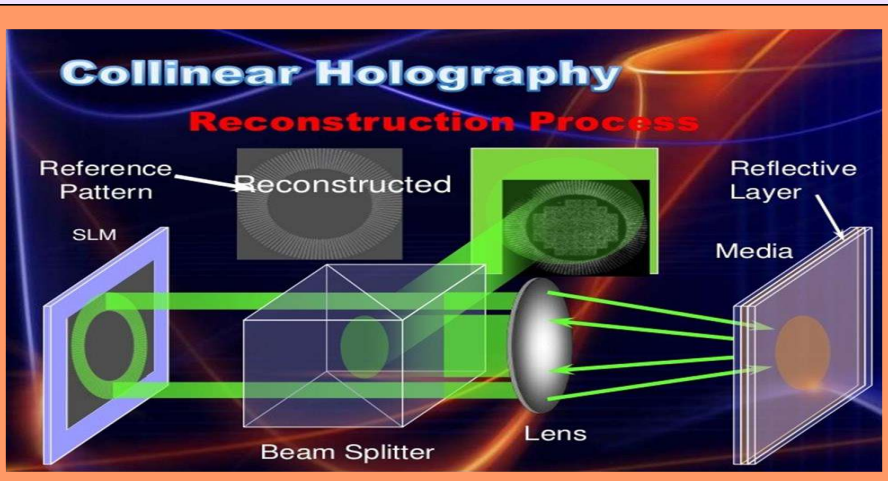
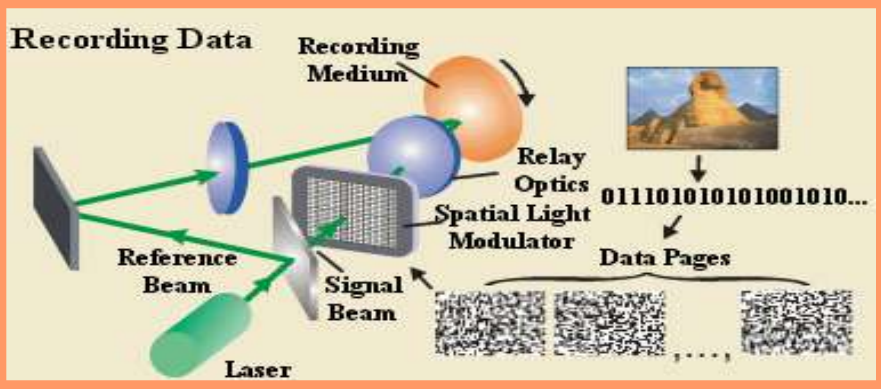
Holographic Data Storage



The growing demands of high definition digital video content, fixed content data, and compliance and security application will soon outstrip the capabilities of current storage technologies to keep up the demand. Clearly a new storage paradigm is needed to meet the growing storage demands. With its omnipresent computer, all connected via the internet, the information age has led to an explosion of information available to users. The decreasing cost of storing data and the increasing storage capability of the same small device footprint have been key enablers of this revolution. While current storage needs are being met, storage technology must continue to improve in order to keep pace with the rapidly increasing demand. Both magnetic and conventional optical data storage technologies, where individual bits are stored as distinct magnetic or optical changes on the surface of a recording medium are approaching physical limits beyond which individual bits may be too small or too difficult to store. Storing information throughout the volume of a medium, not just on its surface is an intriguing solution to our entire problem regarding storage. So this is it, Holographic Data Storage. Holographic Data Storage is a volumetric approach which, although conceived decades ago, has made recent progress towards practicality with the appearance of lower-cost enabling technologies, significant results from longstanding research efforts and progress in holographic recording materials. The technology and the story behind the next revolution in data storage. The advantage of this technology has Resistance to damage - If some parts of the medium are damaged, all information can still be obtained from other parts. Efficient retrieval - All information can be retrieved from any part of the medium. These discs have the capacity to hold up to 3.9 terabyte (TB) of information, which is approximately 6,000 times the capacity of a CDROM, 830 times the capacity of a DVD, 160 times the capacity of single-layer Blue-ray-Discs, and about 48 times the capacity of standard computer hard drives. The HVD also has a transfer rate of 1 gigabit/s. While reading a page the entire page of data can be retrieved quickly and at one time.Recording Data Light from a single laser beam is split into two beams: the signal beam (which carries the data) and the reference beam. The hologram is formed where these two beams intersect in recording medium. The process for encoding data onto the signal beam is accomplished by a device called a Spatial Light Modulator (SLM). The SLM translates the electronic data of 0s and 1s into optical "checker-board" pattern of light and dark pixels. The data is arranged in an array of approximately one million bits. The exact number of bits is determined by the pixel count of the SLM.



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