Rapid increase of available data and information because of the excess, first, usually data New so-called Knowledge Discovery in their base a paradigm has emerged. A more common Data Mining to this area by use is called.

Data mining large amounts of data from within, it will allow us to predict the future it is the search for correlations and rules.

From data stored in structural databases valid, new, potentially useful, and ultimately it is the process of defining understandable patterns.

Previously unknown, valid and applicable obtaining information from large databases and this it is the use of information in making business decisions.

Information with value from large-scale data it's a Acquisition job.

As can be seen from these definitions, between the data establishing relationships and looking forward when necessary making predictions through data mining studies it is possible.

Data mining studies, classification, relationship building, clustering, regression, data summarization, analysis of changes , it involves a certain number of technical approaches, such as the detection of deviations.

It is more accurate to mention about business intelligence before starting the data warehouse. Business intelligence is die reporting of the data needed after the necessary review by looking at the data of the enterprise that has been registered in the past. In a business, data comes from many different sources and is collected in a distributed structure and if Access to in' formation becomes more difficult as this data u. icreases, it is needed to collect the data in a central repository and Data Warehouse meet our needs. Data Warehouses combine data form different soucres to analyze and report on it.

The main purpose of the warehouse is to analyze and report the stored data more accurately using this historicallity by creating a historical structure. Historical depth must definitely be in a data warehouse.

A businees needs a data warehouse if it wants to know how sales have changed over the years, to accurately analyze why it is declining.

The information contained in data warehouse is not always up to date and the information is updated with specific periods. OLTP systems are used to access up- to-date data

# Online Mobility Operations (OLTP)

We can say that it is the source of the data to be drawn to the Data Warehouse. It is an operational database desingned to contain ever-changing data. The data is instantaneous and constantly updated.

## Check (Extract)

Not all data in the database is imported into the data warehouse. Check (Extract) operations are the process of picking the data that the data warehouse needs and define how this process should be pulled from data sources.

## Transform

Ensures that all data in the warehouse is of a certain standard. Many operations are performed here, such as parsing, validating, matching.

## Load

Data that is pulled and converted from data sources is loaded into the data warehouse. The installation process can be done in many different processes. When the data warehouses are established, at the first stage performed transactions are data uploads, then they are updated periodically and according to the need.

## Data Mart

Data mart is a subset of the data warehouse consolidates databases into an entire company, data marts are usually smaller and focus on data for a specific topic or need on the partition

## Data Cubes (OLAP Cubes)

In the structure we create with data cubes, the differences of data over time are modeled as a series change.

## Analysis

This is the part of analyzing and extracting reports from the generated structure.

Data Mining can be defined as hidden data patterns, analyzing meaningful information collected and stored in Data Warehouses for efficient analysis, Data Mining algorithms, facilitating business decision making, ultimately reducing costs and increasing revenue as other information requirements.

Data mining is used to examine raw data, including sales numbers, prices and customers, to develop better marketing strategies, increase performance or reduce the costs of running the business. Data mining also serves to discover new patterns of behavior among consumers.

\*Classification: One of the most widely used methods in data mining is the classification method. In this method, it is to examine the properties of the available data and transfer it to the appropriate one among the previously determined classes.

\* Association Rules: This is another method commonly used in data mining. This method aims to identify the interconnected data contained in large databases and the connections between them.

Clustering: The purpose of this data mining method is to divide the data into subclasses according to the relationships among themselves.

Estimation: It is a data mining method based on the estimation of numerical data that is missing ina data set.

Contradiction Analysis: It is a method of detecting excessive deviations in the data. With this method, unusual expenditures from credit cards are detected.

There are 5 components in the formation of Big Data. These components are respectively; variety, velocity, volume, verification, and value.

\* Variety: Since the data produced is not structured in general and consists of data formats obtained from many different environments, they must be integrated and converted to each other.

Velocity: Big data production adds speed to its speed every day, and this data reaches incredible dimensions per second. Fast-growing data leads to an increase in the number and variety of processes that need this data at the same speed, and we should be able to remove this density both software and hardware.

Volume : Our data, which we call big data, may be growing at speed every day, so we need to think well about how to deal with these stacks of data in the future, putting our future increase at the forefront, and make our plans in this direction.

Verification: Verification can also be seen as another data component when we need to check whether incoming data is secure during the flow of data that is growing so fast. This data may be visible to the correct people ar needs to remain hidden.

Value: One of the most important layers is the “value” layer, the data obtained in the production and processing layers of big data after our data is filtered from the above data components.

Every existence lives, it can be said that all of them have a life, concepts in the computer world also live. it can not be said that no creature exist once and will exist forever. There by, both notions and values are changing. Big data value is also changing, and it also has a life cycle.

Data Life Cycle= According to this approach, data has a life cycle. Production, processing, analysis of this data to be stored against corruption, to be stored against security vulnerabilities or who will access this data and the data cycle that goes like reuse can be mentioned.

Big Data Lifecycle= Big data life cycle concept is a new and not settled concept yet. This term used by many can mean different meanings. In the new model, the business world, data warehouses and business intelligence processes are a life style tied in cycle.

Analysis Life Cycle= It is a model that includes the stages of data processing, called “The Analytics Life Cycle”, prepared by SAS firm, which is known for its software related to data mining and statistics.

In the cycle they offer about Big Data Architecture developed by Oracle there is a dimension that goes from innovation to a working model. The data as the working phase is approached, the concept of innovation begins to disappear gradually. Employee data connecting can be seen as a separate step.

Big data is a field that treats ways to analyze, systematically extract information from, or otherwise deal with data sets that are too large or complex to be dealt with by traditional data- processing application software.

Volume and variety of data have been increasing globally in an unprecedented rate throughout human history. People begin to create data even in their daily activities thanks to the advent of internet technologies and social media on every stage of our lives and especially our mobile phones.

While operated manually in old days, many devices today are referred as intelligent, and almost allof them produce sensor data. Producing such an intense and different data from various sources reveals a new concept: “Big Data”.

Nowadays big data has become a popular concept and it is interpreted as beginning of a new era. While a huge transformation occurs with the creation of big data concept, institutions and organizations’ point of view and benets gained from the data have changed and come to a different point. It seems that it is impossible for institutions and organizations staying out of the said transformation.

Although big data is a new and popular concept, there are no so many studies having corporate nature in local literature. Despite a few publications having corporate base, numerous institutions and organizations operating in technology eld place a signicant importance to this concept and make big investments.

In order to understand 'Big Data’, we first need to understand What is Data ?

The quantities, characters, or symbols on which operations are performed by a computer, which may be stored and transmitted in the form of electrical siqnals and recorded on magnetic, optical, or mechanical recording media.

Big Data is also data but with a huge size. Big Data is a term used to describe a collection of data that is huge in volume and yet growing exponentially with time. In short such data is so large and complex that none of the traditionai data management tools are able to store it or process it efficiently.

The New York Stock Exchange generates about one terabyte of new trade data per day. The statistic shows that 500+terabytes of new data get ingested into the databases of social media site Facebook, every day. This data is mainly generated in terms of photo and video uploads, message exchanges, putting comments etc. A single Jet engine can generate 10+terabytes of data in 30 minutes of flight time. With many thousand flights per day, generation of data reaches up to many Petabytes.

Customer feedback on the product or service of the various company on their website creates data. For Example, a retail commercial site like Amazon, Walmart, Flipkart, Myntra gather customer feedback on the quality of their product, delivery time. Telecom company, other service provider organization seek customer experience with their service. These create a lot of data. loT Appliance: Electronic devices that are connected to the internet create data for their smart functionality, examples are a smart TV, smart washing machine, smart coffee machine, smart AC, etc. It is machine-generated data that are created by sensor kept in various devices In an e-commerce transaction, business transaction, banking, and the stock market, lots of records stored considered as one of the sources of big data. Payment through credit card, debit card or by another electronic way, all these are kept recorded as data. GPS in the vehicle that helps in monitoring movement of the vehicle to shorten the path for a destination to cut fuel, time consumption. This system creates huge data of vehicle position and movement.

Structured

Any data that can be stored, accessed and processed in the

form of fixed format is termed as a ‘structured’ data. Over the

period of time, talent in computer science has achieved greater

success in developing techniques for working with such kind of

data (where the format is well known in advance) and also

deriving value out of it. However, nowadays, we are foreseeing

issues when a size of such data grows to a huge extent, typical

sizes are being in the rage of multiple zettabytes.

Unstructured

Any data with unknown form or the structure is classified as

unstructured data. In addition to the size being huge, un-

structured data poses multiple challenges in terms of its

processing for deriving value out of it. A typical example of

unstructured data is a heterogeneous data source containing a

combination of simple text files, images, videos etc. Now day

organizations have wealth of data available with them but

unfortunately, they don't know how to derive value out of it

Semi-structured

Semi-structured data can contain both the forms of data.

We can see semi-structured data as a structured in form

but it is actually not defined with e.g. a table definition in

relational DBMS. Example of semi-structured data is a data

represented in an XML file.

The Integrated joint Operations Platform is used by the government to monitor the

population, particularly Uyghurs. Biometrics, including DNA samples, are gathered

through a program of free physicals.

By 2020, China plans to give all its citizens a personal "social credit" score based on how they behave. The Social Credit System, now being piloted in a number of Chinese cities, is considered a form of mass surveillance which uses big data analysis technology.

Big data analysis was tried out for the BJP to win the 2014 Indian General Election.

the indian goverment uses numerous technique to ascertain how the indian electorate is responding to government action, as well as ideas for policy augmentation.

ISRAEL

Personalized diagtic treatments can be created through GlucoMe's big data solution.

What is GlucoMe

GlucoMe is a comprehensive, connected diabetes care platform that simplifies the way

patients,caregivers,and medical professionals manage diabetes. It conibines diabetes

monitoring hardware ,mobile software and big data cloud computing infrastructure.

United Kingdom

By connecting Origin, location and the time of each prescription, a research unit was

able to exemplify considerable delay between the release of any given drug, and a

UK-wide adaptation of the National Institute for Health and Care Excellence guidelines.

A local authority blended data about services, such as road gritting rotas, with services

for people at risk. The connection of data allowed the local authority to avoid any

weather-related delay.

United States

In 2012, the Obama administration announced the Big Data Research and

Development Initiative, to explore how big data could be used to address important

problems faced by the government. The initiative is composed of 84 different big data

programs spread across six departments.

Big data analysis played a large role in Barack Obama's successful 2012 re-election

campaign

ABSTRACT

Nowadays big data has become a popular concept and it is interpreted as

beginning of a new era. While a huge transformation occurs with the creation of

big data concept, institutions and organizations point of view and benefits gained

from the data have changed and come to a different point. It seems that is

impossible for institutions and organizations staying out of the said

transformation.

Although big data is a new and popular concept, there are no so many studies

having corporate nature in local literature. Despite a few publications having

corporate base, numerous institutions and organizations operating in technology

field place a significant importance to this concept and make big investments.

Data that doesn’t make sense alone is actually a set of both numeric and quality variables.

‘So what are the steps to naming this data?

In simple terms, here's the Pyramid of Information.

Data= He quantities, characters, or

symbols on which operations are

performed by a computer, which

may be stored and transmitted in

the form of electrical signals and

recorded on magnetic, optical, or

mechanical recording media.

Information= It is the simple

processing of data.

Knowledge= The step that occurs

when information accumulates.

Wisdom= When we start to benefit

from these experiences, we move

to the step of wisdom.

WHAT İS BİG DATA?

Big Data is a collection of data that is huge in volume, yet growing exponentially

with time. It is a data with so large size and complexity that none of traditional

data management tools can store it or process it efficiently. Big data is also a

data but with huge size.

Types Of Big Data

Following are the types of Big Data:

Structured= Any data that can be stored, accessed and processed in the form

of fixed format is termed as a structured data.

Unstructured= Any data with unknown form or the structure is classified as

unstructured data. In addition to the size being huge, un-structured data

poses multiple challenges in terms of its processing for deriving value out of

it.

Semi-structured= Semi-structured data can contain both the forms of data.

We can see semi-structured data as a structured in form but it is actually not

defined with e.g. a table definition in relational DataBase Management

System.

Characteristics Of Big Data

Data is constantly growing. l don't think it's better. Big Data is a definition made

in 5V.

Big data can be described by the following characteristics:

Volume=When it comes to big data, the first thing that comes to mind is big

data as a size, that is, big data as the place it occupies.

Variety= Variety of data. It is the arrival of data with different characteristics

from different sources.

Velocity= Speed is the speed. for example, a large number of tweets are

written on Twitter every day, a certain processing speed must be captured in

order for them to be processed.

Veracity= Reliability of data. How much will you trust which source? The

question is very important for the big data world.

Value= A value can be mentioned based on how large a data is, how quickly a

data changes, how diverse it is, and how reliable it is.

The use of Big Data is becoming common these days by the companies to

outperform their peers. In most industries, exsting competitors and new entrants

alike will use the strategies resulting from the analyzed data to compete, innovate

and capture value.

Big Data helps the organizations to create new growth opportunities and entirely new

categories of companies that can combine and analyze industry data. These

companies have ample information about the products and services, buyers and

suppliers, consumer preferences that can be captured and analyzed.

The importance of big data does not revolve around how much data a

company has but how a company utilises the collected data. Every company

uses data in its own way; the more efficiently a company uses its data, the

more potential it has to grow. The company can take data from any and

analyse it to find answers which will enable:

Cost Savings : Some tools of Big Data like Hadoop and Cloud-Based Analytics

can bring cost advantages to business when large amounts of data are to be

stored and these tools also help in identifying more efficient ways of doing

business.

Time Reductions :The high speed of tools like Hadoop and in-memory

analytics can easily identify new sources of data which helps businesses

analyzing data immediately and make quick decisions based on the learnings.

Understand the market conditions : By analyzing big data you can get a

better understanding of current market conditions. For example, by analyzing

customers’ purchasing behaviors, a company can find out the products that

are sold the most and produce products according to this trend. By this, it can

get ahead of its competitors.

Control online reputation: Big data tools can do sentiment analysis.

Therefore, you can get feedback about who is saying what about your

company. If you want to monitor and improve the online presence of your

business, then, big data tools can help in all this.

Using Big Data Analytics to Boost Customer Acquisition and Retention

The customer is the most important asset any business depends on. There is no single

business that can claim success without first having to establish a solid customer base.

However, even with a customer base, a business cannot afford to disregard the high

competition it faces. If a business is slow to learn what customers are looking for,

then it is very easy to begin offering poor quality products. In the end, loss of

clientele will result, and this creates an adverse overall effect on business success.

The use of big data allows businesses to observe various customer related patterns

and trends. Observing customer behaviour is important to trigger loyalty.

Using Big Data Analytics to Solve Advertisers Problem and Offer Marketing

Insights

Big data analytics can help change all business operations. This includes the

ability to match customer expectation, changing company’s product line and of

course ensuring that the marketing campaigns are powerful.

Big Data Analytics As a Driver of Innovations and Product Development

Another huge advantage of big data is the ability to help companies innovate and

redevelop their products.

Admin privilege: having ultimate control of any given system.

Authenticator: the way of confirming a user’s identity.

Bandwidth: the capacity of a communication channel as measured by the

difference between the highest and lowest frequencies that can be

transmitted by that channel.

Biometric authentication: technology for authenticating system users that

compares a person’s unique characteristics such as fingerprints, face, or

retinal image.

Captcha: a test that distinguishes between robots and humans, using a

website where you have to “prove you’re human”.

Clustering: linking two computers so that the second computer can act as a

backup to the primary computer or speed up processing.

Cyber security: a concept for protecting computers, networks, programs, and

data from unauthorized access or hackers for exploitation.

Database: a group of related files.

Datamining: analysis of large pools of data to find patterns and rules that can

be used to guide decision making and predict future behavior.

Firewall: an internet traffic filter meant to stop unauthorized incoming and

outgoing traffic.

Firmware: code that is embedded into the hardware of a computer.

Hacker: a person who gains unauthorized access to a computer network for

profit, criminal mischief, or personal pleasure.

Information technology: the study or use of computers and

telecommiunications to store, retrieve, transmit, or send data.

Internet of Things: an object that has an internet connection. Can be

anything from your dog’s collar, watch, vehicle, hearing aid, and more.

Metadata: seemingly harmless impersonal data, like how many times a user

clicked or refreshed the page when visiting a website.

Virtual Private Network: also known as a VPN, it allows you to create a

secure connection to another network using the internet.

UNIX: operating system for all types of computers, which is machine

independent and supports multiuser processing, multitasking, and networking.

Voice over IP (VoIP): facilities for managing the delivery of voice information

using the Internet Protocol (IP).

Artificial neural networks (ANN) can be

defined as a system that models the working

system of the human brain in general terms.

Abilities such as generating new information

through learning from the characteristics of the

human brain, creating and discovering new

information, are information systems with the

aim of automatically realizing any assistance.

Serial work

Fast units

Digital

Fully defined script directory

Sensitive to input data

Every step counts

Parallel work

Slow units

Analogue

It can adapt to incomplete or corruptedinformation.

Insensitive to input dataUnits contribute little to the main work

ANN consists of connecting artificial nerve cells

with each other in various ways and is usually

arranged in layers.

ANN consists of 3 layers

İnput Layer

Middle Layer

Output Layer

ANN learn with examples just like people. for this purpose the experimental set is divided into two parts as training and test sets.

the trainin process continues until targeted output value is achieved

Advantages;

densely parallel

fault tolerant sue to parallelism

it can be designed adaptively

apart from the training set, the problem need not be fully defined

Disadvantages;

There are no strict rules and design critena for random applications.

There is no general way to evaluate the internal execution of the network

Training can be difficult or impossible.

It is difficult to predict the future performance of the network.

In cryptography, Alice and Bob are fictional characters commonly used as

placeholders in cryptographic protocols or systems, discussions and other

science and engineering literature with several participants in a thought

experiment.

Oscar is the 3rd person to listen to messages between Bob and Alice.

Symmetric Algorithms are what many people assume cryptography is about:

two parties have an encryption and decryption method for which they share a

secret key. All cryptography from ancient times until 1976 was exclusively based

on symmetric methods. Symmetric ciphers are still in widespread use,

especially for data encryption and integrity check of messages.

Asymmetric (or Public-Key) Algorithms in 1976 an entirely different type of

cipher was introduced by Whitfield Diffie, Martin Hellman and Ralph Merkle.

In public-key cryptography, a user possesses a secret key as in symmetric

cryptography but also a public key. Asymmetric algorithms can be used for

applications such as digital signatures and key establishment, and also for

classical data encryption.

Cryptographic Protocols Roughly speaking, crypto protocols deal with the

application of cryptographic algorithms. Symmetric and asymmetric algorithms

can be viewed as building blocks with which applications such as secure

Internet communication can be realized. The Transport Layer Security (TLS)

scheme, which is used in every Web browser, is an example of a cryptographic

protocol.

Stream Ciphers

If we look at the types of cryptographic algorithms that exist in a little bit more

detail, we see that the symmetric ciphers can be divided into stream ciphers

and block ciphers, as shown in Fig. 2.1.

Stream ciphers encrypt bits individually. This is achieved by adding a bit

from a key stream to a plaintext bit. There are synchronous stream ciphers

where the key stream depends only on the key, and asynchronous ones

where the key stream also depends on the ciphertext.

Block ciphers encrypt an entire block of plaintext bits at a time with the same key.

This means that the encryption of any plaintext bit in a given block depends on

every other plaintext bit in the same block. In practice, the vast majority of block

ciphers either have a block length of 128 bits (16 bytes) such as the advance

encryption standard (AES), or a block length of 64 bits (8 bytes) such as the data

encryption standard (DES) or triple DES (3DES) algorithm.

Introduction to DES

Data Encryption Standard (DES) encrypts blocks of size 64 bit.

Developed by IBM based on the cipher Lucifer under influence of the

National Security Agency (NSA), the design criteria for DES have not been

published.

Most Popular block cipher for most of the last 30 years.

By far best studied symmetric algorithm.

Nowadays considered insecure due to the small key length of 56 bit.

AES is the most widely used symmetric cipher today.

The algorithm for AES was chosen by the US National Unstitute of Standards

and Technology (NIST) in a multi-year selection process.

The requirements for all AES candidate submission were:

1. Block cipher with 128-bit block size

2. Three supportd key lengths: 128, 192 and 256 bit

The requirements for all AES candidate submission were:

3- Security relative to other submitted algorithms

4- Efficiency in software and hardware

Overview of the AES Algorithm

The AES cipher is almost identical to the block cipher Rijndael. The Rijndael

block and key size vary between 128, 192 and 256 bits. However, the AES

standard only calls for a block size of 128 bits. Hence, only Rijndael with a

block length of 128 bits is known as the AES algorithm.

Cryptology is the science of encryption. It is the encryption of various

messages and texts according to a certain system, the transmission of these

messages to the recipient in a secure environment, and the deciphering of

the transmitted message.

Cryptology is basically divided into two main topics;

Cryptography and Cryptanalysis.

Cryptography : It is the process of making data hidden from open. It

ensures the confidentiality, integrityrand security of data. People who do

this process are called cryptographers. The understandable form of the

current text is called plain text or clear text

The new form obtained as a result of converting plain text into a form

that cannot be understood by different processes is called encrypted

od

The purpose of cryptography is to hide the contents of messages

by encrypting them so as to make them unrecognizable except

by someone who has been given a special decryption key.

The main purpose of cryptography is to ensure the confidentiality of

information. There are three basic methods used for this purpose :

1. Substitution Methods: The position of the letters in plain text is fixed.

Encrypted text is obtained by replacing these letters with numbers, symbols

or letters of another alphabet.

2. Transposition Methods: Letters in plain text are replaced. No other

alphabet or symbol is used, the identities of the letters in plain text are fixed;

but their places change. The best example in the past is the Caesar

encryption algorithm.

3. Algebraic Methods: Is done using a variety of mathematical operations

and functions.

Cryptanalysis : It is a sub-science of cryptology that deals with the analysis

of texts encrypted by cryptographers and the resolution of passwords. The

people who do this job are called cryptoanalysts. It is the process of

obtaining plain text, that is the original text, from encrypted text. In short,

the purpose of the cryptoanalysis is to decrypt encrypted text

Various aspects in information security such as data confidentiatity, data

integrity and authentication are central to modern cryptography.

Modern cryptography exists at the intersection of the disciplines of

mathematics, computer science, electrical engineering, communication

science, and physics. Applications of cryptography include electronic

commerce, chip-based payment cards, digital currencies, computer

passwords, and military communications.

Cryptographer

A Cryptographer is responsible for developing security systems using

algorithms and cyphers to encrypt sensitive data. They analyse and decrypt

information contained within cipher texts and encrypted data.

Encryption/Decryption

Encryption is the process of converting normal message (plaintext) into

meaningless message (Ciphertext). Whereas Decryption is the process of

converting meaningless message (Ciphertext) into its original form

(Plaintext).

Cryptographic key

In cryptography, a key is a string of characters used within an encryption

algorithm for altering data so that it appears random. Like a physical key, it

locks (encrypts) data so that only someone with the right key can unlock

(decrypt) it.

CIPHER

Cipher, any method of transforming a message to conceal its meaning. The

term is also used synonymously with ciphertext or cryptogram in reference

to the encrypted form of the message.

Image processing is a set of processes that enable us to extract meaningful expressions

from the image we have. These operations are carried out by means of mathematical

operations to be performed on the pixels that make up the image. After the image is

obtained, an algorithm is designed according to the desired task and the image passes

through these stages and fulfills the desired task.

The two methods used for Image Processing are Analog and Digital Image Processing. Analogue or visual image

processing techniques can be used for hard copies such as photocopies and photographs.

Image processing should not be limited to technical knowledge, but should also be based on the imagination and

thinking ability of engineers.

Another important tool in the field of image processing with visual techniques is the raw data, that is, the image

collected and unprocessed in the past. Analysts teach the system about the past transactions related to the products

they want to identify. As a deep learning arm, the Image Processing application works in the light of historical data.

1. Rectifying the noises on the image and

obtaining a clean image.

2. Detection of objects on the image that are

difficult for human perception to see.

3. Making the image better quality.

4. Object tracking.

5. Distinguishing different object on the image.

Image Enhancement:

There may be some undesirable

structures called noise in the

images taken and cause

distortions on the image.

Gaussian noise, shot noise can be given as examples

of these noises.

With the techniques such as average filter and

median filter, which are among the image processing

techniques, the image can be made better quality and

noiseless. In this way, more accurate results will be

obtained on the image.

Object Recognition:

Using the necessary methods and

algorithms according to the object to

be detected, any object can be

detected and tracked on the image.

For example, in many countries abroad, the detection of

criminals is carried out with this method.

Any person can be detected through the images taken from

the existing camera setups.

It is also used in the traffic area. It can count the vehicles

found and the speed of the vehicles can be measured. In this

way, the control of traffic density or excessive speed

and necessary notifications can be made to the center.

Health sector:

Many diseases can be diagnosed with image processing

techniques.

Pre-natal formation and follow-up of the fetus, examination of

medical images, clarification of suspicious tissues and providing

the opportunity for experts to make a correct diagnosis.

In addition to these, image

processing techniques are used in

such fields in medical science in

processes such as brain imaging,

early diagnosis of breast cancer,

analysis of bone shape and

structure, diagnosis of cancer and tumor detection.

Mobile cloud computing is an technique or model in which mobile

applications are built, powered and hosted using cloud computing

technology.

A mobile cloud approach enables developers to build applications

designed specifically for mobile users without being bound by the

mobile operating system and the computing or memory capacity of

the smartphone.

mobile cloud computing centered are generally accessed via a

mobile browser from a remote webserver, typically without the

need for installing a client application on the recipient phone.

Public Cloud: A cloud technology established with servers on the Internet.An example of this pay-as-you-

go model that you would use in small and medium-sized companies is e-mails.

Private Cloud :lt is a cloud technology preferred by large companies whose information is important. All

information is at the founder's hand and access security and confidentiality is high. Microsoft provides this

with the help of Hyper-V and the System Center Product Family.

Hybrid Cloud: It is a cloud technology that emerges from the combination of Public and

Private Cloud. Differences can be observed in the rate of combination according to the

volume of companies.

Community Cloud: it is a cloud technology that hosts services that are used jointly

with several companies. Community members can access applications and data.

Flexibility and Speed

Resource Sharing

Economy

Data security

Unlimited Storage

Battery Life

Reguires Stable Internet Connection

Slow Running of the Application

System Updates

Vulnerabilities

Dropbox

Google Drive

Mega

Microsoft OneDrive

Software as a service (SaaS) allows users to connect to and use cloud-based

apps over the Internet. Common examples are email, calendaring, and office

tools (such as Microsoft Office 365).

SaaS provides a complete software solution that you purchase on a pay-as-you-go

basis from a cloud service provider. You rent the use of an app for your

organization, and your users connect to it over the Internet, usually with a web

browser. All of the underlying infrastructure, middleware, app software, and app

data are located in the service provider’s data center. The service provider

manages the hardware and software, and with the appropriate service agreement,

will ensure the availability and the security of the app and your data as well. SaaS

allows your organization to get quickly up and running with an app at minimal

upfront cost.

If you’ve used a web-based email service such as Outlook, Hotmail, or Yahoo!

Mail, then you’ve already used a form of SaaS. With these services, you log

into your account over the Internet, often from a web browser. The email

software is located on the service provider’s network, and your messages are

stored there as well. You can access your email and stored messages from a

web browser on any computer or Internet-connected device.

The previous examples are free services for personal use. For organizational

use, you can rent productivity apps, such as email, collaboration, and

calendaring; and sophisticated business applications such as customer

relationship management (CRM), enterprise resource planning (ERP), and

document management. You pay for the use of these apps by subscription or

according to the level of use.

Gain access to sophisticated applications. To provide SaaS apps to users, you

don’t need to purchase, install, update, or maintain any hardware,

middleware, or software. SaaS makes even sophisticated enterprise

applications, such as ERP and CRM, affordable for organizations that lack the

resources to buy, deploy, and manage the required infrastructure and

software themselves.

Pay only for what you use. You also save money because the SaaS service

automatically scales up and down according to the level of usage.

Use free client software. Users can run most SaaS apps directly from their web

browser without needing to download and install any software, although some

apps require plugins. This means that you don’t need to purchase and install

special software for your users.

Mobilize your workforce easily. SaaS makes it easy to “mobilize” your workforce

because users can access SaaS apps and data from any Internet-connected

computer or mobile device. You don’t need to worry about developing apps to run

on different types of computers and devices because the service provider has

already done so. In addition, you don’t need to bring special expertise onboard to

manage the security issues inherent in mobile computing. A carefully chosen

service provider will ensure the security of your data, regardless of the type of

device consuming it.

Access app data from anywhere. With data stored in the cloud, users can

access their information from any Internet-connected computer or mobile

device. And when app data is stored in the cloud, no data is lost if a user's

computer or device fails.

Introduction

This white paper is an introduction to the

terms, characteristics; and services associated

with internet-based computing, commonly

referred to as cloud computing

Characteristics, such as infrastructure,

provisioning, network access, and managed

metering are presented.

Cloud Computing

The term “cloud”, as used in this white paper,

appears to have its origins in network

diagrams that represented the internet, or

various parts of it, as schematic clouds

“Cloud computing” was coined for what

happens when applications and services are

moved into the internet “cloud .”

many companies are delivering services from the cloud.

Some notable examples include the following:

Google; Has a private cloud that it uses for delivering

Google Docs and many other services to its users,

including email access, document applications, text

translations, maps, web analytics, and much more .

Microsoft; Has Microsoft” Office 365” online service

that allows for content and business intelligence tools to

be moved into the cloud, and Microsoft currently makes

its office applications available in a cloud.

Salesforce.com; Runs its application set for its

customers in a cloud, and its Force .com and Vmforce.com

products provide developers with platforms to build customized cloud services

Characteristics

Cloud computing has a variety of

characteristics, with the main ones being:

Shared Infrastructure; Uses a virtualized

software model, enabling the sharing of

physical services, storage, and networking capabilities ..

Dynamic Provisioning; Allows for the

provision of services based on current

demand requirements.

Managed Metering; Uses metering for

managing and optimizing the service and to

provide reporting and billing information .

Deployment Models

Private Cloud; The cloud infrastructure has

been deployed, and is maintained and operated

for a specific organization .

Community Cloud; The cloud infrastructure is

shared among a number of organizations with

similar interests and requirements .

Public Cloud; The cloud infrastructure is available to the public on a commercial basis by a cloud service provider

Hybrid Cloud;This can be a combination of

private and public clouds that support the

requirement to retain some data in an

organization, and also the need to offer services

in the cloud.

The Internet of things (loT) is a system of interrelated computing devices,

mechanical and digital machines, objects, animals or people that are

provided with unique identifiers ( UIDs ) and the ability to transfer data over a

network without requiring human-to-human or human-to-computer

interaction - loTAgenda

A thing in the lol can be a person with a heart monitor implant, a farm

animal with a biochip transponder, an automobile that has built-in sensors to

alert the driver when tire pressure is low or any other natural or man-made

object that can be assigned an IP address and is able to transfer data over

a network.

loT is a sensor network of billions of smart devices that connect people,

systems and other applications to collect and share data.

loT is a concept of connecting any device with an on and off switch to the

Internet (and/or to each other). This includes everything from cellphones,

coffee makers, washing machines, headphones, lamps, wearable devices

and almost anything else you can think of. This also applies to components

of machines, for example a jet engine of an airplane or the drill of an oil rig —

Forbes.

The lol is a giant network of connected "things" (which also includes

people). The relationship will be between people-people, people-things,

and things-things.

The dominant consumer lol device, worldwide, is the smart TV. Between 25-

35% cent of consumers worldwide own a television that can connect to the

Internet, according to a Deloitte research. However, other areas of the lol

market are growing rapidly.

Organizations in a variety of industries are using lol to operate more

efficiently, better Understand customers to deliver enhanced customer

service, improve decision-making and increase the value of the business.

An loT ecosystem consists of web-enabled smart devices that use

embedded processors, sensors and communication hardware to collect,

send and act on data they acquire from their environments.

loT devices share the sensor data they collect by connecting to an lol

gateway or other edge device where data is either sent to the cloud to be

analyzed or analyzed locally.

Trend No. 1: Artificial Intelligence (Al): “Data is the fuel that powers the loT

and the organization’s ability to derive meaning from it will define their long

term success.”

Trend No. 2: Social, Legal and Ethical lol: These include ownership of data

and the deductions made from it, algorithmic bias, privacy and

compliance with regulations such as the General Data Protection

Regulation. “Successful deployment of an loT solution demands that it’s not

just technically effective but also socially acceptable.”

Trend No. 3: Infonomics and Data Broking: The theory of infonomics takes

monetization of data further by seeing it as a strategic business asset to be

recorded in the company accounts. By 2023, the buying and selling of loT

data will become an essential part of many lol systems.

Trend No. 4: The Shift from Intelligent Edge to Intelligent Mesh: The shift from

centralized and cloud to edge architectures is well under way in the loT

space. These mesh architectures will enable more flexible, intelligent and

responsive loT systems although often at the cost of additional

complexities.

Trend No. 5: lol Governance: As the loT continues to expand, the need for

a governance framework that ensures appropriate behaviour in the

creation, storage, use and deletion of information related to loT projects

will become increasingly important.

Trend No. 6: Sensor Innovation: The sensor market will evolve continuously

through 2023. New sensors will enable a wider range of stiations and events to be detected.

Trend No. 7: Trusted ‘Hardware and Operating System: '.. by 2023, we

expect to see the deployment of hardware and software combinations

that together create more trustworthy and secure loT systems...’.

Trend 8: Novel loT User Experiences: User experience driven by 4 factors:

new sensors, new algorithms, new experience architectures and context,

and socially aware experiences.

Trend No. 9: Silicon Chip Innovation: By 2023, it’s expected that new

e Kli chips will reduce the power consumption reguired to run

ol devices.

Trend No. 10: New Wireless Networking Technologies for lol: lol networking

involves balancing a set of competing requirements. In particular they

should explore 5G, the forthcoming generation of low earth orbit satellites,

and backscatter networks.

The Internet of things (loT) describes the network of physical objects “things” or objects that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet

The main concept of a network of smart devices was discussed as early as 1982, with a modified Coca-Cola vending machine at Carnegie Mellon University becoming the first Internet-connected appliance, able to rept its inventory and whether

newly loaded drinks were cold or not. Mark Weiser's 1991 paper on ubiquitous computing, "The Computer of the 21st Century",

as well as academic venues such as UbiComp and PerCom produced the contemporary vision of the IOT In 1994, Reza Raji

described the concept in IEEE Spectrum as "[moving] small packets of data to a large set of nodes, so as to integrate and automate

everything from home appliances to entire factories Between 1993 and 1997, several companies proposed solutions like Microsoft's at Work or Novell's NEST. The field gained momentum when Bill Joy envisioned device-to-device communication as

a part of his "Six Webs” framework, presented at the World Economic Forum at Davos in 1999

Smart homeloT devices are a part of the larger concept of home automation, which can include lighting, heating and air conditioning, media and security systems and camera systems.Long-term benefits could include energy savings by automatically

ensuring lights and electronics are turned off or by making the residents in the home aware of usage.

Elder care

One key application of a smart home is to provide assistance for those with disabilities and elderly individuals. These home

systems use assistive technology to accommodate an owner's specific disabilities. Voice contro! can assist users with sight and

mobility limitations while alert systems can be connected directly to cochlear implants worn by hearing-impaired users. They can

also be equipped with additional safety features. These features can include sensors that monitor for medical emergencies such as

falls or seizures. Smart home technology applied in this way can provide users with more freedom and a higher quality of life.

Medical and healthcare

The Internet of Medical Things (loMT) is an application of the loT for

medical and health related purposes, data collection and analysis for

research, and monitoring The loMT has been referenced as "Smart

Healthcare",as the technology for creating a digitized healthcare system,

connecting available medical resources and healthcare services.

The loT can connect various manufacturing devices equipped with sensing,

identification, processing, communication, actuation, and networking

capabilities. Network control and management of manufacturin

equipment, asset and situation management, or manufacturing process

control allow IoT to be used for industrial applications and smart

manufacturing. loT intelligent systems enable rapid manufacturing and

optimization of new products, and rapid response to product demands.

Usage Areas of Robots

The robot is a device that senses its environment with its sensors (sensor), interprets

what it perceives, makes decisions (artificial intelligence) as a result, acts according to

the decision result, activates or stops the movement organs as an action.

Industrial Robots

Industrial robots are robots used in production. It is used to ensure safety by replacing

workers in dangerous working conditions, and to make more profitable and faster

production by reducing the cost of workers.

Operational Robots

Operational robots are robots that work in situations where human operation is dangerous or

impossible, usually controlled by remote control. These robots are used in areas with high

radiation, mining areas with a risk of collapse, in mined areas or to research space.

Robots in Cybernetics

Robots in the field of cybernetics are robots that are designed to look like humans and

act like humans thanks to artificial intelligence. They are expected to interact with

people and help do simple household chores.

Robots in Agriculture and Livestock

Robots in agriculture and animal husbandry are time and cost-saving robots. These

robots are used in agricultural activities such as plowing the fields, sowing seeds,

harvesting, irrigation, fertilizing, spraying.

Robots in Transportation

Robots in the field of transportation are robots that provide logistical support. Robots

that help people move in balance or driverless cars that have been recently studied are the best examples of robots in the field of transportation.

ROBOT:

DEVICES THAT CAN PERCEIVE THE ENVIRONMENT WITH THE HELP

OF SENSORS AND INTERPRET THE PERCEIVED SITUATION AND

MAKE A DECISION ARE CALLED ROBOTS.

ROBOTICS:

IT IS THE PROCESS OF GIVING COMMANDS IN THE REQUIRED

DIRECTION USING CODING LANGUAGES WITH THE HELP OF

ELECTRONIC CIRCUITS.

THE MACHINE CONTROL SYSTEM PROVIDES OPPORTUNITIES TO

MAKE OUR LIVES EASIER IN MANY AREAS SUCH AS COMPUTERS.

BENEFITS OF ROBOTIC CODING:

ROBOTIC CODING, WHICH PROVIDES BENEFITS SUCH AS

GAINING 21ST CENTURY SKILLS SUCH AS ANALYTICAL THINKING

AND CRITICAL THINKING, HAS BECOME THE MOST POPULAR

EDUCATION TREND OF RECENT TIMES.

ROBOTİC CODİNG MATERİALS:

THE MAIN MATERIAL OF THESE TRAININGS IS ARDUINO TRAINING

SETS. IN ADDITION TO ARDUINO'S, IT IS POSSIBLE TO GET

CODING TRAINING WITH STEM ROBOTS SUCH AS MBOT, Q-

SCOUT, MATATALAB.

ROOT; IT CONSISTS OF THE INITIALS OF THE WORDS SCIENCE,

TECHNOLOGY, ENGINEERING, MATHEMATICS.

MBOT:

IT IS ONE OF THE MOST WIDELY USED STEM ROBOTS. IT

IS VERY EASY TO INSTALL AND USE.

IT HAS TWO DIFFERENT MODELS, BLUETOOTH AND 2.4G.

IT CAN BE EASILY CONTROLLED WITH THE PHONE

APPLICATION.

Q-SCOUT:

BEING A PRODUCT SIMILAR TO MBOT, Q-SCOUT HAS A

MORE ROBUST BODY STRUCTURE AND AN ILLUMINATED

FRONT VIEW.

IT IS EASY TO INSTALL AND CAN BE EASILY CONTROLLED

BY PHONE.

Robots are an application of the technology field. Robots mechanical it

is a combination of tool technology and computer science.

To define robot technology, first of all, robots future technological developments

will be presented and the process steps will be specified. In the operation of the

robot, the following concepts should be considered as a whole.

Robot anatomy

Drive systems

Sensitive movements

Robot anatomy; the machine's hand, arm and body

Includes configuration. Usage areas of robots in factories

is increasing rapidly.

Robot Movements

Robots in industry are designed according to the

production to be made. These works with rapid

movements and positions of the robot body, arm and hand

is achieved.

Robot Drive Systems

The ability of the robot to move with the body, arm and

hand is provided by drive systems that power the robots.

Response Speed and Stability

Response speed and stability associated with the design of control

systems are two important features of dynamic performance.

Robot Programming Methods

Programming robots can be done in many different ways.

Two important methods will be emphasized here:

1.Routing Methods,

2. Robot Programming Languages.

Routing Methods

In guiding methods, the robot uses the desired movements. it first

waits for the programmer to do it. To this method, teach by lead

method.

Robot Programming Languages

Robot programming with programming languages, other high

level programming (C, BASIC, LOGO, etc.) languages.

Robotics is a multidisciplinary science that deals with the design, manufacture and use of robots . It is the

joint study area of mechanical engineering , aircraft engineering , ! aerospace engineering , electronic

engineering , computer engineering , mechatronics engineering and control engineering . Robots are

complex machines that are managed through software and generate work and value for a useful purpose.

Robotic technology aims to build machines that can act in place or imitate human actions. Although robots

are intended to be used in many different situations, today they are mostly used in dangerous

environments (eg bomb disposal | ), production processes, !! or in space, underwater, high temperature and

radiation environments where human beings cannot live. Although robots can be made in any shape, some

robots are made similar to humans. It is thought that this will facilitate the acceptance of robots by humans. Many robots are inspired by nature and are the subject of bio-inspired robotics. opened in universities in turkey mechatronics sction it is closely related robotik.

History

The earliest historical reference to robotics was found in a Lie Zi manuscript written in China in the 3rd century

BC . This manuscript tells of a mechanical human mannequin presented to King Mu of Zhou , who lived around

1000 BC . He did many studies in ancient Greece, going beyond the Ctesibios era in the 3rd century BC ,

and designed more than a hundred mechanical automata . His work was continued by the Byzantine Fleet and Heron of Alexandria .

After them, the most important robotics pioneer known is Al-Cezeri . He made mechanical automata for many

years of his age. He developed the inventions of his colleagues who lived in ancient times and made many

designs of his own. Al -Jazari is known as the Great Engineer Ibn-i Razzaz Cezeri, who reached the Peak of the

Age in the history of Automatic Machines . All the inventions in his book have humane, aesthetic values, and

none of them are imaginary. They were reproduced and run by German Professor Widemann. Original title Kitab-

ül Camii Beyn-el ilmi vel-amel En Nafi-i fi Sinaat-il hiyel book witten by Al Cezeri , Ministry of Culture in 1990He

published the Book on the Knowledge of Extraordinary Mechanical Tools . The Turkish translation of the book

was prepared by Sevim Tekeli and published by Turkish Historical Society Publications. Al-Cezeri's tomb is still

located in the courtyard of the Prophet Noah Mosgue in Cizre . It is known as Al-Jasar by Europeans.

Industrial robotics

The definition of industrial robots and the classification of robot types determined according to the ISO 8373 Standard is as follows:

“Itis an automatically controlled, reprogrammable, multi-purpose, space-fixed or mobile manipulator used in

industrial applications, with three or more programmable axes.”

Classification of Robots

Robots used today can be divided into various classes. These are according to the axis sets used, according to their types,

according to the type of drive element used, etc. The most important classification methods are given below;

Classification of Robots According to Coordinate Systems Cartesian coordinate system,

Cylindrical coordinate system,

Global coordinate system,

Rotary coordinate system.

Classification According to Robot Types

Cartesian robots,

Articulated robots,

Scara robots.

Scara Robots

Scara, English: Selective Compliance Assembly consists of the initials of Robotic Arm words. In other words, it is the

assembly robot arm that fits the choices (performing activity). This robot was developed after 1970 by the Japanese

Industrial Consortium and a group of researchers at Yamanashi University in Japan. The Scara type robot is a type of

robot with very high speeds, the best repeatability, high precision and accuracy.

Features of Scara Robot

Aschematic drawing of a Scara type robot is given. The general features of the Scara robot are as follows:

1. Accuracy

2.High speed

3.Easy assembiy

4. Sensitivity

5.High Efficiency

Structure of the Scara Robot

This robot usually consists of 2 or 3 arm sections rotating around a vertical axis. The axis number 1 seen in Figure 16

is the axis that gives the robot the main rotation. This axis is mostly used in assembly robots. Axis number 2 is the

linear vertical axis.

Only vertical movement can be made on this axis. Since this feature is desired in assembly robots, most of the

assembly robots move vertically downwards. Vertical axis movements are the fastest and smoothest downward

movements within the coordinate movement axes. The distance that the robot arm can reach can be changed on axis

number 3. On axis number 4, the rotating wrist ankle moves. The volume that the robot has drawn for the working area

is given.

Usage Areas of Scara Type Robot Today, Scara type robots are widely used in many areas. These robots are used in the

placement of electronic circuit elements on the printed circuit, in the assembly of electromechanically operating small

devices and computer disk drives.

The holding arm of the robot is used during the placement of electronic circuit elements. The piece bought in this arm

is placed in a predetermined place on the copper plate. Since the insertion process and before are controlled by the

computer, no mistake will occur.

With the use of robots in the electronics industry, mass production has started and the quality has increased.

Operational robotics

They work in environments that are not suitable for human life. Example: Radiation environment,

underwater, space etc. systems are programmable and remote controlled rather than self-powered. Servo DC motor , hydraulic and pneumatic systems can be preferred. It requires high technology . Special approaches are developed for specific purposes. Power transmission systems ( hydraulic or pneumatic )

or radio frequency are used for remote management .

Medicine and medical robotics

Robotic prostheses

Advanced prosthetics piezo-electric with sensors in the tendon tension (brain commands) can detect and can send

power voltage according to the severity of the fingers or axis. Power transmission is done by servo motors and

artificial tendon systems. Since these prostheses are very expensive, they cannot be used widely for now. In order to

reduce the cost , work has been done on memory metals recently .

Surgical Robots (medical operations)

Systems made with fully stepping motors and precise controls can enable surgeons to participate in surgeries with intercontinental communication .

Da Vinci Surgical Robot A new surgical robot named Einstein will be presented by Medtronic to the service of doctors and patients.

A biological database is a large, organized body of persistent data, usually associated with computerized software designed to update, query, and retrieve components of the data stored within the system.

A simple database might be a single file containing many records, each of which includes the same set of information.

Classification Based On Type Of Data Stored.

Primary Databases: Contain original data in the form of primary sequence data or structural data as submitted by the scientific community.

Secondary Databases: Contain information that has been processed and derived from the raw data available in primary database.

Composite Databases: Composite databases contain a variety of primary databases, which eliminates the need to search each one separately. Each composite database has different search algorithms and data structures.

Features Of Biological Databases

Data Heterogeneity: Availability of diverse and complex data types.

High Volume Data: Thewolüme of'da'a refers to the size of the data sets that need to be analyzed and processed, which are now frequently larger than terabytes and petabytes.

Uncertainity: Biological data have great deal of uncertainity as they represent biological

phenomena that are observed and assumed.

Data Curation: Data curation is the organization and integration of data collected from various sources.

Features Of Biological Databases

Data Integration: Data integration is the process of combining data from different sources into a single, unified view.

Data Sharing: Biological data are shared through databases for scientific community

inspectiony and cross-validation.

Organism Database

Organism databases are functional databases that provide species specific data. Databases are important tools in assisting scientists to analyze and explain a host of biological phenomena from the structure of biomolecules and their interaction to the

whole metabolism of organisms and to understanding the evolution of species.

Relational Database

Relational database concepts of computer science and information retrieval concepts

of digital libraries are important for understanding biological databases. Biological database design, development, and long-term management is a core area of the discipline of bioinformatics.

To discover the genes of diseases and to determine their prevalence in the society

investigation of the genetic basis of underlying diseases

Finding out which gene and living thing a DNA sequence belongs to

Finding out which gene and living thing a protein sequence belongs to

Large scale gene expression analysis

3D structure prediction from protein sequence

Investigation of drug interactions

Discovery of new drugs

Modeling of metastasizing cancer cells

Modeling the life cycles and distribution of living things

Meta-analysis

Although bioinformatics studies seem to be aimed at basic scientific research, it will be

indispensable for clinical informatics in the next decade. Combinhig various data sources

such as Clinical and genomic data will enable the use of disease symptoms to predict what

the genetic mutation is. For example, DNA sequencing information will begin to appear in

the medical records of patients with increasing frequency.

Combining data such as m: and weather systems with agricultural product health

and genotype data will enable to predict conditions under which agricultural

periments will yield successful results

Visualizing and modeling entire networks in complex biological systems will allow

predicting how the system will react to chemicals or environmental conditions, like a drug

Problems faced by biotechnology today; faster computers, disk

storage capacity and bandwidth. Considering that these problems are

solved rapidly with each passing day, these developments seem very

close in the field of bioinformatics.

If we need to write down the usage areas

of bioinformatics, these are; Determining

protein structure / function, designing

small molecules that increase or inhibit

any biological function, defining complex

genetic function or regulation activities,

producing new macromolecules for medical

or industrial purposes, revealing the effects

of genetic factors on disease susceptibility.

Information is power and data is reguired

to access information. There are still data

we do not know in the human body.

The aim of bioinformatics is to organize

the existing data in a way that researchers

can access and upload new ones as

they create them.

The Main Targets of bioinformatics

Using information texhnologies in solving biological problems

Studying molecular sequences, designing molecules that increade or decrease any biological function

creation of three-dimensional structural molecular databases

data mining and text mining studies

generating the gene map

Production of new macromolecules for medical or industrial purposes

facilitating the sharing of biological information

simulation of biological activity processes

identification of complex genetic function or regulation

revealing the effects of genetic factors on disease susceptibility

Among the tergets of bioinformatics, apart from biomedical

research, understanding the mechanisms of non-human

organisms, analyzing molecular data for the treatment

of animal and plant diseases, and revealing their

evolutionary relationships are also included.

Researching the systems of pathogenic viruses

(as well as bacteria) such as COVID-19,

understanding the processes of causing

disease in humans, modeling and

preventing pandemics are also among

the topics of bioinformatics.

Bioinformatics;

Bioinformatics is a new and

interdisciplinary Applied Science

born as a result of the integration of

Biology, Medical Sciences,

Information technology,

mathematics to evaluate data

from events in the biological system.

There are two main reasons for the formation of bioinformatics:

1) A large increase in the knowledge that occurs in biological systems,

and the need for new and powerful tools to organize this increased

knowledge.

2) The questions asked about biological systems become quite

complex and the answers given to these questions are insufficient.

Bioinformatics research has three main objectives :

1) organizing biological research

2) tool development for data analysis

3) interpreting data using analysis

as the beginning of the science of bioinformatics, it can be considered as the

publication in 1966 of the first paper on the drawing of molecular graphs with a

computer in the journal Scientific American . however, the term ”Bioinformatics "

began to be used in the 1980s.

to summarize, bionformatics, which began to be used in 1960 and has developed very rapidly in the last 10 years, can be defined as the use of information technologies in solving biological problems in general.

Decision support system (DSS) is an information system that supports

business or organizational decision-making activities.

Requirements

Interactivity

Internal and external data usage

Include models

Support decision makers

Model

The model component includes mathematical and statistical models that,

along with the database, enable a DSS to analyze information.

Interface

The user interface component is how users access the decision support

system, such as when querying the database or model base, For help in making

decisions.

What-if

This Feature shows the effect of a change in one variable on decision.

Goal-Seeking

This Feature is the reverse of “what-if” Feature. It asks what has to be done to

achieve a particular goal.

Sensitivity

This feature, enables user to apply different variables.

Exception Reporting

This Feature, monitors the performance of variables that are outside of a

defined range on decision making.

Roles

Several roles are involved in decision support systems. These roles are a user

of the system, managerial designer, technical designer, and model builder.

Managerial Designer

The managerial designer identifies the management issues in the system by

analyzing and asking system-specific questions.

Technical Designer

The technical designer might be a computer specialist or a consultant From

outside the company and may use a commercial decision support system or

write the system's code From scratch.

Model Builder

A model builder is a connection between users and designers. Model builders

can decide if the managerial designer or technical designer is needed.

CDSS

Clinical diagnosis support system a.k.a CDSS that allows clinic personnel to

diagnose illnesses is with comparison of measured data and existing model.

GPS Route Planning

GPS route planning helps you to take your decisions by determines the fastest and

best route between two points by analyzing and comparing multiple possible options.

Many GPS systems also help you with traffic and congestion avoidance by monitoring

traffic conditions in real-time.

What is the HCI?

Human-computer interaction (HCI) is a multidisciplinary field of study

focusing on the design of computer technology and, in particular, the

interaction between humans (the users) and computers. While initially

concerned with computers, HCI has since expanded to cover almost all

forms of information technology design.

Chapter-1 Human

Humans are limited in their capacity to process information. This has

important implications for design.

-Information is received and responses given via a number of input and

output channels:

\*visual channel

\*auditory channel

\*haptic channel

\*movement

- Information is stored in these memories:

\* sensory memory

\* short-term memory

\* long-term memory

- Information is processed and applied:

\* reasoning

\* problem solving

\* acquire skills

\* error

- And the main thing about human:

\* Emotions influences human capabilities.

\* Users share common capabilities but are individuals with

differences, which should not be ignored.

\* A computer system comprises varios elements, each of which affects the

user of the system.

- Input devices for interactive use, allowing text entry, drawing and

selection from the screen:

\* text entry: keyboard, speech and handwriting

\* pointing: mouse, touchpad and others

Virtual reality systems have special interaction and display devices:

\* physical controls and dedicated displays

\* sound, smell

\* sensors for nearly everything including movement, temperature, bio-

signs

- Processing:

\* the effects when systems run too slow or too fast

\* limitations on processing speed

\* Networks and their impact in system performance

İnteraction means communication between user and computer system.

HCI focused on the interfaces. Because the users can interact with the

system using the interface.

The goals of HCI are to produce usable and safe systems, as well as

functional systems. In order to produce computer systems with good

usability, developers must attempt to:

\* understand the factors that determine how people use technology

\* develop tools and techniques to enable building suitable systems.

Underlying the whole theme of HCI is the belief that people using a

computer system should come first.

People should not have to change the way that they use a system in order

to fit in with it. Instead, the system should be designed to match their

requirements.

Computer forensics is a branch of digital forensic

science pertaining to evidence found in computers

and digital storage media.

The goal of computer forensics is to examine digital media in a

forensically sound manner with the aim of identifying, preserving,

recovering, analyzing and presenting facts and opinions about the digital

information.

Although it is most often associated with the investigation of a wide variety

of computer crime, computer forensics may also be used in civil proceedings. The

discipline involves similar techniques and principles to data recovery, but with

additional guidelines and practices designed to create a legal audit trail.

Evidence from computer forensics investigations is usually subjected to the

same guidelines and practices of other digital evidence. It has been used in a

number of high-profile cases and is becoming widely accepted as reliable

within U.S. and European court systems.

Forensic Informatics is an unlimited branch of informatics that

develops according to technology. Different specialties of all kinds have been

developed by separating the information crimes according to their

types in forensic investigations. Thus, it is easier to solve with

expertise and the evidence is better grouped according to the crime.

Computer Forensic Examination Process and Methods ;

Forensic Informatics Examination and methods should be well known. Because

now, every crime definitely becomes the informatics pillar. It can cause people to

be blamed for simple reasons or to escape crime due to simple ignorance.

Itis easier to leave or erase evidence in virtual environments. It is a helpful issue

not only in terms of crime but also in solving security-related problems ina

network environment.

Computer Forensics Examination is a process and has 4 main methods;

\*definition

\*examination

\*analysis

\*reporting

Definition

Forensic Informatics Examination Identification process begins with the

identification and collection of potential data storage resources (digital

evidence) to be examined. Typical data sources are hard disks mounted on

computers, CD, DVD, USB disks, flash disks, memory cards (MMC, sd), floppy

disk, GPS, mobife phone. Are the resources limited to this? Of course not. Data

such as a magnetic card copier, a database application, a website logs, a

phone call traffic can also be the source.

Examination

Making exact copies of the collected data sources and conducting the research

on these copies is the process of examination. It is essential to protect the data

integrity of the evidence examined here. In other words, the evidence should be

preserved from the moment the evidence is seized. The processes of collecting

data from a working computer and a closed computer are different. In this

narrative, the default is an intervention on a closed computer.

Analysis

In this process, the relevant data are extracted from the exact copy of the

examined evidence.

Reporting

The process by which the information obtained during the

analysis process is presented is the reporting process. Reporting.

should be clear and clear to the reader and should include

evaluations rather than claims.

Of course, these 4 processes listed above are widely applied. The

process can be flexible according to the resources defined. For

example, in a system with 1000-2000 clients, it is not a practical

solution to make exact copies of all computers in the system. Or,

again, it doesn’t make sense to shut down the whole system to.

examine a database application that thousands of clients use.

Therefore, the intervention method will change according to the

characteristics of the systems. Perhaps no exact copies of some

resources will be obtained, the examination will be made while

the system is running.

LET’S FILL THE BLANKS

\*Forensic informatics is divided into,4 main topics.

\*These: it is divided intodefinition,examination,analysis and reporting

\*The process in which the information obtained during the analysis process is presented is the reporting process.

WHAT IS CYBER CRIME?

Cyber Crime: “Any kind of unlawful, immoral or unauthorized behaviour in a

system that automatically processes information or transfers data”.

Deliberately entering,deleting or destroying computer data in order to reach

and transfer illegally to the resource or any value available on the computer.

Deliberately entering, corrupt, deleting or destroying computer data or

programs to commit fraud.

Deliberately entering, corrupt, deleting or destroying computer data or

programs in order to prevent the operation of computer systems.

Damaging the rights of the legal owner of a computer program for

commercial exploitation.

It is to intervene by entering the system deliberately without the permission of

the computer system officer, by overcoming the safety precautions set.

Forensic informatics examination process and methods should be well known.

because now every crime definitely become an informatics pillar. it can cause people to be blamed for simple reasons or to escape crime due to simple ignorance.

it is easier to leave or erase evidence in virtual environments. it is a helpful issue not only in terms of crime but also in solving security-related problems in a network environment.

Computer Forensics Examination is a process and has 4 main methods

\*Definition

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What is Digital Forensics?

Digital Forensics is defined as the process of preservation,

identification, extraction, and documentation of computer evidence

which can be used by the court of law. It is a science of finding

evidence from digital media like a computer, mobile phone, server, or

network. It provides the forensic team with the best techniques and

tools to solve complicated digital-related cases.

Objectives of Digital Forensics

Here are the essential objectives of using Digital Forensics:

\* It helps to recover, analyze, and preserve computer and related

materials in such a manner that it helps the investigation agency to

present them as evidence ina court of law.

\*It helps to postulate the motive behind the crime and identity of the

main culprit.

\*Recovering deleted files from digital media to extract the evidence

and validate them.

\*Helps you to identify the evidence quickly

\*Preserving the evidence.

Process of Digital forensics

-Identification:

\*identify the purpose of investigation

\*İdentify the resources reguired

-Preservation:

\*Dataisisolate,secure and preserve

-Analysis:

\* identify tool and techniques to use

\* Process data

\* interpret analysis results

-Documentation:

\* Documentation of the crime scene along with photographing,

sketching, and crime-scene mapping

-Presentation:

\* Process of summarization and explanation of conclusions is done with

the help to gather facts.

Types of difital forensic:

\*Disk Forensics

\*Network Forensics

\*Wireless Forensics

\*Database Forensics

\*Malware Forensics

\*Email Forensics

\*Memory Forensics

\*Mobile Phone Forensics

Challenges faced by Digital Forensics

Here, are major challenges faced by the Digital Forensic:

\*The increase of PC's and extensive use of internet access

\*Easy availability of hacking tools

\*The large amount of storage space into Terabytes that makes this

investigation job difficult.

\*Any technological changes require an upgrade or changes to solutions.

Example Uses of Digital Forensics:

\*Intellectual Property theft

\*Industrial espionage

\*Fraud investigations

\*Inappropriate use of the Internet and email in the workplace

\*Forgeries related matters

\*Issues concern with the-regulatory compliance

Advantages of Digital Forensics:

\*To ensure the integrity of the computer system.

\*To produce evidence in the court, which can lead to the punishment

of the culprit.

\*It helps the companies to capture important information if their

computer systems or networks'are compromised.

\*Efficientiy tracks down'cybercriminals from anywhere in the world.

Disadvantages of Digital Forensics:

\*Digital evidence accepted into court. However, it is must be proved

that there is no tampering

\*Producing electronic records and storing them is an extremely costly

affair

\*Legal practitioners must have extensive computer knowledge

\*If the tool used for digital forensic is not according'to specified

standards,, then in the court of law, the evidence can be disapproved

by justice.