

Descriptive Information about Bio-Informatics

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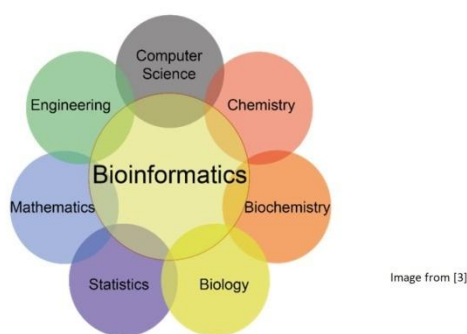
Abstract - Bio-informatics is a field of study that uses computation to extract knowledge from biological data. bio-informatics is including details about computer science, chemistry, bio-chemistry, biology, statistics, mathematics, engineering, etc. this paper is briefly explain about a descriptive information about bio-informatics . in day to day life the bio-informatics is currently used in agriculture and medicines field. in this paper we explain about tools and applications of bio-informatics.

Keywords - overview, applications, tools, fields, importance of bio-informatics

I. INTRODUCTION

Bioinformatics is both mathematical and the body of biological studies that use computer programs as part of their approaches, as well as a reference to specific analysis "pipelines" that are repeatedly used, particularly in the field of genomics and nucleus. Genomics is the research which analyzes the complete genomes and it is a combination of DNA sequencing method. Although, such identification is made with the aim to figure out the genetic basis of disease, unique adaptations, desirable properties (especially. in agricultural species) or differences between populations. In a exact way, bioinformatics also gives a betterment in the organizational principles within nucleic acid and protein sequences, called proteomics. Proteomics are used in huge amount for analyzing the proteins and proteomes, but it is specially used for purification of proteins. In agricultural field the bio informatics is mostly used to study about quality of seeds, weather monitoring, water level sensing.

II. OVERVIEW OF BIO-INFORMATICS



III. WHY BIO-INFORMATICS IS IMPORTANT

Bioinformatics is a multi-disciplinary field that increases and improves the way of storing, retrieving, organizing, monitoring, managing and analyzing biological data. A main activity in bioinformatics is to progress software tools for set up a useful knowledge of biological data..

The field of computer science called bioinformatics is used to analyze complete-genome sequencing data. It may includes pipelines, various algorithm, and software development procedures, and analysis, transfer and storage of genomics data in to the database.

- A classical whole-genome sequencing workflow as the variants steps:
- quality control and data grooming;
- genome assembly and/or variant calling;
- Post-assembly analysis.

IV. FIELDS IN BIO-INFORMATICS

Bioinformatics is the uses of IT in biotechnology for the data storage and retrieving, data warehousing, data mining and the DNA sequences. Bioinformatics is not only used for the computing data, it is also used real time, it can be used to solve many more biological problems and finding how living things works on.

V. VARIOUS FILED OF BIOINFORMATICS INCLUDE THE FOLLOWING

- *Sequence Analysis* - In sequence analysis the sequential information is to be analyzed for determining genes it includes proteins, regulatory sequences RNA genes, and repetitive sequences.
- *Protein and gene expression* - In this files the study of Gene's expressions, protein expressions and regulation as studied with the utilities of many more bioinformatics tools.
- *Structural bioinformatics* - Protein structure prediction is also important concept in bioinformatics. The sequence on the gene codes are easily structured in amino acid sequence of a protein. In this structural bioinformatics is a genomic branch of bioinformatics, and homology it is also used to predict the functions of the genes.
- *Network and systems biology* - Network analysis seeks the betterment of relationships between the biological networks like, metabolic and the protein-protein interaction networks.
- *Software and tools Development* - The filed of Bioinformatics is used to codes and software tools but it is not only fixed to use the codes and software tools which ranges from simple command-line tools to more complex graphical programs. The software and development tool is standalone web-services.
- *Creating Databases* - Database Information are necessary wanted for bioinformatics analysis and the applications. Many databases exist, encapsulating various information types: for example, molecular structures, DNA and protein sequences and biodiversity. So Bioinformatics can also be used in innovating new databases with advance user friendly and with exact features..
- *Development of Drug Design*- At instant all drugs on the market target exactly about 500 proteins. With an better understanding of disease and using the computational tools for validating a new drug targets, specialized medicines that act on the effects, which

are not clearly the symptoms, of the disease can be matured. This is most pointed drugs promise to have fewer side effects compare to other medicines.

VI. APPLICATIONS OF BIO-INFORMATICS

Applications: Bioinformatics merges the mathematics, statistics, and computer science and information technology to solve complicated biological problems. These problems are usually seen at the molecular level which cannot be solved easily. Bioinformatics is most interesting field of science has many more applications and scientific areas can be done.

Sequence Analysis: The sequence analysis resolves those genes which encrypt the sequences or heptads by using the method of sequencing. In sequence analysis, there are variants of effective tools and computer systems, which perform the work of identifying the genome of different organisms.

Protein Structure Prediction: It is simple to describe the global structure of proteins in the form of amino acids which are present on the DNA molecule but it is complex to describe the secondary, tertiary or quaternary protein structure.

Genomics Comparative: Genomics comparison is the variant of bioinformatics which express the genomic structure and operate the relationship between a different biological species. For this need, inter-genomic maps are built which enable the researches and analyst to trace the work of evolution that appears in genomes of various species.

Health and Drug discovery: The tools of bioinformatics are useful in drug discovery, disease management and diagnosis. Complete ordering of human genes has to implement the analyst to develop medicines and drugs which can reach most of than 500 genes.

Medicine: Bioinformatics compromise the development and intrusion of databases, algorithms and statistical, computational techniques and theory for solving formal and real time problems commencing from the management and research of biological data in medicine field.

VII. BIOINFORMATICS HAS FOLLOWING FIELDS IN THE MEDICINE

Molecular medicine - Molecular medicine is uncrowned field, in chemical, physical, biological and medical techniques are used to detail molecular structures and mechanisms, pointing the fundamental molecular and genetic disease.

Personalized medicine - Personalized medicine is a medical exemplary to make emphatic enough to use benefit information about a patient care.

- Pros in bio-informatics:
- Easy manage storage of big amount of data
- Easy access to databases from all over the world
- Fast sequence search by algorithms
- Up to 500 hits displayed
- Gives evaluation on the accuracy of alignment
- Cons in bio-informatics:
- Possibility of sequence matching due to a chance
- Possibility of a mistake in the algorithm
- Chance of loosing the data due to a virus

VIII. TOOLS IN BIO-INFORMATICS

Tool	Description
Blast	It is a search tool, used for DNA

	or protein sequence search based on identity.
Hammer	Homologous protein sequences may be searched from the respective databases using this tool.
Clustal Omega	Multiple sequence alignments may be performed using this program.
Sequerome	Used for sequence profiling.
ProtParam	Used to predict the physico-chemical properties of proteins.
JIGSAW	To find genes, and to predict the splicing sites in the selected DNA sequences.
novoSNP	Used to find the single nucleotide variation in the DNA sequence.
ORF Finder	The putative genes may be subjected to this tool to find Open Reading Frame (ORF).

CONCLUSION

The recent enormous increase in biological data has made it necessary to use computer information technology to collect, organize, maintain, access, and analyze the data. Computer speech, memory, exchange of information over the internet has greatly facilitated bio-informatics. The bio-informatics tools available over the internet are accessible, well developed, fairly comprehensive and relatively easy to use.

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