A note on global Medical bioinformatics

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Abstract

Bioinformatics is an interdisciplinary field that develops methods and software tools for understanding biological data, in particular when the data sets are large and complex. As an interdisciplinary field of science, bioinformatics combines biology, computer science, information engineering, mathematics and statistics to analyze and interpret the biological data. Bioinformatics has been used for in silico analyses of biological queries using mathematical and statistical techniques. Bioinformatics includes biological studies that use computer programming as part of their methodology, as well as a specific analysis "pipelines" that are repeatedly used, particularly in the field of genomics.

Introduction

Bioinformatics now entails the creation and advancement of databases, algorithms, computational and statistical techniques, and theory to solve formal and practical problems arising from the management and analysis of biological data. Before sequences can be analyzed they have to be obtained from the data storage bank example the Genbank. DNA sequencing is still a non-trivial problem as the raw data may be noisy or afflicted by weak signals. Algorithms have been developed for base calling for the various experimental approaches to DNA sequencing. An unprecedented wealth of biological data has been generated by the human genome project and sequencing projects in other organisms. The huge demand for analysis and interpretation of these data is being managed by the evolving science of bioinformatics. Bioinformatics is defined as the application of tools of computation and analysis to the capture and interpretation of biological data.

Analysis

The main tools of a bioinformatician are computer software programs and the internet. A fundamental activity is sequence analysis of DNA and proteins using various programs and databases available on the world wide web. Anyone, from clinicians to molecular biologists, with access to the internet and relevant websites can now freely discover the composition of biological molecules such as nucleic acids and proteins by using basic bioinformatic tools. As medicine and technology continue to intersect, bioinformatics is the science that is driving the future forward. This distinct discipline is a hybrid that draws on both biological and computer science expertise. As medicine and technology continue to intersect, bioinformatics is the science that is driving the future forward.

As bioinformatics emerges as its own distinct field, there are a number of positions those with proper qualifications can pursue. Some of the job titles in bioinformatics include:

• Bioinformatics specialist: Professionals working in this capacity perform duties such as providing bioinformatics and data analysis services, training on available tools and offering scientific writing assistance to researchers.

• Bioinformatics research scientist: These scientists apply information technology and computer science in the study of biology. They research, study, analyze and process genomic and other forms of biological information using the theory of bioinformatics to research and potentially uncover previously unknown information.

• Bioinformatics analyst: These professionals analyze, manipulate and interpret large data sets for use in research.

• Biology informatics software engineer: Biology informatics engineers' tasks include creating or advancing software for use in bioinformatics research. They may work in experimental design, help develop new tools to analyze and validate data, and seek ways to extend data acquisition capabilities.

Conclusion

Biomedical informatics lacks a clear and theoretically-grounded definition. Many proposed definitions focus on data, information, and knowledge, but do not provide an adequate definition of these terms. Leveraging insights from the philosophy of information, we define informatics as the science of information, where information is data plus meaning. Biomedical informatics is the science of information as applied to or studied in the context of biomedicine.