

Computational Intelligence for Computational Biology

Abstract:

In the first part of the lecture we will discuss several computational intelligence algorithms that is used for optimization, machine learning and data mining tasks. This include single and multi-objective Genetic Algorithm, Support Vector Machine and K-Mean clustering algorithms.

In the second part we will initially discuss about the fundamentals of molecular biology, central dogma while introducing the basic concept of Deoxyribonucleic acid (DNA), Ribonucleic acid (RNA), Gene, messenger RNA (mRNA), Proteins, MicroRNA, Micro Array Gen Expression data etc. Subsequently we will try to understand different problems in computational biology which are important to address for designing better and smart healthcare system. We will introduce the concept and importance of statistical test. Finally we will discuss the applications of computational intelligence techniques for efficiently solving certain problems in computational biology. In this regard, some result will be demonstrated for clustering of Micro Array Gene Expression Data, Rational Drug Design and MicronRNA-mRNA target prediction.