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Scuola di Scienze

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Corso di laurea in Informatica

Integer Linear Programming approaches on the DNA recombination problem

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1 — Introduction

1.1 Computational Biology and Bioinformatics

Computational Biology is defined as the development and application of data-analytical and theoretical methods, mathematical modeling and computational simulation techniques to the study of biological, behavioral, and social systems[1].

Some of the most important challenges in the field includes[2]:

- Protein structure prediction;
- Homology searches;
- Multiple alignment and phylogeny construction;
- Genomic sequence analysis and gene-finding.

In particular, *Computational Molecular Biology* (bioinformatics) focuses on studying existing and emerging approaches, techniques and algorithms for string computation (sequences) providing a significant intersection between computer science and molecular biology.

Note that the term "bioinformatics" [...]

1.2 Overview of the study

2 — Integer Linear Programming

2.1 Definition

2.2 In Computational Biology

2.3 Examples

2.3.1 Problem 1

3 — The Problem

3.1 Biological Background

3.2 Formalisation

3.3 Existent Approaches/Solutions

3.4 ILP formulation

Bibliography

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