Pattern Matching of Pyrograms

Undergraduate Thesis Project in Computing Science/Molecular Biotechnology/Bioinformatics

Background

Pyrosequencing is a method of DNA sequencing. Pyrosequencing AB was started to commercialize the machine and reagent for sequencing of short stretches of DNA. Pyrosequencing AB and Personal Chemistry AB merged and were renamed to Biotage in 2003.

Problem Statement

One of the current applications for pyrosequencing technology, see e.g. Wikipedia, is specimen identification. The sequence analyzed may be considered a specimen's (like a bacteria's) "fingerprint". However, when analyzing partial sequences of DNA, patterns of sequences may occur in multiple places and it is not always straightforward to determine which, of a library of specimens, is the closest match.

It is possible to use the pyrogram, i.e. the graphical representation of a sequence analysis using the pyrosequencing technology, or other pattern matching algorithms to determine the degree of matching against a library rather than using the sequences alone.

The Project

The purpose of this project is to analyze the problem domain further and identify possible approaches to solve the problem. The practical feasibility of each should be discussed and a proof of concept prototype should be implemented in software.

The candidate is expected to study bioinformatics, molecular biotechnology or computing science and pursue a 20p project on D level. The project may be carried out by two candidates, one with emphasis on practical lab work and the other on theory and programming. The project should be carried out during the spring of 2008.

About the Company

Biotage AB is a global company providing innovative solutions, knowledge and experience in the areas of medicinal and analytical chemistry, process development and genetic analysis. The company's strengths include revolutionary high-quality technologies, a broad business base and a long-term view of the market.

The company aims to help its global customers meet the enormous pressures of time, cost and innovation. Its mission is to lead customers successfully into the next era of research, discovery and development with its solutions and services.

Contact

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