Genetic algorithms and grouping problems

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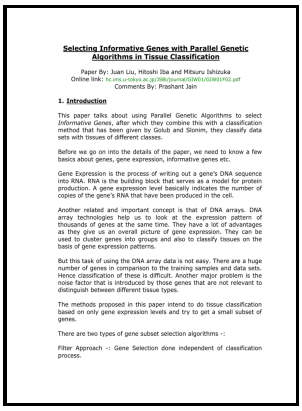

Selecting Informative Genes with Parallel Genetic Algorithms in Tissue Classification

Paper By: Juan Liu, Hitoshi Iba and Mitsuru Ishizuka
Online link: hc.ime.u-tokyo.ac.jp/Sibi/journal/02W01/02W01F02.pdf
Comments By: Prashant Jain

1. Introduction

This paper talks about using Parallel Genetic Algorithms to select *Informative Genes*, after which they combine this with a classification method that has been given by Golub and Slonim, they classify data sets with tissues of different classes.

Before we go on into the details of the paper, we need to know a few basics about genes, gene expression, informative genes etc.

Gene Expression is the process of writing out a gene's DNA sequence into RNA. RNA is the building block that serves as a model for protein production. A gene expression level basically indicates the number of copies of the gene's RNA that have been produced in the cell.

Another related and important concept is that of DNA arrays. DNA array technologies help us to look at the expression pattern of thousands of genes at the same time. They have a lot of advantages as they give us an overall picture of gene expression. They can be used to cluster genes into groups and also to classify tissues on the basis of gene expression patterns.

But this task of using the DNA array data is not easy. There are a huge number of genes in comparison to the training samples and data sets. Hence classification of these is difficult. Another major problem is the noise factor that is introduced by those genes that are not relevant to distinguish between different tissue types.

The methods proposed in this paper intend to do tissue classification based on only gene expression levels and try to get a small subset of genes.

There are two types of gene subset selection algorithms -:

Filter Approach -: Gene Selection done independent of classification process.

Description: -
-
Group theory
English language -- Old English, ca. 450-1100 -- Glossaries, vocabularies, etc.
Weapons -- England -- Terminology.
Luminescent postage stamps -- United States.
Potassium chloride.
Electrolytes.
Dielectrics.
Genetic algorithms.Genetic algorithms and grouping problems
-Genetic algorithms and grouping problems
Notes: Includes bibliographical references (p. [213]-217) and index.
This edition was published in 1998

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Grouping genetic algorithm for solving the serverconsolidation problem with conflicts

University of Texas at Austin Austin, Texas, USA shubham mail. I can not stress enough how useful they are. Implementation Fitness function has a single objective, so a simple fitness object can be used to represent it: typedef Fitness::Representation::GaSVFitness BinFitness; Parameters of fitness operation are handled by BinFitnessOperationParams class.

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Dzubera International Conference on Genetic Algorithms. The final solution is then an end product of the best elements of previous generations, carried forward from generation to generation with some degree of randomness mutation. Fitness function is determined in many ways such as the sum of all parameters related to the problem — Euclidean distance, etc.

Grouping genetic algorithm for solving the serverconsolidation problem with conflicts

A group typically between 2 and 7 individuals are selected at random from the population and the best normally only one, but possibly more is chosen An elitist genetic algorithm is one that always retains in the population the best individual found so far, Tournamnet Selection is naturally elitist.

Genetic Algorithms

Howe Journal of the Operations Research Society, 62:305-312.

Genetic Algorithms

If the second object is in a different group from the first one, it is put into group 2.

Grouping Genetic Algorithms

Genetic algorithm describe in this article is designed for solving 1D bin packing problem.

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