Abstract

Neural networks are organized in committees to improve the correctness of the decisions created by artificial neural networks (ANNs). In the classification of human chromosomes, it is accustomed to use multilayer perceptrons with multiple (22-24) outputs. Because of the huge number of synaptic weights to be tuned, these classifiers cannot go beyond a level of 92% overall correctness. In this study, we represent a special organized committee of 462 simple perceptrons to improve the rate of correct classification of 22 types of human chromosomes. Each of these simple perceptrons is trained to distinguish between two types of chromosomes. When a new data is entered, the votes of these 462 simple perceptrons and additional 22 dummy perceptrons create a decision matrix of the size 22×22. By a special assembling of these votes, we get a higher rate of correct classification of 22 types of human chromosomes.

References

- Haykin S., "Neural Networks: A Comprehensive Foundation", Second
- Errington P. A., Graham J., "Classification of Chromosomes using a Combination of Neural Networks", IEEE International Conference on Neural Networks (ICNN), San Francisco, CA, pp. 1236-1241, Vol. 3, 28th March – 1st April, 1993
An Organized Committee of Artificial Neural Networks in the Classification of Human Chromosomes

- Schwartzkopf, W. C., "Maximum Likelihood Techniques for Joint Segmentation-Classification of Multi-spectral Chromosome Images", Doctoral Dissertation, The Faculty of the Graduate School of The University of Texas at Austin, 2002

Index Terms

Computer Science        Artificial Intelligence

Keywords

Classification of human chromosomes    perceptrons    committee machines    image profile    metaphase
An Organized Committee of Artificial Neural Networks in the Classification of Human Chromosomes