PAPER ID: 17-03-0185

An Improved Integrative Random Forest for Gene Regulatory Network Inference of Breast Cancer

Suntharaamurthi Chandran[1], Kohbalan Moorthy[1], Mohd Arfian Ismail[1], Mohd Zamri Osman[1], Mohd Azwan Mohamad @ Hamza[1], Ferda Ernawan[1]

[1]Soft Computing & Intelligent System Research Group,
Faculty of Computer Systems & Software Engineering,
Universiti Malaysia Pahang, 26300, Kuantan, Pahang, Malaysia

Gene Regulatory Network (GRN) inference aims to capture the regulatory influences between the genes and regulatory events in the GRN. Integrative Random Forest for Gene Regulatory Network Inference (iRafNet) is a RF based algorithm which provides a great result in constructing GRN inference by integrating multiple data types. Most of the approaches did justify their duty but there are some limitations which don't allow it to reach its optimal state and needs a very long computational time to construct a GRN inference. Other than that, they do not provide optimal performance. There are redundant genes in the dataset. GRN inference by existing methods has a lower accuracy on benchmark and real dataset. Furthermore, the computational time to produce the GRN inference is very long in the existing methods. To overcome these issues is proposed improved the existing method by adding a gene selection into it. To perform the improvement the existing methods was studied and analyzed on their performance in constructing GRN inference. Improved iRafNet was designed and developed to reduce the computational time to construct the GRN inference gene from the dataset. Finally, the accuracy and computational time of the proposed method was validated and verified with the benchmark and real dataset. Improved iRafNet has proven its performance by having a higher AUC and lower computational time.

Keywords: Random Forest, Gene Regulatory Network Inference, Microarray Data, Computational Intelligence, Breast

PAPER ID: 17-03-0207

Global best Local Neighbourhood in Particle Swarm Optimization for Big Data Environment

Zalili Musa[1], Mohd Nizam Mohd Kahar[1], Mohd Hafiz Bin Mohd Hassin[1], Rohani Abu Bakar[1], Junzo Watada[2]

[1]Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Kuantan, Pahang, Malaysia
[2]Universiti Teknologi PETRONAS, Department of Computer and Information Sciences, Ipoh, Malaysia

The conventional Particle Swarm Optimization (PSO) still has weaknesses in finding optimal solutions especially in a dynamic environment. Therefore, in this paper we proposed a Global best Local Neighborhood in particle swarm optimization in order to solve the optimum solution in dynamic environment. Based on the experimental results of 50 datasets, show that GbLN-PSO has the ability to find the quality solution in dynamic environment.

Keywords: PSO, Optimization, Big Data Environment, Local Neighbourhood