MASSP: A Hybrid Genetic-Neural System for Predicting Protein Secondary Structure

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ABSTRACT

Being the prediction of protein structure a very complex task, most methodologies concentrate on the simplified task of predicting secondary structures. In this poster, we illustrate a technique based on multiple experts, aimed at predicting protein secondary structures. The prediction activity results from the interaction of a population of experts, each integrating genetic and neural technologies. Roughly speaking, an expert of this kind embodies a genetic classifier designed to control the activation of a feedforward artificial neural network for performing a locally-scoped prediction activity. Genetic and neural components (i.e., guard and embedded predictor, respectively) are devoted to perform different tasks and are supplied with different information: Each guard is aimed at (soft-)partitioning the input space, insomuch assuring both the diversity and the specialization of the corresponding embedded predictor, which in turn is devoted to perform the actual prediction. Experimental results (74.8%) are comparable with other state-of-the-art systems, also taking into account that no post-processing is performed on the predicted secondary structure and that the quality of the currently-adopted metrics has not been assessed by a biologist.