Parallel Growing SOM Monitored by Genetic Algorithm

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***Abstract*-Genetic algorithms are an effective search technique to utilize when the search space of a problem is very large and an unintelligent brute-force search is too time-consuming. One such problem that would benefit from a genetic algorithm is the optimization of the ParaGSOM, a Self-Organizing Map that processes the input space in parallel. The ParaGSOM has several parameters that can be configured with a wide range of possible values. Each of these parameters can significantly change the behavior of the ParaGSOM, depending on the value. These behavioral changes will affect the ParaGSOM's ability to adapt to the input space, leading to anything from a fast convergence to a slow convergence to no convergence at all. Applying a genetic algorithm to determine the optimal parameters to use for fast, accurate convergence in the ParaGSOM yields results much faster than testing each parameter combination individually. A genetic algorithm gives insight about how particular parameter combinations affect the network and shows how their relationships can be exploited for maximum efficiency of the ParaGSOM.**