

Determining Evolutionary Bayesian Probabilistic Neural Network Parameters through Particle Swarm Optimization

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Abstract. A well-known and widely used model for classification and prediction tasks is the Probabilistic Neural Network. Recently, an extension of the Probabilistic Neural Networks has been proposed in the literature, namely the Evolutionary Bayesian Probabilistic Neural Network. Evolutionary Bayesian Probabilistic Neural Networks incorporate a Bayesian model for the estimation of the kernels' spread matrices of the Probabilistic Neural Network. In order to estimate the spread parameters by using the proposed Bayesian model, two parameters of the model have to be selected. For a better determination of these parameters, an optimization algorithm namely Particle Swarm Optimization, is employed. Particle Swarm Optimization is a stochastic, population based optimization algorithm that employs a swarm of particles to probe the search space of the Probabilistic Neural Network's spread matrices. The proposed approach is applied to several benchmark problems with encouraging results.

Keywords: Probabilistic Neural Networks, Particle Swarm Optimization, Bayesian Modelling, Spread Parameters.