ABSTRACT

Radial Basis function Neural Networks (RBFNN) is one of most popular equalizers to mitigate the channel distortions. Most challenging problem associated with design of RBFNN Equalizer is the traditional hit and trial method. This thesis proposes training of RBFNN equalizer using a recently proposed population based optimization such as Genetic Algorithm (GA) and Firefly Algorithm (FFA). It is found from the simulation results that performances of these two algorithms for the training of RBFNN equalizers are superior as compared to existing equalizers.

This thesis makes use of Genetic Algorithm (GA) and Firefly Algorithm (FFA) for channel equalization. The problem of channel equalization is formulated as an optimization problem and optimized using GA and FFA. The proposed strategy is tested for time-invariant channels and interestingly yields better performance than contemporary approaches as evidenced by simulation results.

In the literature, Artificial Neural Network (ANN) has been increasingly used for this problem. However, traditional methods of ANN training fall short of desired performance in the problem of equalization. Hence, this thesis makes use of GA and FFA as a training algorithm to train multi-layer Artificial Neural Network (ANN). Approaches for RBFNN equalizer training provided here in this thesis provide thought-provoking results in the literature of equalizers which are found to be better than the contemporary counterparts.

Use of two population based algorithms for RBFNN training is the essence of the contributions made by this thesis. The proposed strategies are tested both in time-invariant and time varying channels and interestingly yields better performance than contemporary approaches as evidenced by simulation results.