On the Training of DS-CDMA Neural-Network Receivers

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Objectives

Superior interference suppression under short-data-record adaptation of nonlinear receivers to support secure DS-CDMA communications

– Adaptive neural-network receivers with the ability to cope with typical channel fluctuation rates.

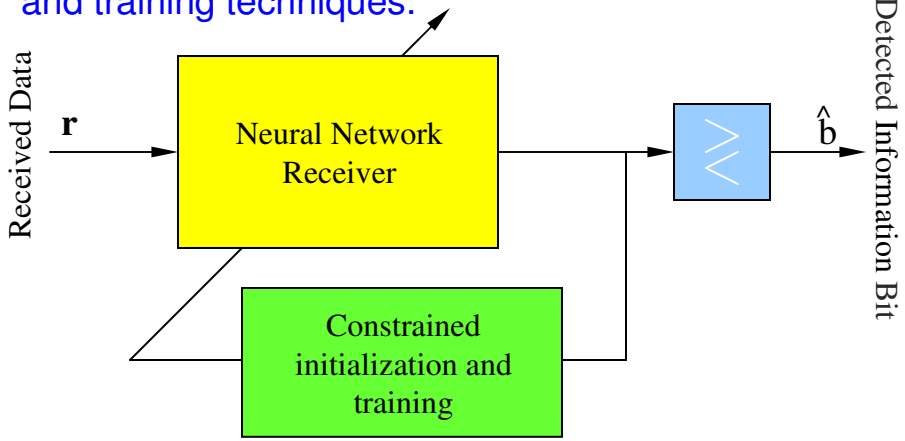
– Obtain a better approximation/estimation of the optimum detector.

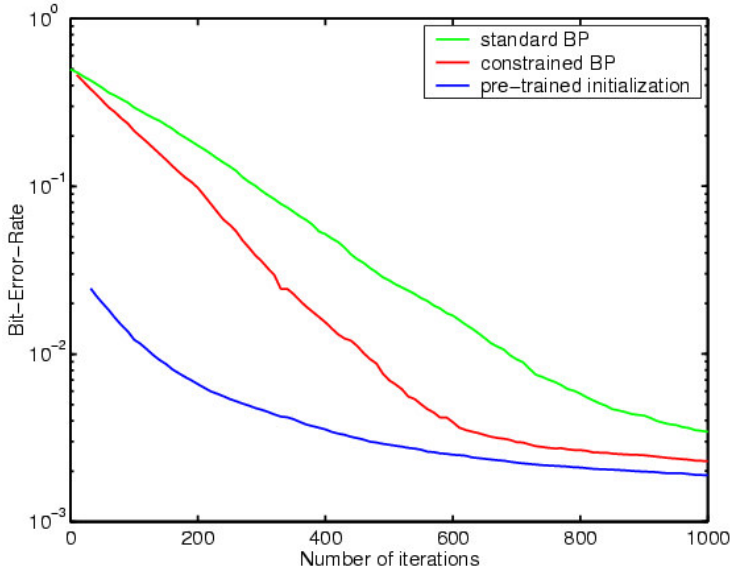
Technical Innovations

- Optimum decision boundary properties identified in the DS-CDMA framework and incorporated into the neural-network receiver design.
- Substantial improvements on the rate of convergence and the number of parameters to be estimated.
- Proper initialization to avoid local minima and redundancy.

Novel Framework

DS-CDMA detection employing adaptive neural-network receivers utilizing constrained initialization and training techniques.





Bit-error-rate versus number of iterations for a 16-3-1 MLP DS-CDMA receiver that is randomly initialized and BP-trained (standard and constrained) and that is pre-trained initialized and constrained-BP-trained, respectively.