Neural Network Implementation Approaches for the Connection Machine

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Abstract:

The SIMD parallelism of the Connection Machine (eM) allows the construction of neural network simulations by the use of simple

data and control structures. Two approaches are described which allow parallel computation of a model's nonlinear functions, parallel modification of

a model's weights, and parallel propagation of a model's activation and error. Each approach also allows a model's interconnect structure

to be physically dynamic. A Hopfield model is implemented with each approach at six sizes over the same number of CM processors to provide a performance comparison.