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An Optimization Network for Matrix Inversion

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Abstract:

Inverse matrix calculation can be considered as an optimization. We have demonstrated that this problem can be rapidly solved by highly interconnected simple neuron-like analog processors. A network for matrix inversion based on the concept of Hopfield's neural network was designed, and implemented with electronic hardware. With slight modifications, the network is readily applicable to solving a linear simultaneous equation efficiently. Notable features of this circuit are potential speed due to parallel processing, and robustness against variations of device parameters.

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