Training Neural Networks with Multi State Extended Kalman Filters

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Presentation Abstract Summary Extended kalman filters (EKFs) is a nonlinear Bayesian filtering method that provides more accurate estimates of unknown variables than single measurements alone. They have been used to model various mechanisms of the brain, including neural action potentials, and are thought to be more bio-plausible than conventional back-propagation for training artificial neural networks. Previous works have used EKFs to update weights for various neural network models and have achieved fast convergence. Here, we show that by incorporating information from multiple states to EKFs, faster convergence and higher test accuracy could be achieved. The method could theoretically be used concurrently with any other performance boosting EKF method available, making it more plausible to train neural networks using EKFs.

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