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Zerotti L Woods* (zerotti.woods@jhuapl.edu), Laurel, MD 20794. *A New Regularization Term for Deep Neural Networks With Applications to Biological Data.*

In this work, a new regularization term that penalizes the conditioning of the weight matrices in a deep neural network is presented. We give a mathematical argument that suggests that in certain situations, the conditioning number of the weight matrices have a direct impact on the error in classification. Empirical evidence suggests that improving the weight matrix associated with the output layer of a matrix improves generalizability when classifying ECG data from a benchmark data-set, and also a novel malaria infection data-set. (Received September 17, 2019)