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**GIANG TRAN**, University of Waterloo

*Adaptive Group Lasso for Time-Dependent Data*

In this paper, we propose an adaptive group Lasso deep neural network for high-dimensional function approximation where input data are generated from a dynamical system and the target function depends on a few active variables or a few linear combinations of variables. We approximate the target function by a deep neural network and enforce an adaptive group Lasso constraint to the weights of a suitable hidden layer in order to represent the constraint on the target function. We prove the total loss decay and study the convergence analysis of the proposed framework. Our empirical studies show that the proposed method outperforms recent state-of-the-art methods including the sparse dictionary matrix method, neural networks with or without group Lasso penalty.