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Sheng Gao*, 800 Lakeshore Drive, Birmingham, AL 35229, and **Mingwei Sun**, 800 Lakeshore Drive, Birmingham, AL 35209. *A Penalized Neural Network Process for Viable Selection and Application in Economics.*

Big data represents a new era in data exploration and utilization, which keeps generating large-volume and complex data sets all the time. Many statistical techniques and computer algorithms including deep learning skills have been created to provide new methods of analyzing big data. In this paper, we research the performances of penalized regressions including lasso, elastic net, and ridge and compare with the Ordinary Least Squared(OLS) model in various simulation scenarios. Furthermore, a new method combines the penalized regression with non-linear neural network model is proposed for variable selection and data prediction. Moreover, we investigated the effects of different regression criteria including Mean Square Error(MSE), Akaike's information criterion (AIC), Bayesian information criterion(BIC) and AIC correction (AICc) to the different models. Last but not least, a real-data application is implemented with these models and the result shows our new method has a better performance than the others. (Received September 16, 2019)