

1135-62-2241 **Mingwei Sun*** (msun5@crimson.ua.edu), The University of Alabama, Department of Mathematics, Box 870350, Tuscaloosa, AL 35487, and **Patrick Wang**. *Regression Models with a Universal Penalized Function*.

Regression problems with many potential candidate predictor variables have brought the intense attention of researchers from many disciplines including statistics, biology, medical care, economics and even arts and humanities among which large volume, complex and growing data is generated. Finding an optimal model via statistical model selection to reduce the number of predictors while providing good predictive performance is demanded. Some classic techniques include stepwise deletion and subset selection. However, these procedures ignore stochastic errors inherited in the stages of variable selections and the resulting subset suffers from lack of stability and low prediction accuracy. Penalized least squares provide new approaches to the variable selection problems. In this research, we develop penalized regressions with a universal penalty function and prove that the LASSO and elastic net are special cases of our function. The structure and properties of our penalty are studied and the corresponding algorithms are developed. Simulation studies and real-data support the advantageous performance of the proposed methods. (Received September 25, 2017)