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In synchrony with the current advancement of science and technology, more complex and multi-dimensional data becomes ubiquitous. This status quo is both challenge and incentive for considering variable selection problems in generally ill-defined situations (number of variables in the data exceeding and having no predetermined relationship to the number of observations). In this research, by assuming the framework of a linear model, our principle goal is to identify the relationship between certain outcomes and a few variables from the data set. Considering high to ultra-high dimensional cases, most variables are believed not responsible for expressing the outcome. Hence the objective would be to abandon those irrelevant variables from the data and hold on to only those that are more relevant for expressing the outcome. In order to do so we propose a novel variable selection procedure along with supportive theoretical results. Extensive simulation studies have been performed to illustrate the performance of the proposed methodology in comparison with other familiar methods from the specialty literature. A number of real data sets have been analyzed from the point of view of the predictive performance to defend the novelty of the proposed approach. (Received September 25, 2012)