

## Chapter 19

# Variable Selection Method for Regression Models Using Computational Intelligence Techniques

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### ABSTRACT

*Regression model (RM) is an important tool for modeling and analyzing data. It is one of the popular predictive modeling techniques which explore the relationship between a dependent (target) and independent (predictor) variables. The variable selection method is used to form a good and effective regression model. Many variable selection methods existing for regression model such as filter method, wrapper method, embedded methods, forward selection method, Backward Elimination methods, stepwise methods, and so on. In this chapter, computational intelligence-based variable selection method is discussed with respect to the regression model in cybersecurity. Generally, these regression models depend on the set of (predictor) variables. Therefore, variable selection methods are used to select the best subset of predictors from the entire set of variables. Genetic algorithm-based quick-reduct method is proposed to extract optimal predictor subset from the given data to form an optimal regression model.*

## INTRODUCTION

Describe Variable selection method plays a vital role to select the best subset of predictors. Variable selection method is the process of selection a subset of relevant predictors for fitting the model. In Regression model, variable selection is used to select the best subset of predictors to build the best regression model. Because redundant predictors are occurs in model that changes the behavior of effective predictors and also degree of freedom is misrepresented (Abraham A, 2003). There are many existing in the literature for regression model. Basically, three methods are used to select the variables for regression model. They are graphical represented in figure 1

The figure 2 describes the workflow of variable selection method. Generation Procedure implements a search method. This is used to generate subset of variables (Bjorvand, 1997). Evaluation Procedure is used to halt the process when an optimal subset is reached. Stopping Criterion is tested every iteration to determine whether the variable selection process should continue or not. If stopping condition has been satisfied, then the loop has been terminated. Validation procedure is used to validate the subset of variables (C. B. Lucasius, 1992).

## Filter Methods

Filter feature selection methods apply a statistical measure to allocate a value to each feature. The features are ranked based on the value and also selected or removed from the dataset. The methods are frequently univariate and reflect the feature independently, or with regard to the dependent variable.

Figure 1. Variable selection methods

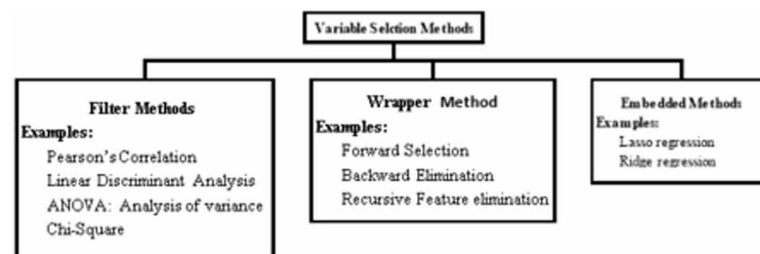
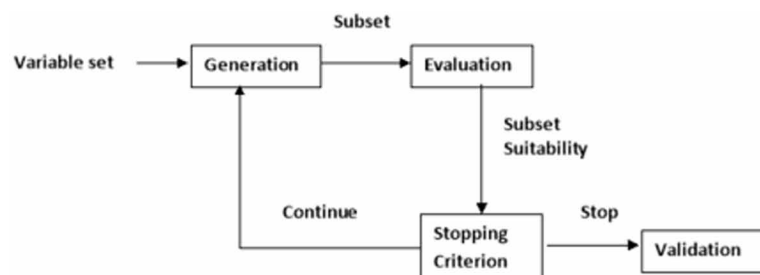


Figure 2. Workflow of variable selection method



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