

Agile Software Effort Estimation Using Regression Techniques

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Abstract : Effort estimation is among the activities carried out in software development processes. An accurate model of estimation leads to project success. The method of agile effort estimation is a complex task because of the dynamic nature of software development. Researchers are still conducting studies on agile effort estimation to enhance prediction accuracy. Due to these reasons, we investigated and proposed a model on LASSO and Elastic Net regression to enhance estimation accuracy. The proposed model has major components: preprocessing, train-test split, training with default parameters, and cross-validation. During the preprocessing phase, the entire dataset is normalized. After normalization, a train-test split is performed on the dataset, setting training at 80% and testing set to 20%. We chose two different phases for training the two algorithms (Elastic Net and LASSO) regression following the train-test-split. In the first phase, the two algorithms are trained using their default parameters and evaluated on the testing data. In the second phase, the grid search technique (the grid is used to search for tuning and select optimum parameters) and 5-fold cross-validation to get the final trained model. Finally, the final trained model is evaluated using the testing set. The experimental work is applied to the agile story point dataset of 21 software projects collected from six firms. The results show that both Elastic Net and LASSO regression outperformed the compared ones. Compared to the proposed algorithms, LASSO regression achieved better predictive performance and has acquired PRED (8%) and PRED (25%) results of 100.0, MMRE of 0.0491, MMER of 0.0551, MdMRE of 0.0593, MdMER of 0.063, and MSE of 0.0007. The result implies LASSO regression algorithm trained model is the most acceptable, and higher estimation performance exists in the literature.

Keywords : agile software development, effort estimation, elastic net regression, LASSO

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