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Intitulé de la thèse

Instance Selection in Maintenance Effort Estimation for Open Source Software

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Abstract: Software maintenance is a laborious activity that takes a significant part of the software's life cycle effort and cost. To deal with this, the software engineering community has devised many maintenance effort estimation models in order to better estimate the effort and therefore contribute to reducing the software cost. Besides, open source software (OSS) project development has gained researchers' interest with the increased use of the Internet. These OSS projects receive a huge number of change requests during maintenance that needs to be addressed daily. For developers, managing all bug reports is challenging, owing to the limited time and human resources. Therefore, the maintenance effort estimation for open source software is challenging considering the absence of OSS effort records and the large size of the available OSS bug reports used for building datasets. To tackle this, researchers' initiatives have sought to better estimate indirect maintenance effort (i.e., not expressed in man–days (or hours)) of such software through a number of empirical studies using instance selection algorithms (ISAs) to minimize the dataset size while keeping its integrity.

The purpose of this thesis is to investigate the impact of instance selection in improving the estimation of maintenance effort in OSS. To achieve this purpose, we provide a useful review of the current studies on this topic, followed by a summary of the current evidence published in the literature regarding the application of ML techniques. The impact of ISAs on the built classifiers' performance was examined using a series of empirical studies. The first study explores the impact of single ISAs, the second one explores the impact of ensemble ISAs, and the third study investigates the impact of ISAs in conjunction with the tuning parameter method in improving the performance of the classifiers.

Keywords:

Instance Selection Algorithm, Machine Learning Technique, Maintenance Effort Estimation, Open Source Software, Ensemble, Tuning Parameter.