Empirical Evaluation of Cross-Release Effort-Aware Defect Prediction Models

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**ABSTRACT**

To prioritize quality assurance efforts, various fault prediction models have been proposed. However, the best performing fault prediction model is unknown due to three major drawbacks: (1) comparison of few fault prediction models considering small number of data sets, (2) use of evaluation measures that ignore testing efforts and (3) use of n-fold cross-validation instead of the more practical cross-release validation. To address these concerns, we conducted cross-release evaluation of 11 fault density prediction models using data sets collected from 2 releases of 25 open source software projects with an effort-aware performance measure known as Norm(Popt). Our result shows that, whilst M5 and K* had the best performances; they were greatly influenced by the percentage of faulty modules present and size of data set. Using Norm(Popt) produced an overall average performance of more than 50% across all the selected models clearly indicating the importance of considering testing efforts in building fault-prone prediction models.

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Research Interests: Defect prediction; Class imbalance learning and Data quality; Bug localization

All are welcome!

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