SVGPM: evolving SVM decision function by using genetic programming to solve imbalanced classification problem

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Abstract In supervised learning, imbalanced class dataset is a state where the class distribution is not uniform among the classes. Most standard classifiers fail to properly identify pattern that belongs to minority class because most of those classifiers are built to minimize the error rate. As a result, a biased classification model is highly anticipated, as higher accuracy metrics can solely be represented by the majority class. In order to tackle this problem, several methods have been proposed, mainly to reduce the classifier's bias, such as performing resampling on the dataset, modification on a classifier optimization problem, or introducing a new optimization task on top of the classifier. Our proposal is based on a new optimization task on top of a classifier, combined

as a part of the learning process. Specifically, a hybrid classifier based on genetic programming and support vector machines is proposed. Our classifier has shown to be competitive enough against several variations of support vector machines in solving imbalanced classification problem from the experimentation carried out.

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