

**Title:**

Heterogeneous Ensemble Classifiers For Malay Syllables Classification

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**Authors :**

Zaridah Mat Zain

Zulkhairi Mohd Yusuf

Muthusamy, Hariharan

Kushsairy Abdul Kadir

Nurul Aida Mohd Mortar

UniKL BMI

**Abstract:**

Traditionally, the approach that has been used in the design of pattern classification was to experimentally assess the performance of several classifiers so that the best one would be chosen. Ensemble classifiers is developed to design a such reliable system with improved accuracy. Recognising that each classifier may make different or complementary errors, the idea is to pool the results from all classifiers to find a composite system that would out-perform any individual (base) classifier. In this way, a single complex classifier may be replaced by a set of relatively simple classifiers. Similarly, the idea of ensemble learning is to employ multiple learners and combine their predictions. Most ensemble methods use a single base learning algorithm to produce homogeneous base learners to produce homogeneous ensembles. Some methods use heterogeneous learners to create heterogeneous ensembles. For ensemble methods to be more accurate than any of its members, the base learners must be as accurate and as diverse as possible. Motivated by this ensemble approach, a heterogeneous ensemble model with different algorithms for members' training is proposed. More specifically, three types of classifiers namely the ELM, SVM and RF have been adopted for classification of Malay syllables. In the process of improving ensemble accuracy and stability, different combination methods are explored. These methods vary in their approach to treat the training data, the type of algorithms used, and the combination methods followed. Diversity among the performance of each single classifier in the ensemble classifiers is also analysed and compared with SD, SI, FI, FD, MI and MD configurations. Based on the obtained results, heterogeneous ensemble method has been successfully proven in improving recognition accuracy on the selected Malay syllables.

**Remark**

You may request full article from the following authors:

Zaridah Mat Zain

[zaridahmz@unikl.edu.my](mailto:zaridahmz@unikl.edu.my)

Assoc. Prof. Dr. Kushsairy Abdul Kadir

[kushsairy@unikl.edu.my](mailto:kushsairy@unikl.edu.my)