

INTISARI

PARAMETER INDEPENDEN PEMBOBOTAN *FUZZY K-NEAREST NEIGHBOR*

Oleh

MAYAWI

19/448809/PPA/05892

Metode klasifikasi *Parameter Independent Fuzzy Weighted k-Nearest Neighbor* (PIFW k NN) sebagai suatu teknik klasifikasi yang dikembangkan dengan menggabungkan salah satu metode *Differential Evolution* (DE) yakni *Succes History based Parameter Adaptive Differential Evolution* (SHADE) dengan *Fuzzy k-Nearest Neighbor* (F k NN). Metode klasifikasi PIFW k NN ini tidak menyatakan optimisasi bobot dan nilai k sebagai dua masalah yang terpisah melainkan digabungkan menjadi satu dan diselesaikan secara bersamaan oleh algoritma SHADE.

Pada penelitian ini dijelaskan terkait langkah-langkah penerapan metode PIFW k NN dan penerapannya pada 10 dataset berbeda yang kemudian dihitung akurasi. Untuk melihat konsistensi kebaikan klasifikasi metode ini, hasil akurasi kemudian akan dibandingkan dengan akurasi metode *k-Nearest Neighbor* (k NN) dan pengembangan metode k NN yang lain yaitu metode F k NN dan *Weighted k-Nearest Neighbor* (W k NN) terhadap 10 dataset yang sama.

Hasil penelitian menunjukkan bahwa rata-rata akurasi dari PIFW k NN, k NN, F k NN dan W k NN sebesar 75,76 %, 68,52%, 71,40% dan 66,22%. Dari hasil tersebut terlihat bahwa rata-rata akurasi metode PIFW k NN lebih tinggi dibanding ketiga metode tersebut. Dengan menggunakan uji *Wilcoxon Sign Rank* (WSR) juga memberikan kesimpulan bahwa dengan tingkat kepercayaan sebesar 95%, rata-rata akurasi PIFW k NN dengan k NN, PIFW k NN dengan F k NN dan PIFW k NN dengan W k NN memiliki perbedaan secara nyata. Lebih lanjut, secara deskriptif menunjukkan bahwa rata-rata rank PIFW k NN lebih tinggi dibanding k NN, F k NN dan W k NN. Dengan demikian, metode klasifikasi PIFW k NN memiliki hasil akurasi yang lebih tinggi dari metode k NN, F k NN dan W k NN.

Kata Kunci: *Parameter Independent Fuzzy Weighted k-Nearest Neighbor, k-Nearest Neighbor, Fuzzy k-Nearest Neighbor, Succes History based Parameter Adaptive Differential Evolution, dan Weighted k-Nearest Neighbor, Wilcoxon Sign Rank*

ABSTRACT

PARAMETER INDEPENDENT FUZZY WEIGHTED K-NEAREST NEIGHBOR

By

MAYAWI

19/448809/PPA/05892

Parameter Independent Fuzzy Weighted k-Nearest Neighbor (PIFWkNN) as a classification technique developed by combining one of the Differential Evolution (DE) methods, namely Success History based Parameter Adaptive Differential Evolution (SHADE) with Fuzzy k-Nearest Neighbor (FkNN) where this PIFWkNN classification method does not state the optimization of weights and k values as two separate problems, but rather they are combined into one and solved simultaneously by the SHADE algorithm.

In this study, the steps for implementing the PIFWkNN method are explained and their application to 10 different datasets and then the accuracy is calculated. To see the consistency of the goodness of classification of this method, the accuracy results are compared with the accuracy of the k-Nearest Neighbor (kNN) method and the development of other kNN methods, namely the FkNN and Weighted k-Nearest Neighbor (WkNN) methods for the same 10 datasets.

The results showed that the average accuracy of PIFWkNN, kNN, FkNN and WkNN was 75.76%, 68.52%, 71.40% and 66.22%. From these results, it can be seen that the average accuracy of the PIFWkNN method is higher than the three methods. Using the Wilcoxon Sign Rank (WSR) test also concluded that with a 95% confidence level, the average accuracy of PIFWkNN with kNN, PIFWkNN with FkNN and PIFWkNN with WkNN had significant differences. Furthermore, it descriptively shows that the average rank of PIFWkNN is higher than kNN, FkNN and WkNN. Thus, the PIFWkNN classification method has higher accuracy than the kNN, FkNN and WkNN methods.

Keywords: *Parameter Independent Fuzzy Weighted k-Nearest Neighbor, k-Nearest Neighbor, Fuzzy k-Nearest Neighbor, Success History based Parameter Adaptive Differential Evolution, and Weighted k-Nearest Neighbor, Wilcoxon Sign Rank*