Adaptif Fuzzy-Neuro Generalized Learning Vector Quantization (FNGLVQ) = Adaptive Fuzzy-Neuro Generalized Learning Vector Quantization (FNGLVQ)

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Abstrak

Telah dilakukan penelitian terhadap pengembangan algoritma FNGLVQ sehingga memiliki karakteristik adaptif terhadap data input sehingga besaran perubahan vektor referensi memiliki besaran nilai yang adaptif. Karakteristik adaptif didapatkan dengan melakukan modifikasi terhadap perubahan update bobot dengan melakukan penurunan fungsi keanggotaan fuzzy tidak hanya terhadap parameter mean (yang dilakukan pada FNGLVQ awal) namun penurunan dilakukan terhadap kedua nilai min dan max sehingga besaran perubahan nilai min dan max akan bervariasi (tidak konstan seperti FNGLVQ) yang tergantung dari besaran input yang digunakan.

Karakteristik ini dapat meningkatkan akurasi dalam percobaan dalam ketiga jenis data, yakni data EKG Aritmia, data pengenalan Aroma dengan 3 campuran, serta data Sleep secara keseluruhan, namun perbedaan nilai akurasi terbesar didapatkan dari pengujian data pengenalan aroma 3 campuran. Pengembangan karakteristik adaptif terhadap algoritma FNGLVQ dilakukan dengan kedua jenis fungsi keanggotaan yakni fungsi keanggotaan segitiga dan fungsi keanggotaan PI, dan FNGLVQ adaptif dengan fungsi keanggotaan PI sedikit lebih baik dibandingkan FNGLVQ adaptif dengan fungsi keanggotaan segitiga.

.....This research has been conducted on the development of FNGLVQ algorithms which have adaptive characteristics to the input data so that the amount of change in the reference vector has a magnitude of adaptive value. Adaptive characteristics are obtained by modifying the update changes the weight by doing a fuzzy membership function derivation. This is not only performed on the parameters of the mean (which is done at the beginning FNGLVQ) but they are derivated to both min and max values so that the amount of change in the weight and is continued with min and max values will vary (not constant as in the case of FNGLVQ) which in turn depends on the amount of inputs used.

These characteristics may increase the accuracy of the experiment in all three types of data, including data Arrhythmia ECG, data recognition Aroma with 3 mix, as well as overall Sleep data, but the biggest difference is the accuracy of values which have obtained from the test for 3 mixed aroma data recognition. Development of adaptive characteristics of the algorithm FNGLVQ has been performed with both types of membership functions namely triangular membership functions and PI membership functions, and FNGLVQ PI adaptive membership functions has been found to be slightly better than FNGLVQ adaptive triangular membership functions.