Improvement of three mixture fragrance recognition using fuzzy similarity based self-organized network inspired by immune algorithm

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Abstrak

To improve the recognition accuracy of a developed artificial odor discrimination system for three mixture fragrance recognition, Fuzzy similarity based Self-Organized Network inspired by Immune Algorithm (F-SONIA) is proposed.Minimum, average, and maximum values of fragrance data acquisition are used to form triangular fuzzy numbers. THen, the fuzzy similarity measure is used to define the relationship between fragrance inputs and connection strengths of hidden units. The fuzzy similarity is defined as the maximum value of the intersection region between triangular fuzzy set of hidden units. In experiments, performances of the proposed method is compared with the conventional self-organized Network inspired by Immune Algorithm (SONIA) and the Fuzzy Learning Vector Quantization (FLVQ). Experiments show that F-SONIA improves recognition accuracy of SONIA by 3-9%. Comparing to the previously developed artificial odor discrimination system that used FLVQ as pattern classifier, the recognition accuracy is increased by 14-15%.